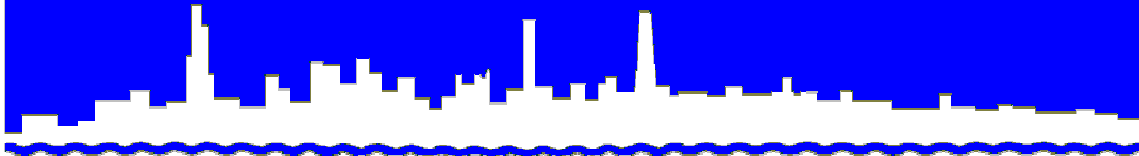


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 09-67

CALUMET WEST SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

THIRD QUARTER 2009

DECEMBER 2009

Protecting Our Water Environment

Board of Commissioners

Terrence J. O'Brien
President
Kathleen Therese Meany
Vice President
Gloria Alitto Majewski
Chairman of Finance
Frank Avila
Patricia Horton
Barbara J. McGowan
Cynthia M. Santos
Debra Shore
Mariyana T. Spyropoulos

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

louis.kollias@mwr.org

December 3, 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 West Solids Management Area - Calumet Water Reclamation Plant, Contract No. 84-270-2P, C175399, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-2, Monitoring Report for July, August, and September 2009

The attached eight tables contain the monitoring data for the Calumet West Solids Management Area for July, August, and September 2009 as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2005-AO-4281-2.

The data reported are as follows:

- Table 1, Analysis of Water from Lysimeters L-1 through L-3N at the Calumet West Solids Management Area Sampled on July 8, 2009
- Table 2, Analysis of Water from Lysimeters L-1 through L-3N at the Calumet West Solids Management Area Sampled on August 5, 2009
- Table 3, Analysis of Water from Lysimeters L-1 through L-3N at the Calumet West Solids Management Area Sampled on September 2, 2009
- Table 4, Analysis of Monthly Compositated Digested Biosolids Placed in the Calumet West Solids Management Drying Area During July 2009
- Table 5, Analysis of Monthly Compositated Digested Biosolids Placed in the Calumet West Solids Management Drying Area During September 2009

Subject: Calumet West Solids Management Area - Calumet Water Reclamation Plant, Contract No. 84-270-2P, C175399, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-2, Monitoring Report for July, August, and September 2009

Table 6, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Calumet West Solids Management Drying Area During July 2009

Table 7, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Calumet West Solids Management Drying Area During August 2009

Table 8, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Calumet West Solids Management Drying Area During September 2009

Three new lysimeters, L-1N, L-2N, and L-3N, were installed at this site in September 2008 as replacements for L-1, L-2, and L-3, respectively. The new and old lysimeters will be monitored simultaneously for one year. A request will then be submitted to the IEPA to terminate monitoring of the old lysimeters.

Biosolids were placed in the solids drying area during July and September 2009. Biosolids were removed from the solids drying area during July, August, and September 2009.

Very truly yours,

Louis Kollias
Director
Monitoring and Research

LK:PL:kq
Attachments
cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA
Granato/O'Connor/Cox/Lindo

TABLE 1: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON JULY 8, 2009

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-2N	L-3
pH ²		7.8	7.9	7.7	11	8.0
EC	mS/m	284	268	317	149	326
Total Dissolved Solids	mg/L	NA	2,684	3,344	1,620	3,212
Total Diss. Org. Carbon	"	<1	2	2	8	2
Cl ⁻	"	61	44	33	43	30
SO ₄ ⁼	"	712	1,511	1,917	905	1,933
TKN	"	<0.2	0.8	<0.2	3	0.3
NH ₃ -N	"	<0.1	0.6	<0.1	2	0.2
NO ₂ + NO ₃ -N	"	0.41	0.05	0.58	0.11	0.60
Total P	"	<0.1	<0.1	<0.1	<0.1	<0.1
Alkalinity as CaCO ₃	"	69	225	189	97	160
Al	"	<0.035	0.047	0.053	0.230	0.083
Ca	"	139	288	357	212	339
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	<0.02	0.16	<0.02	<0.02	<0.02
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	15	9	34	8
Mg	"	61	156	189	29	168
Mn	"	0.087	0.068	0.058	0.005	0.020
Na	"	101	138	175	176	179
Ni	"	<0.002	<0.002	0.006	0.015	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	0.03	<0.01	<0.01

TABLE 1 (Continued): ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON JULY 8, 2009

Parameter	Unit	Lysimeter No. L-3N
pH ²		7.8
EC	mS/m	327
Total Dissolved Solids	mg/L	3,476
Total Diss. Org. Carbon	"	3
Cl ⁻	"	46
SO ₄ ⁼	"	2,016
TKN	"	1
NH ₃ -N	"	0.9
NO ₂ + NO ₃ -N	"	0.79
Total P	"	<0.1
Alkalinity as CaCO ₃	"	247
Al	"	0.060
Ca	"	368
Cd	"	<0.002
Cr	"	<0.0025
Cu	"	<0.01
Fe	"	1.0
Hg	μg/L	<0.20
K	mg/L	11
Mg	"	204
Mn	"	0.399
Na	"	192
Ni	"	<0.002
Pb	"	<0.02
Zn	"	0.02

¹Limit of quantitation (LOQ) instead of MDL was used as reporting limit.

²pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

TABLE 2: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON AUGUST 5, 2009

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-2N	L-3
pH ²		7.8	7.8	7.8	11	7.9
EC	mS/m	287	271	323	202	317
Total Dissolved Solids	mg/L	1,144	2,836	3,468	1,552	3,380
Total Diss. Org. Carbon	"	<1	4	3	9	<1
Cl ⁻	"	55	39	33	44	30
SO ₄ ⁼	"	794	1,538	1,973	820	1,954
TKN	"	<0.2	0.7	<0.2	3	<0.2
NH ₃ -N	"	<0.1	0.6	<0.1	3	<0.1
NO ₂ + NO ₃ -N	"	<0.04	<0.04	<0.04	<0.04	<0.04
Total P	"	<0.1	<0.1	0.6	<0.1	0.5
Alkalinity as CaCO ₃	"	78	241	195	142	142
Al	"	0.049	0.084	0.099	0.279	0.091
Ca	"	148	285	370	212	358
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Cu	"	<0.01	<0.01	<0.01	<0.01	<0.01
Fe	"	<0.02	0.16	<0.02	<0.02	<0.02
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	4	15	9	38	6
Mg	"	68	162	191	8.0	175
Mn	"	0.047	0.070	0.052	0.004	0.028
Na	"	97	135	180	183	187
Ni	"	<0.002	<0.002	0.005	0.014	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	<0.01	0.02	0.03	<0.01	<0.01

TABLE 2 (Continued): ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON AUGUST 5, 2009

Parameter	Unit	Lysimeter No. L-3N
pH ²		7.9
EC	mS/m	343
Total Dissolved Solids	mg/L	3,672
Total Diss. Org. Carbon	"	2
Cl ⁻	"	46
SO ₄ ⁼	"	2,016
TKN	"	0.9
NH ₃ -N	"	0.9
NO ₂ + NO ₃ -N	"	<0.04
Total P	"	<0.1
Alkalinity as CaCO ₃	"	253
Al	"	0.094
Ca	"	378
Cd	"	<0.002
Cr	"	<0.0025
Cu	"	<0.01
Fe	"	0.98
Hg	μg/L	<0.20
K	mg/L	10
Mg	"	216
Mn	"	0.370
Na	"	192
Ni	"	<0.002
Pb	"	<0.02
Zn	"	0.02

¹Limit of quantitation (LOQ) instead of MDL was used as reporting limit.

²pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON SEPTEMBER 2, 2009

Parameter	Unit	Lysimeter No.					L-3
		L-1	L-1N	L-2	L-2N		
pH ²		7.7	8.0	7.9	11		
EC	mS/m	275	285	309	181		
Total Dissolved Solids	mg/L	2,828	2,748	3,088	1,660		
Total Diss. Org. Carbon	"	2	3	3	9		
Cl ⁻	"	106	37	31	35		
SO ₄ ⁼	"	1,611	1,556	2,002	904		
TKN	"	<0.2	0.6	<0.2	3		
NH ₃ -N	"	<0.1	0.6	<0.1	3		L
NO ₂ + NO ₃ -N	"	0.15	0.06	0.43	0.06		Y
Total P	"	<0.1	<0.1	<0.1	<0.1		S
Alkalinity as CaCO ₃	"	147	215	184	103		I
							M
Al	"	0.103	0.100	0.112	0.248		E
Ca	"	315	296	361	234		T
Cd	"	<0.002	<0.002	<0.002	<0.002		E
Cr	"	0.0032	0.0032	0.0031	<0.0025		R
Cu	"	<0.01	<0.01	<0.01	<0.01		D
Fe	"	0.63	0.21	<0.02	<0.02		R
Hg	μg/L	<0.20	<0.20	<0.20	<0.20		Y
K	mg/L	7	15	8	36		
Mg	"	139	163	186	14		
Mn	"	0.123	0.066	0.085	0.005		
Na	"	198	137	170	181		
Ni	"	<0.002	<0.002	0.004	0.013		
Pb	"	<0.02	<0.02	<0.02	<0.02		
Zn	"	0.02	0.02	0.03	<0.01		

TABLE 3 (Continued): ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON SEPTEMBER 2, 2009

Parameter	Unit	Lysimeter No. L-3N
pH ²		7.8
EC	mS/m	320
Total Dissolved Solids	mg/L	3,616
Total Diss. Org. Carbon	"	2
Cl ⁻	"	47
SO ₄ ⁼	"	2,016
TKN	"	1
NH ₃ -N	"	0.9
NO ₂ + NO ₃ -N	"	<0.04
Total P	"	<0.1
Alkalinity as CaCO ₃	"	250
Al	"	0.113
Ca	"	378
Cd	"	<0.002
Cr	"	0.0038
Cu	"	<0.01
Fe	"	3.0
Hg	μg/L	<0.20
K	mg/L	11
Mg	"	215
Mn	"	0.369
Na	"	187
Ni	"	<0.002
Pb	"	<0.02
Zn	"	<0.01

¹Limit of quantitation (LOQ) instead of MDL was used as reporting limit.

²pH 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 JULY 2009

Parameter	Unit	Concentration ¹
pH		7.7
Total Solids	%	<20.0
Total Volatile Solids ²	%	45.5
TKN	mg/kg	27,253
NH ₃ -N	”	7,633

¹Values are the means of five samples.

²Total volatile solids as a percentage of total solids.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
BIOSOLIDS PLACED IN THE CALUMET WEST
SOLIDS MANAGEMENT DRYING AREA DURING SEPTEMBER 2009

Parameter	Unit	Concentration ¹
pH		7.8
Total Solids	%	<20.0
Total Volatile Solids ²	%	42.5
TKN	mg/kg	40,709
NH ₃ -N	”	8,527

¹Values are the means of seven samples.

²Total volatile solids as a percentage of total solids.

TABLE 6: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE CALUMET WEST
SOLIDS MANAGEMENT DRYING AREA DURING JULY 2009

Parameter	Unit	Concentration ¹
pH		6.7
Total Solids	%	80.9
Total Volatile Solids ²	%	37.0
TKN	mg/kg	7,377
NH ₃ -N	”	157
Total P	”	9,764
Al	”	13,307
As	”	10
Ca	”	54,974
Cd	”	4
Cr	”	92
Cu	”	493
Fe	”	28,303
Hg	”	0.99
K	”	2,293
Mg	”	20,004
Mn	”	1,137
Mo	”	13
Na	”	NA
Ni	”	37
Pb	”	128
Se	”	<11.4
Zn	”	1,155

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

NA = No analysis; insufficient sample.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE CALUMET WEST
SOLIDS MANAGEMENT DRYING AREA DURING AUGUST 2009

Parameter	Unit	Concentration ¹
pH		7.1
Total Solids	%	85.9
Total Volatile Solids ²	%	43.4
TKN	mg/kg	25,501
NH ₃ -N	"	2,454
Total P	"	23,679
Al	"	15,795
As	"	10
Ca	"	54,649
Cd	"	4
Cr	"	107
Cu	"	432
Fe	"	25,835
Hg	"	1.2
K	"	3,873
Mg	"	18,083
Mn	"	951
Mo	"	15
Na	"	1,692
Ni	"	48
Pb	"	109
Se	"	<11.4
Zn	"	1,065

¹Values for one sample only.

²Total volatile solids as a percentage of total solids.

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
 BIOSOLIDS REMOVED FROM THE CALUMET WEST
 SOLIDS MANAGEMENT DRYING AREA DURING SEPTEMBER 2009

Parameter	Unit	Concentration ¹
pH		7.0
Total Solids	%	72.6
Total Volatile Solids ²	%	41.9
TKN	mg/kg	27,117
NH ₃ -N	”	2,311
Total P	”	27,273
Al	”	13,267
As	”	<8.6
Ca	”	52,084
Cd	”	4
Cr	”	96
Cu	”	463
Fe	”	26,392
Hg	”	1.2
K	”	3,242
Mg	”	16,966
Mn	”	975
Mo	”	15
Na	”	1,219
Ni	”	45
Pb	”	113
Se	”	<11.4
Zn	”	1,061

¹Values are the means of eight samples.

²Total volatile solids as a percentage of total solids.