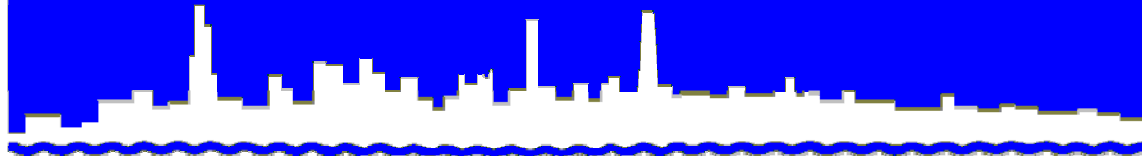


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 09-14

CALUMET EAST SOLIDS MANAGEMENT AREA

MONITORING REPORT

FOURTH QUARTER 2008

MARCH 2009

Protecting Our Water Environment

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

March 12, 2009

Mr. S. Allan 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 October, November, and December 2008

The attached six tables contain the monitoring data for the Calumet East Solids Management Area (SMA) for October, November, and December, 2008 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-6 at the Calumet East SMA Sampled on October 6, 2008

Table 2, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East SMA Sampled on November 12, 2008

Table 3, Analysis of Water from Lysimeters L-1N through L-6 at the Calumet East SMA Sampled on December 10, 2008

Table 4, Analysis of Monthly Compositated Digested Biosolids Placed in the Calumet East Solids Management Drying Area During October 2008

Table 5, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During October 2008

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 October, November, and December 2008

Table 6, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During November 2008

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 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 October 2008. Biosolids were removed from the solids drying area during October, and November 2008.

Very truly yours,

Louis Kollias
Director
Monitoring and Research

LK:PL:kq
Attachments
cc: Mr. R. Sulski, IEPA
Records Unit, IEPA
Stuba/Granato/Cox/Lindo/M. Patel

TABLE 1: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 6, 2008

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH ²		7.4	7.2	7.3	7.0	7.3
EC	mS/m	399	358	165	385	150
Total Dissolved Solids	mg/L	4,236	2,024	1,636	4,064	1,664
Total Diss. Org. Carbon	"	7	<1	6	2	<1
Cl ⁻	"	161	81	35	493	212
SO ₄ ⁼	"	2,081	988	540	1,576	515
TKN	"	13	<0.2	0.6	0.9	0.5
NH ₃ -N	"	5	<0.1	<0.1	0.3	0.3
NO ₂ + NO ₃ -N	"	0.3	0.4	0.5	0.3	0.4
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	490	203	411	327	200
Al	"	0.063	0.048	0.037	0.094	0.060
Ca	"	491	257	185	490	202
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	"	12	<0.02	0.14	9.3	2.0
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	10	3	2	6	4
Mg	"	283	125	115	263	95
Mn	"	0.259	0.003	0.008	0.160	0.057
Na	"	180	68	51	148	85
Ni	"	<0.002	<0.002	<0.002	<0.002	<0.002
Pb	"	<0.02	<0.02	<0.02	<0.02	<0.02
Zn	"	0.02	0.03	<0.01	<0.01	<0.01

TABLE 1 (Continued): ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 6, 2008

Parameter	Unit	Lysimeter No.
		L-6
pH ²		8.0
EC	mS/m	138
Total Dissolved Solids	mg/L	NA
Total Diss. Org. Carbon	"	NA
Cl ⁻	"	NA
SO ₄ ⁼	"	NA
TKN	"	NA
NH ₃ -N	"	NA
NO ₂ + NO ₃ -N	"	NA
Total P	"	NA
Alkalinity as CaCO ₃	"	NA
Al	"	NA
Ca	"	NA
Cd	"	NA
Cr	"	NA
Cu	"	NA
Fe	"	NA
Hg	μg/L	NA
K	mg/L	NA
Mg	"	NA
Mn	"	NA
Na	"	NA
Ni	"	NA
Pb	"	NA
Zn	"	NA

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-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 12, 2008

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-3	L-4	L-5
pH ²		7.2	7.3	7.4	7.1	7.5
EC	mS/m	407	405	176	444	194
Total Dissolved Solids	mg/L	4,080	3,996	1,624	4,076	1,604
Total Diss. Org. Carbon	"	10	8	6	2	<1
Cl ⁻	"	186	169	36	530	225
SO ₄ ⁼	"	2,047	2,078	574	1,641	531
TKN	"	15	1	0.4	1	0.5
NH ₃ -N	"	3	<0.1	<0.1	0.5	0.4
NO ₂ + NO ₃ -N	"	<0.1	2	<0.1	0.2	0.2
Total P	"	<0.25	<0.25	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	559	434	455	377	239
Al	"	0.061	0.069	<0.035	0.061	<0.035
Ca	"	473	543	192	487	191
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	"	12	<0.02	<0.02	13	2.2
Hg	μg/L	<0.20	<0.20	<0.20	<0.20	<0.20
K	mg/L	11	6	2	6	4
Mg	"	269	241	114	255	89
Mn	"	0.300	0.015	0.002	0.129	0.052
Na	"	175	136	51	145	81
Ni	"	<0.002	<0.002	<0.002	<0.002	<0.002
Pb	"	0.04	0.04	0.04	0.04	0.04
Zn	"	<0.01	0.02	<0.01	<0.01	<0.01

TABLE 2 (Continued): ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1N THROUGH L-6 AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 12, 2008

Parameter	Unit	Lysimeter No. L-6
pH ²		
EC	mS/m	
Total Dissolved Solids	mg/L	
Total Diss. Org. Carbon	"	L
Cl ⁻	"	Y
SO ₄ ⁼	"	S
		I
TKN	"	M
NH ₃ -N	"	E
NO ₂ + NO ₃ -N	"	T
Total P	"	E
Alkalinity as CaCO ₃	"	R
Al	"	I
Ca	"	N
Cd	"	A
Cr	"	C
Cu	"	C
		E
Fe	"	S
Hg	μg/L	S
K	mg/L	I
Mg	"	B
Mn	"	L
		E
Na	"	
Ni	"	
Pb	"	
Zn	"	

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-1N THROUGH L-6N AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 10, 2008

Parameter	Unit	Lysimeter No.				
		L-1N	L-2	L-2N	L-3	L-3N
pH ²			7.3	7.4	7.4	
EC	mS/m		243	270	163	
Total Dissolved Solids	mg/L		2,068	3,288	1,504	
Total Diss. Org. Carbon	"		2	NA	7	
Cl ⁻	"		88	191	36	
SO ₄ ⁼	"		1,083	1,394	550	
		L				L
TKN	"	Y	0.4	9	0.5	Y
NH ₃ -N	"	S	<0.1	4	<0.1	S
NO ₂ + NO ₃ -N	"	I	<0.1	<0.1	<0.1	I
Total P	"	M	<0.25	3.3	<0.25	M
Alkalinity as CaCO ₃	"	E	210	563	475	E
		T				T
Al	"	E	0.044	0.059	0.041	E
Ca	"	R	283	473	198	R
Cd	"		<0.002	<0.002	<0.002	
Cr	"	F	<0.003	<0.003	<0.003	F
Cu	"	R	<0.01	<0.01	<0.01	R
		O				O
Fe	"	Z	<0.02	16	0.16	Z
Hg	μg/L	E	<0.20	<0.20	<0.20	E
K	mg/L	N	3	23	3	N
Mg	"		135	199	118	
Mn	"		0.004	1.70	0.067	
Na	"		75	119	52	
Ni	"		<0.002	0.015	<0.002	
Pb	"		0.05	0.05	0.05	
Zn	"		<0.01	<0.01	<0.01	

TABLE 3 (Continued): ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1N THROUGH L-6N AT THE CALUMET EAST
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 10, 2008

Parameter	Unit	Lysimeter No.					
		L-4	L-4N	L-5	L-6	L-6N	
pH ²							7.8
EC	mS/m						95
Total Dissolved Solids	mg/L						796
Total Diss. Org. Carbon	"				L		11
Cl ⁻	"				Y		24
SO ₄ ⁼	"				S		198
		L	L	L	I		
TKN	"	Y	Y	Y	M		2
NH ₃ -N	"	S	S	S	E		1
NO ₂ + NO ₃ -N	"	I	I	I	T		<0.1
Total P	"	M	M	M	E		7.8
Alkalinity as CaCO ₃	"	E	E	E	R		308
		T	T	T			
Al	"	E	E	E	I		<0.035
Ca	"	R	R	R	N		116
Cd	"				A		<0.002
Cr	"	F	F	F	C		<0.003
Cu	"	R	R	R	C		<0.01
		O	O	O	E		
Fe	"	Z	Z	Z	S		0.28
Hg	μg/L	E	E	E	S		<0.20
K	mg/L	N	N	N	I		7
Mg	"				B		46
Mn	"				L		0.068
					E		
Na	"						48
Ni	"						<0.002
Pb	"						0.05
Zn	"						<0.01

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 4: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
BIOSOLIDS PLACED IN THE CALUMET EAST
SOLIDS MANAGEMENT DRYING AREA DURING OCTOBER 2008

Parameter	Unit	Concentration ¹
pH		7.7
Total Solids	%	9.3
Total Volatile Solids ²	%	42.2
TKN	mg/kg	34,856
NH ₃ -N	”	7,394

¹Values are the means of two samples.

²Total volatile solids as a percentage of total solids.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE CALUMET EAST
SOLIDS MANAGEMENT DRYING AREA DURING OCTOBER 2008

Parameter	Unit	Concentration ¹
pH		7.6
Total Solids	%	38.8
Total Volatile Solids ²	%	43.9
TKN	mg/kg	32,243
NH ₃ -N	”	4,123
Total P	”	162
Al	”	17,828
As	”	10
Ca	”	48,981
Cd	”	4
Cr	”	95
Cu	”	421
Fe	”	31,617
Hg	”	1.3
K	”	4,032
Mg	”	16,262
Mn	”	1,020
Mo	”	17
Na	”	797
Ni	”	40
Pb	”	117
Se	”	<11.4
Zn	”	1,170

¹Values are the means of four samples.

²Total volatile solids as a percentage of total solids.

TABLE 6: ANALYSIS¹ OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE CALUMET EAST SOLIDS MANAGEMENT DRYING AREA DURING NOVEMBER 2008

Parameter	Unit	Concentration
pH		8.0
Total Solids	%	27.4
Total Volatile Solids ²	%	46.4
TKN	mg/kg	35,693
NH ₃ -N	"	5,898
Total P	"	40
Al	"	16,915
As	"	11
Ca	"	45,739
Cd	"	4
Cr	"	79
Cu	"	401
Fe	"	33,642
Hg	"	0.87
K	"	3,901
Mg	"	16,307
Mn	"	1,085
Mo	"	16
Na	"	1,112
Ni	"	38
Pb	"	114
Se	"	<11.4
Zn	"	1,133

¹Values are the means of two samples.

²Total volatile solids as a percentage of total solids.