MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 09-20

HANOVER PARK WATER RECLAMATION PLANT

FISCHER FARM MONITORING REPORT FOR

FOURTH QUARTER 2008

MARCH 2009

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

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March 12, 2009

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: Hanover Park Water Reclamation Plant - IEPA Permit No. 2007-SC-2951, Monitoring Report for October, November, and December 2008

The attached report includes ten tables of the monitoring results for the Hanover Park Water Reclamation Plant Fischer Farm site for the fourth quarter of 2008.

Very truly yours,

Louis Kollias
Director
Monitoring and Research

LK:PL:kq
Enclosures
cc: Mr. Patel, Manager, IEPA Region II - Des Plaines
Mr. Valdis Aistars, USEPA Region V
Mr. Ash Sajjad, USEPA Region V
Stuba/Granato/Liston/O'Connor
Cox/Lindo/Patel, M.

Metropolitan Water Reclamation District of Greater Chicago

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FOURTH QUARTER 2008

Research and Development
P. Lindo
A. Cox

MARCH 2009

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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. 2007-SC-2951 for the fourth quarter of 2008.

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ACKNOWLEDGEMENT

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.

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 2008

During October, November, and December 2008, 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 Operating Permit No. 2007-SC-2951. 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. Analytical data for samples collected during the quarter are presented in Tables 1 through 6. Samples collected on October 7 and 21, 2008 from Well 8 contained elevated fecal coliform counts. However, as the quarter progressed, counts were reduced to the normal level. Such occurences are generally temporary, and associated with an increase in the activity of geese near the wells.

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 4.52, 4.41, 28.65 million gallons in October, November, and December, respectively. The analytical data for the lagoon supernatant and biosolids are presented in Table 8 and Table 9, respectively. The volumes and dry weights applied are reported in Table 10.

FIGURE 1: FIELDS AND WELLS AT THE HANOVER PARK FISCHER FARM SITE OF THE 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 7, 2008

Parameter	Unit	Well 1	Well 3	Well 5	Well 6	Well 7	Well 8
pH[1]		6.7	7.6	7.5	7.3	7.2	7.6
EC	mS/m	241	74	76	105	132	51
Cl^-	mg/L	686	12	15	64	49	10
$SO_4^=$	"	3.0	62	91	163	249	62
Alkalinity[2]	"	224	347	324	311	463	217
TKN	"	11	0.64	0.41	0.49	12	0.62
NH_3-N	"	7.6	<0.03	0.27	0.30	11	0.40
$NO_2 + NO_3$-N	"	0.17	0.50	0.03	0.03	0.03	0.08
Total P	"	0.55	0.10	0.03	0.20	0.05	0.19
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	"	0.0022	0.0055	0.0256	0.0062	<0.0005	0.0269
Fe	"	36.0	1.54	1.52	5.62	4.43	6.43
Mn	"	1.655	0.0460	0.0154	0.1401	0.0719	0.1376
Ni	"	0.0070	0.0027	0.0010	0.0042	0.0037	0.0028
Zn	"	0.0726	0.0226	0.0062	0.0074	0.0482	0.0128
Fecal Coliform	MPN	20	5	<1	60	110	8,300

[1]Samples analyzed beyond recommended holding time of 15 minutes.
[2]As $CaCO_3$.
MPN = Most probable number/100 mL.

TABLE 2: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER PARK FISCHER FARM SITE SAMPLED ON OCTOBER 21, 2008

Parameter	Unit	Well 1	3	5	6	7	8
pH[1]		|	7.5	7.6	7.5	7.2	7.9
EC	mS/m		81	78	107	135	54
Cl^-	mg/L	W	12	15	67	51	10
$SO_4^=$	,,	E	99	100	179	236	56
Alkalinity[2]	,,	L	358	329	311	452	234
		L					
TKN	,,		0.11	0.21	0.46	10	0.60
NH_3-N	,,	I	<0.03	0.30	0.28	11	0.47
$NO_2 + NO_3$-N	,,	N	0.12	0.04	0.03	0.03	0.03
Total P	,,	A	0.04	0.06	0.17	0.05	0.18
		C					
Cd	,,	C	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	,,	E	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	,,	S	<0.0005	0.0077	0.0054	<0.0005	0.0255
Fe	,,	S	0.296	1.60	5.35	4.87	7.61
Mn	,,	I	0.0909	0.0167	0.0926	0.0664	0.1605
Ni	,,	B	<0.0007	0.0012	0.0035	0.0017	0.0031
Zn	,,	L	0.0027	0.0049	0.0054	0.0289	0.0268
		E					
Fecal Coliform	MPN		<1	<1	24	20	1,400

[1]Samples analyzed beyond recommended holding time of 15 minutes.
[2]As $CaCO_3$.
MPN = Most probable number/100 mL.

TABLE 3: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER PARK FISCHER FARM SITE SAMPLED ON NOVEMBER 18, 2008

Parameter	Unit	Well 1	3	5	6	7	8
pH[1]		NA	6.8	7.1	7.1	7.0	7.4
EC	mS/m	NA	87	73	107	124	52
Cl^-	mg/L	NA	14	15	70	53	9.0
$SO_4^=$	"	NA	130	99	176	249	50
Alkalinity[2]	"	NA	336	318	308	434	218
TKN	"	NA	0.38	0.35	0.37	9.6	0.70
NH_3-N	"	NA	0.27	0.31	0.24	9.1	0.44
$NO_2 + NO_3$-N	"	NA	0.06	0.03	0.04	0.03	0.08
Total P	"	NA	<0.02	<0.02	0.14	0.03	0.16
Cd	"	0.0025	<0.0003	<0.0003	0.0011	<0.0003	0.0005
Cr	"	0.007	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	"	<0.0005	0.0046	0.0126	0.0091	0.0014	0.0209
Fe	"	53.5	2.23	1.63	4.26	4.43	5.68
Mn	"	1.288	0.1601	0.0177	0.0687	0.0595	0.1425
Ni	"	0.0083	0.0011	0.0010	0.0051	0.0022	0.0053
Zn	"	0.0817	0.0117	0.0055	0.0108	0.0485	0.0203
Fecal Coliform	MPN	<1	<1	<1	2	8	200

[1]Samples analyzed beyond recommended holding time of 15 minutes.
[2]As $CaCO_3$.
NA = No analysis.
MPN = Most probable number/100 mL.

TABLE 4: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER PARK FISCHER FARM SITE SAMPLED ON DECEMBER 2, 2008

Parameter	Unit	Well 1	3	5	6	7	8
pH[1]		|	6.8	7.3	7.2	7.1	7.7
EC	mS/m		88	78	107	131	66
Cl^-	mg/L	W	15	15	73	53	8.0
$SO_4^=$	,,	E	146	95	172	237	65
Alkalinity[2]	,,	L	331	323	313	437	295
		L					
TKN	,,		0.58	0.67	0.73	9.3	0.62
NH_3-N	,,	I	0.09	0.22	0.23	8.5	0.31
$NO_2 + NO_3$-N	,,	N	0.04	<0.02	<0.02	0.03	<0.02
Total P	,,	A	<0.02	<0.02	0.15	0.03	0.09
		C					
Cd	,,	C	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Cr	,,	E	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	,,	S	<0.0005	0.0062	0.0241	<0.0005	0.0101
Fe	,,	S	9.85	4.46	1.77	4.31	5.45
Mn	,,	I	0.1424	0.0723	0.0190	0.0572	0.1237
Ni	,,	B	0.0015	0.0033	0.0014	0.0021	0.0027
Zn	,,	L	0.0195	0.0047	0.0059	0.0286	0.0102
		E					
Fecal Coliform	MPN		<1	<1	<1	2	55

[1]Samples analyzed beyond recommended holding time of 15 minutes.
[2]As $CaCO_3$.
MPN = Most probable number/100 mL.

TABLE 5: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER PARK FISCHER FARM SITE SAMPLED ON DECEMBER 9, 2008

Parameter	Unit	Well 1	3	5	6	7	8
pH[1]		|	6.9	7.2	7.1	7.0	7.6
EC	mS/m		91	78	108	132	65
Cl^-	mg/L	W	17	15	73	54	8.0
$SO_4^=$	,,	E	150	89	171	226	62
Alkalinity[2]	,,	L	335	322	316	435	288
		L					
TKN	,,		0.31	0.58	0.43	9.0	0.48
NH_3-N	,,	I	0.08	0.21	0.18	8.5	0.32
$NO_2 + NO_3$-N	,,	N	0.04	<0.02	<0.02	0.03	<0.02
Total P	,,	A	<0.02	<0.02	0.16	0.03	0.07
		C					
Cd	,,	C	<0.0003	<0.0003	<0.0003	0.0004	<0.0003
Cr	,,	E	<0.002	<0.002	<0.002	<0.002	<0.002
Cu	,,	S	0.0017	0.0078	0.0087	0.0059	0.0037
Fe	,,	S	5.20	1.61	3.88	4.49	3.76
Mn	,,	I	0.1504	0.0162	0.0641	0.0605	0.0974
Ni	,,	B	0.0026	0.0021	0.0036	0.0038	0.0014
Zn	,,	L	0.0098	0.0036	0.0054	0.0432	0.0076
		E					
Fecal Coliform	MPN		<1	<1	3	2	22

[1]Samples analyzed beyond recommended holding time of 15 minutes.
[2]As $CaCO_3$.
MPN = Most probable number/100 mL.

TABLE 6: ANALYSIS OF WATER FROM THE SIX MONITORING WELLS AT THE HANOVER PARK FISCHER FARM SITE SAMPLED ON DECEMBER 16, 2008

Parameter	Unit	Well 1	Well 3	Well 5	Well 6	Well 7	Well 8
pH[1]		|	7.3	7.6	7.5	|	|
EC	mS/m		95	77	109	|	|
Cl^-	mg/L	W	15	15	74	|	|
$SO_4^=$	"	E	155	90	173		
Alkalinity[2]	"	L	354	329	316	W	W
		L				E	E
TKN	"		0.31	0.56	0.49	L	L
NH_3-N	"	I	0.04	0.26	0.28	L	L
$NO_2 + NO_3$-N	"	N	0.05	<0.02	<0.02		
Total P	"	A	<0.02	<0.02	0.16	F	F
		C				R	R
Cd	"	C	<0.0003	<0.0003	<0.0003	O	O
Cr	"	E	<0.002	<0.002	<0.002	Z	Z
Cu	"	S	0.0050	0.0029	0.0030	E	E
Fe	"	S	3.62	1.38	3.99	N	N
Mn	"	I	0.1751	0.0138	0.0660		
Ni	"	B	0.0016	0.0008	0.0026	|	|
Zn	"	L	0.0151	0.0037	0.0044	|	|
		E				|	|
Fecal Coliform	MPN		<1	<1	<1	|	|

[1]Samples analyzed beyond recommended holding time of 15 minutes.
[2]As $CaCO_3$.
MPN = Most probable number/100 mL.

TABLE 7: ANALYSIS OF COMBINED SURFACE AND SUBSURFACE DRAINAGE FROM THE FISCHER FARM SITE RETURNED TO THE HANOVER PARK WATER RECLAMATION PLANT DURING OCTOBER, NOVEMBER, AND DECEMBER 2008

Date	Sump	NH_3-N	TSS[1]	BOD_5
		..... mg/L		
10/07/08	East	40	9	10
10/07/08	West	3.1	7	4
10/21/08	East	77	237	49
10/21/08	West	32	114	19
11/18/08	East	5.7	5	9
11/18/08	West	0.25	7	4
12/02/08	East	7.7	73	10
12/02/08	West	0.05	8	<2
12/09/08	East	3.7	9	13
12/09/08	West	0.21	31	4

[1]Total Suspended Solids.

TABLE 8: ANALYSIS OF LAGOON SUPERNATANT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING OCTOBER AND NOVEMBER 2008

Parameter	Unit	Concentration[1]
pH		8.0
TS	%	0.08
TVS[2]	,,	42.7
TKN	mg/kg	296,655
NH_3-N	,,	276,884
Volatile Acids[3]	,,	9,630
Total P	,,	40,336
As	,,	24
Cd	,,	<0.72
Cr	,,	<3.6
Cu	,,	45
Hg	,,	0.26
Mn	,,	188
Mo	,,	2.9
Ni	,,	22
Pb	,,	3.2
Se	,,	<3.6
Zn	,,	56

[1]Values are the means of three samples of lagoon supernatant.
[2]Total volatile solids as a percentage of total solids.
[3]As acetic acid.

TABLE 9: ANALYSIS OF LAGOON BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING NOVEMBER 2008

Parameter	Unit	Concentration[1]
pH		7.3
TS	%	3.98
TVS[2]	,,	69.0
TKN	mg/kg	65,698
NH_3-N	,,	13,972
Volatile Acids[3]	,,	427
Total P	,,	23,307
As	,,	5
Cd	,,	2
Cr	,,	39
Cu	,,	1,244
Hg	,,	1.9
Mn	,,	771
Mo	,,	13
Ni	,,	48
Pb	,,	36
Se	,,	5
Zn	,,	944

[1]Values are for 1 sample only.
[2]Total volatile solids as a percentage of total solids.
[3]As acetic acid.

TABLE 10: VOLUMES AND DRY WEIGHTS OF LAGOON SUPERNATANT AND BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE SITE DURING OCTOBER AND NOVEMBER 2008

Field	Date	Biosolids Source	Volume (Gallons)	Dry Weight (Tons)
1	10/15/08	Lagoon	340,000	1.42
1	10/29/08	”	160,000	0.67
2	10/16/08	Lagoon	620,000	2.07
2	10/30/08	”	200,000	0.83
5	10/22/08	Lagoon	990,000	2.48
5	10/30/08	”	792,000	143.66
5	10/31/08	”	1,584,000	289.31
5	11/01/08	”	478,000	87.70
6	10/28/08	Lagoon	1,320,000	168.43
6	10/29/08	”	1,584,000	202.12
6	10/30/08	”	792,000	143.66
Total			8,860,000	1,042.35