Metropolitan Water Reclamation District of Greater Chicago

MONITORING AND RESEARCH DEPARTMENT

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ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR 2023

August 2024

Metropolitan Water Reclamation District of Greater Chicago
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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF TABLES (Continued)

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviation	Definition
°C	degrees Celsius
°F	degrees Fahrenheit
As	arsenic
Cd	cadmium
CFR	*Code of Federal Regulations*
Co	cobalt
CSD	Controlled Solids Distribution
Cu	copper
District	Metropolitan Water Reclamation District of Greater Chicago
DT	dry tons
Egan	John E. Egan
EQ	"Exceptional Quality"
Hg	mercury
IDOA	Illinois Department of Agriculture
IEPA	Illinois Environmental Protection Agency
kg	kilogram
Kirie	James C. Kirie
L	liter
MBM	Metropolitan Biosolids Management, LLC
mg	milligram
MGD	million gallons per day
Mo	molybdenum
N	nitrogen
NH_3-N	ammonia nitrogen
Ni	nickel
NO_3^-+NO_2^--N	nitrate plus nitrite nitrogen
NO_3^--N	nitrate nitrogen
O'Brien	Terrence J. O'Brien
Part 503	Title 40 Part 503
Pb	lead
PFRP	Process to Further Reduce Pathogens
Se	selenium
SMA	Solids Management Area
TKN	total Kjeldahl nitrogen
TVS	total volatile solids
USEPA	United States Environmental Protection Agency
VAR	vector attraction reduction
WRP	water reclamation plant
Zn	zinc

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DISCLAIMER

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

FOREWORD

This report serves as a record of the data and information that fulfills the frequency of monitoring and the reporting requirements for 2023 for biosolids management by the Metropolitan Water Reclamation District of Greater Chicago (District), as specified in the United States Environmental Protection Agency's (USEPA's) *Code of Federal Regulations* (*CFR*) Title 40 Part 503 (Part 503). The Part 503 reporting was done as required through the USEPA's online reporting system in February 2024.

OVERVIEW OF METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO BIOSOLIDS PRODUCTS AND UTILIZATION PROGRAM

The District operates seven water reclamation plants (WRPs), namely the Stickney, Calumet, Terrence J. O'Brien (O'Brien), John E. Egan (Egan), Hanover Park, James C. Kirie (Kirie), and Lemont WRPs. Four WRPs, Stickney, Calumet, Egan, and Hanover Park, produce final biosolids products. Generally, the untreated sludge generated at the Kirie WRP is sent to the Egan WRP, and sludge from the O'Brien and Lemont WRPs is sent to the Stickney WRP for processing into final products. The processing of biosolids at the four WRPs that generate final biosolids products includes anaerobic digestion at 35°C for at least 15 days of detention time to meet the 40 *CFR* Part 503 Class B pathogen reduction requirements. The metal concentrations in all biosolids produced at the District are well below the pollutant concentration limits established in Table 3 of Part 503.13(b)(3). In 2023, all Egan biosolids were sent to the Stickney WRP for processing into final products. The additional processing to achieve the final products varies among the three WRPs as indicated in the description of the biosolids products outlined below.

Biosolids Products at the Metropolitan Water Reclamation District of Greater Chicago

- **Dewatered Class B Biosolids:** These biosolids are produced primarily by centrifugation of anaerobically digested liquid biosolids (~5 percent solids content) to approximately 25 percent solids content (centrifuge cake). Alternatively, the anaerobically digested liquid biosolids are stored temporarily in lagoons, then placed on drying beds for partial drying to >20 percent solids content through mechanical agitation before use. These dewatered biosolids meet the Class B pathogen standards of the United States Environmental Protection Agency (USEPA) Part 503 biosolids rule and meet vector attraction reduction (VAR) requirements through timely incorporation into land. This product is produced at the Stickney and Calumet WRPs, and sometimes at the Egan WRP (centrifuged biosolids), and commonly applied to farmland as a fertilizer.

- **Air-dried Exceptional Quality Biosolids:** These biosolids are produced by aging centrifuge cake biosolids or digested liquid biosolids in lagoons (typically for over one year) followed by air-drying to at least 65 percent solids content. This air-dried material meets the "Exceptional Quality" (EQ) standards of the USEPA Part 503 biosolids rule, which designates biosolids that meet the strictest trace metals, pathogen, and VAR requirements. This product is produced at the Stickney and Calumet WRPs, and since the early 1990s, it has been used under a Controlled Solids Distribution (CSD) program as a fertilizer or soil amendment on areas such as recreational fields and golf courses and for reclamation of urban soils. The material is currently voluntarily registered as a soil amendment with the Illinois Department of Agriculture (IDOA).

- **Composted Exceptional Quality Biosolids:** The composted biosolids are produced at the Stickney WRP Harlem Avenue and at the Calumet East Solids Management Areas (SMAs) under permits issued by the Illinois Environmental

Protection Agency (IEPA) Bureau of Land and according to operational standards of the Federal 40 *CFR* Part 503 Process to Further Reduce Pathogens (PFRP) protocol (USEPA, 1993). The composting recipe consists of one part centrifuge cake biosolids and two or three parts woodchips. The composting process used is open windrow composting for a minimum of 23 days, a minimum of five turnings, with temperature maintained at a minimum of 55°C, and then followed by 16 weeks of curing. The compost produced is currently voluntarily registered as a soil amendment with the IDOA.

- **Liquid Class B Biosolids:** The digested biosolids produced at the Hanover Park WRP are stored and thickened to ~5 percent solids content in lagoons on the grounds of the Hanover Park WRP. This material meets the 40 *CFR* Part 503 Class B pathogen and VAR requirements and is applied through subsurface injection at the on-site Fischer Farm as a fertilizer for crops, mainly corn. The Fisher Farm has an underdrain system that returns drainage from the fields back to the headworks of the WRP.

- **Biosolids Pellets:** The product is produced by heat-drying at a pelletizer facility located at the Stickney WRP that is owned and operated by Metropolitan Biosolids Management, LLC (MBM), a subsidiary of Veolia Water North America. The operation generates fertilizer pellets with a solids content greater than 90 percent that meet EQ biosolids standards.

Metropolitan Water Reclamation District of Greater Chicago Site-Specific Designations and Adjusted Standards for Biosolids Quality and Utilization

- **Illinois Pollution Control Board Adjusted Standards (AS 95-4 and 02-03):** This adjusted standard, originally granted to the District in 1995 by the Illinois Pollution Control Board, allows the use of lagoon-aged (at least 1.5 years) air-dried (at least 65 percent solids content) biosolids for establishing the final vegetative layer on landfills as a landfill final cover. Class A status is not necessary for lagoon-aged air-dried biosolids used for final cover.

- **United States Environmental Protection Agency Site-Specific Process to Further Reduce Pathogens Certification:** This site-specific certification of the Calumet and Stickney WRPs' biosolids processing trains was granted in 2002. The certification specifies that biosolids produced by these processing trains in accordance with all parameters specified in the certification are designated Class A. The codified operational parameters are related to digestion time and temperature, lagoon storage time, loading rates, and frequency of agitation on drying cells. Any biosolids which do not comply with any of the codified parameters for the biosolids processing trains are to be isolated from PFRP-compliant biosolids and must be tested to meet the Part 503 pathogen (virus and helminth) requirements to be designated Class A. This certification was renewable every five years. Over the past ten years, due to operational efficiencies related to lagoon storage time and air-drying operations, biosolids processing at both the Calumet and Stickney WRPs have not been operated to

follow the codified parameters; therefore, all air-dried EQ biosolids are tested for helminth ova and viruses. The site-specific certification for Calumet and Stickney WRP air-dried biosolids was also not renewed after it expired in 2022.

Requirements for Co-Disposal of Unsuitable Biosolids Materials at Landfills

Some biosolids are considered as unsuitable for land application because they contain gravel, wood debris, and dust from the sweeping of roads at biosolids processing sites. These materials are co-disposed with municipal solid wastes at a nonhazardous waste landfill according to the federal requirements in 40 *CFR* Parts 258 and 261 and the Illinois nonhazardous waste landfill regulations (Illinois Administrative Code Title 35, Subtitle G, Chapter I, Subchapter H, Part 810). The biosolids are certified for co-disposal at landfills through analysis as specified in 40 *CFR* Part 261 to establish their nonhazardous nature. District biosolids have always met these requirements. Analytical results required for the landfill company's IEPA permits, including toxic characteristic leaching procedure constituents, polychlorinated biphenyls, cyanide, sulfide, and paint filter tests, were updated in October 2021 and remain valid until 2024. Some unsuitable biosolids can be also used as daily cover on landfills.

Total Biosolids Produced at the Metropolitan Water Reclamation District of Greater Chicago

A total of 149,270 dry tons (DT) of biosolids was produced at District WRPs in 2023 based on the total of amounts at the Calumet and Stickney WRPs (which received all solids produced at the Egan, O'Brien, Kirie, and Lemont WRPs) and Hanover Park WRP (Table 1). The Stickney WRP produced 121,670 DT of biosolids from processing of solids generated at the plant and solids transported from the Egan, O'Brien, Kirie, and Lemont WRPs. The Calumet WRP produced 26,817 DT. The Hanover Park WRP produced 783 DT, all of which was land applied at the on-site Fischer Farm or stored on site. This brings the District's five- and ten-year biosolids production running averages to 145,118 and 141,593 DT/year, respectively.

Biosolids Utilization Outlets

The District's Biosolids Management Program is designed to manage all the biosolids for beneficial reuse. There are five main outlets for the beneficial utilization of District biosolids: (1) the Farmland Application Program, (2) the Urban Utilization Program, (3) the Fischer Farm Utilization Program, (4) pelletizing at the MBM facility, and (5) landfill final cover. In 2023, a total of 126,940 DT of biosolids were utilized through these outlets (Table 1). During 2023, no biosolids were co-disposed with municipal solid wastes at landfill sites (Figure 1).

Farmland Application Program. In this program, dewatered Class B biosolids are utilized as a fertilizer for production of row crops in nearby counties in northeastern Illinois. Under this program, land application companies are contracted by the District through the competitive bidding process. The contractor is responsible for enrolling farmers in the program and for hauling and applying the biosolids to the farm fields. The farmland application program is conducted under separate permits issued by the IEPA to the District and the contractor. The District provides oversight of the program to ensure that the land application of biosolids is conducted in accordance

TABLE 1: PRODUCTION AND UTILIZATION OF SLUDGE AND BIOSOLIDS DURING 2023[1]

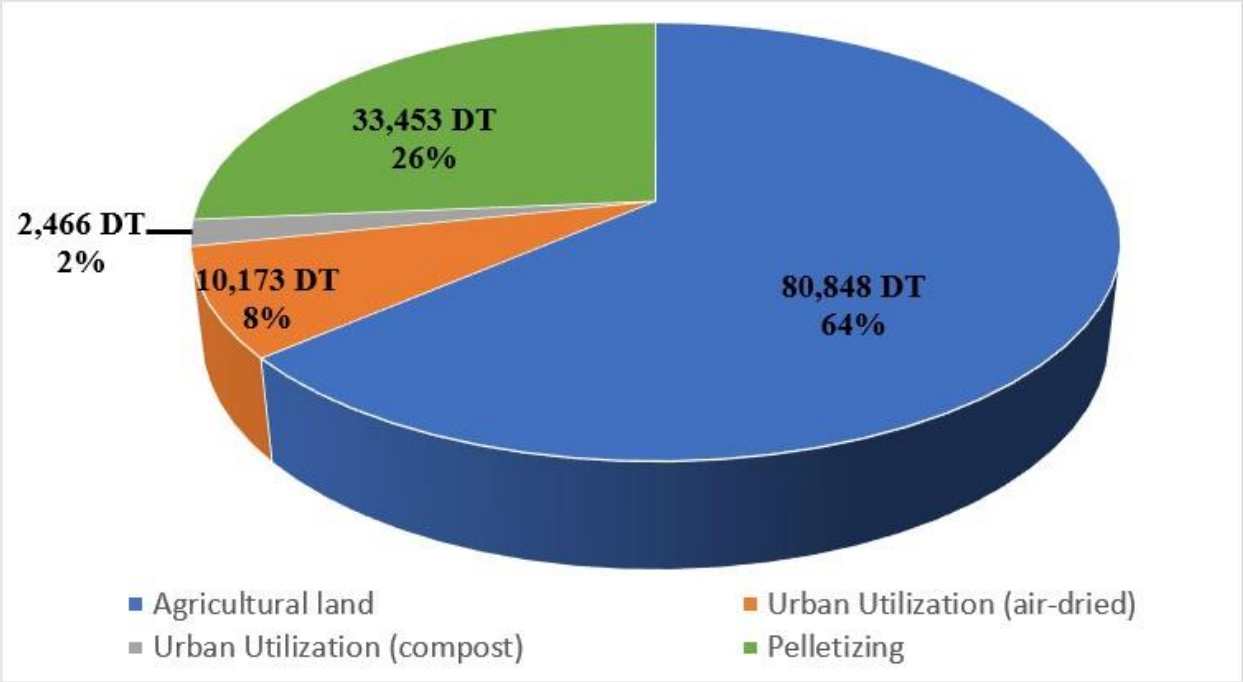
Production and Utilization	Water Reclamation Plants						
	Stickney	Calumet	Hanover Park	Egan	O'Brien	Kirie	Lemont
	Dry Tons (Metric Tons)						
Production	121,670 (110,377)	26,817 (24,328)	783 (710)	5,928 (5,378)	31,499 (28,575)	5,996 (5,440)	347 (315)
To other WRP (Stickney)[2]	0	0	0	-5,928 (5,378)	-31,499 (28,575)	-5,996 (5,440)	-347 (315)
Total	121,670 (110,377)	26,817 (24,328)	783 (710)	0	0	0	0
Utilization							
Agricultural land	66,594 (60,413)	12,264 (11,126)	1,990 (1,805)	0	0	0	0
Urban land (total)	8,584 (7,787)	4,055 (3,679)	0	0	0	0	0
air-dried	6,768 (6,140)	3,405 (3,089)	0	0	0	0	0
composted	1,816 (1,647)	650 (590)	0	0	0	0	0
Pelletizing facility[3]	33,453 (30,348)	0	0	0	0	0	0
Total	108,631 (98,548)	16,319 (14,805)	1,990 (1,805)	0	0	0	0

[1]Differences between biosolids production and total use or disposal in 2023 were due to a net withdrawal or storage in lagoons or drying areas and processing of biosolids imported from other WRPs.

[2]In 2023, biosolids produced at Egan WRP and sludge from O'Brien, Kirie, and Lemont WRPs were sent to Stickney WRP for further processing and utilization. Figures represent solids generated at each WRP plus those imported from other plants.

[3]Processed at Stickney WRP pelletizing facility owned and operated by Metropolitan Biosolids Management, LLC, 6001 W. Pershing Road, Cicero, IL 60804 (Contract No. 98-RFP-10).

FIGURE 1: OUTLETS OF BIOSOLIDS UTILIZATION AND DISPOSAL AT THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO IN 2023



with regulations and permits and that the contractor's operations are consistent with the District's goal of improving the public's awareness of the benefits of the farmland application program to the farming community. This District oversight is done by requiring the land application contractor to comply with hauling and field operation specifications and to execute a Public Relations Program, and by District staff who conduct additional activities to complement the activities of the contractors. The District continually evaluates and modifies the program as needed to improve public awareness, benefits to farmers, and long-term sustainability of the program. In 2023, a total of 80,848 DT of dewatered Class B biosolids were applied to farmland as fertilizer, most (78,858 DT) of which was from the Stickney and Calumet WRPs (Figure 1).

Urban Utilization Program. Air-dried and composted EQ biosolids are applied to recreational areas (e.g., parks, golf courses, and athletic fields) and residential properties within the Chicago metropolitan area. The air-dried biosolids are typically used as topdressing on established turfgrass or blended into topsoil as a soil amendment. The composted biosolids are typically applied to land as a soil amendment or as mulch on planter beds. This program has traditionally been done under a CSD Permit issued by the IEPA Bureau of Water. In 2015, the Illinois General Assembly amended the Illinois Environmental Protection Act to adopt the USEPA EQ standard in the state and recognize biosolids as a safe, beneficial, and renewable resource. This legislative change eased state regulations that were stricter than federal restrictions on the use of EQ biosolids, and the CSD permit is no longer relevant for utilization of EQ biosolids. In 2023, 10,173 DT of air-dried biosolids and 2,466 DT of composted biosolids from the Stickney and Calumet WRPs were used in the metropolitan Chicago area (Figure 1).

Fischer Farm Utilization Program. The liquid Class B biosolids produced at the Hanover Park WRP are stored and thickened in lagoons and are utilized as fertilizer for application to

farmland by a subsurface injection at the Fischer Farm located at the WRP. The supernatant from the settling of the biosolids and the settled biosolids are applied separately. In 2023, a total of 1,990 DT of biosolids as liquid biosolids and lagoon supernatant was applied to the farm (included in the 80,848 DT of total amount applied to agricultural land shown in Figure 1). The application of the biosolids and production of the row crops at that site are done by a contractor under separate contracts.

Pelletizing Facility. Anaerobically digested centrifuge-dewatered biosolids are delivered to the MBM facility located at the Stickney WRP, where they are dried to at least 90 percent solids, pelletized, and sold as a fertilizer product by MBM. In 2023, 33,453 DT of pelletized biosolids were generated from anaerobically digested biosolids produced at the Stickney WRP (Figure 1).

Biosolids to Landfills. In 2023, no biosolids were sent to landfills for co-disposal with municipal solid wastes or used as daily or final landfill cover.

The following sections provide a short description of the sludge processing and biosolids management operations at each of the District's seven WRPs. In addition, we discuss the utilization of the biosolids, outline the data-reporting requirements under Part 503, and present the required monitoring data in summary tables. The production and utilization of sludge and biosolids by the District in 2023 are summarized in Table 1. All utilization of biosolids in 2023 complied with the management practices specified in Section 503.14. It should be noted that the total biosolids production in any given year may not equal the amount of the final biosolids product utilized, since biosolids may be utilized from production inventory for a previous year or biosolids produced in a given year may be stored or aged for utilization in subsequent years.

This report documents the production and utilization of the District's biosolids in 2023 records required under Part 503 at Section 503.18.

The District has three IEPA permitted biosolids management programs that must also comply with Part 503 requirements. These programs are:

1. Hanover Park Fischer Farm Biosolids Application to Land (IEPA Permit No. 2022-SC-66896).

2. The CSD Program (Biosolids Application to Land in the Chicago Area under IEPA Permit No. 2019-SC-64906).

3. Farmland Application Program (Biosolids Application to Farmland from the Calumet, Stickney, and the Egan WRPs under IEPA Permit Numbers 2018-SC-63703 and 2023-SC-68367).

In addition, the District has two IEPA permits for composting biosolids, at the Calumet East SMA (Permit No. 2017-017-DE/OP updated in 2021-403-SP) and at the Harlem Avenue SMA (Permit No. 2017-013-DE/OP updated in 2021-440-SP), and an IEPA Beneficial Use Determination for compost generated at both Calumet East and Harlem Avenue SMAs (BUD21-001). The biosolids compost is distributed for use as a soil amendment under Illinois Department of Agriculture registration (License No. 100181).

STICKNEY WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Stickney WRP, located in Stickney, Illinois, has a design average flow of 1,200 million gallons per day (MGD). The annual average treated flow in 2023 was 670 MGD. Wastewater reclamation processes include primary (Imhoff and primary settling) and secondary (activated sludge process) treatments. All solids produced at this WRP, solids directly transported from the Lemont WRP, and solids pipelined from the O'Brien WRP, which received processed solids generated at the Egan and Kirie WRPs, are anaerobically digested at the Stickney WRP. Stickney WRP biosolids are then handled as follows:

1. Placed in lagoons for dewatering, aging, and stabilization and then transported to paved cells and air-dried prior to:

    a. Application to urban land as EQ biosolids.

    b. Application to farmland as dewatered Class B biosolids.

    c. Use at local municipal solid waste landfills as final landfill cover. No biosolids were utilized through this outlet in 2023 (Table 1).

2. Dewatered by centrifuging to approximately 25 percent solids content and then applied to farmland as Class B biosolids by a private contractor.

3. Dewatered by centrifuging to approximately 25 percent solids content, transported to paved cells, and air-dried prior to use as daily landfill cover. No biosolids were utilized this way in 2023 (Table 1).

4. Dewatered by centrifuging to approximately 25 percent solids content and transported to the Harlem Avenue SMA for co-composting with woodchips and yard waste prior to application to urban land as composted EQ biosolids. Class A pathogen reduction was achieved using the open windrow composting process through which all the requirements were met. The temperature of the compost piles in 2023 was maintained at ≥ 55°C for at least 15 days, and the piles were turned five times during this period (Table 2). The VAR requirement was achieved through the same open windrow composting process and met the established standards of Section 503.33(b)(5) by fulfilling the temperature and time requirements (≥ 45°C for at least 14 days) in the open windrows (Table 2).

5. Dewatered by centrifuging to approximately 25 percent solids content, placed in lagoons for aging and stabilization, and transported to paved cells and air-dried prior to:

    a. Application to urban land as EQ biosolids.

    b. Use at local municipal solid waste landfills as final landfill cover. No biosolids were utilized through this outlet in 2023.

TABLE 2: SUMMARY OF TEMPERATURE READINGS AND TURNING DATES OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2023

Pile ID Number[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature °C (Range)
23-1	05/18 – 06/12	05/26	05/30	06/02	06/06	06/09	56 - 75
23-2	05/18 - 06/12	05/26	05/30	06/02	06/06	06/09	58 - 73
23-3	05/18 -06/12	05/26	05/30	06/02	06/06	06/09	59 - 78
23-4	05/24 -06/24	06/06	06/09	06/13	06/16	06/21	55 - 76
23-5	05/24 - 06/12	05/26	05/30	06/02	06/06	06/09	58 - 74
23-6	06/03 - 06/27	06/07	06/09	06/13	06/16	06/21	53 - 75
23-7	06/03 - 06/27	06/07	06/09	06/13	06/16	06/21	57 - 79
23-8	06/07 - 06/27	06/09	06/13	06/16	06/21	06/24	57 - 76
23-9	06/07 - 06/27	06/09	06/13	06/16	06/21	06/24	60 - 76
23-10	06/11 – 07/03	06/13	06/16	06/21	06/24	06/27	58 - 78
23-11	06/14 – 07/09	06/21	06/24	06/27	06/30	07/03	55 - 79
23-12	06/14 - 07/09	06/21	06/24	06/27	06/30	07/03	60 - 79
23-13	06/21 - 07/09	06/24	06/27	06/30	07/03	07/06	61 - 76
23-14	06/21 - 07/09	06/24	06/27	06/30	07/03	07/06	58 - 72
23-15	06/21 - 07/09	06/24	06/27	06/30	07/03	07/06	59 - 72
23-16	06/28 - 07/16	06/30	07/03	07/06	07/11	07/13	57 - 76
23-17	06/28 - 07/16	06/30	07/03	07/06	07/11	07/13	55 - 71
23-18	06/28 - 07/16	06/30	07/03	07/06	07/11	07/13	56 - 73
23-19	06/28 – 08/04	06/30	07/03	07/06	07/11	07/13	57 - 74
23-20	07/03 - 08/04	07/06	07/11	07/13	07/21	08/01	56 - 73
23-21	08/02 - 08/24	08/04	08/07	08/10	08/14	08/17	55 - 73
23-22	08/02 - 08/24	08/04	08/07	08/10	08/14	08/17	56 - 70
23-23	08/02 - 08/24	08/04	08/07	08/10	08/14	08/17	56 - 74
23-24	08/02 - 08/24	08/04	08/07	08/10	08/14	08/17	57 - 75
23-25	08/08 – 09/08	08/14	08/17	08/21	08/24	09/01	56 - 75
23-26	08/11 – 09/08	08/14	08/17	08/21	08/24	09/01	55 - 77

[1]All piles reported are certified in accordance with the temperature and turning time requirements.
[2]Dates are month/day in 2023.

6. Dewatered by centrifuging to approximately 25 percent solids content and conveyed to MBM to produce heat-dried biosolids pellets under Contract 98-RFP-10. The biosolids pellets were marketed to users by MBM. The analysis of these biosolids (provided by MBM) is presented in Table 3.

In 2023, the Stickney WRP produced a total of 121,670 DT of biosolids (Table 1). This total includes biosolids generated by processing sludge originating at the Stickney WRP as well as the sludge imported from the Egan, O'Brien, Kirie, and Lemont WRPs for further processing. The quantity of biosolids beneficially utilized (108,631 DT) was less than the total 2023 production (121,670 DT) for the Stickney WRP. Hence, 13,039 DT of the biosolids generated in 2023 were stored in lagoons and/or on drying cells for further processing and future use.

Biosolids to Landfills

In 2023, no biosolids produced at the Stickney WRP were sent to landfill for co-disposal with municipal solid wastes or used as daily or final landfill cover.

Application of Class B Biosolids to Farmland

In 2023, a total of 66,594 DT of dewatered Class B biosolids (centrifuge cake and semi-dried biosolids) generated at the Stickney WRP was applied to agricultural land under IEPA Permit Numbers 2018-SC-63703 and 2023-SC-68367. Application to agricultural land was done through contracts with Synagro Midwest, Inc., and Stewart Environmental, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is 12 times per year.

All Stickney WRP dewatered Class B biosolids land applied in 2023 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 4), the VAR requirements of Section 503.33(b)(10) (by incorporation in soil within six hours after application), and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 5). The biosolids nitrogen concentrations (Table 4) were used to compute the agronomic rates for farmland application.

Application of Exceptional Quality Biosolids to Urban Land

In 2023, a total of 8,584 DT of Stickney WRP air-dried EQ (6,768 DT) and composted EQ (1,816 DT) biosolids were applied to urban land for various uses such as the construction and maintenance of golf courses, recreation fields, and parks. The sites and methods of utilization of these biosolids under the program are listed in Table 6.

Air-Dried Exceptional Quality Biosolids. In 2023, a total of 6,768 DT of Stickney WRP air-dried EQ biosolids was applied to urban land. All Stickney air-dried biosolids applied to urban land in 2023 met the pollutant concentration limits in Table 3 of Section 503.13 and the VAR requirements of Section 503.33(b)(1) (Table 7).

All of the air-dried EQ biosolids met the Class A pathogen limits of Section 503.32(a)(5) (Tables 8 and 9). Enteric viruses and helminth ova were analyzed before biosolids were dried

TABLE 3: CONCENTRATIONS OF NITROGEN AND METALS IN HEAT-DRIED BIOSOLIDS PELLETS GENERATED BY METROPOLITAN BIOSOLIDS MANAGEMENT FACILITIES AT THE STICKNEY WATER RECLAMATION PLANT IN 2023[1]

Date	Total N[2]	NO_3^- +NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
01/03/23	41,210	<13.9	5,030	7.6	2.7	475	0.48	17.0	43.6	62.5	4.6	735
02/07/23	27,410	<14.6	3,260	8.0	3.0	467	0.46	16.8	41.6	67.4	5.0	815
03/07/23	40,110	<14.6	2,400	7.7	7.5	421	0.55	12.5	37.5	74.1	5.4	837
04/04/23	36,510	<14.7	5,470	8.4	6.6	414	0.41	11.0	36.4	70.4	5.5	774
05/02/23	42,610	<14.6	4,660	8.5	4.2	426	0.51	12.0	37.8	67.3	4.9	775
06/06/23	36,020	<28.4	4,130	9.1	3.4	486	0.66	18.2	40.9	63.0	5.7	814
07/05/23	21,310	<13.6	2,900	7.5	4.4	478	0.49	20.2	46.2	77.3	<4.2	897
08/01/23	31,709	<13.2	3,400	9.4	3.1	427	0.55	17.1	41.9	103	4.4	852
09/05/23	28,919	<26.8	3,190	8.3	5.3	431	0.51	17.7	40.1	101	4.5	851
10/03/23	34,119	<27.1	3,080	8.5	5.5	437	0.46	17.6	43.7	111	4.5	874
11/07/23	32,109	<13.4	2,660	9.1	5.4	432	0.45	15.5	41.1	80.4	4.4	804
12/05/23	38,620	<27.6	5,100	8.4	3.0	444	0.34	16.5	42.7	69.4	<4.3	880
Minimum	21,310	NC[3]	2,400	7.5	2.7	414	0.34	11.0	36.4	62.5	<4.2	735
Mean[4]	34,221	NC	3,773	8.4	4.5	445	0.49	16.0	41.1	78.9	4.6	826
Maximum	42,610	NC	5,470	9.4	7.5	486	0.66	20.2	46.2	111	5.7	897
503 Limit[5]	NL[6]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Data provided by Metropolitan Biosolids Management, LLC.
[2]Total N was calculated as total Kjeldahl N plus nitrate- and nitrite-N. If the sum of nitrate- and nitrite-N was below the laboratory reporting limit, that sum was divided by the square-root of two and added to total Kjeldahl N.
[3]Minimum, mean, and maximum were not calculated because more than half of reported values were below the laboratory reporting limit.
[4]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[5]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[6]No limit established under Part 503.

TABLE 4: CONCENTRATIONS OF NITROGEN AND METALS IN DEWATERED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2023

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/L											
01/20/23	27,320	32.9	6,907	<10.0	4.41	494	0.71	14.5	46.2	110	<10.0	969
01/20/23	39,735	48.2	11,980	<10.0	4.68	509	0.57	19.7	53.0	89.0	<10.0	976
01/20/23	41,313	<41.8	13,269	<10.0	3.44	446	0.49	14.6	47.9	89.3	<10.0	891
03/14/23	36,453	<45.7	8,232	<10.0	4.93	424	0.46	11.2	41.8	82.4	<10.0	827
03/14/23	30,310	<32.7	8,206	<10.0	3.81	431	0.57	13.3	48.0	96.8	<10.0	840
04/11/23	32,392	<33.9	6,017	<10.0	3.03	487	0.64	12.9	42.0	94.0	<10.0	826
04/11/23	40,541	<39.1	11,754	<10.0	2.95	437	0.45	13.9	47.3	87.5	<10.0	869
04/19/23	41,834	<43.1	16,553	<10.0	4.25	413	0.59	15.1	42.7	80	<10.0	847
04/19/23	28,330	<29.9	7,579	<10.0	2.84	427	0.62	13.5	42.9	93.3	<10.0	852
04/21/23	49,852	<48.2	16,217	<10.0	2.96	427	0.58	17.7	46.6	78.5	<10.0	833
05/12/23	47,125	<39.2	14,248	<10.0	2.46	301	0.26	9.3	32.9	112	<10.0	674
05/12/23	44,625	<45	14,014	<10.0	10.4	443	<0.25	15.3	46.9	93.7	<10.0	984
05/23/23	38,938	<40.7	9,397	<10.0	2.99	465	0.75	15.0	44.7	102	<10.0	927
05/23/23	45,629	<45.6	14,333	<10.0	3.82	443	0.53	18.2	46.9	94.8	<10.0	969
06/14/23	40,901	<37.8	14,547	<10.0	2.92	452	0.45	15.3	47.7	88.3	<10.0	857
06/14/23	36,051	<33.1	11,882	<10.0	3.15	485	0.71	14.7	43.1	88.6	<10.0	858
06/21/23	45,254	<41.9	17,770	<10.0	3.59	448	0.57	16.4	46.5	79.0	<10.0	906
06/21/23	44,528	<42.3	14,028	<10.0	3.09	498	0.54	18.4	47.0	76.4	<10.0	869
07/07/23	23,646	<28.5	4,718	<10.0	3.45	515	0.50	16.3	47.4	105	<10.0	908
07/11/23	55,444	<31.7	8,212	<10.0	3.68	491	0.48	15.7	47.6	102	<10.0	911
07/18/23	34,623	<29.9	11,825	<10.0	4.71	462	0.53	16.5	47.8	92.5	<10.0	954
07/18/23	35,306	<32.8	9,731	<10.0	3.35	437	0.50	14.6	49.0	92.7	<10.0	899
07/25/23	41,418	<42.3	14,474	<10.0	3.72	445	0.33	16.8	44.1	78.2	<10.0	867
08/10/23	44,305	<47.8	16,236	<10.0	2.70	454	0.41	19.7	41.6	59.9	<10.0	850
08/10/23	34,689	<36.4	13,213	<10.0	3.04	422	0.46	14.0	44.6	86.5	<10.0	831
08/18/23	32,334	<31.9	7,178	<10.0	2.98	504	0.84	16.1	47.0	103	<10.0	940

TABLE 4 (Continued): CONCENTRATIONS OF NITROGEN AND METALS IN DEWATERED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2023

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/L											
08/24/23	39,997	40.2	11,825	<10.0	3.53	465	0.52	16.4	44.5	79.9	<10.0	880
09/15/23	46,847	<42.1	13,887	<10.0	2.98	401	0.53	16.9	39.7	92.4	<10.0	824
09/15/23	49,268	<39.4	14,075	<10.0	7.17	428	0.48	13.5	42.6	86.2	<10.0	845
09/22/23	29,227	<27.3	7,713	<10.0	2.68	466	0.61	14.0	41.7	93.5	<10.0	813
09/22/23	NDR[1]	<39.7	6,458	<10.0	2.66	444	0.46	15.3	41.0	71	<10.0	799
10/17/23	30,693	<39.7	11,509	<10.0	3.08	415	0.51	16.9	39.8	104	<10.0	877
10/17/23	41,986	<41.4	12,143	<10.0	6.93	418	1.02	13.9	40.8	87.5	<10.0	847
10/27/23	25,315	<31.5	6,607	<10.0	3.68	464	0.60	15.5	46.2	104	<10.0	929
10/27/23	27,833	<35.3	7,624	<10.0	3.33	443	0.49	16.7	45.1	76.7	<10.0	864
Minimum	23,646	<27.3	4,718	<10.0	2.46	301	<0.25	9.3	32.9	59.9	<10.0	674
Mean[2]	38,355	NC[3]	11,268	<10.0	3.81	449	0.54	15.4	44.7	90.1	<10.0	875
Maximum	55,444	48.2	17,770	<10.0	10.4	515	1.02	19.7	53.0	112	<10.0	984
503 Limit[4]	NL[5]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]No data reportable due to laboratory quality assurance/quality control sample failure.
[2]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[3]Mean was not calculated because more than half of reported values were below the laboratory reporting limit.
[4]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[5]No limit established under Part 503.

TABLE 5: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT IN 2023

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[1]	Meets Part 503 Class B Requirements
		days		
January	96.8	19.8	15.0	Yes
February	96.5	20.8	15.0	Yes
March	96.8	19.9	15.0	Yes
April	97.8	19.3	15.0	Yes
May	98.2	20.6	15.0	Yes
June	98.5	21.1	15.0	Yes
July	98.8	20.5	15.0	Yes
August	99.1	21.8	15.0	Yes
September	98.6	21.5	15.0	Yes
October	98.4	22.5	15.0	Yes
November	98.5	25.1	15.0	Yes
December	98.0	24.7	15.0	Yes

[1]For anaerobic digestion at average temperature achieved.

TABLE 6: PROFILE OF USERS THAT UTILIZED STICKNEY WATER RECLAMATION PLANT AIR-DRIED AND COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS IN 2023[1]

User Type	Use	Number of Users
Composted Biosolids		
Park districts, municipalities, governments	Landscaping	10
Schools and universities	Landscaping	1
Golf courses and athletic clubs	Landscaping	3
Landscaping and construction companies	Landscaping	6
Nongovernmental organizations	Landscaping	6
Nongovernmental organizations	Ornamentals & Landscaping	3
Landscaping and construction companies	Brownfields and construction sites	3
Metropolitan Water Reclamation District of Greater Chicago Stickney Water Reclamation Plant	Landscaping	NA
Air-Dried Biosolids		
Park districts, municipalities, governments	Landscaping & topdressing	6
Park districts, municipalities, governments	Landscaping	1
Landscaping and construction companies	Landscaping	3
Nongovernmental organizations	Landscaping	7
Park districts, municipalities, governments	Topdressing	10
Golf courses and athletic clubs	Topdressing	7
Landscaping and construction companies	Brownfields and construction sites	2
Park districts, municipalities, governments	Soil amendment	2
Residents of Metropolitan Chicago area	Private residential use	1

[1]Individual users and organizations on file.

TABLE 7: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2023

Date	TVS[1]	TVS[2] Reduction	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	%		mg/dry kg											
03/29/23	33.8	65.8	20,313	3,028	5,061	<10.0	5.94	435	0.85	12.8	45.0	111	<10.0	925
05/02/23	35.5	63.7	27,598	505	8,014	<10.0	3.24	427	0.57	13.8	46.6	108	<10.0	955
06/06/23	33.3	75.2	26,368	1,558	8,261	<10.0	2.58	420	0.67	11.5	39.5	97	<10.0	750
06/29/23	41.9	64.1	19,046	86	5,256	<10.0	3.01	492	0.67	14.4	41.5	96	<10.0	824
07/24/23	36.2	71.7	20,617	429	1,974	<10.0	3.03	469	0.60	13.6	42.9	100	<10.0	849
08/09/23	38.0	69.4	21,626	955	1,488	<10.0	2.77	513	0.57	14.1	44.4	101	<10.0	878
08/16/23	37.7	69.8	21,885	760	1,609	<10.0	2.45	481	0.81	13.6	42.6	95	<10.0	847
08/30/23	38.6	68.7	16,749	497	3,096	<10.0	2.87	466	0.64	13.9	43.5	93	<10.0	866
09/21/23	36.7	71.1	22,817	825	582	<10.0	2.76	487	0.64	14.1	41.9	101	<10.0	825
10/02/23	38.4	57.9	NRR[3]	1,203	3,373	<10.0	3.31	502	0.55	15.0	47.6	107	<10.0	967
10/10/23	37.3	59.9	25,108	856	3,826	<10.0	2.85	473	0.80	15.4	44.2	97	<10.0	922
Minimum	33.3	57.9	16,749	86	582	<10.0	2.45	420	0.55	11.5	39.5	93	<10.0	750
Mean	37.0	67.0	22,213	973	3,867	<10.0	3.16	470	0.67	13.8	43.6	101	<10.0	873
Maximum	41.9	75.2	27,598	3,028	8,261	<10.0	5.94	513	0.85	15.4	47.6	111	<10.0	967
503 Limit[4]	NL[5]	≥38.0	NL	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids as percentage of total solids.
[2]TVS of digester feed used for calculating TVS reduction were the means over the months from September 2006 through March 2023 for the South Desilting Pond sampled on 03/29/23, and months lagoons were filled from December 2017 to July 2020 for lagoon 26 sampled on 05/02/23, from December 2019 to March 2020 for lagoon 25 sampled on 06/06/23 through 09/21/23, and from December 2018 to December 2021 for lagoon 23 sampled in October 2023.
[3]No reportable result due to possible sample contamination.
[4]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[5]No limit established under Part 503.

TABLE 8: PATHOGEN ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2023

Sample Date	Lagoon No.	Enteric Virus PFU[1]/4g	Helminth Ova Viable Ova/4g
08/09/22	SDP[2]	<0.8000	<0.0800
09/13/22	SDP	<0.8000	<0.0800
10/11/22	SDP	<0.8000	<0.0800
04/12/23	26	<0.8000	0.0800
05/09/23	26	<0.8000	<0.0800
06/13/23	25	<0.8000	<0.0800

[1]Plaque-forming unit.
[2]South desilting pond.

TABLE 9: FECAL COLIFORM ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2023

Sample Date	Lagoon No.	Total Solids %	Fecal Coliform MPN[1]/g
03/29/23	SDP[2]	60.2	6
05/02/23	26	62.5	21
06/29/23	25	66.4	570
08/16/23	25	64.7	44
08/30/23	25	73.1	9
09/21/23	25	66.8	8
10/18/23	23	61.5	8

[1]Most probable number.
[2]South desilting pond.

(Table 8). The fecal coliform analyses were performed after the biosolids were dried and prior to utilization on urban land (Table 9). Management practices complied with Section 503.14. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

Composted Exceptional Quality Biosolids. In 2023, a total of 1,816 DT of composted EQ biosolids generated at the Stickney WRP during 2022 was applied to urban land. The composted EQ biosolids applied to urban land in 2023 met composting temperature and time requirements in 2022 and met the pollutant concentration limits in Table 3 of Section 503.13 prior to utilization in 2023 (Table 10). The fecal coliform analyses were performed after the composted EQ biosolids were cured and prior to utilization on urban land (Table 11). In accordance with Table 1 of Section 503.16, the frequency of monitoring for the biosolids is six times per year.

Site-Specific Process to Further Reduce Pathogens

For the Calumet and Stickney WRPs, the USEPA Region 5 designated, on a site-specific basis, the District's two biosolids processing trains as equivalent to PFRP, according to Section 503.32(a)(8). The PFRP equivalency commenced on August 1, 2002 (Appendix). The renewable certification of the PFRP designation was valid from August 1, 2017, through July 31, 2022, and required the analysis of six samples annually for helminth ova and enteric viruses during this period and the submittal of the data together with the annual Part 503 report. The District opted to not renew the certification after it expired.

None of the Stickney WRP air-dried EQ biosolids generated or utilized in 2023 were PFRP-compliant with respect to the minimum required duration of lagoon aging (18 months) due to operational constraints. Therefore, all air-dried biosolids utilized as EQ material in 2023 were tested for helminth ova and enteric virus compliance in August, September, and October 2022 and April, May, and June 2023 (Table 8), and for fecal coliform compliance in March, May, June, August, September, and October 2023 (Table 9), according to Section 503.32(a)(5).

TABLE 10: CONCENTRATIONS OF NITROGEN AND METALS IN COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2022 AND APPLIED TO URBAN LAND IN 2023[1]

Date[1]	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
03/22/23	18,995	199	165	15.0	3.31	301	0.35	7.83	31.6	125	<10.0	673
03/22/23	14,835	208	182	11.6	3.33	296	0.38	7.68	31.2	110	<10.0	658
04/27/23	16,820	208	31	11.7	2.70	314	0.39	10.6	34.8	139	<10.0	734
04/27/23	18,369	206	42	<10.0	3.18	426	0.47	19.0	52.1	81	<10.0	917
06/13/23	16,579	281	135	<10.0	2.30	252	0.34	8.91	28.0	67	<10.0	498
06/13/23	16,819	239	164	<10.0	2.26	262	0.33	8.45	29.3	72	<10.0	518
08/22/23	20,152	650	480	<10.0	3.46	383	0.69	12.1	37.2	114	<10.0	837
08/22/23	17,521	639	480	<10.0	3.42	371	0.46	11.9	37.4	103	<10.0	795
09/25/23	16,644	351	33	<10.0	2.79	359	0.44	12.3	38.2	87	<10.0	759
09/25/23	17,890	443	27	<10.0	2.60	332	0.48	11.0	38.0	82	<10.0	696
10/17/23	16,297	496	30	<10.0	2.61	355	0.59	13.1	36.9	85	<10.0	755
10/17/23	20,938	507	24	<10.0	2.66	365	0.49	12.5	38.1	87	<10.0	753
Minimum	14,835	199	24	<10.0	2.26	252	0.33	7.68	28.0	66.7	<10.0	498
Mean	17,655	369	149	NC[2]	2.88	335	0.45	11.3	36.1	96	<10.0	716
Maximum	20,938	650	480	15.0	3.46	426	0.69	19.0	52.1	139	<10.0	917
503 Limit[3]	NL[4]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Materials produced in 2022 and tested in 2023 prior to utilization.
[2]Mean was not calculated because only three values were above the laboratory reporting limit.
[3]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[4]No limit established under Part 503.

TABLE 11: FECAL COLIFORM ANALYSIS OF CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2022 AND SAMPLED PRIOR TO UTILIZATION ON URBAN LAND IN 2023

Sample Date[1]	Total Solids %	Fecal Coliform MPN[2]/g
03/22/23	43.7	9
04/27/23	40.6	12
06/13/23	58.1	5
08/22/23	49.5	6
09/25/23	47.3	6
10/17/23	46.7	0

[1]Materials produced in 2022 and tested in 2023 prior to utilization.
[2]Most probable number.

CALUMET WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Calumet WRP, located in Chicago, Illinois, has a design average flow of 354 MGD. The annual average treated flow in 2023 was 227 MGD. Wastewater reclamation processes at this WRP include primary settling and secondary activated sludge processes. All solids produced at the Calumet WRP are anaerobically digested. The Calumet WRP biosolids are then:

1. Placed in lagoons for dewatering, aging, and stabilization and then transported to paved cells and air-dried prior to:

    a. Application to urban land as EQ biosolids.

    b. Use at local municipal solid waste landfills as final cover. No biosolids were utilized through this outlet in 2023.

2. Placed in lagoons for dewatering and transported to paved cells for air-drying prior to:

    a. Application to farmland as dewatered Class B biosolids by a private contractor.

    b. Use as daily landfill cover. No biosolids were utilized through this outlet in 2023.

Composted EQ biosolids have also been produced at the Calumet SMA by co-composting biosolids with woodchips and curing. Class A pathogen reduction is achieved using the open windrow composting process through which all the requirements of Section 503.32(a)(7) are met. The temperature of the compost piles is maintained at ≥ 55°C for at least 15 days, and the piles are turned five times during the composting process. The VAR requirement is achieved through the same open windrow composting process to meet the established standards of Section 503.33(b)(5) by achieving the temperature and time requirements (≥ 45°C for at least 14 days) in the open windrows. No composted EQ biosolids were produced at the Calumet SMA in 2023. Composted EQ biosolids distributed from the Calumet SMA in 2023 were produced in 2022.

In 2023, a total of 26,817 DT of biosolids was produced at the Calumet WRP (Table 1). The total quantity of biosolids utilized (16,319 DT) was less than the total 2023 production for the Calumet WRP (26,817 DT). Hence, 10,498 DT of biosolids were stored in lagoons and/or on drying cells for further processing and later use.

Biosolids to Landfills

In 2023, no biosolids produced at the Calumet WRP were sent to landfill for co-disposal with municipal solid wastes or used as daily or final landfill cover (Table 1).

Application of Class B Biosolids to Farmland

In 2023, the Calumet WRP land-applied 12,264 DT of dewatered (semi-dried) Class B biosolids to farmland (Table 1) under IEPA Permit Numbers 2018-SC-63703 and 2023-SC-68367 through contracts with Synagro Midwest, Inc. (Contract No. 18-692-11) and Stewart Environmental, Inc. (Contract No. 14-690-11). In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

All Calumet WRP dewatered Class B biosolids land-applied in 2023 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 12), the VAR requirements of Section 503.33(b)(10) (by incorporation in soil within six hours after application), and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 13). The biosolids nitrogen concentrations (Table 12) were used to compute the agronomic rates for farmland application.

Application of Exceptional Quality Biosolids to Urban Land

In 2023, a total of 4,055 DT of air-dried (3,405 DT) and composted (650 DT) EQ biosolids generated at the Calumet WRP was applied to urban land for various uses such as maintenance of golf courses and recreation fields, landscaping, and the construction of new recreation fields. The sites and method of utilization of these biosolids are listed in Table 14.

Air-Dried Exceptional Quality Biosolids. In 2023, a total of 3,405 DT of air-dried EQ biosolids generated at the Calumet WRP was applied to urban land. All Calumet WRP air-dried EQ biosolids land-applied in 2023 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 15), the VAR requirements of Section 503.33(b)(1) (Table 15), and the Class A pathogen limits of Section 503.32(a)(5) (Tables 16 and 17). Enteric viruses and helminth ova (Table 16) were analyzed before biosolids were dried. The fecal coliform analyses (Table 17) were performed after the biosolids were dried and prior to utilization on urban land. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

Composted Exceptional Quality Biosolids. In 2023, a total of 650 DT of composted EQ biosolids generated at the Calumet WRP during 2022 was applied to urban land. No composted EQ biosolids were generated at the Calumet SMA during 2023. All composted biosolids land-applied in 2023 met composting temperature and time requirements in 2022 and met the pollutant concentration limits in Table 3 of Section 503.13 prior to utilization in 2023 (Table 18). The fecal coliform analyses were performed after the composted EQ biosolids were cured and prior to utilization on urban land (Table 19). In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is four times per year.

Site-Specific Process to Further Reduce Pathogens

For the Calumet and Stickney WRPs, USEPA Region 5 designated, on a site-specific basis, the District's two biosolids processing trains as equivalent to PFRP, according to Section 503.32(a)(8). The PFRP equivalency commenced on August 1, 2002 (Appendix). The

TABLE 12: CONCENTRATIONS OF NITROGEN AND METALS IN DEWATERED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2023

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
04/14/23	31,749	<14	2,609	10.6	2.37	436	0.57	20.2	34.9	68.9	<10.0	1,091
06/02/23	50,365	<109	12,817	<10.0	2.26	440	0.65	23.2	38.2	76.6	<10.0	1,211
07/05/23	34,647	<37	6,862	10.5	2.52	449	0.56	23.2	36.9	77.0	<10.0	1,144
07/28/23	37,562	<34	3,671	<10.0	2.26	420	0.56	21.9	36.1	74.8	<10.0	1,140
10/06/23	29,400	<30	3,414	<10.0	1.83	434	0.51	20.0	35.4	68.9	<10.0	1,124
10/06/23	31,698	<19	2,103	<10.0	1.87	458	0.52	20.4	36.3	70.0	<10.0	1,169
10/11/23	33,763	37	4,878	<10.0	1.75	425	0.68	21.5	35.0	65.0	<10.0	1,137
10/17/23	26,004	<32	2,035	<10.0	1.84	470	0.62	23.9	39.3	77.6	<10.0	1,229
10/17/23	26,428	32	2,463	<10.0	1.96	417	0.58	20.6	35.2	75.0	<10.0	1,099
10/19/23	31,591	553	1,450	<10.0	2.77	460	0.58	21.4	38.6	75.4	<10.0	1,220
11/02/23	34,290	41	3,572	10.2	1.69	421	0.52	19.9	33.3	62.0	<10.0	1,049
11/02/23	41,453	<28	2,675	10.1	1.76	433	0.55	20.6	34.5	66.6	<10.0	1,067
Minimum	26,004	<14	1,450	<10.0	1.69	417	0.51	19.9	33.3	62.0	<10.0	1,049
Mean	34,079	NC[1]	4,046	NC	2.07	439	0.58	21.4	36.2	71.5	<10.0	1,140
Maximum	50,365	553	12,817	10.6	2.77	470	0.68	23.9	39.3	77.6	<10.0	1,229
503 Limit[2]	NL[3]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Mean was not calculated because only four values were above the laboratory reporting limit.
[2]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[3]No limit established under Part 503.

TABLE 13: DIGESTER[1] TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT IN 2023

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[2]	Meets Part 503 Class B Requirements
		days		
January	96.1	24.1	15.0	Yes
February	97.0	41.1	15.0	Yes
March	97.2	46.5	15.0	Yes
April	97.2	41.6	15.0	Yes
May	97.0	28.7	15.0	Yes
June	97.3	29.7	15.0	Yes
July	97.3	23.2	15.0	Yes
August	97.9	35.8	15.0	Yes
September	97.5	33.0	15.0	Yes
October	97.7	33.4	15.0	Yes
November	97.4	47.7	15.0	Yes
December	97.3	47.3	15.0	Yes

[1]Temperatures and detention times are for primary digesters 1 through 12 at the Calumet WRP.
[2]For anaerobic digestion at average temperature achieved.

TABLE 14: PROFILE OF USERS THAT UTILIZED CALUMET WATER RECLAMATION PLANT AIR-DRIED AND COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS IN 2023[1]

User Type and Number of Users	Use	Number of Users
Composted Biosolids		
Landscaping and construction companies	Landscaping	1
Air-Dried Biosolids		
Park districts, municipalities, governments	Topdressing	5
Schools and universities	Topdressing	1
Landscaping and construction companies	Topdressing	6

[1]Individual users and organizations on file.

TABLE 15: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2023

Date	TVS[1]	TVS[2] Reduction	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	---%		---mg/dry kg---											
05/11/23	42.2	70.7	27,554	15	3,533	<10.0	2.14	460	0.58	24.7	41.2	79.1	<10.0	1,351
06/07/23	40.9	72.3	33,567	<12	3,155	<10.0	2.24	464	0.57	23.1	38.3	79.5	<10.0	1,271
06/08/23	39.9	73.4	31,334	15	3,888	10.7	2.25	449	0.52	21.6	38.4	75.8	<10.0	1,252
06/08/23	39.3	74.0	31,092	38	363	<10.0	2.29	459	0.44	25.3	40.3	76.1	<10.0	1,227
06/15/23	36.3	74.8	29,875	27.2	5965	<10.0	2.19	432	0.59	19.6	34.1	77.0	<10.0	1,079
06/20/23	38.2	75.2	35,978	13	8,104	<10.0	2.19	467	0.59	23.7	36.6	70.7	<10.0	1,101
06/22/23	34.1	79.2	16,419	829	34	10.2	2.71	438	0.91	15.4	33.6	104	<10.0	1,232
08/22/23	36.5	75.7	NRR[3]	884	1,180	<10.0	1.97	415	0.00	18.2	33.8	76.4	<10.0	1,086
11/02/23	34.2	78.0	26,353	1,053	65	<10.0	1.81	437	0.84	16.3	33.9	78.7	<10.0	1,158
11/06/23	36.9	75.2	24,918	599	170	11.0	1.81	460	0.69	20.1	35.7	78.7	<10.0	1,155
Minimum	34.1	70.7	16,419	<12	34	<10	1.81	415	0.00	15.4	33.6	70.7	<10.0	1,079
Mean[4]	37.8	74.8	28,566	348	2,646	NC[5]	2.16	448	0.57	20.8	36.6	79.6	<10.0	1,191
Maximum	42.2	79.2	35,978	1,053	8,104	11.0	2.71	467	0.91	25.3	41.2	104.3	<10.0	1,351
503 Limit[6]	NL[7]	≥38	NL	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids as percentage of total solids.
[2]TVS of digester feed used for calculating TVS reduction were the means for the months lagoons were filled from August 2020 to August 2022 for lagoon 1 sampled on 05/11/23 through 06/08/23, and on 06/20/23 and 06/22/23; from March 2020 to March 2021 for lagoon 18 sampled on 06/15/23; and from July 2020 to August 2022 for lagoon 19 sampled in August and November 2023.
[3]No reportable result because sample storage conditions did not meet quality assurance/quality control requirements.
[4]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[5]Mean was not calculated because more than half of reported values were below the laboratory reporting limit.
[6]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[7]No limit established under Part 503.

TABLE 16: PATHOGEN ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2023

Sample Date	Lagoon No.	Enteric Virus PFU[1]/4g	Helminth Ova Viable Ova/4g
08/10/22	18	<0.8000	<0.0800
09/20/22	18	<0.8000	<0.0800
10/18/22	1	<0.8000	<0.0800
04/19/23	1	<0.8000	<0.0800
04/19/23	18	<0.8000	<0.0800
05/11/23	1	<0.8000	<0.0800
06/13/23	19	NRR[2]	<0.0800
07/18/23	19	<0.8000	NA[3]

[1]Plaque-forming unit.
[2]No reportable result due to quality assurance/quality control sample failure.
[3]Not analyzed. An additional sample was analyzed for enteric viruses only because this analysis was canceled for the previous sample due to quality assurance/quality control sample failure.

TABLE 17: FECAL COLIFORM ANALYSIS OF AIR-DRIED EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2023

Sample Date	Lagoon No.	Total Solids %	Fecal Coliform MPN[1]/dry g
05/25/23	18	87.0	45
05/25/23	1	84.2	13
06/07/23	1	90.9	110
06/07/23	19	91.4	490
06/08/23	1	92.1	3
06/22/23	3	75.3	13
08/03/23	19	84.3	810
08/30/23	7	84.9	80
10/19/23	3	49.4	770
11/02/23	19	66.0	6

[1]Most probable number.

TABLE 18: CONCENTRATIONS OF NITROGEN AND METALS IN COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2022 AND APPLIED TO URBAN LAND IN 2023

Sample Date[1]	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg											
03/21/23	19,341	598	679	<10.0	3.34	314	0.53	9.9	29.8	81.1	<10.0	827
03/21/23	15,343	281	183	<10.0	3.30	303	0.43	9.4	29.2	81.5	<10.0	789
04/26/23	14,250	167	45	<10.0	1.94	227	0.39	6.7	25.4	74.1	<10.0	528
04/26/23	15,425	208	63	<10.0	2.40	269	0.41	8.0	30.3	87.1	<10.0	620
06/14/23	15,823	556	20	<10.0	2.58	317	0.38	12.1	33.5	78.4	<10.0	600
06/14/23	16,731	537	31	<10.0	2.46	313	0.36	12.2	33.6	80.0	<10.0	633
06/15/23	19,911	133	582	<10.0	2.09	237	0.31	11.1	27.6	79.5	<10.0	475
08/16/23	17,459	1,016	21	<10.0	1.66	277	0.54	10.9	29.2	71.6	<10.0	568
08/16/23	16,475	1,000	22	<10.0	1.63	283	0.52	11.4	29.5	70.7	<10.0	562
Minimum	14,250	133	20	<10.0	1.63	227	0.31	6.7	25.4	70.7	<10.0	475
Mean	16,751	500	183	<10.0	2.38	282	0.43	10.2	29.8	78.2	<10.0	622
Maximum	19,911	1,016	679	<10.0	3.34	317	0.54	12.2	33.6	87.1	<10.0	827
503 Limit[2]	NL[3]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Materials produced in 2022 and tested in 2023 prior to utilization.
[2]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[3]No limit established under Part 503.

TABLE 19: FECAL COLIFORM ANALYSIS OF CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2022 AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2023

Sample Date[1]	Total Solids %	Fecal Coliform MPN[2]/dry g
03/21/23	41.9	12
04/26/23	52.1	5
06/14/23	52.7	5
08/16/23	47.3	4

[1]Materials produced in 2022 and tested in 2023 prior to utilization.
[2]Most probable number.

renewable certification of the PFRP designation was valid from August 1, 2017, through July 31, 2022, and required the analysis of six samples annually for helminth ova and enteric viruses during this period and the submittal of the data together with the annual Part 503 report. The District opted to not renew the certification after it expired.

None of the Calumet WRP air-dried EQ biosolids generated or utilized in 2023 were PFRP-compliant with respect to the minimum required duration of lagoon aging (18 months) due to operational constraints. Therefore, all air-dried biosolids utilized as EQ material in 2023 were tested for helminth ova and enteric virus compliance in August, September, and October 2022 and April, May, June (helminth ova only), and July (enteric virus only) 2023 (Table 16), and for fecal coliform compliance in May, June, August, October, and November 2023 (Table 17), according to Section 503.32(a)(5).

HANOVER PARK WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Hanover Park WRP, located in Hanover Park, Illinois, has a design average flow of 12 MGD. The annual average treated flow in 2023 was 6.68 MGD. Wastewater reclamation processes at this WRP include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatments. All solids produced at the Hanover Park WRP are anaerobically digested and stored in lagoons and later land-applied by injection at the on-site Fischer Farm.

In 2023, the total biosolids production at this WRP was 783 DT (Table 1).

Land Application of Class B Liquid Biosolids

In 2023, the Hanover Park WRP land-applied a total of 1,990 DT of lagooned biosolids and lagoon supernatant at the on-site Fischer Farm under IEPA Permit No. 2022-61315. The total quantity of biosolids utilized (1,990 DT) was more than the total 2023 production for the Hanover Park WRP (783 DT) with the excess coming from the on-site storage lagoons. Hence, net storage of biosolids in lagoons was reduced by 1,207 DT in 2023. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids was six times per year.

All Hanover Park WRP lagoon biosolids land-applied in 2023 met the pollutant concentration limits in Table 3 of Section 503.13 for all metals (Table 20), the anaerobic digestion time and temperature requirements of the Class B pathogen standards of Section 503.32(b)(3) (Table 21), and the VAR requirements of Section 503.33(b)(1) (Table 22). Management practices at this land-application site complied with Section 503.14. Because application of Hanover Park WRP biosolids in 2023 (Table 1) was higher than typical (usually <1000 DT annually, requiring four monitoring events), data from two digester draw samplings were included with the four samplings of biosolids at application in USEPA reporting.

TABLE 20: CONCENTRATIONS OF NITROGEN AND METALS IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2023

Sample Date	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	Supernatant, mg/L											
04/15/23	903	<0.500	797	0.016	<0.002	0.327	<0.0005	0.011	0.036	0.008	0.007	0.527
09/02/23	802	0.566	745	0.017	<0.002	0.094	<0.0005	0.007	0.039	0.002	0.006	0.178
09/09/23	791	0.785	721	0.018	<0.002	0.089	<0.0005	0.009	0.042	0.002	0.006	0.189
Minimum	791	<0.500	721	0.016	<0.002	0.089	<0.0005	0.007	0.036	0.002	0.006	0.178
Mean[1]	832	0.568	754	0.017	<0.002	0.170	<0.0005	0.009	0.039	0.004	0.006	0.298
Maximum	903	0.785	797	0.018	<0.002	0.327	<0.0005	0.011	0.042	0.008	0.007	0.527
	Liquid Biosolids, mg/kg											
10/13/23	56,397	<202	18,880	<10.0	1.09	789	0.76	16.0	29.6	18.9	<10.0	916
	Digester Draw[2], mg/kg											
07/03/23	NA[3]	NA	NA	<10.0	1.26	655	0.29	12.2	27.0	18.5	<10.0	950
08/07/23	NA	NA	NA	<10.0	<1.00	622	0.95	10.8	37.1	19.8	<10.0	881
503 Limit[4]	NL[5]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]In calculating each mean, any value less than the reporting limit was treated as equal to the reporting limit divided by the square root of two.
[2]Results from two digester draw samples were included in United States Environmental Protection Agency Part 503 reporting to meet the requirement for six monitoring events at application rates between 1,650 and 16,500 dry tons per year.
[3]Nitrogen concentrations are not analyzed in digester draw samples.
[4]Regulatory limit established under United States *Code of Federal Regulations* Title 40 Part 503.
[5]No limit established under Part 503.

TABLE 21: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT IN 2023

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[1]	Meets Part 503 Class B Requirements
		days		
January	98.0	31.1	15.0	Yes
February	98.0	29.3	15.0	Yes
March	98.0	30.7	15.0	Yes
April	98.0	30.9	15.0	Yes
May	97.4	32.3	15.0	Yes
June	97.4	31.5	15.0	Yes
July	97.4	37.8	15.0	Yes
August	98.0	27.9	15.0	Yes
September	98.0	31.9	15.0	Yes
October	98.0	30.2	15.0	Yes
November	98.0	29.5	15.0	Yes
December	98.0	26.9	15.0	Yes

[1]For anaerobic digestion at average temperature achieved.

TABLE 22: VOLATILE SOLIDS REDUCTION IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2023

Month[1]	Digester Feed	Digester Draw	Applied Biosolids	Volatile Solids Reduction[2]
	% Total Volatile Solids			%
April	85.9	73.0	61.9	73.4
July	86.6	76.8	NA[3]	49.0
August	86.1	75.9	NA	49.2
September	87.3	76.6	67.9	69.0
October	86.2	75.9	65.2	69.9

[1]Biosolids applied as lagoon supernatant in April and September, and as liquid biosolids in October.
[2]Volatile solids reduction computed using total volatile solids data for digester feed and applied biosolids.
[3]Biosolids were not applied in July or August 2023. Results from two digester draw samples, in July and August, were included in United States Environmental Protection Agency Part 503 reporting to meet the requirement for six monitoring events at application rates between 1,650 and 16,500 dry tons per year.

JOHN E. EGAN WATER RECLAMATION PLANT

The Egan WRP, located in Schaumburg, Illinois, has a design average flow of 30 MGD. The annual average treated flow in 2023 was 22.4 MGD. Wastewater reclamation processes include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatments. Under normal operations, all solids generated at the Egan WRP, including solids conveyed from the Kirie WRP, are anaerobically digested.

In 2023, a total amount of 5,928 DT biosolids were produced at the Egan WRP, all of which were pumped to the Stickney WRP for further processing, storage, and utilization (Table 1). Anaerobic digestion at the Egan WRP in 2023 met the time and temperature requirements of the Class B pathogen standards of Section 503.32(b)(3) (Table 23).

TABLE 23: DIGESTER[1] TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE JOHN E. EGAN WATER RECLAMATION PLANT IN 2023

Month	Average Temperature °F	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[2]	Meets Part 503 Class B Requirements
		days		
January	96.4	27.8	15.0	Yes
February	94.9	27.5	15.2	Yes
March	96.7	28.7	15.0	Yes
April	94.1	29.1	16.5	Yes
May	97.1	29.5	15.0	Yes
June	97.1	30.0	15.0	Yes
July	96.8	25.7	15.0	Yes
August	98.2	33.6	15.0	Yes
September	98.2	32.5	15.0	Yes
October	98.2	31.3	15.0	Yes
November	97.3	32.5	15.0	Yes
December	97.2	27.8	15.0	Yes

[1]Temperatures and detention times are for primary digesters A and C at the Egan WRP.
[2]For anaerobic digestion at average temperature achieved.

TERRENCE J. O'BRIEN WATER RECLAMATION PLANT

The O'Brien WRP, located in Skokie, Illinois, has a design average flow of 333 MGD. The annual average treated flow in 2023 was 211 MGD. Wastewater reclamation processes at the O'Brien WRP include primary (primary settling) and secondary (activated sludge process) treatments. In 2023, the O'Brien WRP produced 31,499 DT of solids (Table 1), which were sent via pipeline to the Stickney WRP where they were commingled with the solids from that WRP for anaerobic digestion and further processing, storage, and utilization.

JAMES C. KIRIE WATER RECLAMATION PLANT

The Kirie WRP, located in Des Plaines, Illinois, has a design average flow of 52 MGD. The annual average treated flow in 2023 was 33.68 MGD. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatments. In 2023, the Kirie WRP produced 5,996 DT of solids (Table 1), which were sent via force main to the Egan WRP, then to the Stickney WRP and were commingled with the solids from these WRPs for anaerobic digestion and further processing, storage, and utilization.

LEMONT WATER RECLAMATION PLANT

The Lemont WRP, located in Lemont, Illinois, has a design average flow of 2.3 million MGD. The annual average treated flow in 2023 was 2.58 MGD. Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatments. In 2023, the Lemont WRP produced 347 DT of solids (Table 1), which were gravity concentrated and transported to the Stickney WRP where they were commingled with the solids from that WRP for anaerobic digestion and further processing, storage, and utilization.

APPENDIX

DESIGNATION OF SITE-SPECIFIC EQUIVALENCY TO PROCESS TO FURTHER REDUCE PATHOGENS FOR METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO BIOSOLIDS PROCESSING TRAINS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUN 20 2002

REPLY TO THE ATTENTION OF:

WN-16J

Mr. Jack Farnan
General Superintendent
Metropolitan Water Reclamation
District of Greater Chicago
100 East Erie Street
Chicago, Illinois 60611

REF: Mr. Richard Lanyon's November 30, 2001, Letter Request for Site-specific Equivalency Certification for the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) Biosolids Processing Trains at the Stickney and Calumet Waste Water Treatment Plants.

Dear Mr. Farnan:

We acknowledge receipt of the referenced letter request along with attachments A through I. This request conforms with the requirements of the Federal rules for the use and disposal of biosolids codified at 40 CFR part 503. These rules designate the Regional permitting authority to be responsible for determining equivalency, and require generators of biosolids to formally seek an equivalency certification of their process to further reduce pathogens (PFRP) from the permitting authority. To be equivalent, a treatment process must be able to consistently reduce pathogens to levels comparable to the other PFRP processes listed in part 503, Appendix B.

The granting of a site-specific equivalency designation by the Regional permitting authority–based on a thorough review of the adequacy of the process trains to consistently reduce pathogens in biosolids as indicated by the pathogen data, and in consultation with the Pathogen equivalency Committee (PEC)–certifies the biosolids generated by using a PFRP equivalent process is Class A with respect to pathogens. The pathogen standards are specified in section 503.32(a)(7)(i). However, the granting of a site-specific equivalency is limited to the set of process and operating conditions in use at the Stickney and Calumet waste water treatment plants at the time of the application for equivalency designation (Appendix B of the November 30, 2001, Letter Request), and as described by MWRDGC in its application for equivalency submitted to the PEC. The PEC is an US Environmental Protection Agency resource to provide technical assistance and recommendations to Regional permitting authorities regarding pathogen reduction equivalency in implementing the part 503 standards for use and disposal of biosolids.

We are familiar with the MWRDGC's request for equivalency because our biosolids team members participated in numerous phone conversations and meetings with the PEC and Dr. Prakasam Tata of your staff, and both were extremely helpful in explaining and clarifying various issues related to the subject.

Our review of the MWRDGC's biosolids data submitted for 1994 to 2001 indicates Class A biosolids were produced at the Stickney and Calumet plants as they operated their respective low-and high-solids sludge processing trains (SPTs) according to codified protocols delineated in Attachment B of Mr. Lanyon's letter request, dated November 30, 2001. The part 503 rules for PFRP equivalency require that enteric viruses and viable helminth ova are reduced to below detection level. The pathogen data obtained from actual measurements and the statistical treatment of that data by MWRDGC indicated reductions of greater than two logs. We appreciate the MWRDGC's effort in analyzing 1,400 discreet samples of biosolids for pathogens, and the professionalism and patience displayed by Dr. Prakasam Tata of your staff in responding to our queries pertaining to this matter.

In consideration of the quality of data provided for our review, the consistent achievement of a Class A product, we are pleased to grant a conditional site-specific certification of equivalency to the MWRDGC's SPTs at Stickney and Calumet waste water treatment plants for a period of two years effective August 1, 2002 to July 30, 2004, provided the following conditions are met.

1) The Stickney and Calumet plants must operate at all times according to the codified process and operating protocols referred to in the letter request dated November 30, 2001.

2) Monitor biosolids (treated sludge) at Stickney and Calumet plants once per month for the first year and subsequently, once every other month for enteric viruses and helminth ova, and certify the MWRDGC is in compliance with Class A standards and report the results semi-annually to the attention of Mr. Valdis Aistars, Mail Drop WC-15J, 77 West Jackson, Chicago, Illinois 60604.

We appreciate MWRDGC's ongoing efforts to improve the quality of its biosolids. If you have any further questions about this matter, please contact Ash Sajjad of my staff at 312-886-6112.

Sincerely yours,

Robert J. Harry
for

Jo Lynn Traub
Director, Water Division

cc: Dick Lanyon, MWRDGC
Dr. Prakasam Tata, MWRDGC ✓
Dr. James Smith Jr., ORD, Cincinnati

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUL 30 2012

REPLY TO THE ATTENTION OF:

WN-16J

Thomas C. Granato, Ph.D.
Director of Monitoring and Research
Metropolitan Water Reclamation
District of Greater Chicago
100 East Erie Street
Chicago, Illinois 60611-3154

Re: June 1, 2012, Request for Renewal of Site-Specific Equivalency Determination for the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) Biosolids Processing Trains at the Stickney and Calumet Wastewater Treatment Plants

Dear Dr. Granato:

We have received the above-referenced request on June 6, 2012, along with microbiological analyses of biosolids generated by MWRDGC between August 2002 and December 2011. We appreciate your interest in seeking renewal of MWRDGC's equivalency certification. You have also requested that data reporting be reduced and the sampling frequency for enteric viruses and helminth ova be retained at six times per year if your equivalency certification is renewed. The following discussion highlights the regulatory requirements of establishing equivalency, memorializes past Agency decisions, and provides Region 5's decision on your requests.

Biosolids are a product of wastewater treatment and are suitable for beneficial reuse in agriculture and other applications, subject to conformance with the Federal biosolids rules at 40 Code of Federal Regulations Part 503 (503 Rules) addressing disease-causing organisms (pathogens) in biosolids. The 503 Rules establish requirements for classifying biosolids as either a Class A or Class B product with respect to pathogens. Class A requirements are met by treating the sewage sludge to reduce pathogens below detection levels, while the Class B requirements rely on a combination of treatment and site restrictions to reduce pathogens and potential exposure to pathogens. The 503 Rules provide a series of options for meeting the specific requirements for the two classes of biosolids.

One of the Class A options is to treat the sewage sludge by a process equivalent to a process listed in the 503 Rules, Appendix B. To be equivalent, a sewage sludge treatment process must be able to consistently reduce pathogens to levels comparable with the processes listed in Appendix B. Under the 503 Rules, the permitting authority (in this case, EPA Region 5) is responsible for determining equivalency.

MWRDGC's sewage sludge processing trains differ from those listed in Appendix B. In March 1998, MWRDGC submitted an equivalency application to EPA's Pathogen Equivalency Committee (PEC) and the Region for approval. The Region and the PEC reviewed MWRDGC's initial request and granted a site-specific and conditional equivalency in June 2002, for a period of 2 years. Subsequently, the Region granted four 2-year extensions, in effect until August 1, 2012.

We have reviewed your most recent renewal request and request for reporting and sampling frequency reduction. Based on the microbiological data provided to us, I am approving your equivalency renewal request for a period of five years, until August 1, 2017. This approval is subject to all conditions that were included in the initial approval and all subsequent extensions except as it relates to reporting. As part of your equivalency approval, you were required to submit semi-annual reports to EPA. Based on your past performance, we agree that annual reporting as required by the Part 503 rules is sufficient and therefore, approve the reduction to annual reporting. Regarding the retention of the reduction in sampling frequency for enteric viruses and helminth ova to six times per year, we would like to provide some clarification. This reduction is only allowed when MWRDGC's sewage sludge processing trains are not meeting the approved conditions for equivalency and you are analyzing the sewage sludge in accordance with 40 CFR 503.32(a)(5)(ii) and (a)(5)(iii) to meet Class A. Monthly sampling for enteric viruses and helminth ova is still required as part of your equivalency approval.

If you have any further questions about this matter, please contact Mr. John Colletti of my staff, at (312) 886-6106.

Sincerely,

Tinka G. Hyde
Director, Water Division

cc: Albert Cox, MWRDGC
Al Keller, IEPA

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago
100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.5190 f: 312.751.5194

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THOMAS C. GRANATO, Ph.D.
Director of Monitoring and Research Department
thomas.granato@mwrd.org

September 14, 2012

Ms. Tinka Hyde
Director, Water Division
United States Environmental
Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Ms. Hyde:

Subject: Clarification on July 30, 2012, Letter: Renewal of Site-Specific Equivalency to Process to Further Reduce Pathogens Designation of the Metropolitan Water Reclamation District of Greater Chicago's Biosolids Processing Trains at the Stickney and Calumet Water Reclamation Plants

In a letter dated July 30, 2012 (attached), the United States Environmental Protection Agency (USEPA) notified the Metropolitan Water Reclamation District of Greater Chicago (District) that the site-specific equivalency to process to further reduce pathogens (PFRP) designation of the District's low- and high-solids biosolids processing trains at the Stickney and Calumet Water Reclamation Plants was renewed for a period of five years, until August 1, 2017. Based on a discussion with Mr. John Colletti of your staff, the District will operate as specified in this renewal letter and with the following clarifications:

- Sampling for enteric viruses and helminth ova will be done six times per year as part of the PFRP equivalency as approved in the 2010 renewal (attached) of the two-year certification.

- Since the reporting frequency is changed from semi-annual to annual, and monitoring data will be included in the annual USEPA 40 Code of Federal Regulations Part 503 Rule (Part 503) report to the USEPA, the annual reporting begins with the 2012 calendar year. As such, no more semi-annual reports will be submitted from now onwards. The monitoring data for the period January through July 2012 of the previous certification period (August 2010 to July 2012) will be reported in the 2012 Part 503 report.

Subject: Clarification on July 30, 2012, Letter: Renewal of Site-Specific Equivalency to Process to Further Reduce Pathogens Designation of the Metropolitan Water Reclamation District of Greater Chicago's Biosolids Processing Trains at the Stickney and Calumet Water Reclamation Plants

For additional information, please contact Dr. Albert Cox, Supervising Environmental Soil Scientist, at 708.588.4063.

Very truly yours,

Thomas C. Granato, Ph.D.
Director
Monitoring and Research

TCG:AC:cm
Attachment
cc w/att: S. A. Keller, IEPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

JUL 20 2010

REPLY TO THE ATTENTION OF: WN-16J

Mr. Louis Kollias
Director of Monitoring and Research
Metropolitan Water Reclamation
District of Greater Chicago
100 East Erie Street
Chicago, Illinois 60611-3154

Re: May 17 2010, Request for Renewal of Site-specific Equivalency Determination for the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). Biosolids Processing Trains at the Stickney and Calumet Wastewater Treatment Plants.

Dear Mr. Kollias:

We have received the above-referenced request on May 20, 2010, along with microbiological analyses of biosolids generated by MWRDGC between August 2002 and December 2009. We appreciate your interest in seeking renewal of MWRDGC's equivalency certification. You have also requested the sampling frequency for enteric viruses and helminth ova be reduced if your equivalency certification is renewed. The following discussion highlights the regulatory requirements of establishing equivalency, memorializes past Agency decisions, and provides Region 5's decision on your requests.

Biosolids are a product of wastewater treatment and are suitable for beneficial reuse in agriculture and other applications, subject to conformance with the Federal biosolids rules at 40 Code of Federal Regulations Part 503 (503 Rules) addressing disease-causing organisms (pathogens) in biosolids. The 503 Rules establish requirements for classifying biosolids as either a Class A or Class B product with respect to pathogens. Class A requirements are met by treating the sewage sludge to reduce pathogens below detection levels, while the Class B requirements rely on a combination of treatment and site restrictions to reduce pathogens and potential exposure to pathogens. The 503 Rules provide a series of options for meeting the specific requirements for the two classes of biosolids.

One of the Class A options is to treat the sewage sludge by a process equivalent to a process listed in the 503 Rules, Appendix B. To be equivalent, a sewage sludge treatment process must be able to consistently reduce pathogens to levels comparable with the processes listed in Appendix B. Under the 503 Rules, the permitting authority

(in this case, EPA Region 5) is responsible for determining equivalency. MWRDGC's sewage sludge processing trains differ from those listed in Appendix B. In March 1998, MWRDGC submitted an equivalency application to EPA's Pathogen Equivalency Committee (PEC) and the Region for approval. The Region and the PEC reviewed MWRDGC's initial request and granted a site-specific and conditional equivalency in June 2002, for a period of 2 years. Subsequently, the Region granted three 2-year extensions, in effect until July 31, 2010.

We have reviewed your most recent renewal request and request for sampling frequency reduction. Based on the microbiological data provided to us, I am approving your equivalency renewal request for a period of two years, until August 1, 2012. This approval is subject to all conditions that were included in the initial approval and all subsequent extensions except as it relates to sampling frequency. With this approval, the sampling frequency for enteric viruses and helminth ova is reduced to six times per year.

If you have any further questions about this matter, please contact Mr. John Colletti of my staff, at (312) 886-6106.

Sincerely,

for Tinka G. Hyde
Director, Water Division