

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***MONITORING AND RESEARCH  
DEPARTMENT***

***REPORT NO. 10-46***

***LAWNDALE AVENUE SOLIDS MANAGEMENT AREA***

***MONITORING REPORT FOR***

***SECOND QUARTER 2010***

***AUGUST 2010***

## Protecting Our Water Environment

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Director of Monitoring and Research

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August 20, 2010

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: Lawndale Avenue Solids Management Area – Stickney Water Reclamation Plant, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-2, Monitoring Report for April, May, and June 2010

The attached eight tables contain the monitoring data for the Lawndale Avenue Solids Management Area for April, May, and June 2010 as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2005-AO-4281-2. Lysimeters L-4N and L-6N are monitored monthly and all other devices are monitored quarterly.

The data reported are as follows:

Table 1, Analysis of Water from Monitoring Wells M-11 through M-15 at the Lawndale Avenue Solids Management Area Sampled on April 19, 2010

Table 2, Analysis of Water from Lysimeters L-4N and L-6N at the Lawndale Avenue Solids Management Area Sampled During April, May, and June 2010

Table 3, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on April 7, 2010

Table 4, Analysis of Monthly Composited Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During May 2010

Table 5, Analysis of Monthly Composited Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During June 2010

Subject: Lawndale Avenue Solids Management Area – Stickney Water Reclamation Plant, Illinois Environmental Protection Agency Permit No. 2005-AO-4281-2, Monitoring Report for April, May, and June 2010

Table 6, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During April 2010

Table 7, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During May 2010

Table 8, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During June 2010

Two new lysimeters, L-1N and L-2N, were installed at this site in September 2008 as replacements for L-1 and L-2, respectively. By a letter dated June 10, 2010, the IEPA approved termination of monitoring of the old lysimeters, including L-6. Data for these lysimeters will not be included in future quarterly reports.

No data are reported for L-7N because this lysimeter was removed during a site investigation in March 2010 as indicated in a letter of notification to the IEPA dated April 22, 2010. Lysimeter L-7N was replaced in June 2010 by L-7N1.

Biosolids were placed in the solids drying area during May and June and removed from the site during April, May, and June 2010.

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

TABLE 1: ANALYSIS OF WATER FROM MONITORING WELLS M-11  
THROUGH M-15 AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT  
AREA SAMPLED ON APRIL 19, 2010

Parameter <sup>1</sup>	Unit	Monitoring Well No.		
		M-11	M-12	M-13
pH <sup>2</sup>		7.2	7.3	7.4
EC	mS/m	47	63	73
Total Dissolved Solids	mg/L	668	868	1,312
Total Dissolved Organic Carbon	"	1	1	2
Cl <sup>-</sup>	"	15	15	15
SO <sub>4</sub> <sup>=</sup>	"	176	319	562
TKN	"	< 0.5	< 0.5	< 0.5
NH <sub>3</sub> -N	"	0.5	0.2	0.4
NO <sub>2</sub> + NO <sub>3</sub> -N	"	< 0.04	0.18	< 0.04
Total P	"	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	345	294	323
Al	"	< 0.040	< 0.040	0.053
As	"	< 0.050	< 0.050	< 0.050
B	"	1.3	1.8	1.5
Ca	"	93	79	164
Cd	"	< 0.003	< 0.003	< 0.003
Cr	"	< 0.003	< 0.003	< 0.003
Cu	"	< 0.008	< 0.008	< 0.008
Fe	"	0.150	0.040	< 0.025
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	9	10	10
Mg	"	44.0	36.1	75.2
Mn	"	0.053	0.005	0.007
Na	"	56	132	92
Ni	"	< 0.004	< 0.004	< 0.004
Pb	"	< 0.020	< 0.020	< 0.020
Se	"	< 0.10	< 0.10	< 0.10
Zn	"	1.61	1.43	2.06
Fecal coliform	MPN <sup>3</sup>	1	1	1
Static H <sub>2</sub> O Elev.	ft	628	632	627

TABLE 1: (Continued) ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 19, 2010

Parameter <sup>1</sup>	Unit	Monitoring Well No.	
		M-14	M-15
pH <sup>2</sup>		7.6	7.2
EC	mS/m	57	96
Total Dissolved Solids	mg/L	562	1,682
Total Dissolved Organic Carbon	"	1	2
Cl <sup>-</sup>	"	15	15
SO <sub>4</sub> <sup>=</sup>	"	114	773
TKN	"	< 0.5	< 0.5
NH <sub>3</sub> -N	"	0.2	0.5
NO <sub>2</sub> + NO <sub>3</sub> -N	"	< 0.04	< 0.04
Total P	"	< 0.10	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	311	348
Al	"	< 0.040	0.075
As	"	< 0.050	< 0.050
B	"	1.3	1.2
Ca	"	76	246
Cd	"	< 0.003	< 0.003
Cr	"	< 0.003	< 0.003
Cu	"	< 0.008	< 0.008
Fe	"	< 0.025	0.392
Hg	μg/L	< 0.20	< 0.20
K	mg/L	8	11
Mg	"	40.4	107
Mn	"	0.004	0.018
Na	"	42	65
Ni	"	< 0.004	< 0.004
Pb	"	< 0.020	< 0.020
Se	"	< 0.10	< 0.10
Zn	"	0.549	3.48
Fecal coliform	MPN <sup>3</sup>	1	1
Static H <sub>2</sub> O Elev.	ft	622	NA <sup>4</sup>

<sup>1</sup>Limit of quantitation (LOQ) instead of minimum detection limit (MDL) used as a reporting limit.

<sup>2</sup>pH analyzed beyond recommended holding time of 15 minutes.

<sup>3</sup>Most probable number.

<sup>4</sup>No analysis.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS L-4N  
AND L-6N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT  
AREA SAMPLED DURING APRIL, MAY, AND JUNE 2010

Parameter	Unit	Date Sampled			
		04/07/10		05/05/10	
		L-4N	L-6N	L-4N	L-6N
pH <sup>1</sup>		7.9	7.9	7.8	7.7
EC	mS/m	257	317	307	352
Total Dissolved Solids	mg/L	3,018	3,500	3,022	3,664
Total Dissolved Organic Carbon	"	8	62	6	64
Cl <sup>-</sup>	"	22	72	15	79
SO <sub>4</sub> <sup>=</sup>	"	1,416	1,389	1,492	1,415
TKN	"	5	14	5	17
NH <sub>3</sub> -N	"	5	12	5	12
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.71	0.06	0.98	0.10
Total P	"	< 0.10	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	611	859	627	908
Al	"	0.084	0.093	0.121	0.138
As	"	< 0.050	< 0.050	< 0.050	< 0.050
B	"	0.12	0.16	0.14	0.17
Ca	"	565	670	594	711
Cd	"	< 0.003	< 0.003	< 0.003	< 0.003
Cr	"	< 0.003	< 0.003	< 0.003	< 0.003
Cu	"	< 0.008	< 0.008	< 0.008	< 0.008
Fe	"	5.61	28.9	5.28	35.7
Hg	µg/L	< 0.20	< 0.20	< 0.20	< 0.20
K	mg/L	5	5	6	5
Mg	"	120	142	123	150
Mn	"	0.710	0.685	0.735	0.723
Na	"	91	72	97	77
Ni	"	< 0.004	0.007	< 0.004	< 0.004
Pb	"	< 0.020	< 0.020	< 0.020	< 0.020
Se	"	< 0.100	< 0.100	< 0.100	< 0.100
Zn	"	< 0.015	< 0.015	0.016	< 0.015

TABLE 2: (Continued) ANALYSIS OF WATER FROM LYSIMETERS L-4N  
AND L-6N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT  
AREA SAMPLED DURING APRIL, MAY, AND JUNE 2010

Parameter	Unit	Date Sampled	
		L-4N	L-6N
		06/02/10	
pH <sup>1</sup>		7.9	7.8
EC	mS/m	303	380
Total Dissolved Solids	mg/L	2,964	3,588
Total Dissolved Organic Carbon	"	5	59
Cl <sup>-</sup>	"	15	76
SO <sub>4</sub> <sup>=</sup>	"	1,429	1,438
TKN	"	4	15
NH <sub>3</sub> -N	"	4	12
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.70	0.05
Total P	"	< 0.10	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	609	861
Al	"	0.114	0.124
As	"	< 0.050	< 0.050
B	"	0.11	0.14
Ca	"	571	665
Cd	"	< 0.003	< 0.003
Cr	"	< 0.003	< 0.003
Cu	"	< 0.008	< 0.008
Fe	"	6.47	35.3
Hg	μg/L	< 0.20	< 0.20
K	mg/L	5	5
Mg	"	114	145
Mn	"	0.694	0.728
Na	"	87	75
Ni	"	< 0.004	0.005
Pb	"	< 0.020	< 0.020
Se	"	< 0.100	< 0.100
Zn	"	< 0.015	< 0.015

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

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS L-1  
THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT  
AREA SAMPLED ON APRIL 7, 2010

Parameter	Unit	Lysimeter No.		
		L-1	L-1N	L-2
pH <sup>1</sup>		7.8	8.0	7.9
EC	mS/m	175	188	250
Total Dissolved Solids	mg/L	1,532	1,586	NA <sup>2</sup>
Total Dissolved Organic Carbon	"	9	7	2
Cl <sup>-</sup>	"	56	24	750
SO <sub>4</sub> <sup>=</sup>	"	492	640	264
TKN	"	5	4	< 0.5
NH <sub>3</sub> -N	"	5	5	< 0.1
NO <sub>2</sub> + NO <sub>3</sub> -N	"	< 0.04	1.8	< 0.04
Total P	"	< 0.10	< 0.10	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	470	473	718
Al	"	2.46	0.055	0.152
As	"	< 0.050	< 0.050	< 0.050
B	"	0.48	0.58	0.11
Ca	"	221	225	130
Cd	"	< 0.003	< 0.003	< 0.003
Cr	"	< 0.003	< 0.003	< 0.003
Cu	"	< 0.004	< 0.004	0.016
Fe	"	5.94	1.16	0.348
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	7	13	1.6
Mg	"	91.4	102	56.5
Mn	"	0.111	0.040	0.012
Na	"	37	44	140
Ni	"	< 0.004	< 0.004	< 0.004
Pb	"	< 0.020	< 0.020	< 0.020
Se	"	< 0.100	< 0.100	< 0.100
Zn	"	< 0.015	< 0.015	< 0.015



TABLE 3: (Continued) ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 7, 2010

Parameter	Unit	Lysimeter No.		
		L-2N	L-3N	L-5N
pH <sup>1</sup>		8.2	7.8	8.0
EC	mS/m	172	259	579
Total Dissolved Solids	mg/L	1,216	2,000	4,884
Total Dissolved Organic Carbon	"	3	26	3
Cl <sup>-</sup>	"	285	130	534
SO <sub>4</sub> <sup>=</sup>	"	155	241	1,748
TKN	"	< 0.5	3	3
NH <sub>3</sub> -N	"	< 0.1	1	2
NO <sub>2</sub> + NO <sub>3</sub> -N	"	2.7	0.12	0.21
Total P	"	< 0.10	0.21	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	402	1,172	531
Al	"	< 0.040	0.069	0.088
As	"	< 0.050	< 0.050	< 0.050
B	"	0.15	0.06	0.27
Ca	"	116	353	565
Cd	"	< 0.003	< 0.003	< 0.003
Cr	"	< 0.003	< 0.003	< 0.003
Cu	"	< 0.004	< 0.004	< 0.004
Fe	"	< 0.025	10.1	10.2
Hg	μg/L	< 0.20	< 0.20	< 0.20
K	mg/L	2	1	17
Mg	"	62.5	133	242
Mn	"	0.056	0.661	0.249
Na	"	166	74	448
Ni	"	< 0.004	< 0.004	< 0.004
Pb	"	< 0.020	< 0.020	< 0.020
Se	"	< 0.100	< 0.100	< 0.100
Zn	"	< 0.015	< 0.015	< 0.015

TABLE 3: (Continued) ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 7, 2010

Parameter	Unit	Lysimeter No.		
		L-7N	L-8N	L-9N
pH <sup>1</sup>			8.2	8.1
EC	mS/m		204	202
Total Dissolved Solids	mg/L		1,422	NA <sup>2</sup>
Total Dissolved Organic Carbon	"		3	27
Cl <sup>-</sup>	"		453	230
SO <sub>4</sub> <sup>=</sup>	"		186	239
		L		
TKN	"	Y	1	2
NH <sub>3</sub> -N	"	S	0.7	0.6
NO <sub>2</sub> + NO <sub>3</sub> -N	"	I	0.08	0.14
Total P	"	M	< 0.10	< 0.10
Alkalinity as CaCO <sub>3</sub>	"	E	277	919
		T		
Al	"	E	< 0.040	0.063
As	"	R	< 0.050	< 0.050
B	"		0.18	0.16
Ca	"	I	126	257
Cd	"	N	< 0.003	< 0.003
		A		
Cr	"	C	< 0.003	< 0.003
Cu	"	C	< 0.004	< 0.004
Fe	"	E	1.39	0.746
Hg	μg/L	S	< 0.20	< 0.20
K	mg/L	S	5	4
		I		
Mg	"	B	48.6	147
Mn	"	L	0.199	0.437
Na	"	E	244	130
Ni	"		< 0.004	< 0.004
Pb	"		< 0.020	< 0.020
Se	"		< 0.100	< 0.100
Zn	"		< 0.015	< 0.015

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

<sup>2</sup>No analysis.

TABLE 4: ANALYSIS OF MONTHLY COMPOSITED BIOSOLIDS  
 PLACED IN THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA  
 DURING MAY 2010

Parameter	Unit	Concentration <sup>1</sup>
pH		7.6
Total Solids	%	19.2
Total Volatile Solids <sup>2</sup>	"	42.0
TKN	mg/kg	35,165
NH <sub>3</sub> -N	"	12,037

<sup>1</sup>Values are the means of two samples.

<sup>2</sup>Total volatile solids as a percentage of total solids.

TABLE 5: ANALYSIS OF MONTHLY COMPOSITED BIOSOLIDS  
 PLACED IN THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA  
 DURING JUNE 2010

Parameter	Unit	Concentration <sup>1</sup>
pH		7.7
Total Solids	%	15.9
Total Volatile Solids <sup>2</sup>	"	42.9
TKN	mg/kg	40,074
NH <sub>3</sub> -N	"	11,715

<sup>1</sup>Values are the means of six samples.

<sup>2</sup>Total volatile solids as a percentage of total solids.

TABLE 6: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED  
BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE SOLIDS  
MANAGEMENT DRYING AREA DURING APRIL 2010

Parameter	Unit	Concentration <sup>1</sup>
pH		7.8
Total Solids	%	21.3
Total Volatile Solids <sup>2</sup>	"	51.4
TKN	mg/kg	52,614
NH <sub>3</sub> -N	"	11,647
Total P	"	21,584
Al	"	16,353
Ca	"	35,563
Cd	"	3
Cr	"	133
Cu	"	389
Fe	"	14,854
Hg	"	1.2
K	"	2,943
Mg	"	15,232
Mn	"	570
Na	"	1,220
Ni	"	39
Pb	"	96
Zn	"	842

<sup>1</sup>Values are the means of four samples.

<sup>2</sup>Total volatile solids as a percentage of total solids.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED  
BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE SOLIDS  
MANAGEMENT DRYING AREA DURING MAY 2010

Parameter	Unit	Concentration <sup>1</sup>
pH		6.7
Total Solids	%	58.2
Total Volatile Solids <sup>2</sup>	"	43.5
TKN	mg/kg	28,720
NH <sub>3</sub> -N	"	4,343
Total P	"	23,482
Al	"	18,515
Ca	"	37,152
Cd	"	4
Cr	"	162
Cu	"	444
Fe	"	15,664
Hg	"	1.3
K	"	1,968
Mg	"	17,051
Mn	"	503
Na	"	644
Ni	"	44
Pb	"	133
Zn	"	960

<sup>1</sup>Values are the means of six samples.

<sup>2</sup>Total volatile solids as a percentage of total solids.

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED  
BIOSOLIDS REMOVED FROM THE LAWNSDALE AVENUE SOLIDS  
MANAGEMENT DRYING AREA DURING JUNE 2010

Parameter	Unit	Concentration <sup>1</sup>
pH		6.9
Total Solids	%	61.4
Total Volatile Solids <sup>2</sup>	"	36.2
TKN	mg/kg	21,674
NH <sub>3</sub> -N	"	2,075
Total P	"	24,089
Al	"	20,561
Ca	"	37,208
Cd	"	4
Cr	"	160
Cu	"	432
Fe	"	17,085
Hg	"	1.2
K	"	2,513
Mg	"	18,020
Mn	"	546
Na	"	549
Ni	"	41
Pb	"	135
Zn	"	931

<sup>1</sup>Values are the means of five samples.

<sup>2</sup>Total volatile solids as a percentage of total solids.