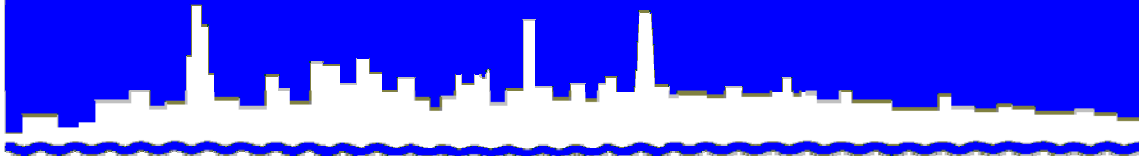


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-18

MONTHLY REPORT OF THE FULTON COUNTY

ENVIRONMENTAL PROTECTION SYSTEM

DECEMBER 2006

APRIL 2007

Protecting Our Water Environment

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Louis Kollias, P.E., BCEE
Director of Research and Development

312-751-5190

April 11, 2007

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:

Attached for your information and use is the December 2006 monthly report of the Fulton County Environmental Protection System. In addition to data collected in December 2006, this report contains the 2005 soil and crop data, and a summary of all 2006 monitoring data.

Very truly yours,

Louis Kollias
Director
Research and Development

LK:GT:spy
Attachment
cc w/enc.:

Mr. Valdis Aistars, USEPA Region V
Mr. Ash Sajjad, USEPA Region V
Mr. Matthew Williams, USEPA Region V
IEPA Permit Section, Springfield
IEPA Surveillance Section, Peoria
Chairman of the Fulton County Board
Fulton County Board of Health
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**ENVIRONMENTAL PROTECTION SYSTEM
REPORT FOR FULTON COUNTY, ILLINOIS
DECEMBER 2006**

**Research and Development Department
G. Tian
A. Cox**

April 2007

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FOREWORD

The data and information in this report fulfill the frequency of monitoring and the reporting requirements for the Land Application of Biosolids at the Fulton County Land Reclamation Project as specified in the Illinois Environmental Protection Agency Permit No. 2005-SC-5073 for December 2006.

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ACKNOWLEDGMENT

Thanks are due to the staff of the Analytical Laboratories Division for assistance in conducting analyses and Ms. Sabina Yarn for typing this report.

DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago.

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600

FULTON COUNTY
DEWATERED BIOSOLIDS REPORT
December 2006

DEWATERED BIOSOLIDS REPORT

No dewatered biosolids were applied to fields during the month of December 2006. In addition, no supernatant was available for application to fields during this month. The last supernatant application was made in 1995, and the last biosolids application was made in 2004.

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FULTON COUNTY
WATER ANALYSIS REPORT
December 2006

WATER ANALYSIS REPORT

There was no water release and sampling in retention basins during this month. A site plan of farm field and retention basin locations is attached in Figure 1.

The surface water sites (streams, reservoirs, and SP sites) and wells were also not sampled during the month. A site plan of water monitoring locations is attached in Figure 2.

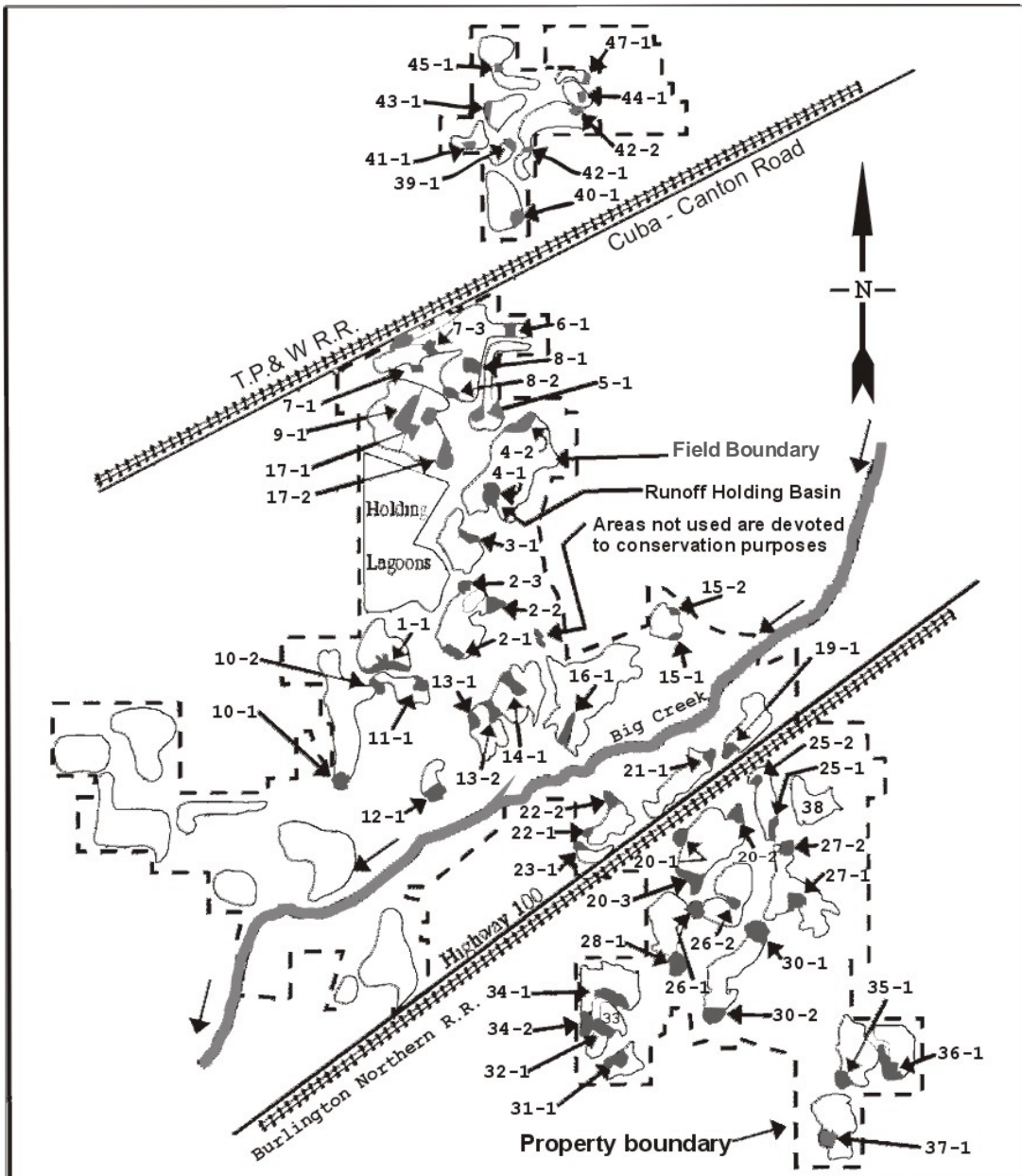
Water quality of samples taken in 2006 from the permitted monitoring stations is summarized in the following tables:

1. Well water, Table 1
2. Spring and stream waters, Table 2
3. Reservoir water, Table 3
4. Surface water (SP sites) Table 4

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 1

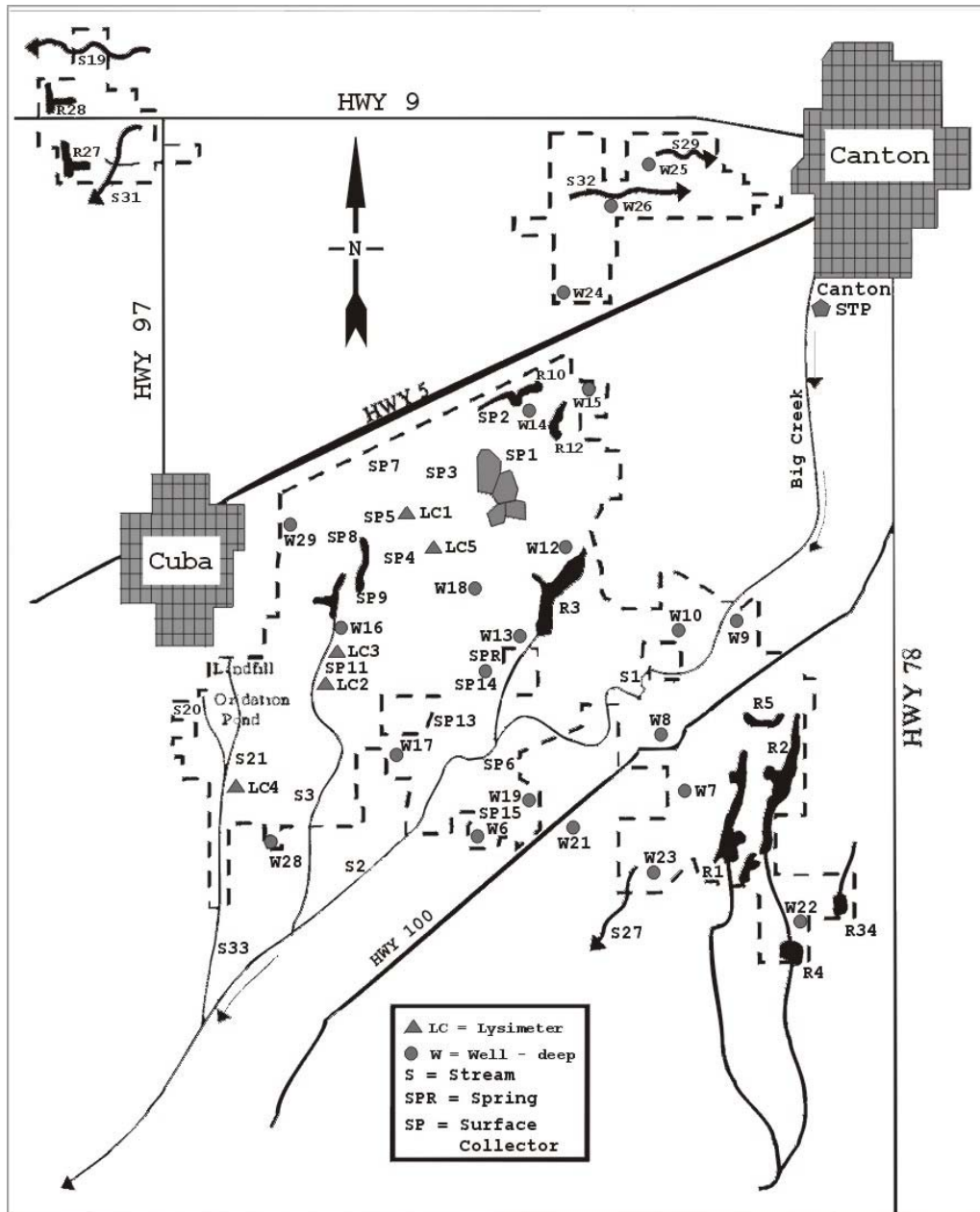
FARM FIELDS AND RUNOFF BASINS AT THE LAND RECLAMATION PROJECT AT FULTON COUNTY, ILLINOIS



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 2

WATER MONITORING LOCATIONS AT THE LAND RECLAMATION PROJECT AT FULTON COUNTY, ILLINOIS



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

FULTON COUNTY LAND RECLAMATION PROJECT WELL DATA YEARLY
SUMMARY – 2006

Well	NH ₃ -N			NO ₂ -N		
	Mean*	Maximum	Minimum	Mean	Maximum	Minimum
	----- mg/L -----			----- mg/L -----		
W 6	0.54	0.61	0.47	0.000	0.000	0.000
W 7	1.42	1.49	1.37	0.000	0.000	0.000
W 8	0.80	1.05	0.52	0.000	0.000	0.000
W 9	1.41	2.53	0.93	0.000	0.000	0.000
W10	0.78	1.18	0.54	0.000	0.000	0.000
W12	0.39	0.46	0.33	0.000	0.000	0.000
W14	0.58	0.75	0.41	5.500	18.000	0.000
W15	0.67	0.87	0.59	0.000	0.000	0.000
W16	0.05	0.08	0.02	0.000	0.000	0.000
W17	0.02	0.09	0.00	0.000	0.000	0.000
W18	0.78	1.26	0.41	0.000	0.000	0.000
W19	0.97	1.03	0.91	0.000	0.000	0.000
W21	1.50	1.51	1.49	0.000	0.000	0.000
W22	4.91	8.95	1.66	0.000	0.000	0.000
W23	0.05	0.08	0.02	0.000	0.000	0.000
W24	0.67	1.02	0.33	0.000	0.000	0.000
W25	0.04	0.07	0.02	0.000	0.000	0.000
W26	1.56	1.77	1.29	0.000	0.000	0.000
W28	0.22	0.26	0.14	0.000	0.000	0.000
W29	1.61	2.38	0.91	0.178	0.420	0.000
MDL**	0.02	0.02	0.02	0.150	0.150	0.150

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1 (Continued)

FULTON COUNTY LAND RECLAMATION PROJECT WELL DATA YEARLY
SUMMARY – 2006

Well	NO ₃ -N			Cd		
	Mean*	Maximum	Minimum	Mean	Maximum	Minimum
	----- mg/L -----			----- mg/L -----		
W 6	0.061	0.145	0.000	0.0000	0.0000	0.0000
W 7	0.198	0.373	0.041	0.0000	0.0000	0.0000
W 8	0.200	0.258	0.170	0.0000	0.0000	0.0000
W 9	0.227	0.365	0.034	0.0009	0.0022	0.0000
W10	0.114	0.150	0.080	0.0000	0.0000	0.0000
W12	0.250	0.451	0.021	0.0000	0.0000	0.0000
W14	0.167	0.344	0.000	0.0000	0.0000	0.0000
W15	0.108	0.123	0.075	0.0000	0.0000	0.0000
W16	0.144	0.271	0.008	0.0000	0.0000	0.0000
W17	4.755	5.183	4.229	0.0000	0.0000	0.0000
W18	0.101	0.225	0.014	0.0000	0.0000	0.0000
W19	0.146	0.215	0.050	0.0000	0.0000	0.0000
W21	0.023	0.055	0.000	0.0000	0.0000	0.0000
W22	0.390	1.200	0.010	0.0000	0.0000	0.0000
W23	0.455	1.026	0.014	0.0000	0.0000	0.0000
W24	0.708	1.102	0.427	0.0000	0.0000	0.0000
W25	0.066	0.137	0.000	0.0000	0.0000	0.0000
W26	0.136	0.303	0.000	0.0000	0.0000	0.0000
W28	0.062	0.156	0.000	0.0000	0.0000	0.0000
W29	0.319	0.778	0.000	0.0000	0.0000	0.0000
MDL**	0.004	0.005	0.004	0.0004	0.0004	0.0004

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1 (Continued)

FULTON COUNTY LAND RECLAMATION PROJECT WELL DATA YEARLY
SUMMARY – 2006

Well	Cu			Hg		
	Mean*	Maximum	Minimum	Mean	Maximum	Minimum
	----- mg/L -----			----- µg/L -----		
W 6	0.002	0.004	0.000	0.03	0.10	0.00
W 7	0.010	0.041	0.000	0.03	0.11	0.00
W 8	0.001	0.004	0.000	0.03	0.10	0.00
W 9	0.000	0.000	0.000	0.02	0.09	0.00
W10	0.001	0.004	0.000	0.02	0.08	0.00
W12	0.000	0.000	0.000	0.02	0.09	0.00
W14	0.001	0.003	0.000	0.03	0.10	0.00
W15	0.005	0.012	0.000	0.02	0.09	0.00
W16	0.008	0.026	0.000	0.03	0.11	0.00
W17	0.003	0.008	0.000	0.02	0.09	0.00
W18	0.004	0.007	0.000	0.02	0.09	0.00
W19	0.001	0.004	0.000	0.03	0.10	0.00
W21	0.003	0.011	0.000	0.03	0.11	0.00
W22	0.000	0.000	0.000	0.03	0.10	0.00
W23	0.002	0.004	0.000	0.04	0.16	0.00
W24	0.127	0.337	0.021	0.00	0.00	0.00
W25	0.003	0.007	0.000	0.02	0.08	0.00
W26	0.001	0.004	0.000	0.02	0.07	0.00
W28	0.005	0.021	0.000	0.02	0.08	0.00
W29	0.003	0.006	0.000	0.03	0.10	0.00
MDL**	0.003	0.003	0.003	0.05	0.05	0.05

* In computing the mean, values below the method detection limit (MDL) were considered as zero. The mean is based on four samples per year.

**Values less than MDL at a given sampling date are reported as zero.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

FULTON COUNTY LAND RECLAMATION PROJECT SPRING AND STREAM DATA
YEARLY SUMMARY - 2006

Stream Number		Total P	NH ₃ -N	NO ₂ -N	NO ₃ -N	Cd	Cu	Hg
		----- mg/L -----						µg/L
Spring 01	Mean*	0.02	0.00	0.000	0.017	0.0000	0.006	0.00
	Maximum	0.07	0.00	0.000	0.033	0.0000	0.009	0.00
	Minimum	0.00	0.00	0.000	0.000	0.0000	0.004	0.00
S1	Mean	1.37	0.12	0.000	4.792	0.0000	0.007	0.01
	Maximum	1.82	0.24	0.000	6.102	0.0000	0.008	0.02
	Minimum	0.62	0.04	0.000	2.690	0.0000	0.007	0.00
S2	Mean	1.11	0.08	0.000	3.309	0.0000	0.007	0.01
	Maximum	1.90	0.12	0.000	5.052	0.0000	0.008	0.02
	Minimum	0.42	0.04	0.000	2.301	0.0000	0.006	0.00
S3	Mean	0.09	0.03	0.000	0.164	0.0000	0.006	0.01
	Maximum	0.10	0.08	0.000	0.327	0.0000	0.007	0.02
	Minimum	0.08	0.00	0.000	0.040	0.0000	0.005	0.00
S20	Mean	2.85	0.04	0.000	17.750	0.0000	0.014	0.01
	Maximum	3.63	0.13	0.000	23.216	0.0000	0.019	0.04
	Minimum	1.52	0.00	0.000	12.864	0.0000	0.011	0.00
S21	Mean	0.57	0.81	0.000	2.330	0.0000	0.006	0.01
	Maximum	1.42	1.47	0.000	6.877	0.0000	0.008	0.03
	Minimum	0.09	0.27	0.000	0.035	0.0000	0.006	0.00
S27	Mean	0.90	0.84	0.000	0.709	0.0003	0.017	0.01
	Maximum	1.76	1.85	0.000	1.348	0.0005	0.022	0.03
	Minimum	0.08	0.04	0.000	0.333	0.0000	0.008	0.00

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

FULTON COUNTY LAND RECLAMATION PROJECT SPRING AND STREAM DATA
YEARLY SUMMARY - 2006

Stream Number		Total P	NH ₃ -N	NO ₂ -N	NO ₃ -N	Cd	Cu	Hg
		----- mg/L -----						μg/L
S29	Mean*	0.22	0.19	0.000	2.948	0.0000	0.008	0.01
	Maximum	0.31	0.41	0.000	7.729	0.0000	0.009	0.02
	Minimum	0.09	0.05	0.000	0.137	0.0000	0.005	0.00
S32	Mean	0.52	0.50	0.000	1.696	0.0000	0.007	0.01
	Maximum	1.16	0.83	0.000	4.918	0.0000	0.007	0.02
	Minimum	0.11	0.08	0.000	0.043	0.0000	0.007	0.00
S33	Mean	0.97	0.02	0.000	8.482	0.0000	0.010	0.03
	Maximum	1.44	0.03	0.000	13.019	0.0000	0.011	0.08
	Minimum	0.28	0.00	0.000	4.899	0.0000	0.008	0.00
MDL**	Mean	0.06	0.02	0.150	0.005	0.0003	0.002	0.06
	Maximum	0.09	0.02	0.150	0.005	0.0004	0.003	0.06
	Minimum	0.04	0.02	0.150	0.004	0.0002	0.001	0.05

*In computing the mean, values below the method detection limit (MDL) were considered as zero. The mean is based on three samples per year.

**Values less than the MDL at a given sampling date are reported as zero.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

FULTON COUNTY LAND RECLAMATION PROJECT RESERVOIR DATA
YEARLY SUMMARY - 2006

Reservoir Number		Total P	NH ₃ -N	NO ₂ -N	NO ₃ -N	Cd	Cu	Hg
		----- mg/L -----						µg/L
R 1	Mean*	0.08	0.15	0.000	0.146	0.0000	0.005	0.00
	Maximum	0.12	0.25	0.000	0.212	0.0000	0.006	0.00
	Minimum	0.00	0.03	0.000	0.053	0.0000	0.005	0.00
R 2	Mean	0.31	0.71	0.000	0.085	0.0000	0.005	0.00
	Maximum	0.57	1.69	0.000	0.171	0.0000	0.006	0.00
	Minimum	0.15	0.07	0.000	0.020	0.0000	0.004	0.00
R 3	Mean	0.14	0.02	0.000	0.028	0.0000	0.006	0.00
	Maximum	0.18	0.05	0.000	0.046	0.0000	0.007	0.00
	Minimum	0.11	0.00	0.000	0.000	0.0000	0.004	0.00
R 4	Mean	0.27	0.12	0.180	5.187	0.0000	0.008	0.00
	Maximum	0.49	0.18	0.200	9.057	0.0000	0.010	0.00
	Minimum	0.15	0.04	0.160	1.071	0.0000	0.006	0.00
R 5	Mean	0.15	0.02	0.000	0.019	0.0000	0.004	0.00
	Maximum	0.27	0.02	0.000	0.032	0.0000	0.006	0.00
	Minimum	0.08	0.02	0.000	0.000	0.0000	0.003	0.00
R 10	Mean	0.05	0.04	0.000	0.016	0.0000	0.005	0.00
	Maximum	0.08	0.07	0.000	0.034	0.0000	0.007	0.00
	Minimum	0.00	0.00	0.000	0.000	0.0000	0.004	0.00
R 12	Mean	0.20	0.01	0.000	0.084	0.0000	0.005	0.00
	Maximum	0.49	0.02	0.000	0.156	0.0000	0.006	0.00
	Minimum	0.00	0.00	0.000	0.007	0.0000	0.003	0.00

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (Continued)

FULTON COUNTY LAND RECLAMATION PROJECT RESERVOIR DATA
YEARLY SUMMARY - 2006

Reservoir Number		Total P	NH ₃ -N	NO ₂ -N	NO ₃ -N	Cd	Cu	Hg
		----- mg/L -----						μg/L
R 34	Mean*	0.80	0.18	0.160	6.047	0.0000	0.010	0.00
	Maximum	1.95	0.24	0.480	8.627	0.0000	0.012	0.00
	Minimum	0.11	0.15	0.000	1.846	0.0000	0.007	0.00
MDL**	Mean	0.06	0.02	0.150	0.005	0.0003	0.002	0.06
	Maximum	0.09	0.02	0.150	0.005	0.0004	0.003	0.06
	Minimum	0.04	0.02	0.150	0.004	0.0002	0.001	0.05

*In computing the mean, values below the method detection limit (MDL) were considered as zero. The mean is based on three samples per year.

**Values less than the MDL at a given sampling date are reported as zero.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

FULTON COUNTY LAND RECLAMATION PROJECT, SURFACE WATERS -
 PUTNAM TOWNSHIP, DISTRICT PROPERTY (WESTERN SECTION)
 YEARLY SUMMARY - 2006

Surface Water Site		Total P	NH ₃ -N	NO ₂ -N	NO ₃ -N	Cd	Cu	Hg
		----- mg/L -----						µg/L
SP 6	Mean*	0.23	0.02	0.000	0.124	0.0003	0.011	0.00
	Maximum	0.51	0.07	0.000	0.175	0.0009	0.018	0.00
	Minimum	0.08	0.00	0.000	0.038	0.0000	0.007	0.00
SP 14	Mean	0.04	0.01	0.000	0.146	0.0000	0.003	0.00
	Maximum	0.07	0.02	0.000	0.309	0.0000	0.005	0.00
	Minimum	0.00	0.00	0.000	0.031	0.0000	0.000	0.00
MDL**	Mean	0.06	0.02	0.150	0.005	0.0003	0.002	0.06
	Maximum	0.09	0.02	0.150	0.005	0.0004	0.003	0.06
	Minimum	0.04	0.02	0.150	0.004	0.0002	0.002	0.05

*In computing the mean, values below the method detection limit (MDL) were considered as zero. The mean is based on three samples per year.

**Values less than MDL at a given sampling date are reported as zero.

Metropolitan Water Reclamation District of Greater Chicago
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FULTON COUNTY
CLIMATOLOGICAL OBSERVATIONS
December 2006

CLIMATOLOGICAL OBSERVATIONS

The daily climatological observations for December 2006 are summarized in Table 5.

The total precipitation recorded for the month was 2.28 inches.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

RECORD OF CLIMATOLOGICAL OBSERVATIONS FOR DECEMBER 2006,
 FULTON COUNTY, ILLINOIS, STATION SEQ, SEC.10, R3E, T6N

Date	Temperature °C			Precipitation		Wind		
	Max	Min	Avg	rain, melted snow	snow, sleet, hail	m/S	m/S	Dir
				(inches & hundredths)	(inches & tenths)	Avg	Max	
1	-1.7	-9.4	-6.1	0.00	14.0	5.6	15.2	SW
2	2.2	-12.9	-6.4	0.00		2.5	8.5	SW
3	-5.4	-15.1	-10.7	0.00		3.6	11.6	SW
4	0.4	-16.5	-8.0	0.00		3.6	12.5	SW
5	0.1	-15.2	-6.4	0.00		3.0	9.8	NW
6	4.2	-2.6	0.7	0.09		3.8	11.6	SW
7	-2.6	-15.8	-10.4	0.00		4.2	12.5	W
8	-3.6	-19.0	-11.1	0.00		2.6	8.9	SW
9	5.1	-8.2	-1.6	0.04		3.6	10.3	SE
10	5.9	-1.8	2.4	0.24		3.8	8.9	SE
11	5.7	2.1	3.7	0.20		3.5	8.0	E
12	13.0	2.8	7.2	0.02		4.3	12.5	SE
13	12.9	-2.4	3.6	0.00		1.9	8.9	SW
14	14.7	3.1	8.7	0.00		4.5	14.8	S
15	10.9	-0.1	4.7	0.00		3.0	11.2	SW
16	14.0	2.2	8.3	0.00		3.5	8.9	SE
17	13.9	4.5	7.9	0.04		2.1	8.0	NW
18	7.5	-3.4	2.1	0.00		1.8	7.2	NW
19	8.1	-6.1	-1.0	0.00		0.7	3.6	NW
20	4.8	-3.9	1.2	0.43		2.8	8.0	NE
21	10.9	4.4	8.4	0.60		2.2	7.2	NE
22	9.6	4.7	7.0	0.03		3.6	12.5	NE
23	8.6	-0.1	3.9	0.00		4.7	11.6	SW
24	7.2	-4.4	0.7	0.00		1.2	6.3	E
25	3.6	-0.8	1.3	0.00		3.0	13.9	NW
26	4.5	-3.1	-0.4	0.00		2.9	9.4	SW
27	6.7	-4.0	1.7	0.00		2.8	9.8	SW
28	13.2	1.1	6.0	0.00		2.0	8.0	SE
29	14.7	2.5	8.4	0.00		1.6	5.8	SE
30	12.8	7.7	10.0	0.00		3.4	10.3	NE
31	13.7	1.9	8.9	0.59		5.7	17.4	S
Sum				2.28	14.0	Observer: Josh DeWees Station: R&D Lab		
Avg	7.0	-3.5	1.4					
Extreme	14.7	-19.0		0.60	14.0			

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FULTON COUNTY
RECLAMATION OF COAL REFUSE PILES WITH BIOSOLIDS
December 2006

RECLAMATION OF COAL REFUSE PILES WITH BIOSOLIDS

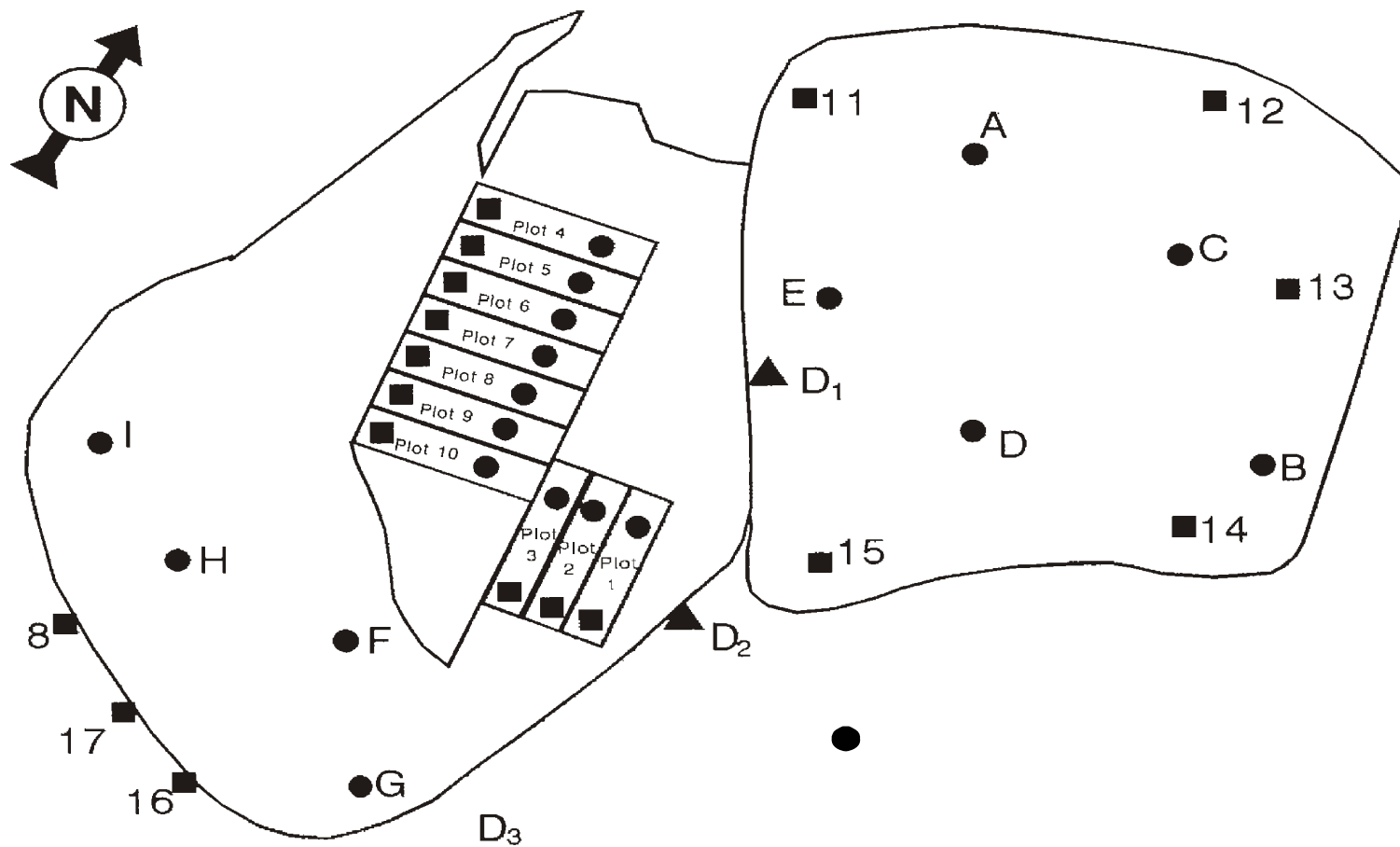
Lysimeters and drainage tiles at the St. David coal refuse pile reclamation site were sampled during the month. Locations for all lysimeters and drainage tile sampling sites are shown in Figure 3. The analytical data for lysimeter samples are presented in Table 6. There was no flow in the tile drains D1 and D2 at the time of sampling in December. The analytical results for drainage tile samples are reported in Table 7.

Lysimeters at the Big Ten (Morgan Mine) and the United Electric coal refuse pile sites were also sampled during the month. The analytical data for the Morgan Mine and the United Electric coal refuse pile sites are listed in Tables 8 and 9, respectively.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 3

ST. DAVID COAL REFUSE PILE RECLAMATION SITE



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED ST. DAVID COAL REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation			
		1	2	3	4
pH		7.1	7.7	7.1	6.9
E.C.	mS/m	410	290	260	280
Acidity*	mg/L	46	7	27	72
Alkalinity*	"	308	237	161	347
Total P	"	0.06	0.05	0.07	0.05
Cl ⁻	"	11	2	2	3
SO ₄ ⁼	"	2,720	1,887	1,658	1,628
NH ₃ -N	"	0.33	0.06	0.09	0.08
NO ₂ +NO ₃ -N	"	33.8	0.94	0.80	1.95
Al	"	0.01	0.01	1.35	0.05
Cd	"	0.112	0.014	0.002	0.056
Cr	"	0.002	0.003	0.005	0.003
Cu	"	0.007	0.009	0.022	0.019
Fe	"	0.087	0.065	NRR	0.174
Mn	"	0.634	0.087	0.322	0.006
Ni	"	0.097	0.091	0.023	0.019
Pb	"	<0.004	<0.004	<0.004	<0.004
Zn	"	NRR	0.978	0.302	NRR

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED ST. DAVID COAL
REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation			
		5	6	7	8
pH		7.8	7.1	6.6	7.2
E.C.	mS/m	243	360	240	160
Acidity*	mg/L	4	28	16	19
Alkalinity*	"	82	192	70	91
Total P	"	0.05	0.06	0.05	0.05
Cl ⁻	"	8	7	6	2
SO ₄ ⁼	"	1,558	2,464	1,502	824
NH ₃ -N	"	0.10	0.04	0.85	0.08
NO ₂ +NO ₃ -N	"	2.67	0.78	10.22	1.53
Al	"	0.05	0.21	0.22	0.29
Cd	"	0.009	<0.0004	0.115	0.012
Cr	"	0.003	0.003	0.011	0.005
Cu	"	0.011	0.013	0.038	0.022
Fe	"	0.201	3.53	0.224	0.410
Mn	"	0.005	0.085	0.270	0.064
Ni	"	0.012	0.007	0.157	0.028
Pb	"	<0.004	<0.004	<0.004	<0.004
Zn	"	0.481	0.218	NRR	0.757

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED ST. DAVID COAL
REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation			
		9	10	A	B
pH		6.9	7.4	6.3	7.6
E.C.	mS/m	330	300	260	390
Acidity*	mg/L	34	36	62	11
Alkalinity*	"	209	385	52	226
Total P	"	0.05	0.05	0.06	0.06
Cl ⁻	"	9	4	14	9
SO ₄ ⁼	"	1,958	1,780	1,740	2,837
NH ₃ -N	"	<0.02	<0.02	0.99	0.07
NO ₂ +NO ₃ -N	"	61.7	41.9	1.38	6.26
Al	"	0.62	<0.007	0.01	0.06
Cd	"	0.019	0.019	<0.0004	<0.0004
Cr	"	0.003	0.003	0.003	0.003
Cu	"	0.006	0.006	<0.002	0.010
Fe	"	0.317	0.040	15.84	0.054
Mn	"	0.503	0.013	1.70	0.007
Ni	"	0.137	0.068	0.020	0.005
Pb	"	<0.004	<0.004	<0.004	<0.004
Zn	"	NRR	NRR	0.332	0.044

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED ST. DAVID COAL
REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation			
		C	D	E	F
pH			2.2		
E.C.	mS/m		950		
Acidity*	mg/L		25,000		
Alkalinity*	"		<1		
Total P	"		41.9		
		L		L	L
		Y		Y	Y
Cl ⁻	"	S	3	S	S
SO ₄ ⁼	"	I	10,428	I	I
NH ₃ -N	"	M	0.89	M	M
NO ₂ +NO ₃ -N	"	E	4.93	E	E
Al	"	T	266	T	T
		E		E	E
		R		R	R
Cd	"		2.05		
Cr	"	D	2.16	D	D
Cu	"	R	1.67	R	R
Fe	"	Y	2,974	Y	Y
Mn	"		22.0		
Ni	"		2.15		
Pb	"		0.005		
Zn	"		137		

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED ST. DAVID COAL
REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation		
		G	H	I
pH			7.3	7.0
E.C.	mS/m		270	360
Acidity*	mg/L		24	98
Alkalinity*	"		317	328
Total P	"		0.13	0.09
		L		
		Y		
Cl ⁻	"	S	14	19
SO ₄ ⁼	"	I	1,492	2,309
NH ₃ -N	"	M	0.04	4.20
NO ₂ +NO ₃ -N	"	E	4.21	1.19
Al	"	T	0.22	0.09
		E		
		R		
Cd	"		<0.0004	0.002
Cr	"	D	0.003	0.004
Cu	"	R	0.016	0.009
Fe	"	Y	0.503	10.2
Mn	"		0.568	5.28
Ni	"		0.005	0.133
Pb	"		<0.004	<0.004
Zn	"		0.030	1.32

* As calcium carbonate.

NRR = No reportable result.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

ANALYSIS OF WATER FROM DRAINAGE TILE ON THE RECLAIMED ST. DAVID
COAL REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Tile Drain		
		D1	D2	D3 12/13
pH		N O	N O	6.3
Total Suspended Solids	mg/L	F L O	F L O	85.0
Total Fe	mg/L	W	W	79.2

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED MORGAN MINE
COAL REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation		
		1	2	3
pH		6.9	7.3	
E.C.	mS/m	340	330	
Acidity*	mg/L	33	27	
Alkalinity*	"	171	225	
Total P	"	0.06	0.06	
				L
				Y
Cl ⁻	"	20	29	S
SO ₄ ⁼	"	2,143	2,102	I
NH ₃ -N	"	0.18	0.02	M
NO ₂ +NO ₃ -N	"	5.48	25.5	E
Al	"	0.20	0.05	T
				E
				R
Cd	"	0.001	<0.0004	
Cr	"	0.004	0.003	D
Cu	"	0.017	0.013	R
Fe	"	2.88	0.397	Y
Mn	"	2.14	0.248	
Ni	"	0.076	0.009	
Pb	"	<0.004	<0.004	
Zn	"	0.496	0.062	

*As calcium carbonate.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED UNITED
ELECTRIC COAL REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation				
		1	2	3	4	5
pH			7.0	7.3	7.5	7.2
E.C.	mS/m		300	250	400	330
Acidity*	mg/L		36	8	56	44
Alkalinity*	"		237	87	438	285
Total P	"		0.10	0.16	0.08	0.08
		L				
		Y				
Cl ⁻	"	S	6	25	37	24
SO ₄ ⁼	"	I	1,263	1,474	2,237	2,058
NH ₃ -N	"	M	<0.02	0.24	<0.02	0.02
NO ₂ +NO ₃ -N	"	E	113	16.1	71.6	1.52
Al	"	T	0.15	0.15	0.15	0.15
		E				
		R				
Cd	"		0.009	0.013	0.001	<0.0004
Cr	"	D	0.003	0.005	0.004	0.004
Cu	"	R	0.031	0.055	0.054	0.016
Fe	"	Y	0.165	0.114	0.094	0.121
Mn	"		0.036	0.185	0.028	0.536
Ni	"		0.021	0.057	0.032	0.043
Pb	"		<0.004	<0.004	<0.004	<0.004
Zn	"		0.396	1.06	0.356	0.404

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS ON THE RECLAIMED UNITED ELECTRIC COAL REFUSE PILE SITE SAMPLED ON DECEMBER 13, 2006

Constituent	Units	Lysimeter Designation					
		6	7	8	9	10	
pH		3.1	7.2	7.2	7.3		
E.C.	mS/m	320	320	580	500		
Acidity*	mg/L	560	45	100	65		
Alkalinity*	"	<1	276	759	517		
Total P	"	0.18	0.18	0.07	0.07		
							L
							Y
Cl ⁻	"	12	12	83	87		S
SO ₄ ⁼	"	2,123	1,724	4,109	3,403		I
NH ₃ -N	"	2.02	<0.02	14.68	0.05		M
NO ₂ +NO ₃ -N	"	6.97	43.4	1.55	0.76		E
Al	"	62.4	0.07	0.02	0.03		T
							E
							R
Cd	"	0.283	<0.0004	<0.0004	<0.0004		
Cr	"	0.041	0.003	0.005	0.003		D
Cu	"	0.425	0.025	0.004	0.012		R
Fe	"	35.8	0.153	5.68	0.163		Y
Mn	"	4.70	0.071	7.55	1.94		
Ni	"	0.766	0.011	0.042	0.031		
Pb	"	<0.004	<0.004	<0.004	<0.004		
Zn	"	22.4	0.064	0.057	0.194		

*As calcium carbonate.

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FULTON COUNTY

FULTON COUNTY CROP YIELD AND PLANT TISSUE ANALYSES

December 2005

FULTON COUNTY CROP YIELD AND PLANT TISSUE ANALYSES FOR 2005

Fulton County crops are sampled annually to monitor yield and to determine metal concentrations in harvested portions of the crops.

Crop yields for 2005 are presented in Table 10.

Crop tissue analyses for 2005 are presented as follows:

1. Table 11, 2005 corn leaf.
2. Table 12, 2005 corn grain.
3. Table 13, 2005 soybean grain.
4. Table 14, 2005 hay.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10

2005 FULTON COUNTY CROP YIELD DATA

Field Number	Soil Type ¹	Cumulative Biosolids Applied ²		Corn bu/acre	Soybeans bu/acre
		-----Dry Solids----- Mg/ha	tons/acre		
1	MS	1,736	775	12	
2	MS	1,816	811		27
3	MS	1,814	810	11	
4	MS	1,522	679		27
5	MS	1,562	698	35	30
7E	MS	1,494	667	35	
7W	MS	1,494	667	35	
8	MS	1,320	589		
9	MS	1,602	716		30
11	MS	1,485	663		25
12	MS	1,398	624		25
13	MS	1,366	610	17	
14	MS	1,472	657	20	
15	MS	1,483	662	25	
16E	1/4 MS	1,510	674		42
16W	1/4 MS	1,510	674		40
17	MS	1,722	770		30
18	½ MS	1	0.46	66	
19	PL	644	287	148	

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10 (Continued)

2005 FULTON COUNTY CROP YIELD DATA

Field Number	Soil Type ¹	Cumulative Biosolids Applied ²		Corn bu/acre	Soybeans bu/acre
		-----Dry Solids----- Mg/ha	tons/acre		
20	PL	531	237	100	
21	PL	618	276	148	
22	PL	455	203	148	
23	PL	473	211	148	
24	MS	1	0.5		32
25	MS	869	388	0	
26	MS	1,086	485	0	
27	2/3 MS	847	378	0	
28	MS	903	403	3	
29	MS	1	0.5		
30	MS	1,169	522	3	
31	PL	557	249	148	
32	MS	600	268	12	
33	MS	1,109	495	18	
34	PL	566	253	148	
36	PL	1,083	483	90	
37	PL	801	358	90	
38A	MS	9	4	37	
38C	MS	9	4		28

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10 (Continued)

2005 FULTON COUNTY CROP YIELD DATA

Field Number	Soil Type ¹	Cumulative Biosolids Applied ²		Corn bu/acre	Soybeans bu/acre
		-----Dry Solids----- Mg/ha	tons/acre		
39	MS	645	288		36
40	1/2 MS	497	222	75	
41	MS	979	437	15	
42	MS	858	384	50	
43	MS	983	439		18
44	MS	804	359	38	
45	3/4 MS	844	377	45	
47	MS	1,120	500	40	
50	5/6 MS	7	3		31
51	1/4 MS	46	20		28
52	MS	9	4		30
54	MS	14	6		20
55	MS	7	3		30
56	MS	13	6		31
59	PL	2	1		42
60	MS	3	1.5		20
61	MS	2	1		20
63-1-1	MS	22	10		20

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10 (Continued)

2005 FULTON COUNTY CROP YIELD DATA

Field Number	Soil Type ¹	Cumulative Biosolids Applied ²		Corn bu/acre	Soybeans bu/acre
		-----Dry Solids----- Mg/ha	tons/acre		
63-8-1 ³	MS	22	10	ND	
63-8-2	MS	22	10		35
64	MS	2	0.7		22
65	MS	0	0.17		18
75	MS	336	150		ND
80	PL	0	0	108	
82	PL	0	0	108	
83	PL	0	0	32	
84	MS	0	0	42	

¹MS = mine-spoil; fractions appearing before MS indicate the proportion of the field that consists of mine-spoil with the remainder of the surface being placed land. PL = placed land indicating that the field has not been strip mined.

²Through 2004.

³Portion of field used for biosolids P runoff study.

ND = Not determined.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 11

MEAN CONCENTRATIONS OF METALS IN CORN LEAF SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number ¹	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
----- mg/kg -----									
1	117	2.1	10	0.31	0.36	<0.3	21,447	5,150	2,868
3	124	4.4	9	0.32	0.45	<0.3	23,369	4,411	2,348
7E	94	3.1	10	0.33	0.41	<0.3	21,381	5,576	4,183
7W	48	0.73	11	0.30	0.22	<0.3	12,288	7,471	6,414
8	92	3.4	12	0.33	0.35	<0.3	19,378	5,846	4,576
13	134	3.4	13	0.33	0.53	<0.3	15,882	6,838	5,305
14	112	2.3	12	0.31	0.35	<0.3	13,098	6,711	6,331
15	122	3.9	12	0.35	0.29	<0.3	15,313	6,847	5,524
18	32	<0.02	9	0.31	0.35	<0.3	11,087	9,142	8,693
19-1	77	6.3	10	0.54	0.74	<0.3	22,216	7,312	2,902
19-2	54	5.4	11	0.57	0.44	<0.3	16,549	8,015	5,490
20-1	59	1.3	9	0.34	0.31	<0.3	14,030	7,126	6,427
20-2	62	1.5	10	0.61	0.26	<0.3	11,760	8,445	7,098
21-1	59	6.3	10	0.91	0.46	<0.3	22,555	6,957	3,159
21-2	49	4.7	11	0.99	0.29	<0.3	11,619	7,805	7,027
22-1	42	0.85	11	0.97	0.21	<0.3	10,197	8,517	8,215
22-2	63	1.4	10	0.82	0.25	<0.3	16,171	6,512	4,735
23-1	36	0.98	8	0.84	<0.20	<0.3	6,641	6,700	8,160
23-2	49	1.4	9	0.80	0.24	<0.3	14,964	5,718	4,686
25	73	2.8	8	0.76	<0.20	<0.3	19,612	5,235	4,198

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 11 (Continued)

MEAN CONCENTRATIONS OF METALS IN CORN LEAF SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number ¹	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
----- mg/kg -----									
26	103	2.4	11	0.32	0.27	<0.3	16,278	6,623	7,073
27	85	2.9	11	0.26	0.39	<0.3	20,482	5,283	3,603
28	79	0.87	10	<0.20	0.28	<0.3	21,914	5,109	4,217
30	86	1.4	12	0.21	0.26	<0.3	22,134	5,629	4,477
31-1	33	1.1	12	0.28	0.24	<0.3	5,491	6,855	10,078
31-2	90	4.9	13	0.25	0.41	<0.3	11,157	6,238	5,808
32	67	0.61	11	0.32	0.53	<0.3	16,297	4,489	4,049
33	130	3.1	13	0.33	0.38	<0.3	21,861	5,816	3,419
34-1	65	4.5	14	0.36	0.40	<0.3	7,683	8,224	7,893
34-2	54	2.4	11	0.23	0.22	<0.3	12,766	4,857	6,601
35	118	1.0	11	0.27	0.35	<0.3	20,140	6,713	4,647
36	131	1.5	12	0.23	0.43	<0.3	23,357	5,559	3,845
37	56	2.0	11	0.75	0.38	<0.3	11,742	7,450	7,059
38A	42	0.08	9	0.23	0.22	<0.3	10,133	6,107	6,013
40-1	63	0.43	10	0.33	0.23	<0.3	8,798	7,378	10,325
40-2	141	1.2	8	0.24	0.52	<0.3	14,721	8,278	6,020
41	66	1.9	8	0.63	0.71	<0.3	20,269	3,670	2,568
42	83	2.6	8	0.24	0.21	<0.3	20,510	5,776	4,123
44	110	3.2	9	0.24	0.24	<0.3	20,393	5,294	3,289
45	66	1.1	7	0.31	<0.20	<0.3	17,266	5,863	5,082

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 11 (Continued)

MEAN CONCENTRATIONS OF METALS IN CORN LEAF SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number ¹	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
	----- mg/kg -----								
47	105	2.8	10	0.39	0.33	<0.3	22,015	5,194	2,545
63-8-1	49	<0.02	14	0.71	0.61	<0.3	9,530	6,433	6,138
80	23	<0.02	7	<0.20	0.35	<0.3	17,650	3,697	2,578
82	22	<0.02	9	0.26	0.33	<0.3	17,336	5,874	3,528
83	31	<0.02	8	0.25	0.32	<0.3	17,529	4,509	3,286
84	17	<0.02	5	<0.20	<0.20	<0.3	14,728	4,807	3,586

¹Field numbers with designations '-1' and '-2' were sampled as two sections.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12

MEAN CONCENTRATIONS OF METALS IN CORN GRAIN SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
	-----mg/kg-----								
1	41	<0.01	2.1	0.13	1.3	<0.15	3,281	31	1,399
3	46	<0.01	2.4	0.12	1.3	<0.15	3,521	36	1,464
7E	26	<0.01	1.9	<0.10	0.39	<0.15	3,109	33	1,236
7W	34	<0.01	2.1	<0.10	0.92	<0.15	3,286	30	1,278
8	27	<0.01	1.4	<0.10	0.33	<0.15	3,435	31	1,320
13	36	<0.01	1.7	<0.10	1.0	<0.15	3,186	37	1,363
14	32	<0.01	1.6	0.17	0.56	<0.15	3,134	43	1,316
15	37	<0.01	2.3	<0.10	0.36	<0.15	3,493	34	1,413
18	21	<0.01	1.3	0.16	0.50	<0.15	3,451	52	1,252
19	42	0.03	2.3	0.12	1.3	<0.15	3,300	66	1,546
20	28	<0.01	1.9	<0.10	1.1	<0.15	3,191	31	1,161
21	34	<0.01	2.3	0.77	1.2	<0.15	3,028	44	1,380
22	28	<0.01	1.8	<0.10	0.90	<0.15	3,276	32	1,359
23	27	<0.01	1.7	0.13	0.89	<0.15	3,127	27	1,288
25	37	<0.01	1.5	0.12	0.84	<0.15	3,442	19	1,318
26	38	<0.01	1.9	0.12	1.0	<0.15	3,506	26	1,331
27	36	<0.01	2.1	<0.10	0.87	<0.15	3,442	34	1,245
28	38	<0.01	1.9	<0.10	0.66	<0.15	3,493	24	1,404

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12 (Continued)

MEAN CONCENTRATIONS OF METALS IN CORN GRAIN SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
	-----mg/kg-----								
30	34	<0.01	1.5	<0.10	0.82	<0.15	3,350	38	1,217
31	27	<0.01	1.6	0.14	0.66	<0.15	3,159	37	1,223
32	35	<0.01	1.9	<0.10	0.70	0.2	3,331	40	1,374
33	34	<0.01	2.2	<0.10	0.65	<0.15	3,256	43	1,336
34	30	<0.01	1.9	1.03	1.30	<0.15	3,578	38	1,450
35	36	<0.01	1.3	0.13	0.84	<0.15	3,465	32	1,290
36	38	<0.01	1.6	0.12	0.88	<0.15	3,688	32	1,382
37	30	<0.01	1.7	0.16	0.74	<0.15	3,520	41	1,269
38A	28	<0.01	2.4	<0.10	0.54	<0.15	3,105	50	1,038
40	39	<0.01	1.9	0.12	0.88	<0.15	3,694	35	1,401
41	35	<0.01	1.9	0.11	0.37	<0.15	3,458	49	1,502
42	32	<0.01	1.9	<0.10	0.57	<0.15	3,377	44	1,307
44	38	<0.01	2.8	0.23	0.53	<0.15	3,505	41	1,352
45	33	<0.01	2.3	<0.10	0.59	<0.15	3,383	46	1,320
47	36	<0.01	2.5	0.11	0.27	<0.15	3,479	40	1,362
63-8-1 ¹	ND	ND	ND	ND	ND	ND	ND	ND	ND
80	25	<0.01	1.9	<0.10	0.70	<0.15	3,262	39	1,247
82	24	<0.01	2.3	<0.10	0.42	<0.15	3,221	37	1,127

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 12 (Continued)

MEAN CONCENTRATIONS OF METALS IN CORN GRAIN SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
	-----mg/kg-----								
83	25	<0.01	1.4	0.16	0.83	<0.15	3,879	50	1,200
84	29	<0.01	1.6	0.16	0.43	<0.15	3,856	57	1,421

¹Portions of field used for biosolids P runoff study.
 ND = Not determined.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 13

MEAN CONCENTRATIONS OF METALS IN SOYBEAN GRAIN SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
	-----mg/kg-----								
2	69	0.40	15	0.67	8.6	<0.15	21,520	2,771	2,599
4	63	0.30	15	0.72	9.2	<0.15	20,387	2,869	2,579
5	67	0.91	15	0.60	7.9	<0.15	19,504	3,555	2,950
9	71	0.42	16	1.11	10.2	<0.15	20,792	3,294	2,973
11	65	0.87	15	0.60	7.9	<0.15	19,742	3,474	2,923
12	67	0.92	15	0.58	8.2	<0.15	19,515	3,480	2,914
16E	65	0.67	14	0.53	8.5	<0.15	18,265	3,582	2,992
16W	65	0.65	15	0.54	8.6	<0.15	18,735	3,514	3,001
17	76	0.46	17	1.24	10.6	<0.15	20,776	3,359	2,974
24	52	0.19	15	0.53	2.7	<0.15	19,481	3,274	2,761
38C	48	<0.01	15	0.30	7.1	<0.15	19,030	3,317	2,827
39	66	0.41	13	0.33	5.4	<0.15	21,177	2,917	2,810
43	66	0.43	13	0.37	5.5	<0.15	20,926	2,819	2,774
50	44	<0.01	16	0.36	2.6	<0.15	19,789	3,264	2,518
51	46	<0.01	13	0.28	9.7	<0.15	18,669	3,522	2,696
52	44	<0.01	14	0.23	3.3	<0.15	19,418	3,108	2,529
54	53	<0.01	15	0.22	2.8	<0.15	19,064	3,058	2,275
55	51	<0.01	16	0.34	3.9	<0.15	20,444	3,252	2,520

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 13 (Continued)

MEAN CONCENTRATIONS OF METALS IN SOYBEAN GRAIN SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
	-----mg/kg-----								
56	47	<0.01	13	0.19	2.5	<0.15	18,584	3,154	2,279
59	42	<0.01	14	0.45	5.0	<0.15	17,590	3,217	3,093
60	46	<0.01	17	0.25	2.4	<0.15	18,167	4,116	3,077
61	49	<0.01	18	0.55	2.1	<0.15	19,900	4,647	3,607
63-1-1	50	<0.01	18	0.27	2.6	<0.15	19,997	4,474	3,173
63-8-2	52	<0.01	20	0.20	2.6	<0.15	19,836	3,686	2,773
64	56	<0.01	17	0.20	3.2	<0.15	21,153	3,542	2,514
65	54	<0.01	17	0.29	5.6	<0.15	22,145	3,654	2,565
75	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND = Not determined.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 14

MEAN CONCENTRATIONS OF METALS IN HAY SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Cutting	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
----- mg/kg -----										
10-1	1	75	2.9	8.6	1.6	7.2	<0.15	15,410	10,804	2,460
10-2	1	74	1.6	6.6	0.93	1.9	<0.15	17,459	3,792	1,437
29-1	1	20	0.03	6.9	0.73	0.94	<0.15	11,210	7,836	3,161
29-2	1	13	<0.01	6.4	0.24	0.54	<0.15	16,818	6,937	2,915
62-1	1	15	<0.01	7.7	0.23	1.0	<0.15	16,137	13,792	2,811
62-2	1	10	<0.01	7.8	0.24	0.51	<0.15	11,314	11,537	3,356
63-1-2	1	12	<0.01	5.4	0.23	0.58	<0.15	16,274	6,110	2,054
63-2-1	1	15	<0.01	5.2	0.19	0.72	<0.15	21,701	4,312	2,169
63-2-2	1	15	<0.01	6.0	0.13	0.72	<0.15	23,099	4,491	2,121
63-3-1	1	11	<0.01	3.3	0.22	0.14	<0.15	15,634	2,809	1,165
63-3-2	1	13	<0.01	6.7	0.20	0.95	<0.15	16,166	9,706	2,388
63-4-1	1	11	<0.01	5.2	0.18	0.46	<0.15	13,945	9,146	2,138
63-4-2	1	15	0.05	5.9	0.32	0.97	<0.15	13,749	8,854	2,578
63-5-1	1	14	<0.01	3.6	0.23	0.23	<0.15	17,060	3,387	1,432
63-5-2	1	16	<0.01	5.1	0.19	0.31	<0.15	16,606	6,026	2,001
63-6-1	1	13	<0.01	6.3	0.22	0.56	<0.15	15,004	9,145	2,578

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 14 (Continued)

MEAN CONCENTRATIONS OF METALS IN HAY SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Cutting	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
		----- mg/kg -----								
63-6-2	1	15	<0.01	5.2	0.29	0.59	<0.15	16,122	6,700	2,363
63-7-1	1	12	<0.01	5.5	0.15	0.40	<0.15	12,395	6,825	2,234
63-7-2	1	14	<0.01	6.3	0.14	0.88	<0.15	13,806	11,577	2,573
73-1	1	15	<0.01	3.6	0.20	0.61	<0.15	17,956	3,333	1,674
73-2	1	15	<0.01	2.7	0.19	0.18	<0.15	16,057	3,272	1,115
76-1	1	17	0.02	5.8	0.34	0.62	<0.15	13,532	9,602	2,285
76-2	1	15	<0.01	6.6	0.36	1.3	<0.15	11,850	11,729	2,862
10-1	2	61	2.8	6.1	0.94	8.5	<0.15	11,307	7,405	2,424
62-1	2	21	<0.01	8.4	0.18	0.63	<0.15	15,601	7,953	2,626
62-2	2	20	<0.01	6.4	0.18	0.57	<0.15	15,744	8,451	2,702
63-2-1	2	17	<0.01	7.3	0.22	0.85	<0.15	15,252	10,982	3,108
63-2-2	2	16	<0.01	8.0	0.24	0.67	<0.15	14,443	10,321	3,190
63-4-1	2	18	<0.01	6.9	0.13	0.71	<0.15	17,756	10,350	2,392
63-4-2	2	17	<0.01	6.5	0.14	0.88	<0.15	17,920	9,497	2,366
63-5-2	2	16	<0.01	5.3	0.13	0.65	<0.15	21,565	8,332	1,963

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 14 (Continued)

MEAN CONCENTRATIONS OF METALS IN HAY SAMPLES COLLECTED AT THE FULTON COUNTY RECLAMATION SITE IN 2005

Field Number	Cutting	Zn	Cd	Cu	Cr	Ni	Pb	K	Ca	Mg
		----- mg/kg -----								
63-6-1	2	14	<0.01	6.1	0.17	0.72	<0.15	14,823	10,872	3,118
63-6-2	2	15	<0.01	6.4	0.14	0.69	<0.15	14,948	9,834	3,061
63-7-1	2	18	<0.01	2.7	0.18	1.09	<0.15	14,672	9,703	3,104
63-7-2	2	15	<0.01	1.5	0.13	0.60	<0.15	14,102	9,175	2,159
76-1	2	22	<0.01	3.8	0.20	0.87	<0.15	16,631	9,445	3,130
76-2	2	19	<0.01	8.9	0.18	0.89	<0.15	12,152	10,036	3,593
63-2-1	3	26	<0.01	11	0.16	0.84	<0.15	20,770	10,694	2,869
63-2-2	3	25	<0.01	10	0.17	0.96	<0.15	23,809	9,568	3,024

Metropolitan Water Reclamation District of Greater Chicago
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FULTON COUNTY FIELDS SOIL ANALYSES FOR 2005

FULTON COUNTY FIELDS SOIL ANALYSES FOR 2005

Fulton County fields are sampled (0-6 inch depth) annually to monitor plant nutrient and metals concentrations. Table 15 presents the analysis of Fulton County field soil samples taken in 2005.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 15

MEAN pH, ELECTRICAL CONDUCTIVITY (EC), AND CONCENTRATIONS OF ORGANIC CARBON, NUTRIENTS AND METALS FOR BERMED BIOSOLIDS APPLICATION FIELDS AT THE FULTON COUNTY RECLAMATION SITE SAMPLED IN 2005¹

Field Number	Cumulative Biosolids Applied ²		pH	EC	Organic Carbon	TKN	Tot.-P	NH ₃ -N ³	NO ₂ -N+ NO ₃ -N ³	Zn	Cd	Cu	Cr	Ni	Pb
	Mg/ha	tons/acre													
			(dS/m)	(%)	-----mg/kg -----										
1	1,735	775	6.7	0.72	5.37	6,429	10,952	5.45	106	1,121	67.3	628	862	126	270
2	1,816	810	6.7	0.42	5.89	6,186	12,309	3.20	42.0	1,256	71.7	678	905	127	299
3	1,814	810	6.4	0.95	6.28	6,638	9,938	3.90	124	1,069	54.7	599	737	107	247
4	1,522	680	6.7	0.40	6.13	5,573	9,778	1.20	40.1	1,019	53.2	551	693	109	226
5	1,562	698	6.8	0.39	6.04	5,505	10,133	3.15	29.4	989	51.4	549	687	103	233
6	614	274	7.4	0.24	3.37	2,482	2,734	0.00	7.04	318	19.5	170	266	53	79
7E	1,494	667	7.0	0.29	4.84	4,272	7,586	0.85	18.5	924	58.9	547	779	113	234
7W	1,494	667	7.3	0.21	3.43	2,659	4,234	0.95	12.8	459	27.0	250	361	64	112
8	1,320	589	7.0	0.28	4.87	4,526	9,217	4.20	20.7	1,105	70.7	679	946	124	284
9	1,602	716	6.9	0.39	5.73	4,611	8,458	7.55	18.5	878	48.3	520	665	101	208
10	1,073	479	6.7	0.28	5.21	5,247	11,972	11.3	26.8	1,289	89.8	849	1,220	150	356
11	1,485	663	6.9	0.25	4.87	3,839	7,527	7.50	18.6	927	62.1	553	830	120	259
12	1,398	624	7.1	0.31	4.47	4,112	8,572	7.30	20.2	1,031	63.2	468	760	112	255
13	1,367	610	6.6	0.67	4.99	4,754	9,119	11.4	109	1,148	71.0	536	859	118	281
14	1,473	657	6.8	0.70	5.08	5,133	9,663	10.6	107	1,150	62.7	488	755	113	262
15	1,482	662	6.7	0.81	5.17	5,437	9,079	8.85	108	1,077	52.2	453	628	96	230
16E	1,510	674	6.9	0.19	4.13	3,015	5,434	7.40	11.7	874	55.6	387	663	95	218

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 15 (Continued)

MEAN pH, ELECTRICAL CONDUCTIVITY (EC), AND CONCENTRATIONS OF ORGANIC CARBON, NUTRIENTS AND METALS FOR BERMED BIOSOLIDS APPLICATION FIELDS AT THE FULTON COUNTY RECLAMATION SITE SAMPLED IN 2005¹

Field Number	Cumulative Biosolids Applied ²		pH	EC	Organic Carbon	TKN	Tot.-P	NH ₃ -N ³	NO ₂ -N+ NO ₃ -N ³	Zn	Cd	Cu	Cr	Ni	Pb
	Mg/ha	tons/acre													
			(dS/m)	(%)	-----mg/kg -----										
16W	1,510	674	6.9	0.24	4.50	3,621	7,364	8.10	14.4	1,016	64.1	464	767	107	247
17	1,722	770	6.9	0.35	5.76	5,759	11,193	12.3	20.3	1,242	68.9	569	843	125	288
19	644	287	6.8	0.17	3.21	2,471	4,578	5.45	7.46	761	52.6	339	621	83	218
20	531	237	6.6	0.44	3.83	3,103	4,494	5.15	68.5	721	47.4	331	581	81	193
21	618	276	6.9	0.19	3.37	2,447	5,232	6.05	7.70	729	48.8	320	571	77	191
22	455	203	6.9	0.25	3.49	2,758	5,719	4.50	22.4	737	49.6	343	591	78	197
23	473	211	6.8	0.20	3.15	2,658	4,827	4.05	18.3	688	45.6	319	551	74	181
25	869	388	6.6	1.59	4.81	3,409	5,479	3.35	96.7	740	39.0	299	463	75	165
26	1,086	485	6.8	0.79	3.98	3,547	6,304	3.50	107	781	43.3	324	511	84	171
27	847	378	6.9	1.07	4.70	4,161	7,756	6.75	120	911	50.4	393	616	91	214
28	903	403	6.8	0.68	4.58	4,310	7,497	6.90	107	852	51.2	424	642	103	207
30	1,169	522	7.1	0.71	4.46	3,928	6,938	6.45	107	777	41.3	346	509	86	172
31	557	249	6.9	0.19	2.51	2,202	4,495	5.60	16.1	585	37.7	280	463	70	150
32	601	269	6.7	0.74	4.75	4,717	7,203	12.2	94.5	680	33.7	310	423	76	147
33	1,109	495	6.8	0.77	5.45	3,893	8,814	11.3	94.4	870	49.2	434	619	96	198
34	566	253	7.0	0.19	2.73	5,190	4,700	11.3	17.7	545	36.8	268	454	65	148
35	1,048	468	6.6	0.81	4.01	2,218	6,990	13.8	146	801	46.0	362	571	79	184

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 15 (Continued)

MEAN pH, ELECTRICAL CONDUCTIVITY (EC), AND CONCENTRATIONS OF ORGANIC CARBON, NUTRIENTS AND METALS FOR BERMED BIOSOLIDS APPLICATION FIELDS AT THE FULTON COUNTY RECLAMATION SITE SAMPLED IN 2005¹

Field Number	Cumulative Biosolids Applied ²		pH	EC	Organic Carbon	TKN	Tot.-P	NH ₃ -N ³	NO ₂ -N+ NO ₃ -N ³	Zn	Cd	Cu	Cr	Ni	Pb
	Mg/ha	tons/acre													
			(dS/m)	(%)	-----mg/kg -----										
36	1,083	483	6.9	0.65	3.68	3,683	6,172	15.0	112	724	42.6	328	520	75	167
37	801	358	6.6	0.62	3.16	3,324	5,368	13.5	104	630	36.8	283	455	69	143
39	646	288	7.0	0.46	3.68	4,125	6,073	19.4	26.7	566	26.4	240	331	61	114
40	497	222	6.9	0.17	3.65	3,062	5,730	14.8	7.38	699	46.4	341	569	80	177
41	979	437	6.8	0.85	4.66	4,560	7,482	27.2	75.5	742	38.6	340	472	73	161
42	858	384	7.0	0.35	3.95	3,755	7,110	19.4	21.8	801	49.0	381	594	86	192
43	984	439	6.9	0.91	5.85	6,279	9,483	38.6	131	750	30.8	336	386	66	146
44	806	360	6.8	0.93	4.26	4,196	6,847	40.6	107	691	40.3	333	493	78	158
45	1,659	741	6.8	0.85	4.78	4,680	7,956	15.4	50.2	693	35.1	341	427	67	150
47	1,122	500	6.5	1.37	5.95	6,775	11,563	65.2	199	1,110	56.6	538	694	101	230

¹Sampling depth 0-15 cm.

²Cumulative biosolids applied up to 2004, when the last biosolids applications were done at the Fulton County site.

³1-M KCl-extractable.