Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 22-02

HANOVER PARK WATER RECLAMATION PLANT

FISCHER FARM MONITORING REPORT FOR

FOURTH QUARTER 2021

February 2022

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Edward W. Podczerwinski, P.E.
Director of Monitoring and Research

February 17, 2022

Ms. Catherine Siders
Illinois Environmental Protection Agency
Bureau of Water
DWPC Compliance Section #19
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9274

Dear Ms. Siders:

Subject: Hanover Park Water Reclamation Plant - Illinois Environmental Protection Agency Permit No. 2016-SC-61315, Monitoring Report for October, November, and December 2021

The attached tables contain the monitoring data for the Hanover Park Water Reclamation Plant (WRP) Fischer Farm site for October, November, and December 2021, as required by Illinois Environmental Protection Agency (IEPA) Operating Permit No. 2016-SC-61315. Analytical data for well water samples collected during the quarter are presented in Table 1.

Drainage water (combined surface and subsurface) returned to the Hanover Park WRP from the farm fields was sampled in October, November, and December 2021, and data for these samples are presented in Table 2. The volumes of drainage water returned to the WRP during the fourth quarter were estimated as 9.1, 16.0, and 13.5 million gallons in October, November, and December, respectively. The analytical data for lagoon supernatant applied to Fischer Farm fields in November are presented in Table 3. The analytical data for liquid biosolids applied to Fischer Farm fields in November are presented in Table 4. The volumes of lagoon supernatant and liquid biosolids, and the associated dry weight of biosolids applied, are shown in Table 5. For the next growing season (2022), corn (*Zea mays*) will be planted in the fields, except Farm Field Number 7 because no biosolids will be applied to that field. Field and water monitoring locations are presented in Figure 1.

Based on the investigation of the high levels of ammonia nitrogen (NH_3-N) in Well 7 for the past monitoring, it appears that the source of these high levels is seepage from adjacent lagoons and subsurface drainage associated with supernatant application, both of which have high NH_3-N levels. Since implementing management practices to reduce the loading in adjacent lagoons and stop all applications of supernatant and biosolids in the closest farm field (Field 7), NH_3-N in Well 7 has shown a decreasing trend, but with some significant fluctuation. We will continue implementing these practices.

Subject: Hanover Park Water Reclamation Plant - Illinois Environmental Protection Agency Permit No. 2016-SC-61315, Monitoring Report for October, November, and December 2021

The data reported are as follows:

Table 1 Analysis of Water From Monitoring Wells W-3, W-5, W-6, W-7, and W-8 at the Hanover Park Fischer Farm Site Sampled in October 2021.

Table 2 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 2021.

Table 3 Analysis of Lagoon Supernatant applied to Fields at the Hanover Park Fischer Farm Site During November 2021.

Table 4 Analysis of Liquid Biosolids applied to Fields at the Hanover Park Fischer Farm Site During November 2021.

Table 5 Volumes and Dry Weights of Lagoon Supernatant and Liquid Biosolids Applied to Fields During November 2021 at the Hanover Park Fischer Farm Site

Figure 1 Map of Fields and Wells at the Hanover Park Fischer Farm Site of the Metropolitan Water Reclamation District of Greater Chicago.

Very truly yours,

Albert Cox

Albert E. Cox, Ph.D.
Environmental Monitoring and Research Manager
Monitoring and Research Department

AC:lf
Attachment
cc: Mr. J. Patel, Manager, IEPA – Des Plaines
Mr. T. Bennett, IEPA
Mr. B. Fleming, IEPA
Mr. J. Colletti, USEPA, Region 5
Mr. P. Kuefler, USEPA, Region 5
Mr. J. Chavich
Mr. B. Kaunelis
Mr. A. Gronski
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HANOVER PARK WATER RECLAMATION PLANT

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By

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Albert Cox
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Monitoring and Research Department
Edward W. Podczerwinski, Director **February 2022**

TABLE 1: ANALYSIS OF WATER FROM MONITORING WELLS W-3, W-5, W-6, W-7, AND W-8 AT THE HANOVER PARK FISCHER FARM SITE SAMPLED IN OCTOBER 2021[1]

	Unit	W-3	W-5	W-6	W-7	W-8
pH[2]		7.7	8.0	7.9	7.9	8.2
EC	mS m^{-1}	122	75	76	75	61
Cl-	mg L^{-1}	14	18	19	33	10
SO_4^{2-}	"	460	97	114	117	68
Alkalinity as $CaCO_3$	"	375	316	299	245	278
TKN	"	3.8	<1.0	<1.0	8.0	<1.0
NH_3-N	"	<0.30	0.37	0.32	7.2	0.41
NO_2^-+NO_3^--N	"	<0.25	<0.25	<0.25	<0.25	<0.25
Total P	"	0.52	<0.15	<0.15	0.37	<0.15
Cd	"	<0.002	<0.002	<0.002	<0.002	<0.002
Cr	"	<0.004	<0.004	<0.004	<0.004	<0.004
Cu	"	0.017	0.006	0.046	0.005	<0.002
Fe	"	26	2.6	19	7.7	1.4
Mn	"	0.224	0.026	0.119	0.341	0.030
Ni	"	0.006	<0.002	0.003	0.009	<0.002
Zn	"	0.094	<0.010	0.011	0.088	<0.010

[1]Wells W-5 through W-8 were sampled on October 12, 2021. Well W-3 could not be sampled on that day due to bailer malfunction, and was sampled on December 22, 2021.

[2]pH was measured beyond 15-minute holding time.

TABLE 2: 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 2021

Date	Sump	NH_3-N	TSS[1]	BOD_5
		mg L^{-1}		
10/12/21	East	147	78	104
10/12/21	West	30.8	31	78
10/19/21	East	0.31	3	3
10/19/21	West	58.5	6	11
11/02/21	East	NRR[2]	62	150
11/02/21	West	<0.30	9	NRR[3]
11/16/21	East	13.8	<2	12
11/16/21	West	<0.30	2	<2
12/07/21	East	15.2	8	7
12/07/21	West	12.7	9	11
12/28/21	East	13.6	49	21
12/28/21	West	13.1	31	22

[1]Total suspended solids.
[2]No reportable result. Samples did not meet holding time requirement.
[3]No reportable results. Lab QA/QC failed and samples could not be reanalyzed due to holding time requirement.

TABLE 3: ANALYSIS OF LAGOON SUPERNATANT APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING NOVEMBER 2021

Constituent	Unit	November
pH		7.9
Total Solids	%	0.14
Total Volatile Solids[1]	"	61.0
Volatile Acids	mg L^{-1}	<5
TKN	"	762
NH_3-N	"	672
Total P	"	68
Cd	"	<0.002
Cr	"	<0.004
Cu	"	0.123
Mn	"	0.247
Ni	"	0.022
Pb	"	0.002
Zn	"	0.203

[1]Total volatile solids as a percentage of total solids.

TABLE 4: ANALYSIS OF LIQUID BIOSOLIDS APPLIED TO FIELDS AT THE HANOVER PARK FISCHER FARM SITE DURING NOVEMBER 2021

Constituent	Unit	November
pH		7.3
Total Solids	%	3.72
Total Volatile Solids[1]	"	70.1
Volatile Acids	mg kg^{-1}	995
TKN	"	81,086
NH_3-N	"	26,726
Total P	"	27,597
Cd	"	1.49
Cr	"	35.6
Cu	"	834
Mn	"	661
Ni	"	32.1
Pb	"	25.0
Zn	"	904

[1]Total volatile solids as a percentage of total solids.

TABLE 5: VOLUMES AND DRY WEIGHTS OF LAGOON SUPERNATANT AND LIQUID BIOSOLIDS APPLIED TO FIELDS DURING NOVEMBER 2021 AT THE HANOVER PARK FISCHER FARM SITE

Field	Date	Biosolids Type	Volume (Gallons)	Dry Weight (Tons)
6	11/01/21	Supernatant	280,000	1.63
5	11/02/21	Supernatant	240,000	1.50
6	11/21/21	Biosolids	238,580	32.33
6	11/22/21	Biosolids	1,569,450	212.70
5	11/23/21	Biosolids	974,567	183.27
6	11/23/21	Biosolids	391,801	73.70
4	11/24/21	Biosolids	339,514	56.91
5	11/24/21	Biosolids	1,461,679	245.03
1	11/25/21	Biosolids	1,013,625	148.79
4	11/25/21	Biosolids	502,823	73.8
2	11/26/21	Biosolids	542,654	70.40
3	11/26/21	Biosolids	966,993	125.38
Total			8,521,686	1,225.45

FIGURE 1: MAP OF FIELDS AND WELLS AT THE HANOVER PARK FISCHER FARM SITE OF THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO