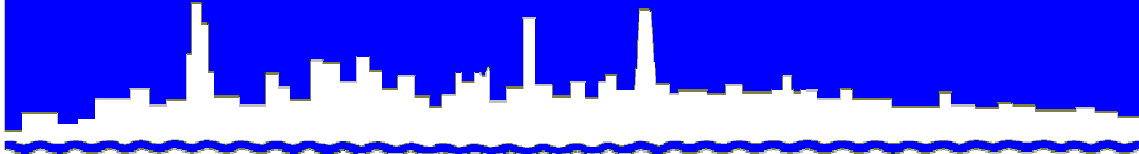


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-9

HANOVER PARK FISCHER FARM MONITORING REPORT

FOURTH QUARTER 2006

MARCH 2007

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Director of Research and Development
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March 5, 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:

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

Very truly yours,

Louis Kollias
Director
Research and Development

LK:TCG:AC: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
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HANOVER PARK WATER RECLAMATION PLANT

FISCHER FARM REPORT

FOURTH QUARTER 2006

Research and Development

P. Lindo

A. Cox

March 2007

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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 fourth quarter of 2006.

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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
FOURTH QUARTER OF 2006

During October, November, and December 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 October, November, and December 2006. Analytical data for samples collected during the quarter are presented in Tables 1 through 6.

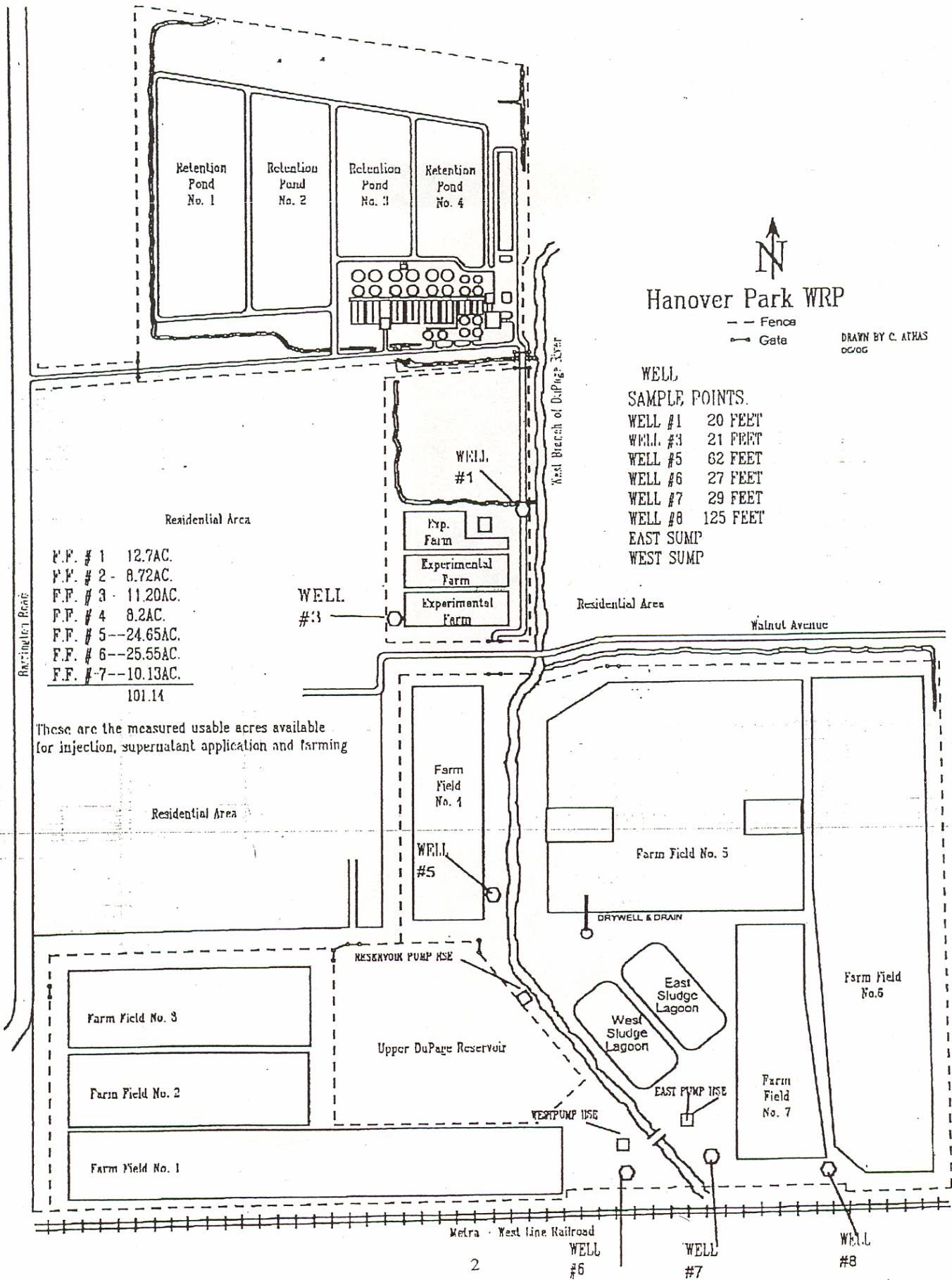
Drainage water (combined surface and subsurface) returned to the Hanover Park WRP from the farm fields was sampled twice per month in October, November, and December. Analytical data for these samples are presented in Table 7. The volumes of drainage water returned to the WRP during the fourth quarter were estimated as 9.98 (October), 8.83 (November), and 6.24 (December) million gallons (MG).

During the quarter, a total of 8.67 MG lagoon supernatant and biosolids containing 1,347 dry tons of solids was applied to Fields 1, 2, 3, 5, and 6 at the Fischer Farm site. The analytical data for both lagoon supernatant and biosolids 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
OCTOBER 10, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		6.9	7.0	7.4	7.2	7.7	7.8
EC	mS/m	260	129	78	96	122	64
Cl ⁻	mg/L	606	18	14	19	37	7
SO ₄ ⁼	"	10	406	97	156	242	63
Alkalinity as CaCO ₃	"	407	312	328	373	436	294
TKN	"	8.0	0.56	0.45	0.41	9.9	0.59
NH ₃ -N	"	7.0	<0.03	0.41	0.28	10	0.43
NO ₂ +NO ₃ -N	"	0.12	0.53	0.03	0.03	0.02	0.02
Total P	"	0.17	0.12	0.05	0.05	0.06	0.05
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	"	0.0017	0.0045	0.0345	0.0077	<0.0005	0.0023
Fe	"	12.0	5.33	4.05	4.65	4.81	1.24
Mn	"	0.8049	0.0572	0.0313	0.0282	0.0625	0.0360
Ni	"	0.0043	0.0032	0.0027	0.0025	0.0021	0.0009
Zn	"	0.0295	0.0487	0.0099	0.0078	0.0360	0.0065
Fecal coliform	MPN/100 mL	<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 2

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER
PARK FISCHER FARM SITE SAMPLED ON
OCTOBER 24, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.3	7.6	7.6	7.6	7.3	7.7
EC	mS/m	260	112	77	93	126	65
Cl ⁻	mg/L	646	20	15	33	39	8
SO ₄ ⁼	"	7	292	98	139	243	70
Alkalinity as CaCO ₃	"	384	313	311	333	423	284
TKN	"	8.4	0.65	0.45	0.45	10	0.53
NH ₃ -N	"	6.7	0.09	0.37	0.32	10	0.52
NO ₂ +NO ₃ -N	"	0.12	1.2	0.03	0.03	0.04	0.04
Total P	"	0.13	0.11	0.03	0.03	0.06	0.07
Cd	"	0.0006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	"	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	"	0.0013	0.0054	0.0070	0.0029	<0.0005	0.0049
Fe	"	19.7	1.87	2.05	2.72	4.43	2.17
Mn	"	1.033	0.0353	0.0206	0.0258	0.0592	0.0601
Ni	"	0.0054	0.0033	0.0030	0.0038	0.0038	0.0045
Zn	"	0.0297	0.0360	0.0070	0.0070	0.0285	0.0085
Fecal coliform	MPN/100 mL	<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
NOVEMBER 14, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.8	7.6	7.6	7.5	7.2	7.7
EC	mS/m	110	232	77	94	116	65
Cl ⁻	mg/L	625	21	14	17	38	7
SO ₄ ⁼	"	9	299	95	158	236	83
Alkalinity as CaCO ₃	"	359	306	328	370	421	292
TKN	"	6.3	0.62	0.57	0.52	8.3	0.50
NH ₃ -N	"	5.7	0.06	0.31	0.24	9.1	0.40
NO ₂ +NO ₃ -N	"	0.24	0.46	0.08	<0.02	<0.02	<0.02
Total P	"	0.10	0.15	0.06	0.04	0.05	0.06
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	"	0.0027	0.0076	0.0159	0.0050	0.0005	0.0088
Fe	"	12.1	1.58	3.60	3.60	4.58	2.95
Mn	"	0.5629	0.1098	0.0290	0.0233	0.0606	0.0820
Ni	"	0.0028	0.0036	0.0035	0.0024	0.0035	0.0013
Zn	"	0.0280	0.0330	0.0120	0.0073	0.0429	0.0077
Fecal coliform	MPN/100 mL	<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
NOVEMBER 28, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.9	7.5	7.5	7.4	7.2	8.0
EC	mS/m	240	109	75	85	119	65
Cl ⁻	mg/L	628	22	15	18	40	7
SO ₄ ⁼	"	18	296	97	148	227	65
Alkalinity as CaCO ₃	"	322	320	320	357	418	303
TKN	"	5.4	0.97	0.45	0.47	9.4	0.59
NH ₃ -N	"	2.4	0.05	0.35	0.18	8.4	0.37
NO ₂ +NO ₃ -N	"	0.27	0.12	0.11	0.03	0.03	0.03
Total P	"	1.1	0.25	0.04	<0.02	0.07	0.08
Cd	"	0.0061	<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	0.0088	0.1238	0.0056	0.0011	0.0013
Fe	"	138	2.14	14.2	3.27	4.50	1.75
Mn	"	0.9829	0.2600	0.0656	0.0247	0.0594	0.0525
Ni	"	0.0072	0.0020	0.0102	0.0014	0.0015	<0.0007
Zn	"	0.2433	0.0430	0.0351	0.0067	0.0295	0.0045
Fecal coliform	MPN/100 mL	<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 5

ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE
HANOVER PARK FISCHER FARM SITE SAMPLED ON
DECEMBER 5, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.7	7.7	7.6	7.5		
EC	mS/m	241	103	77	94		
Cl ⁻	mg/L	603	23	15	19		
SO ₄ ⁼	"	15	239	102	161	W	W
Alkalinity as CaCO ₃	"	400	338	324	356	E L L	E L L
TKN	"	5.0	0.61	0.43	0.36		
NH ₃ -N	"	3.6	0.04	0.40	0.27		
NO ₂ +NO ₃ -N	"	0.09	0.52	0.07	0.02	F	F
Total P	"	0.17	0.13	0.06	0.06	R O	R O
Cd	"	<0.0003	<0.0003	<0.0003	<0.0003	Z	Z
Cr	"	<0.002	<0.002	<0.002	<0.002	E	E
Cu	"	0.0051	0.0068	0.0812	0.0046	N	N
Fe	"	12.7	2.55	8.75	2.72		
Mn	"	1.113	0.0589	0.0423	0.0200		
Ni	"	0.0036	0.0038	0.0092	0.0009		
Zn	"	0.0402	0.0366	0.0208	0.0077		
Fecal coliform	MPN/100 mL	<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
 DECEMBER 19, 2006

Parameter	Unit	Well					
		1	3	5	6	7	8
pH*		7.6	7.7	7.6	7.5		
EC	mS/m	241	101	80	96		
Cl ⁻	mg/L	598	19	14	20		
SO ₄ ⁻	"	19	236	94	178		
Alkalinity as CaCO ₃	"	381	318	318	352	W E L	W E L
TKN	"	5.7	0.38	0.45	0.42	L	L
NH ₃ -N	"	3.6	0.04	0.33	0.17		
NO ₂ +NO ₃ -N	"	0.21	0.26	0.03	0.04		
Total P	"	0.56	0.08	0.04	0.05		
Cd	"	0.0008	<0.0003	<0.0003	<0.0003	D R	D R
Cr	"	<0.002	<0.002	<0.002	<0.002	Y	Y
Cu	"	0.0014	0.0037	0.0366	0.0092		
Fe	"	18.2	0.922	5.30	2.87		
Mn	"	0.9128	0.0208	0.0414	0.0201		
Ni	"	0.0024	0.0024	0.0034	0.0026		
Zn	"	0.0432	0.0222	0.0093	0.0258		
Fecal coliform	MPN/100 mL	<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 7

ANALYSIS OF COMBINED SURFACE AND SUBSURFACE DRAINAGE FROM THE FISCHER FARM SITE RETURNED TO THE HANOVER PARK WATER RECLAMATION PLANT IN OCTOBER, NOVEMBER, AND DECEMBER 2006

Sample Date	Sump	NH ₃ -N	Total Suspended Solids	BOD ₅
		----- mg/L -----		
10/10	East	27	47	14
	West	1.3	11	NA
10/24	East	11	8	6
	West	1.5	7	<2
11/14	East	0.15	7	<2
	West	0.53	9	4
11/28	East	45	52	46
	West	16	74	13
12/05	East	13	84	11
	West	3.7	22	54
12/19	East	12	48	24
	West	3.8	44	9

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 OCTOBER 2006

Constituent	Unit	Concentration ¹
pH		8.0
Total Solids	%	0.13
Total Volatile Solids	"	65.4
Total Kjeldahl-N	mg/kg	382,923
NH ₃ -N	"	369,692
Volatile Acids ²	"	3,846
Total P	"	42,769
As	"	15
Cd	"	<0.0006
Cr	"	2
Cu	"	92
Hg	"	0.20
Mn	"	142
Mo	"	3
Ni	"	23
Pb	"	5
Se	"	5
Zn	"	104

¹Values for only one sample of lagoon supernatant.

²As acetic acid.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 9

ANALYSIS OF LAGOON BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK
FISCHER FARM SITE DURING NOVEMBER 2006

Constituent	Unit	Concentration ¹
pH		7.6
Total Solids	%	4.1
Total Volatile Solids	"	70.2
Total Kjeldahl-N	mg/kg	84,088
NH ₃ -N	"	23,234
Volatile Acids ²	"	613
Total P	"	30,850
As	"	7
Cd	"	2
Cr	"	45
Cu	"	1,240
Hg	"	3.3
Mn	"	470
Mo	"	18
Ni	"	65
Pb	"	35
Se	"	9
Zn	"	938

¹Means of three samples of lagoon biosolids.

²As acetic acid.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 10

VOLUMES AND DRY WEIGHTS OF LAGOON SUPERNATANT AND BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING OCTOBER AND NOVEMBER 2006¹

Field	Date	Biosolids Source	Volume Gallons	Weight Dry Tons
1	10/12	Lagoon	770,000	3.53*
5	11/18	Lagoon	912,000	154.02
6	11/18	Lagoon	942,000	159.09
5	11/20	Lagoon	490,800	80.57
6	11/20	Lagoon	540,000	87.37
5	11/21	Lagoon	906,000	174.17
6	11/22	Lagoon	804,000	131.43
6	11/24	Lagoon	816,000	134.07
1	11/24	Lagoon	588,000	96.61
3	11/25	Lagoon	942,000	153.20
2	11/26	Lagoon	960,000	176.54
Total			8,670,800	1,347

*Applied in the form of supernatant. All others applied as biosolids.

¹No biosolids applied in December.