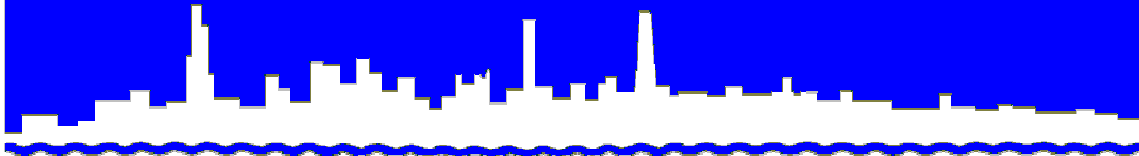


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 09-56

CALUMET WEST SOLIDS MANAGEMENT AREA

MONITORING REPORT

SECOND QUARTER 2009

SEPTEMBER 2009

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.5190

Louis Kollias, P.E., BCEE
Director of Monitoring and Research
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September 4, 2009

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 - Calumet Water Reclamation Plant, Contract No. 85-273-2P, L170401, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-1, Monitoring Report for April, May, and June 2009

The attached four tables contain the monitoring data for the Calumet East Solids Management Area for April, May, and June 2009 as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2005-AO-4281-1.

The data reported are as follows:

Table 1, Analysis of Water from Lysimeters L-1N through L-6N at the Calumet East Solids Management Area Sampled on April 1, 2009

Table 2, Analysis of Water from Lysimeters L-1N through L-6N at the Calumet East Solids Management Area Sampled on May 13, 2009

Table 3, Analysis of Water from Lysimeters L-1N through L-6N at the Calumet East Solids Management Area Sampled on June 10, 2009

Table 4, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area during June 2009

Four new lysimeters, L-2N, L-3N, L-4N, and L-6N, were installed at this site in September 2008 as replacements for L-2, L-3, L-4, and L-6, respectively. The new and old

Mr. S. Alan Keller

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lysimeters will be monitored simultaneously for one year. A request will then be submitted to the IEPA to terminate monitoring of the old lysimeters.

No biosolids were placed in the solids drying area during April, May, and June 2009. Biosolids were removed from the solids drying area during June 2009.

Very truly yours,

Louis Kollias
Director
Monitoring and Research

LK:PL:kq
Attachments
cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 1, 2009

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-2N	L-3
pH ¹		7.7	7.9	7.8	12	8.0
EC	mS/m	310	298	359	251	348
Total Dissolved Solids	mg/L	2,776	2,704	3,296	1,536	3,236
Total Diss. Org. Carbon	"	2	4	2	8	2
Cl ⁻	"	121	47	37	48	31
SO ₄ ⁼	"	1,455	1,468	1,884	683	1,858
TKN	"	0.4	0.8	0.4	4	0.3
NH ₃ -N	"	<0.1	0.6	<0.1	3	0.2
NO ₂ + NO ₃ -N	"	0.3	0.2	0.5	<0.1	0.6
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	153	192	187	249	164
Al	"	0.087	0.089	0.103	0.445	0.181
Ca	"	277	284	361	217	335
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	0.65	0.03	0.05	<0.02	<0.02
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	7	17	8	42	8
Mg	"	121	150	186	6.6	160
Mn	"	0.145	0.043	0.042	<0.001	0.011
Na	"	218	131	185	176	188
Ni	"	<0.002	<0.002	0.005	0.015	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	<0.01	0.05	<0.01	<0.01

TABLE 1 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 1, 2009

Parameter	Unit	Lysimeter No. L-3N
pH ¹		7.8
EC	mS/m	321
Total Dissolved Solids	mg/L	3,464
Total Diss. Org. Carbon	"	2
Cl ⁻	"	79
SO ₄ ⁼	"	1,745
TKN	"	1
NH ₃ -N	"	0.9
NO ₂ + NO ₃ -N	"	<0.1
Total P	"	<0.25
Alkalinity as CaCO ₃	"	255
Al	"	0.105
Ca	"	366
Cd	"	<0.002
Cr	"	<0.003
Cu	"	<0.01
Fe	"	0.36
Hg	μg/L	<0.20
K	mg/L	11
Mg	"	185
Mn	"	0.385
Na	"	191
Ni	"	<0.002
Pb	"	<0.02
Zn	"	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 13, 2009

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-2N	L-3
pH ¹		7.5	7.9	7.6	12	7.6
EC	mS/m	301	219	275	194	299
Total Dissolved Solids	mg/L	2,808	2,740	3,328	1,532	3,316
Total Diss. Org. Carbon	"	3	3	3	9	2
Cl ⁻	"	119	50	35	49	33
SO ₄ ⁼	"	1,621	1,548	2,113	730	2,004
TKN	"	0.8	1	0.7	3	<0.2
NH ₃ -N	"	0.3	0.6	0.2	3	<0.1
NO ₂ + NO ₃ -N	"	0.3	<0.1	0.3	<0.1	0.4
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	169	218	195	232	169
Al	"	0.060	0.062	0.072	0.200	0.070
Ca	"	299	290	360	214	358
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	2.9	0.24	0.16	<0.02	<0.02
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	8	16	8	43	7
Mg	"	136	157	187	6.0	184
Mn	"	0.136	0.064	0.117	0.002	0.044
Na	"	205	133	178	181	183
Ni	"	<0.002	<0.002	0.006	0.016	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	0.02	<0.01	0.05	<0.01	<0.01

TABLE 2 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 13, 2009

Parameter	Unit	Lysimeter No. L-3N
pH ¹		
EC	mS/m	
Total Dissolved Solids	mg/L	
Total Diss. Org. Carbon	"	
Cl ⁻	"	
SO ₄ ⁼	"	
TKN	"	
NH ₃ -N	"	L
NO ₂ + NO ₃ -N	"	Y
Total P	"	S
Alkalinity as CaCO ₃	"	I
		M
Al	"	E
Ca	"	T
Cd	"	E
Cr	"	R
Cu	"	
		D
Fe	"	R
Hg	μg/L	Y
K	mg/L	
Mg	"	
Mn	"	
Na	"	
Ni	"	
Pb	"	
Zn	"	

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 10, 2009

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-2N	L-3
pH ¹			7.9	7.6	11	7.8
EC	mS/m		247	276	162	275
Total Dissolved Solids	mg/L		2,660	3,308	1,432	3,204
Total Diss. Org. Carbon	"	L	3	3	9	2
Cl ⁻	"	Y	42	33	43	29
SO ₄ ⁼	"	S	1,488	1,920	747	1,877
		I				
TKN	"	M	1	0.5	4	0.7
NH ₃ -N	"	E	0.6	<0.1	3	0.3
NO ₂ + NO ₃ -N	"	T	0.2	0.6	<0.1	0.8
Total P	"	E	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	R	213	186	136	158
Al	"	I	0.059	0.072	0.249	0.101
Ca	"	N	282	368	192	345
Cd	"	A	<0.002	<0.002	<0.002	<0.002
Cr	"	C	<0.003	<0.003	<0.003	<0.003
Cu	"	C	<0.01	<0.01	<0.01	<0.01
		E				
Fe	"	S	0.08	<0.02	<0.02	<0.02
Hg	μg/L	S	<0.20	<0.20	<0.20	<0.20
K	mg/L	I	16	9	42	9
Mg	"	B	160	193	7.1	173
Mn	"	L	0.055	0.093	0.003	0.029
		E				
Na	"		133	180	184	184
Ni	"		<0.002	0.005	0.016	<0.002
Pb	"		<0.02	<0.02	<0.02	<0.02
Zn	"		<0.01	0.05	<0.01	<0.01

TABLE 3 (Continued): ANALYSIS OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 10, 2009

Parameter	Unit	Lysimeter No.
		L-3N
pH ¹		7.8
EC	mS/m	275
Total Dissolved Solids	mg/L	3,316
Total Diss. Org. Carbon	"	3
Cl ⁻	"	42
SO ₄ ⁼	"	1,888
TKN	"	2
NH ₃ -N	"	0.8
NO ₂ + NO ₃ -N	"	<0.1
Total P	"	<0.25
Alkalinity as CaCO ₃	"	248
Al	"	0.076
Ca	"	352
Cd	"	<0.002
Cr	"	<0.003
Cu	"	<0.01
Fe	"	0.46
Hg	μg/L	<0.20
K	mg/L	11
Mg	"	189
Mn	"	0.403
Na	"	185
Ni	"	<0.002
Pb	"	<0.02
Zn	"	<0.01

¹pH analyzed beyond recommended holding time of 15 minutes.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
 BIOSOLIDS PLACED IN THE CALUMET WEST
 SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2009

Parameter	Unit	Concentration ¹
pH		7.8
Total Solids	%	<20.0
Total Volatile Solids ²	%	44.6
TKN	mg/kg	43,799
NH ₃ -N	”	12,476

¹Values are the means of five samples.

²Total volatile solids as a percentage of total solids.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE CALUMET WEST
SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2009

Parameter	Unit	Concentration ¹
pH		6.5
Total Solids	%	56.9
Total Volatile Solids ²	%	36.5
TKN	mg/kg	17,487
NH ₃ -N	”	100
Total P	”	21,937
Al	”	10,193
As	”	<8.6
Ca	”	48,773
Cd	”	4
Cr	”	79
Cu	”	458
Fe	”	25,311
Hg	”	3.3
K	”	1,384
Mg	”	16,809
Mn	”	1,040
Mo	”	12
Na	”	<171
Ni	”	35
Pb	”	126
Se	”	<11.4
Zn	”	1,111

¹Values are the means of four samples.

²Total volatile solids as a percentage of total solids.