

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***MONITORING AND RESEARCH
DEPARTMENT***

REPORT NO. 09-15

CALUMET WEST SOLIDS MANAGEMENT AREA

MONITORING REPORT

FOURTH QUARTER 2008

MARCH 2009

Protecting Our Water Environment

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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 West Solids Management Area – Calumet Water Reclamation Plant, Contract No. 84-270-2P, C175399, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-1, Monitoring Report for October, November and December 2008

The attached seven tables contain the monitoring data for the Calumet West 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 are reported as follows:

Table 1, Analysis of Water from Lysimeters L-1 through L-3 at the Calumet West SMA Sampled on October 6, 2008

Table 2, Analysis of Water from Lysimeters L-1 through L-3 at the Calumet West SMA Sampled on November 12, 2008

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

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

Table 5, Analysis of Monthly Compositing Digested Biosolids Placed in the Calumet West Solids Management Drying Area During November 2008

Subject: Calumet West Solids Management Area – Calumet Water Reclamation Plant, Contract No. 84-270-2P, C175399, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-1, Monitoring Report for October, November and December 2008

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

Table 7, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Calumet West Solids Management Drying Area During November 2008

The 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 and removed from the solids drying area during October and November 2008.

Very truly yours,

Louis Kollias
Director
Monitoring and Research

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

Subject: Calumet West Solids Management Area - Calumet WRP, Contract No. 84-270-2P, C175399, IEPA Permit No. 2005-AO-4281-1, Monitoring Report for October, November, and December 2008

Table 7, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Calumet West Solids Management Drying Area During November 2008

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

Very truly yours,

Louis Kollias
Director
Research and Development

LK:PL:kq

Attachments

cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA
Stuba/Granato/Cox/Lindo/M. Patel

cc wo/att: Jamjun/Sharma/Garelli

TABLE 1: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3 AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 6, 2008

Parameter	Unit	Lysimeter No.		
		L-1	L-2	L-3
pH ²		7.5	7.6	7.6
EC	mS/m	296	307	304
Total Dissolved Solids	mg/L	2,916	3,296	3,408
Total Diss. Org. Carbon	"	<1	<1	<1
Cl ⁻	"	100	34	26
SO ₄ ⁼	"	1,410	1,700	1,810
TKN	"	0.4	<0.2	<0.2
NH ₃ -N	"	0.4	<0.1	<0.1
NO ₂ + NO ₃ -N	"	0.3	0.6	0.5
Total P	"	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	141	158	136
Al	"	<0.035	<0.035	<0.035
Ca	"	303	364	375
Cd	"	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01
Fe	"	2.2	0.09	<0.02
Hg	μg/L	<0.25	<0.25	<0.25
K	mg/L	7	8	6
Mg	"	139	186	190
Mn	"	0.146	0.086	0.028
Na	"	208	183	183
Ni	"	<0.002	0.005	<0.002
Pb	"	<0.02	<0.02	<0.02
Zn	"	<0.01	0.05	<0.01

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

²pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3 AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 12, 2008

Parameter	Unit	Lysimeter No.		
		L-1	L-2	L-3
pH ²		7.5	7.7	7.8
EC	mS/m	303	329	325
Total Dissolved Solids	mg/L	2,836	3,292	NA
Total Diss. Org. Carbon	"	2	2	NA
Cl ⁻	"	118	34	16
SO ₄ ⁼	"	1,500	1,925	NA
TKN	"	0.9	0.6	<0.2
NH ₃ -N	"	0.3	0.2	<0.1
NO ₂ + NO ₃ -N	"	0.2	0.2	0.2
Total P	"	<0.25	<0.25	<0.25
Alkalinity as CaCO ₃	"	158	182	72
Al	"	0.041	0.057	<0.035
Ca	"	288	365	178
Cd	"	<0.002	<0.002	<0.002
Cr	"	<0.003	<0.003	<0.003
Cu	"	<0.01	<0.01	<0.01
Fe	"	2.5	0.22	<0.02
Hg	μg/L	<0.20	0.26	<0.20
K	mg/L	7	8	3
Mg	"	130	183	88
Mn	"	0.151	0.140	0.013
Na	"	210	179	90
Ni	"	<0.002	0.005	<0.002
Pb	"	0.04	0.03	0.04
Zn	"	0.04	0.06	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 3: ANALYSIS¹ OF WATER FROM LYSIMETERS
L-1 THROUGH L-3N AT THE CALUMET WEST
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 10, 2008

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-2N	L-3
pH ²		7.5				7.5
EC	mS/m	243				257
Total Dissolved Solids	mg/L	2,796				3,292
Total Diss. Org. Carbon	"	<1				<1
Cl ⁻	"	94				28
SO ₄ ⁼	"	1,555				2,038
			L	L	L	
TKN	"	0.5	Y	Y	Y	<0.2
NH ₃ -N	"	0.2	S	S	S	<0.1
NO ₂ + NO ₃ -N	"	0.5	I	I	I	0.6
Total P	"	<0.25	M	M	M	<0.25
Alkalinity as CaCO ₃	"	136	E	E	E	132
			T	T	T	
Al	"	0.040	E	E	E	0.049
Ca	"	314	R	R	R	385
Cd	"	<0.002				<0.002
Cr	"	<0.003	F	F	F	<0.003
Cu	"	<0.01	R	R	R	<0.01
			O	O	O	
Fe	"	1.9	Z	Z	Z	0.07
Hg	μg/L	<0.20	E	E	E	<0.20
K	mg/L	8	N	N	N	7
Mg	"	140				193
Mn	"	0.137				0.036
Na	"	220				193
Ni	"	<0.002				<0.002
Pb	"	0.05				0.05
Zn	"	<0.01				<0.01

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

Parameter	Unit	Lysimeter No. L-3N
pH ²		
EC	mS/m	
Total Dissolved Solids	mg/L	
Total Diss. Org. Carbon	"	
Cl ⁻	"	
SO ₄ ⁼	"	
TKN	"	L
NH ₃ -N	"	Y
NO ₂ + NO ₃ -N	"	S
Total P	"	I
Alkalinity as CaCO ₃	"	M
		E
		T
Al	"	E
Ca	"	R
Cd	"	
Cr	"	F
Cu	"	R
		O
		Z
Fe	"	E
Hg	μg/L	N
K	mg/L	
Mg	"	
Mn	"	
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 4: ANALYSIS OF MONTHLY COMPOSITED DIGESTED
BIOSOLIDS PLACED IN THE CALUMET WEST
SOLIDS MANAGEMENT DRYING AREA DURING OCTOBER 2008

Parameter	Unit	Concentration ¹
pH		7.7
Total Solids	%	10.3
Total Volatile Solids ²	%	40.1
TKN	mg/kg	35,551
NH ₃ -N	”	7,399

¹Values for one sample only.

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 NOVEMBER 2008

Parameter	Unit	Concentration ¹
pH		7.8
Total Solids	%	10.0
Total Volatile Solids ²	%	39.7
TKN	mg/kg	32,248
NH ₃ -N	”	7,461

¹Values are the means of two 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 OCTOBER 2008

Parameter	Unit	Concentration ¹
pH		7.2
Total Solids	%	60.1
Total Volatile Solids ²	%	42.3
TKN	mg/kg	27,728
NH ₃ -N	”	1,749
Total P	”	24,103
Al	”	17,819
As	”	<8.6
Ca	”	52,880
Cd	”	4
Cr	”	107
Cu	”	456
Fe	”	27,759
Hg	”	1.5
K	”	4,356
Mg	”	18,301
Mn	”	1,099
Mo	”	16
Na	”	1,098
Ni	”	41
Pb	”	120
Se	”	<11.4
Zn	”	1,126

¹Values are the means of ten samples.

²Total volatile solids as a percentage of total solids.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
 BIOSOLIDS REMOVED FROM THE CALUMET WEST
 SOLIDS MANAGEMENT DRYING AREA DURING NOVEMBER 2008

Parameter	Unit	Concentration ¹
pH		7.5
Total Solids	%	66.7
Total Volatile Solids ²	%	40.3
TKN	mg/kg	23,902
NH ₃ -N	"	3,548
Total P	"	22,265
Al	"	16,827
As	"	11
Ca	"	54,667
Cd	"	4
Cr	"	108
Cu	"	480
Fe	"	28,433
Hg	"	1.2
K	"	3,997
Mg	"	18,764
Mn	"	1,101
Mo	"	16
Na	"	1,068
Ni	"	42
Pb	"	126
Se	"	<11.4
Zn	"	1,195

¹Values are the means of three samples.

²Total volatile solids as a percentage of total solids.