

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 06-16

LAWNDALE AVENUE SOLIDS MANAGEMENT AREA

MONITORING DATA FOR

FOURTH QUARTER 2005

MARCH 2006

March 10, 2006

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: LASMA Solids Drying Site - Stickney WRP Contract No. 80-159-2P, IEPA Permit No. 2005-AO-4283, Monitoring Data for October, November, and December 2005

The attached seven tables contain the monitoring data for the LASMA site for October, November, and December 2005 as required by IEPA Operating Permit No. 2005-AO-4283.

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 October 26, 2005

Table 2, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on October 12, 2005

Table 3, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on November 9, 2005

Table 4, Analysis of Water from Lysimeters L-1 through L-9N at the Lawndale Avenue Solids Management Area Sampled on December 7, 2005

Table 5, Analysis of Monthly Composited Digested Biosolids Placed in the Lawndale Avenue Solids Management Drying Area During October 2005

Table 6, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During October 2005

Subject: LASMA Solids Drying Site - Stickney WRP Contract No. 80-159-2P, IEPA Permit No. 2005-AO-4283, Monitoring Data for October, November, and December 2005

Table 7, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Lawndale Avenue Solids Management Drying Area During November 2005

During this quarter, Lysimeter L-6 yielded no sample despite several attempts to sample it. Lysimeter L-5 yielded a sample in October only. During the month of December, most lysimeters were frozen due to frigid weather conditions, and therefore could not be sampled. The District will continue to sample the old and new lysimeters simultaneously until June 2006, and will then submit a request to the IEPA to terminate monitoring of the old lysimeters.

Biosolids were placed in the drying site during the month of October, but removed from the site during October and November 2005.

Very truly yours,

Richard Lanyon
Director
Research and Development

RL:PL:spy

Enclosure

cc w/enc: Sulski (IEPA)
Records Unit (IEPA)

cc via MWRDGC web site:
Levy/Kollias/Sharma
Granato/O'Connor
Cox/Lindo/Patel

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE
LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON
OCTOBER 26, 2005

Parameter	Units	Monitoring Well No.				
		M-11	M-12	M-13	M-14	M-15
pH*		7.4	7.3	7.3	7.4	7.2
EC	mS/m	79	102	132	69	155
Total Dissolved Solids	mg/L	676	878	1,338	550	1,686
Total Dissolved Organic Carbon	"	1	1	2	1	2
Cl ⁻	"	7	16	11	9	10
SO ₄ ⁼	"	201	354	616	119	857
TKN	"	1.5	0.45	0.58	0.34	0.63
NH ₃ -N	"	1.2	0.29	0.42	0.22	0.51
NO ₂ +NO ₃ -N	"	0.025	0.013	0.010	0.011	0.032
Total P	"	<0.04	<0.04	<0.04	<0.04	<0.04
Alkalinity as CaCO ₃	"	360	302	329	323	361
Al	"	<0.07	<0.07	<0.07	<0.07	0.08
As	"	<0.002	<0.002	<0.002	<0.002	<0.002
B	"	1.18	1.55	1.32	1.16	1.04
Ca	"	87	76	159	70	229
Cd	"	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Cu	"	<0.002	<0.002	<0.002	<0.002	<0.002
Fe	"	1.13	0.067	0.167	0.050	1.71
Hg	µg/L	0.06	0.08	0.13	<0.05	0.11
K	mg/L	8	10	10	8	10
Mg	"	42.3	36.1	76.1	39.9	105
Mn	"	0.0153	0.0037	0.0075	0.0028	0.0139
Na	mg/L	56	133	87	42	62
Ni	"	<0.002	<0.002	<0.002	<0.002	<0.002
Pb	"	0.0010	<0.0009	<0.0009	<0.0009	0.0010
Se	"	0.004	0.005	0.008	0.005	0.007
Zn	"	1.85	0.849	1.39	1.03	3.82

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1 (Continued)

ANALYSIS OF WATER FROM MONITORING WELLS M-11 THROUGH M-15 AT THE
LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON
OCTOBER 26, 2005

Parameter	Units	Monitoring Well No.				
		M-11	M-12	M-13	M-14	M-15
Fecal coliform	#100mL	<1	<1	<1	<1	<1
Static H ₂ O Elev.	ft.	579	578	582	584	605

* pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 12, 2005

Parameter	Units	Lysimeter No.				
		L-1	L-2	L-3	L-4	L-5
pH*		7.6	8.0	7.9	7.4	7.9
EC	mS/m	160	287	131	382	154
Total Dissolved Solids	mg/L	1,392	2,404	976	4,356	1,414
Total Dissolved Organic Carbon	"	8	3	7	17	<2
Cl ⁻	"	48	495	167	63	48
SO ₄ ⁼	"	510	571	170	2,111	640
TKN	"	4.5	0.36	3.9	16	<0.08
NH ₃ -N	"	3.9	0.10	3.4	12	<0.02
NO ₂ +NO ₃ -N	"	0.299	0.666	0.116	0.041	0.077
Total P	"	0.05	0.14	0.77	0.39	0.08
Alkalinity as CaCO ₃	"	457	406	325	906	274
Al	"	<0.07	<0.14	<0.07	<0.07	<0.07
As	"	<0.002	<0.004	<0.002	<0.002	<0.002
B	"	0.521	0.288	0.219	0.187	0.854
Ca	"	202	220	114	561	157
Cd	"	0.0015	0.0024	<0.0003	<0.0003	0.0015
Cr	"	<0.0007	<0.0014	<0.0007	<0.0007	<0.0007
Cu	"	<0.002	0.004	<0.002	<0.002	<0.002
Fe	"	4.45	0.020	3.11	19.7	0.017
Hg	µg/L	0.16	0.10	0.07	0.09	0.07
K	mg/L	6	3	3	9	4
Mg	"	87.8	107	50.5	334	103
Mn	"	0.0817	0.0258	0.1218	0.7842	0.0433
Na	"	43	234	81	27	43
Ni	"	<0.002	<0.004	<0.002	<0.002	<0.002
Pb	"	0.0020	0.0080	0.0050	<0.0009	<0.0009
Se	"	0.020	0.032	0.007	0.013	0.021
Zn	"	0.012	0.022	0.005	0.018	0.007

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 12, 2005

Parameter	Units	Lysimeter No.				
		L-6	L-6N**	L-7N**	L-8N**	L-9N
pH*		NA	7.9	8.2	8.0	7.9
EC	mS/m	NA	302	137	215	256
Total Dissolved Solids	mg/L	NA	2,598	1,072	1,548	1,806
Total Dissolved Organic Carbon	"	NA	34	10	6	27
Cl ⁻	"	NA	144	157	405	152
SO ₄ ⁼	"	NA	1,075	201	198	284
TKN	"	0.53	35	2.2	1.9	2.6
NH ₃ -N	"	0.04	34	1.1	1.3	1.2
NO ₂ +NO ₃ -N	"	0.117	0.442	0.142	0.100	0.085
Total P	"	0.08	0.09	0.16	0.08	0.10
Alkalinity as CaCO ₃	"	NA	680	378	402	1,115
Al	"	NA	<0.07	<0.14	<0.07	<0.07
As	"	NA	<0.002	<0.004	<0.002	<0.002
B	"	NA	0.353	0.338	0.322	0.329
Ca	"	NA	383	99	129	156
Cd	"	NA	0.0020	0.0020	0.0020	0.0018
Cr	"	NA	<0.0007	<0.0014	<0.0007	<0.0007
Cu	"	NA	<0.002	<0.004	<0.002	<0.002
Fe	"	NA	1.62	0.032	0.029	4.21
Hg	µg/L	NA	<0.05	0.18	0.20	<0.05
K	mg/L	NA	19	10	6	7
Mg	"	NA	168	72.5	69.5	88.8
Mn	"	NA	0.1117	0.0824	0.1256	0.1360
Na	"	NA	86	75	218	335
Ni	"	NA	0.005	<0.004	<0.002	<0.002
Pb	"	NA	<0.0009	0.0080	0.0040	0.0020
Se	"	NA	0.018	0.020	0.019	0.012
Zn	"	NA	0.015	0.010	0.008	0.015

* pH analyzed beyond recommended holding time of 15 minutes.

** L-6N, L-7N, and L-8N were installed in May 2005.

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N AT THE LAWNSDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 9, 2005

Parameter	Units	Lysimeter No.					
		L-1	L-2	L-3	L-4	L-5	
pH*		7.5	7.8	7.6	7.2		
EC	mS/m	158	276	142	399		
Total Dissolved Solids	mg/L	1,378	2,212	964	4,206		
Total Dissolved Organic Carbon	"	7	NA	7	17		
Cl ⁻	"	50	524	178	66		
SO ₄ ⁼	"	558	NA	200	2,124		
TKN	"	5.7	0.80	4.8	15		L
NH ₃ -N	"	3.8	<0.04	4.0	12		Y
NO ₂ +NO ₃ -N	"	0.098	0.054	<0.005	<0.005		S
Total P	"	0.06	0.18	1.3	0.58		I
Alkalinity as CaCO ₃	"	461	376	326	938		M E E
Al	"	0.07	<0.14	<0.07	0.14		T
As	"	<0.002	<0.004	<0.002	<0.002		E
B	"	0.402	0.160	0.198	0.165		R
Ca	"	199	230	123	574		
Cd	"	<0.0003	<0.0006	<0.0003	<0.0003		D
Cr	"	<0.0007	<0.0014	<0.0007	<0.0007		R Y
Cu	"	<0.002	<0.004	<0.002	<0.002		
Fe	"	5.09	0.030	3.13	20.1		
Hg	µg/L	<0.05	<0.10	<0.05	<0.05		
K	mg/L	6	3	3	9		
Mg	"	87.8	105	51.1	325		
Mn	"	0.0674	0.0070	0.0980	0.7635		
Na	"	44	255	87	25		
Ni	"	<0.002	<0.004	<0.002	<0.002		
Pb	"	0.0010	<0.0018	0.0010	<0.0009		
Se	"	0.006	0.028	0.015	<0.002		
Zn	"	0.005	0.016	0.009	0.008		

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N AT THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 9, 2005

Parameter	Units	Lysimeter No.				
		L-6	L-6N**	L-7N**	L-8N**	L-9N
pH*			7.7	8.2	8.1	7.9
EC	mS/m		309	118	184	260
Total Dissolved Solids	mg/L		3,044	888	1,428	1,900
Total Dissolved Organic Carbon	"		40	NA	NA	25
Cl ⁻	"		114	131	NA	146
SO ₄ ⁼	"		1,338	NA	NA	278
TKN	"	L	38	1.7	2.5	3.7
NH ₃ -N	"	Y	35	0.54	1.4	2.1
NO ₂ +NO ₃ -N	"	S	<0.010	<0.010	0.108	0.054
Total P	"	I	<0.08	<0.08	<0.08	<0.08
Alkalinity	"	M	768	346	298	1,132
		E				
Al	"	T	0.16	<0.14	<0.14	<0.14
As	"	E	<0.004	<0.004	<0.004	<0.004
B	"	R	0.240	0.264	0.182	0.410
Ca	"		462	91	100	163
Cd	"	D	<0.0006	<0.0006	<0.0006	<0.0006
Cr	"	R	<0.0014	<0.0014	<0.0014	<0.0014
		Y				
Cu	"		<0.004	<0.004	<0.004	<0.004
Fe	"		15.5	0.030	0.046	4.89
Hg	µg/L		<0.10	<0.10	<0.10	<0.10
K	mg/L		19	10	5	6
Mg	"		173	68.4	67.1	90.8
Mn	"		0.1592	0.0294	0.0246	0.1456
Na	"		77	61	203	319
Ni	"		0.008	0.004	<0.004	0.004
Pb	"		0.0060	<0.0018	<0.0018	<0.0018
Se	"		<0.004	0.012	<0.004	<0.004
Zn	"		0.030	0.008	0.014	0.016

* pH analyzed beyond recommended holding time of 15 minutes.

** L-6N, L-7N, and L-8N were installed in May 2005.

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N T THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 7, 2005

Parameter	Units	Lysimeter No.				
		L-1	L-2	L-3	L-4	L-5
pH*				7.6	7.1	8.0
EC	mS/m			145	399	122
Total Dissolved Solids	mg/L			940	4,350	NA
Total Dissolved Organic Carbon	"			6	18	NA
Cl ⁻	"			186	63	NA
SO ₄ ⁼	"			183	1,957	NA
TKN	"			4.4	17	NA
NH ₃ -N	"	L	L	3.3	12	NA
NO ₂ +NO ₃ -N	"	Y	Y	0.023	0.034	NA
Total P***	"	S	S	1.1	0.52	NA
Alkalinity as CaCO ₃	"	I	I	322	958	NA
		M	M			
Al	"	E	E	<0.07	<0.07	NA
As	"	T	T	<0.002	<0.002	NA
B	"	E	E	0.173	0.130	NA
Ca	"	R	R	117	575	NA
Cd	"			<0.0003	<0.0003	NA
Cr	"	F	F	<0.0007	<0.0007	NA
		R	R			
Cu	"	O	O	<0.002	<0.002	NA
Fe	"	Z	Z	3.37	21.5	NA
Hg	µg/L	E	E	0.10	0.07	NA
K	mg/L	N	N	3	9	NA
Mg	"			52.5	334	NA
Mn	"			0.1106	0.7841	NA
Na	"			91	23	NA
Ni	"			<0.002	<0.002	NA
Pb	"			<0.0009	<0.0009	NA
Se	"			<0.002	0.006	NA
Zn	"			0.006	0.011	NA

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-9N T THE LAWNDALE AVENUE SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 7, 2005

Parameter	Units	Lysimeter No.				
		L-6	L-6N**	L-7N**	L-8N**	L-9N
pH*					7.9	
EC	mS/m				191	
Total Dissolved Solids	mg/L				634	
Total Dissolved Organic Carbon	"				<2	
Cl ⁻	"				207	
SO ₄ ⁼	"				99	
TKN	"				0.95	
NH ₃ -N	"	L	L	L	0.39	L
NO ₂ +NO ₃ -N	"	Y	Y	Y	0.147	Y
Total P***	"	S	S	S	0.13	S
Alkalinity as CaCO ₃	"	I	I	I	157	I
		M	M	M		M
Al	"	E	E	E	<0.07	E
As	"	T	T	T	<0.002	T
B	"	E	E	E	0.087	E
Ca	"	R	R	R	53	R
Cd	"				<0.0003	
Cr	"	F	F	F	<0.0007	F
		R	R	R		R
Cu	"	O	O	O	<0.002	O
Fe	"	Z	Z	Z	0.010	Z
Hg	µg/L	E	E	E	<0.05	E
K	mg/L	N	N	N	3	N
Mg	"				31.0	
Mn	"				0.0155	
Na	"				108	
Ni	"				<0.002	
Pb	"				<0.0009	
Se	"				0.004	
Zn	"				0.010	

* pH analyzed beyond recommended holding time of 15 minutes.

** L-6N, L-7N, and L-8N were installed in May 2005.

*** Less than 10X method blank criteria for Total P not met.

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS PLACED IN THE
LAWNDALE AVENUE SOLIDS MANAGEMENT AREA DURING OCTOBER 2005

Constituent	Units	Concentration*
pH		8.1
Total Solids	%	34.4
Total Volatile Solids	%	32.5
TKN	mg/dry kg	15,683
NH ₃ -N	"	3,822

*Values are the means of five samples.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS
REMOVED FROM THE LAWNSDALE AVENUE SOLIDS MANAGEMENT DRYING AREA
DURING OCTOBER 2005

Constituent	Units	Concentration*
pH		7.8
Total Solids	%	44.3
Total Volatile Solids	%	40.0
TKN	mg/dry kg	23,800
NH ₃ -N	"	5,810
Total P	"	11,260
Al	"	19,959
As	"	7
Ca	"	42,174
Cd	"	4
Cr	"	234
Cu	"	355
Fe	"	18,725
Hg	"	1.3
K	"	3,863
Mg	"	21,105
Mn	"	484
Mo	"	16
Na	"	939
Ni	"	56
Pb	"	130
Se	"	< 0.7
Zn	"	783

*Values are the means of sixteen samples.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS
REMOVED FROM THE LAWDALE AVENUE SOLIDS MANAGEMENT DRYING AREA
DURING NOVEMBER 2005

Constituent	Units	Concentration*
pH		7.2
Total Solids	%	60.6
Total Volatile Solids	%	37.4
TKN	mg/dry kg	16,947
NH ₃ -N	"	3,936
Total P	"	12,617
Al	"	23,988
As	"	3
Ca	"	45,546
Cd	"	8
Cr	"	291
Cu	"	382
Fe	"	20,650
Hg	"	1.5
K	"	5,022
Mg	"	22,279
Mn	"	521
Mo	"	18
Na	"	960
Ni	"	60
Pb	"	159
Se	"	< 0.7
Zn	"	854

*Values are the means of eleven samples.