

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

*REPORT NO. 06-71*

*HANOVER PARK FISCHER FARM MONITORING REPORT*

*THIRD QUARTER 2006*

*NOVEMBER 2006*

Terrence J. O'Brien  
*President*

Kathleen Therese Meany  
*Vice President*

Gloria Alitto Majewski  
*Chairman of Finance*

Frank Avila

James C. Harris

Barbara J. McGowan

Cynthia M. Santos

Patricia Young

Harry "Bus" Yourell

**Metropolitan Water Reclamation District of Greater Chicago**

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312-751-5600

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

312-751-5190

November 28, 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:

The attached report contains the monitoring results for the Hanover Park Water Reclamation Plant Fischer Farm site for the third quarter of 2006, as required by IEPA Operating Permit No. 2002-SC-0672.

Very truly yours,

Louis Kollias  
Director  
Research and Development

LK:PL:spy

Enclosure

cc w/enc:

Jay Patel, Manager, IEPA Region II - Des Plaines

Mr. Valdis Aistars, USEPA Region V

Mr. Ash Sajjad, USEPA Region V

Drs. Granato

Khalil

O'Connor

Cox

Lindo

Ms. Sharma

Patel

Messrs. Levy

Lazicki (2)

Stuba

Library

***Metropolitan Water Reclamation District of Greater Chicago***

*100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600*

**HANOVER PARK WATER RECLAMATION PLANT**

**FISCHER FARM REPORT**

**THIRD QUARTER 2006**

**Research and Development**

**P. Lindo**

**A. Cox**

**November 2006**

## TABLE OF CONTENTS

	<u>Page</u>
FOREWORD	ii
LIST OF TABLES	iii
LIST OF FIGURES	iv
ACKNOWLEDGMENT	v
DISCLAIMER	v
HANOVER PARK WATER RECLAMATION PLANT FISCHER FARM REPORT FOR THIRD QUARTER OF 2006	1

## FOREWORD

The data and information in this report fulfill the frequency of monitoring and the reporting requirements for the Hanover Park Fischer Farm Site as specified in the Illinois Environmental Protection Agency Permit No. 2002-SC-0672 for the third quarter of 2006.

## LIST OF TABLES

<u>Table No.</u>		<u>Page</u>
1	Analysis of Water from the Six Monitoring Wells at the Hanover Park Fischer Farm Site Sampled on July 11, 2006	3
2	Analysis of Water from the Six Monitoring Wells at the Hanover Park Fischer Farm Site Sampled on July 25, 2006	4
3	Analysis of Water from the Six Monitoring Wells at the Hanover Park Fischer Farm Site Sampled on August 8, 2006	5
4	Analysis of Water from the Six Monitoring Wells at the Hanover Park Fischer Farm Site Sampled on August 22, 2006	6
5	Analysis of Water from the Six Monitoring Wells at the Hanover Park Fischer Farm Site Sampled on September 12, 2006	7
6	Analysis of Water from the Six Monitoring Wells at the Hanover Park Fischer Farm Site Sampled on September 26, 2006	8
7	Analysis of Combined Surface and Subsurface Drainage from the Fischer Farm Site Returned to the Hanover Park Water Reclamation Plant in July August, and September 2006	9
8	Analysis of Lagoon Supernatant Applied to Fields at the Hanover Park Fischer Farm Site During July, August, and September 2006	10
9	Analysis of Retention Pond Sediment Applied to Fields at the Hanover Park Fischer Farm Site During August 2006	11
10	Volumes and Dry Weights of Lagoon Supernatant and Retention Pond Sediment Applied to Fields at the Hanover Park Fischer Farm Site During July, August, and September 2006	12

## LIST OF FIGURES

<u>Figure No.</u>		<u>Page</u>
1	Fields and Wells at the Hanover Park Fischer Farm Site	2

## ACKNOWLEDGMENT

The assistance given by Ms. Minaxi Patel, Sanitary Chemist I, of the Environmental Monitoring and Research Division, and Mr. John Chavich, Sanitary Chemist IV, of the John E. Egan Analytical Laboratory Section, is greatly appreciated.

Thanks are due to 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.

HANOVER PARK WATER RECLAMATION PLANT FISCHER FARM REPORT FOR  
THIRD QUARTER OF 2006

During July, August, and September 2006, activities at the Hanover Park Water Reclamation Plant (WRP) Fischer Farm included well and field drainage water sampling, and flow measurements. These monitoring activities are required by the Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2002-SC-0672. Fields and water monitoring locations are presented in Figure 1.

Water from each of the six monitoring wells was sampled twice monthly in July, August, and September 2006. Analytical data for samples collected during the quarter are presented in Tables 1 through 6.

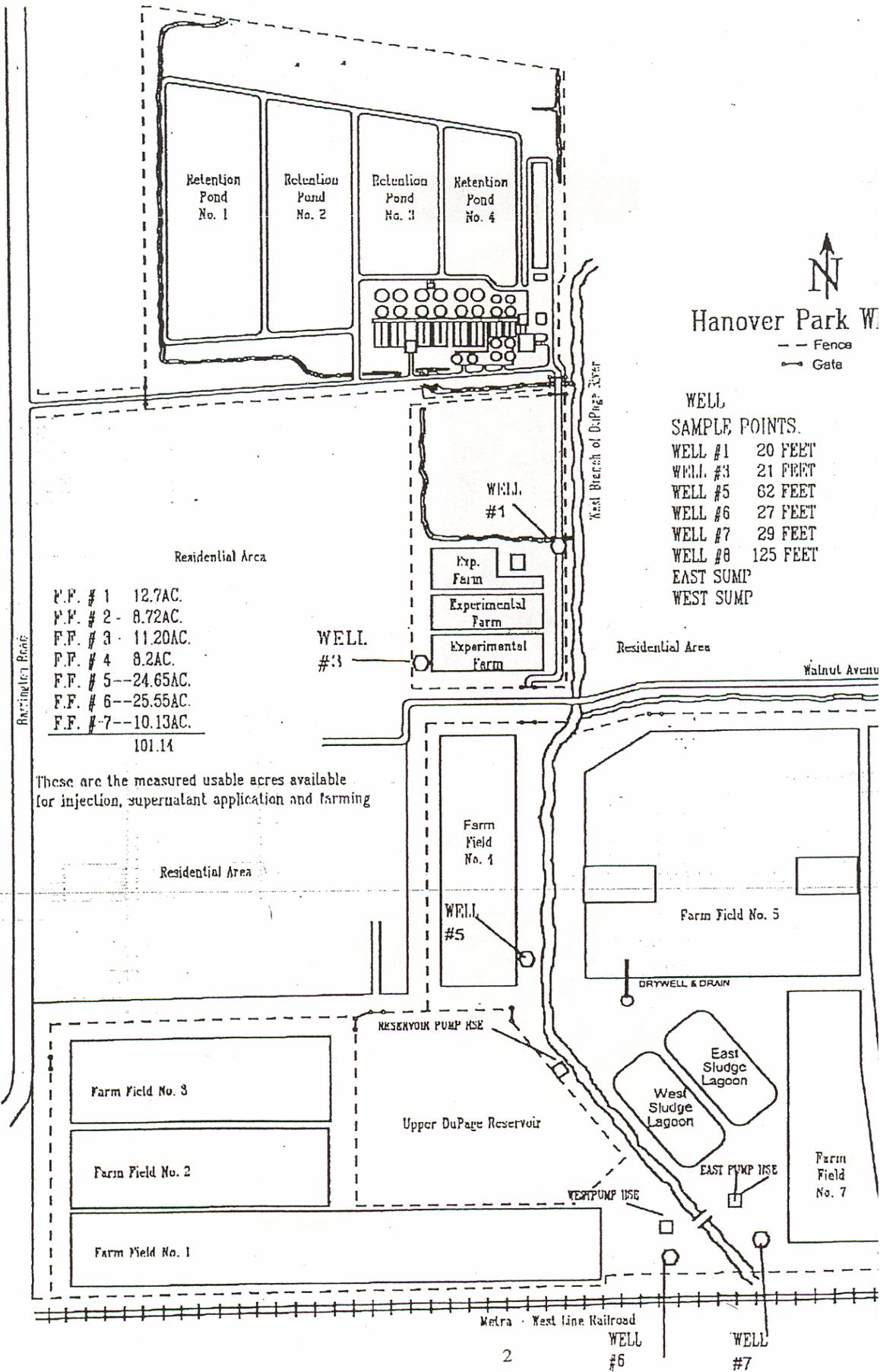
Drainage water (combined surface and subsurface) returned to the Hanover Park WRP from the farm fields was sampled twice per month in July, August, and September. Analytical data for these samples are presented in Table 7. The volumes of drainage water returned to the WRP during the third quarter were estimated as 9.65 (July), 6.41 (August), and 7.60 (September) million gallons (MG).

During the quarter, a total of 3.52 MG lagoon supernatant containing 23.5 dry tons of solids was applied to Fields 1, 2, and 5 at the Fischer Farm site. In addition, 1.255 MG retention pond sediment containing 2,025 dry tons of solids was applied to Field 2 and the experimental fields. The analytical data for both lagoon supernatant and retention pond sediment are presented in Tables 8 and 9, respectively. The volumes and dry weights are reported in Table 10.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 1

FIELDS AND WELLS AT THE HANOVER PARK FISCHER FARM SITE



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER  
PARK FISCHER FARM SITE SAMPLED ON JULY 11, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.6	7.5	7.6	7.4	7.2	8.1
EC	mS/m	218	105	68	99	108	56
Cl <sup>-</sup>	mg/L	546	16	13	24	35	7
SO <sub>4</sub> <sup>=</sup>	"	34	397	98	238	234	57
Alkalinity as CaCO <sub>3</sub>	"	442	257	324	385	438	293
TKN	"	6.4	1.0	0.40	0.46	NA	0.49
NH <sub>3</sub> -N	"	5.2	0.29	0.30	0.25	8.4	0.36
NO <sub>2</sub> +NO <sub>3</sub> -N	"	0.61	0.11	0.06	0.04	0.03	0.04
Total P	"	0.08	0.15	0.04	0.04	0.05	0.05
Cd	"	0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	"	<0.0005	0.0010	0.0026	0.0074	<0.0005	<0.0005
Fe	"	21.5	4.28	1.52	5.43	4.73	1.11
Mn	"	1.418	0.3693	0.0157	0.0295	0.0629	0.0380
Ni	"	0.0049	0.0034	0.0012	0.0029	0.0025	0.0023
Zn	"	0.0621	0.0469	0.0053	0.0153	0.0339	0.0060
Fecal coliform	MPN/100mL	29	<1	<1	<1	<1	<1

\*Samples analyzed beyond recommended holding time of 15 minutes.

NA = No analysis.

MPN = Most probable number.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER  
PARK FISCHER FARM SITE SAMPLED ON JULY 25, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.7	7.6	7.7	7.5	7.3	8.1
EC	mS/m	249	119	74	108	122	60
Cl <sup>-</sup>	mg/L	572	17	13	23	35	7
SO <sub>4</sub> <sup>=</sup>	"	23	414	98	238	248	60
Alkalinity as CaCO <sub>3</sub>	"	435	262	324	385	448	288
TKN	"	6.1	0.84	0.50	0.57	8.4	0.60
NH <sub>3</sub> -N	"	5.6	0.29	0.27	0.27	8.7	0.35
NO <sub>2</sub> +NO <sub>3</sub> -N	"	0.57	0.33	0.22	0.39	0.06	0.03
Total P	"	0.07	0.15	0.04	0.05	0.05	0.04
Cd	"	0.0003	0.0004	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	"	<0.0005	0.0038	0.0298	0.0283	<0.0005	0.0013
Fe	"	23.0	9.91	2.28	12.1	5.02	1.30
Mn	"	1.367	0.3203	0.0204	0.0597	0.0648	0.0383
Ni	"	0.0013	0.0008	0.0009	0.0017	0.0016	<0.0007
Zn	"	0.0514	0.0818	0.0122	0.0207	0.0290	0.0047
Fecal coliform	MPN/100mL	<1	<1	<1	<1	<1	<1

\*Samples analyzed beyond recommended holding time of 15 minutes.

MPN = Most probable number.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER  
PARK FISCHER FARM SITE SAMPLED ON AUGUST 8, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.4	7.4	7.8	7.6	7.4	8.2
EC	mS/m	256	126	78	109	130	62
Cl <sup>-</sup>	"	601	17	14	22	35	7
SO <sub>4</sub> <sup>=</sup>	"	14	436	97	228	249	58
Alkalinity as CaCO <sub>3</sub>	"	424	247	315	377	445	281
TKN	"	7.2	1.0	0.39	0.44	8.7	0.42
NH <sub>3</sub> -N	"	6.6	0.40	0.34	0.27	9.1	0.41
NO <sub>2</sub> +NO <sub>3</sub> -N	"	1.4	0.15	0.03	0.04	0.05	0.09
Total P	mg/L	0.12	0.18	0.05	0.04	0.04	0.04
Cd	"	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0021	0.0008	0.0047	0.0101	<0.0005	<0.0005
Fe	"	9.69	13.8	1.60	6.23	5.01	1.27
Mn	"	1.014	0.3486	0.0164	0.0358	0.0649	0.0400
Ni	"	0.0026	0.0045	0.0014	0.0022	0.0032	<0.0007
Zn	"	0.0659	0.0786	0.0047	0.0097	0.0362	0.0040
Fecal coliform	MPN/100mL	<1	<1	<1	<1	<1	<1

\*Samples analyzed beyond recommended holding time of 15 minutes.

MPN = Most probable number.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER  
PARK FISCHER FARM SITE SAMPLED ON AUGUST 22, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.2	6.8	7.6	7.5	7.3	8.1
EC	mS/m	256	127	78	100	127	63
Cl <sup>-</sup>	"	617	24	14	18	36	7
SO <sub>4</sub> <sup>=</sup>	"	12	439	94	176	247	55
Alkalinity as CaCO <sub>3</sub>	"	421	257	320	379	449	290
TKN	"	10	7.6	0.44	0.34	8.6	0.45
NH <sub>3</sub> -N	"	7.7	3.3	0.34	0.21	9.7	0.43
NO <sub>2</sub> +NO <sub>3</sub> -N	"	0.32	0.19	0.05	0.07	0.04	0.03
Total P	mg/L	0.62	1.4	<0.02	0.08	0.06	0.03
Cd	"	0.0029	NRR	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	NRR	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0118	NRR	0.0088	0.0071	<0.0005	0.0026
Fe	"	65.3	NRR	1.77	3.45	4.74	1.21
Mn	"	1.334	NRR	0.0175	0.0222	0.0610	0.0373
Ni	"	0.0114	0.0990	0.0030	0.0042	0.0050	0.0028
Zn	"	0.2898	NRR	0.0085	0.0111	0.0275	0.0058
Fecal coliform	MPN/100mL	17	1	<1	<1	<1	<1

\*Samples analyzed beyond recommended holding time of 15 minutes.

NRR = No reportable result.

MPN = Most probable number.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER  
PARK FISCHER FARM SITE SAMPLED ON SEPTEMBER 12, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.2		7.7	7.5	7.3	8.1
EC	mS/m	250		79	86	104	62
Cl <sup>-</sup>	"	608		14	17	36	7
SO <sub>4</sub> <sup>=</sup>	"	14		100	180	239	58
Alkalinity as CaCO <sub>3</sub>	"	424	W	324	378	446	286
			E				
TKN	"	12	L	0.45	0.49	11	0.49
NH <sub>3</sub> -N	"	8.4	L	0.41	0.22	10	0.38
NO <sub>2</sub> +NO <sub>3</sub> -N	"	0.30		0.04	0.02	0.04	0.05
Total P	mg/L	0.95		0.07	0.05	0.07	0.05
Cd	"	0.0023	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	R	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0223	Y	0.0051	0.0128	0.0006	0.0013
Fe	"	51.5		1.62	4.80	4.79	1.27
Mn	"	0.9734		0.0161	0.0279	0.0615	0.0360
Ni	"	0.0118		0.0039	0.0034	0.0032	0.0014
Zn	"	0.2780		0.0086	0.0123	0.0314	0.0083
Fecal coliform	MPN/100mL	220	<1	<1	<1	<1	<1

\*Samples analyzed beyond recommended holding time of 15 minutes.

MPN = Most probable number.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER  
PARK FISCHER FARM SITE SAMPLED ON SEPTEMBER 26, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.4		7.6	7.5	7.2	8.1
EC	mS/m	248		78	96	129	62
Cl <sup>-</sup>	"	632		14	17	37	7
SO <sub>4</sub> <sup>=</sup>	"	10		99	178	232	57
Alkalinity as CaCO <sub>3</sub>	"	424	W	328	384	453	288
			E				
TKN	"	9.0	L	0.49	0.41	11	0.54
NH <sub>3</sub> -N	"	7.5	L	0.28	0.23	11	0.45
NO <sub>2</sub> +NO <sub>3</sub> -N	"	0.55		0.03	0.18	0.03	0.03
Total P	mg/L	0.12		0.06	0.04	<0.02	0.04
Cd	"	0.0013	D	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	R	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0136	Y	0.0051	0.0103	0.0021	0.0022
Fe	"	24.3		1.71	5.77	4.94	1.21
Mn	"	0.9193		0.0174	0.0333	0.0635	0.0352
Ni	"	0.0069		0.0027	0.0026	0.0034	0.0019
Zn	"	0.1561		0.0093	0.0101	0.0325	0.0064
Fecal coliform	MPN/100mL	4		<1	<1	2	<1

\*Samples analyzed beyond recommended holding time of 15 minutes.  
MPN = Most probable number.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

ANALYSIS OF COMBINED SURFACE AND SUBSURFACE DRAINAGE FROM THE FISCHER FARM SITE RETURNED TO THE HANOVER PARK WATER RECLAMATION PLANT IN JULY, AUGUST, AND SEPTEMBER 2006

Date	Sump	NH <sub>3</sub> -N	Total Suspended Solids	BOD <sub>5</sub>
		----- mg/L -----		
7/11	East	1.2	3	4
	West	<0.03	6	<2
7/25	East	28	56	34
	West	58	74	41
8/08	East	49	14	6
	West	8.3	15	9
8/22	East	278	204	NA
	West	344	196	NA
9/12	East	142	113	79
	West	139	108	75
9/26	East	16	78	17
	West	0.82	16	6

NA = No analysis.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8

ANALYSIS OF LAGOON SUPERNATANT APPLIED TO FIELDS AT THE HANOVER  
PARK FISCHER FARM SITE DURING JULY, AUGUST AND SEPTEMBER 2006

Constituent	Unit	Concentration <sup>1</sup>
pH		8.1
Total Solids	%	0.16
Total Volatile Solids	"	63.5
Total Kjeldahl-N	mg/kg	349,291
NH <sub>3</sub> -N	"	322,274
Volatile Acids <sup>2</sup>	"	4,634
Total P	"	44,195
As	"	15
Cd	"	0.2
Cr	"	2
Cu	"	99
Hg	"	0.15
Mn	"	138
Mo	"	2
Ni	"	32
Pb	"	5
Se	"	5
Zn	"	120

<sup>1</sup>Means of eight samples of lagoon supernatant.

<sup>2</sup>As acetic acid.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9

ANALYSIS OF RETENTION POND SEDIMENT APPLIED TO FIELDS AT THE  
HANOVER PARK FISCHER FARM SITE DURING AUGUST 2006<sup>1</sup>

Constituent	Unit	Concentration <sup>2</sup>
pH		8.2
Total Solids	%	61.9
Total Volatile Solids	"	9.1
Total Kjeldahl-N	mg/kg	3,027
NH <sub>3</sub> -N	"	617
Volatile Acids <sup>3</sup>	"	3
Total P	"	1,634
As	"	8
Cd	"	6
Cr	"	72
Cu	"	143
Hg	"	0.59
Mn	"	490
Mo	"	2
Ni	"	37
Pb	"	37
Se	"	<0.8
Zn	"	181

<sup>1</sup>No lagoon biosolids were applied to fields in July through September 2006.

<sup>2</sup>Means of three samples of retention pond sediment.

<sup>3</sup>As acetic acid.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10

VOLUMES AND DRY WEIGHTS OF LAGOON SUPERNATANT AND RETENTION POND SEDIMENT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING JULY, AUGUST, AND SEPTEMBER 2006

Field	Date	Biosolids Source	Volume (Gallons)	Dry Weight (Tons)
1	7/12	Lagoon	1,140,000	7.61*
2	7/13	Lagoon	190,000	1.66*
1	7/14	Lagoon	240,000	2.00*
1	7/17	Lagoon	140,000	0.99*
1	7/21	Lagoon	140,000	1.11*
1	8/02	Lagoon	80,000	0.60*
1	8/16	Lagoon	410,000	2.56*
1	9/08	Lagoon	550,000	3.44*
5	9/15	Lagoon	560,000	3.04*
5	9/20	Lagoon	70,000	0.47*
<b>Lagoon Total</b>			<b>3,520,000</b>	<b>23.5</b>
EXP	8/07	Retention Pond	24,235	39.36
EXP	8/09	“	72,706	117.29
EXP	8/10	“	113,905	221.60
EXP	8/11	“	118,752	172.83
EXP	8/14	“	172,070	285.54
EXP	8/15	“	113,905	196.79
2	8/16	“	111,482	171.94
2	8/17	“	111,482	192.95
2	8/18	“	106,635	159.22
2	8/21	“	109,058	191.47
2	8/22	“	92,094	137.92
2	8/23	“	109,058	137.70
<b>Retention Pond Total</b>			<b>1,255,382</b>	<b>2,025</b>
<b>Grand Total</b>			<b>4,775,382</b>	<b>2,048</b>

\*Applied in the form of supernatant.  
EXP = Experimental field.