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ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR

2018

October 2019

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LIST OF ACRONYMS

Abbreviation/Acronym	Definition
CALSMA	Calumet Solids Management Area
CFR	Code of Federal Regulations
CSD	Controlled Solids Distribution
District	Metropolitan Water Reclamation District of Greater Chicago
DT	dry tons
Egan	John E. Egan Water Reclamation Plant
EQ	Exceptional Quality Biosolids
IEPA	Illinois Environmental Protection Agency
Kirie	James C. Kirie Water Reclamation Plant
MGD	million gallons per day
O'Brien	Terrence J. O'Brien Water Reclamation Plant
Part 503	United States Environmental Protection Agency's Code of Federal Regulations Title 40 Part 503
PFRP	Process to Further Reduce Pathogens
USEPA	United States Environmental Agency
WRP	Water Reclamation Plant

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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 (District).

FOREWORD

This report serves as a record of the data and information that fulfills the frequency of monitoring and the reporting requirements for 2018 for Biosolids Management by the 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 2018.

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

The District operates seven water reclamation plants (WRP), namely 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. Under normal operations, the untreated sludge generated at the Kirie WRP is sent to the Egan WRP, and sludge from the O'Brien and Lemont WRPs are 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 for over 15 days of detention time at 35^0C 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). The additional processing to achieve the final products varies between the four WRPs as indicated in the description of the biosolids products outlined below.

Biosolids Products at the District

- **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. Alternatively, the anaerobically digested biosolids are stored temporarily in lagoons then placed on drying beds for partial drying (>20 percent solids content) through mechanical agitation before use. This product is produced at the Stickney, Calumet, and Egan (centrifuged biosolids only) WRPs and commonly applied to farmland as a fertilizer.

- **Air-dried Exceptional Quality Biosolids:** These biosolids are produced through the aging of centrifuge cake biosolids or digested sludge in lagoons for at least 1.5 years followed by air-drying to at least 65 percent solids content. This air-dried material meets the "Exceptional Quality" (EQ) standards of the United States Environmental Protection Agency (USEPA) Part 503 biosolids rule, which designates biosolids that meet the strictest trace metals, pathogen, and vector reduction requirements. This product is produced at the Stickney and Calumet WRPs, and since the early 1990's, it has been used under a Controlled Solids Distribution 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.

- **Exceptional Quality Composted Biosolids:** The composted biosolids are produced at the Stickney WRP Harlem Avenue Solids Management Area and at the Calumet East Solids Management Area 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 protocol (USEPA, 1993). The composting recipe consists of one part centrifuge cake biosolids and three parts woodchips. The composting process used is open windrow composting for a minimum of 23 days, a minimum of five turnings, temperature maintained at a minimum of 55 °C, and then followed by 16 weeks of curing. The product produced is currently voluntarily registered as a soil amendment with the Illinois Department of Agriculture.

- **Liquid Biosolids:** The digested biosolids produced at the Hanover Park WRP are stored and thickened (~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 requirements and is applied through a 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 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 small fertilizer pellets that meet Class A, exceptional quality (EQ) biosolids with a solids content greater than 90 percent.

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

- **IPCB 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 a requirement for this standard. Therefore, lagoon-aged air-dried biosolids used for landfill final cover are not tested to confirm Class A status.

- **USEPA Site-Specific Process to Further Reduce Pathogens Certification** – This site-specific certification of the Calumet and Stickney WRPs' biosolids solids 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 solids processing trains are to be isolated from Process to Further Reduce Pathogens (PFRP)-compliant biosolids and must be tested to meet the Part 503 pathogen (virus and helminth) requirements to be designated Class A. Currently, this certification is renewable every five years. Over the past eight years, due to operational efficiencies related to lagoon storage time and air-drying operations, biosolids processing at both the

Calumet and Stickney WRPs are not operated to follow the codified parameters; therefore, all EQ biosolids are tested for helminth ova and virus.

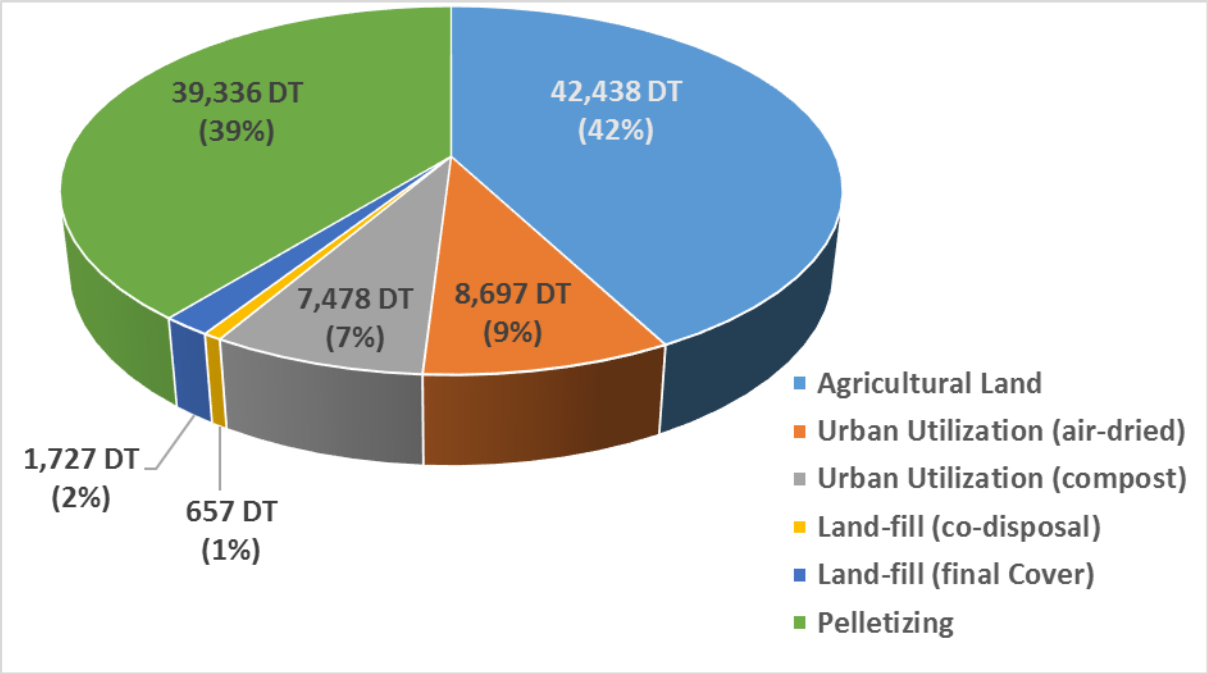
Biosolids Utilization Programs

The District's Biosolids Management Program is designed to manage all the biosolids for beneficial reuse. During 2018, only 1 percent biosolids which were unsuitable for land application was co-disposed in municipal landfills (Figure 1). The unsuitable materials generally contain gravel, wood debris, and dust from sweeping of roads at biosolids drying sites. There are four main outlets for the beneficial utilization of District biosolids: (1) Farmland Application; (2) Urban Utilization of air-dried and composted biosolids; (3) Hanover Park Utilization Program; and (4). Landfill Final Cover.

Farmland Application Program. In this program, dewatered Class B biosolids are utilized as a fertilizer for the production of row crops in nearby counties in Illinois. Under this program, land application companies are contracted by the District through the competitive bidding process to enroll farmers in the program and to haul and apply 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 land-application contractor performs the biosolids hauling and application. The District provides oversight of the program to ensure that the land application of biosolids is conducted in accordance with regulations and permits and that the contractor's operations are consistent with the District's goal to improve the public's awareness of the benefits of the farmland application program to the farming community. This District oversight is done by: (1) requiring the land application contractor to comply with hauling and field operation specifications and execute a Public Relations Program, and (2) District staff who conduct additional activities to complement the activities of the contractors. The District continually evaluates and modifies the program to improve public awareness, benefits, and long-term sustainability of the program. In 2018, a total of 41,445 dry tons (DT) of dewatered Class B biosolids from the Stickney and Calumet WPRs and 993 DT of liquid biosolids from the Hanover Park WRP was applied to farmland as fertilizer (Figure 1).

Urban Utilization Program. The EQ air-dried and composted biosolids are applied to public lands (e.g., parks, golf courses, and athletic fields) and residential properties within the District's service 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 in planter beds. This program has been traditionally done under a Controlled Solids Distribution (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 classification 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 2018, 8,697 DT of air-dried biosolids and 7,478 DT of compost from the Stickney and Calumet WRPs were used in the metropolitan Chicago area (Figure 1).

FIGURE 1: OUTLETS OF BIOSOLIDS UTILIZATION AT THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO IN 2018



Hanover Park Utilization Program. The liquid biosolids 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 Hanover Park WRP. The supernatant from the settling of the biosolids, and the settled biosolids are injected separately. In 2018, a total of 993 DT biosolids in liquid biosolids and supernatant was applied to the farm at Hanover Park WRP (part of biosolids applied to agricultural land in Figure 1).

Landfill Final Cover. A total of 1,727 DT of biosolids generated at the Calumet WRP was applied as final cover at the Land and Lakes Landfill, Dolton, Illinois.

Landfill Co-Disposal. In 2018, a total of 490 DT of unsuitable biosolids generated at the Stickney WRP and 167 DT at the Calumet WRP were co-disposed with municipal solid wastes at Waste Management's Laraway Landfill site, Joliet, Illinois.

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 2018 are summarized in Table 1. All utilization of biosolids in 2018 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.

TABLE 1: PRODUCTION AND UTILIZATION OF SLUDGE AND BIOSOLIDS DURING 2018[1]

Production and Utilization	Water Reclamation Plants						
	Stickney	Calumet	O'Brien	Egan	Hanover Park	Kirie	Lemont
	Dry Tons (Metric Tons)						
Production[2]	102,097 (92,602)	23,065 (20,920)	39,235 (35,586)	7,043 (6,388)	851 (772)	7,403 (6,714)	334 (303)
Utilization	87,578 (79,433)	11,762 (9,102)	-	-	993 (900)	-	-
Agricultural land	33,986 (30,825)	7,459 (6,765)	-	-	993 (900)		
Urban land (total)	13,766 (12,486)	2,409 (2,185)	-	-	-	-	-
air-dried	6,339 (5,749)	2,358 (2,139)	-	-	-	-	-
composted	7,427 (6,736)	51 (46)					
Landfill (total)	490 (444)	1,894 (1,718)	-	-	-	-	-
Co-disposal	490 (444)	167 (151)	-	-	-	-	-
Daily cover	-	-	-	-	-	-	-
Final cover	-	1,727 (1,566)	-	-	-	-	-
To Other WRPs[3]	-	-	39,235 (35,586)	7,233[4] (6,560)	-	7,403 (6,714)	334 (303)
Pelletizing facility[5]	39,336 (35,678)	-	-	-	-	-	-

[1]Differences between biosolids production and total use or disposal in 2018 were due to a net withdrawal or storage in lagoons or drying areas, and processing of biosolids imported from other WRPs.

[2]Stickney, Calumet, and Hanover Park WRPs produced biosolids while O'Brien, Kirie, Egan, and Lemont produced undigested or partially digested sludge. Figures represent total solids generated at the end of each plant's processing train plus those imported from other plants for further processing.

[3]For further processing.

[4]Includes centrate and solids pumped to the O'Brien WRP for further processing, and centrifuge cake trucked to CALSMA for farmland application or for composting. The discrepancy between biosolids production and utilization was due to the different procedures used to track the quantities of biosolids production and utilization.

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

This report documents the production and utilization of the District's biosolids in 2018 records required under Part 503 at Section 503.18.

The District has four Illinois Environmental Protection Agency (IEPA) permitted biosolids management programs that must comply with Part 503 requirements. These programs are:

1. Fulton County Dedicated Biosolids Application to Land (IEPA Permit No. 2018-SC-63477).

2. Hanover Park Fischer Farm Biosolids Application to Land (IEPA Permit No. 2016-61315).

3. Controlled Solids Distribution Program (Biosolids Application to Land in the Chicago Area under IEPA Permit No. 2015-SC-59620).

4. Farmland Application Program (Biosolids Application to Farmland from the Calumet, Stickney, and the John E. Egan (Egan) WRPs under IEPA Permit No. 2018-SC-63703).

In addition, the District has two IEPA permits for composting biosolids at the Calumet East Solids Management Area (Permit No. 2017-017-DE/OP) and the Harlem Avenue Solids Management Area (Permit No. 2017-017-DE/OP). The biosolids composts are distributed for use as a soil amendment under Illinois Department of Agriculture registration (Registration No. License No. 100181).

LEMONT WATER RECLAMATION PLANT

The Lemont WRP, located in Lemont, Illinois, has a design average flow of 2.3 million gallons per day (MGD). The annual average treated flow in 2018 was 2.49 MGD. Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatments. In 2018, the Lemont WRP produced 334 dry tons (DT) of solids (Table 1), which were gravity concentrated and transported to the Stickney WRP for further processing.

No final biosolids product is generated at this WRP.

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 2018 was 47.02 MGD. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatments. In 2018, the Kirie WRP produced 7,403 DT of solids (Table 1), which were sent via force main to the Egan WRP, then to the O'Brien WRP, and finally to the Stickney WRP for further processing.

No final biosolids product is generated at this WRP.

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 2018 was 247 MGD. Wastewater reclamation processes at the O'Brien WRP include primary (primary settling) and secondary (activated sludge process) treatments. In 2018, the O'Brien WRP produced 39,235 DT of solids (Table 1), which were sent via pipeline to the Stickney WRP for further treatment. This total includes solids generated from water reclamation at the O'Brien WRP and solids conveyed from the Egan WRP, including the Kirie WRP, to the O'Brien WRP via sewer, which is described in the next section.

No final biosolids product is generated at this WRP.

JOHN E. EGAN WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Egan WRP, located in Schaumburg, Illinois, has a design average flow of 30 MGD. The annual average treated flow in 2018 was 24.7 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. During some winters or when the centrifuges are not operating, liquid digested solids are sent via sewers to the O'Brien WRP. Centrifuge centrate is also sent via sewers to the O'Brien WRP.

In 2018, the total biosolids production at the Egan WRP was 7,043 DT (Table 1). Of that total, 2,407 DT (2,214 DT of liquid biosolids/sludge and 193 DT of centrifuge centrate) were pumped to the O'Brien WRP and then to the Stickney WRP for digestion and further processing. A total of 4,799 DT of biosolids (centrifuge cake) was shipped to the CALSMA site for composting and temporary storage for farmland utilization. Also, 27 DT were recycled to the Egan WRP for use in the ANITA™ MOX ammonia removal process.

Solids were not digested at the Egan WRP for some periods during the year, because at least one digester was temporarily out of service. No further reporting is required because these undigested solids generated at the Egan WRP were sent to the Stickney WRP via the O'Brien WRP for digestion and further processing.

Summary of Biosolids Use and Disposal at Landfills

In 2018, no Egan biosolids were co-disposed in landfill.

Biosolids Conveyed to Other Water Reclamation Plants for Further Processing

In 2018, 2,214 DT of biosolids in liquid biosolids/sludge and 193 DT biosolids/sludge in centrifuge centrate were pumped to the O'Brien WRP for further processing. In addition, a total of 4,799 DT of centrifuge cake biosolids were trucked from the Egan WRP to the CALSMA site for farmland application or additional processing.

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 2018 was 9.50 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 2018, the total biosolids production at this WRP was 851 DT (Table 1).

Land Application of Class B Liquid Biosolids

In 2018, the Hanover Park WRP land-applied a total of 993 DT of biosolids at the on-site Fischer Farm under IEPA Permit No. 2016-61315. The quantity of land-applied biosolids (993 DT) was higher than the quantity produced (851 DT) in 2018; hence 142 additional DT were utilized from storage lagoons during the year. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is four times per year.

All Hanover Park WRP lagoon biosolids land-applied in 2018 met the pollutant concentration limits in Table 3 of Section 503.13 for all metals (Table 2). Except for the period of June to September, the biosolids also met the anaerobic digestion time and temperature requirements of the Class B pathogen standards of Section 503.32(b)(3) (Table 3), and the vector attraction reduction requirements of Section 503.33(b)(1) (Table 4). During the period of June to September, lower doses of polymer were used for thickening the activated sludge. This resulted in lower total solids content of liquid sludge fed to the digesters. The lower total solids content caused faster movement of sludge through the digester system, and hence a shorter retention time, as reflected in Table 3. This incidence was corrected as of October 2018. Management practices at this land-application site complied with Section 503.14.

TABLE 2: CONCENTRATIONS OF NITROGEN AND METALS IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISHER FARM SITE IN 2018

Sample Date	TKN	NO_2+NO_3-N	TN	NH_3-N	As[1]	Cd[1]	Cu	Hg	Mo	Ni	Pb[1]	Se	Zn
	Supernatant												
	mg/L												
05/01/18	710	0.40	710	646	<0.050	<0.0050	0.227	<0.0005	0.012	0.030	<0.030	0.050	0.328
07/06/18	470	ND[2]	470	402	0.010	<0.0010	0.051	<0.0005	0.005	0.023	<0.001	0.005	0.068
07/17/18	190	4.9	195	160	0.006	<0.0010	0.014	<0.0005	0.004	0.018	<0.001	0.002	0.018
08/01/18	302	ND	302	292	0.006	<0.0010	0.039	<0.0005	0.003	0.018	<0.001	0.004	0.057
08/27/18	381	ND	381	356	0.007	<0.0010	0.038	<0.0005	0.004	0.019	<0.001	0.005	0.055
	Liquid Biosolids												
	mg/kg												
09/08/18	73,336	78	73,414	28,166	<5	2	813	0.65	11	32	22	<5	855
09/15/18	71,539	120	71,659	26,472	<5	2	854	0.62	14	32	23	<5	917
Minimum[3]	71,539	78	71,659	26,472	<5	2	813	0.62	11	32	22	<5	855
Mean	72,437	99	72,536	27,319	<5	2	833	0.64	13	32	22	<5	886
Maximum	73,336	120	73,414	28,166	<5	2	854	0.65	14	32	23	<5	917
503 Limit	NL[4]	NL	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Sample analyzed by older instrument until June 2018; new instrument in use from July 2018.
[2]Not determined.
[3]Minimum, mean, and maximum values provided for the liquid biosolids only.
[4]No limit.

TABLE 3: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2018

Month	Average Temperature	Average Detention Retention Time	Minimum Detention Time Required by 503.32(b)(3)[1]	Meets Part 503 Class B Requirements
	-------- °F --------	------- days------	------- days------	
January	95.0	20.4	15.0	Yes
February	95.0	22.2	15.0	Yes
March	95.0	23.3	15.0	Yes
April	95.0	20.5	15.0	Yes
May	95.0	17.5	15.0	Yes
June	95.0	13.9	15.0	No[2]
July	95.0	13.4	15.0	No
August	95.0	11.1	15.0	No
September	95.0	11.9	15.0	No
October	95.0	29.0	15.0	Yes
November	95.0	24.5	15.0	Yes
December	95.0	16.5	15.0	Yes

[1]For anaerobic digestion at average temperature achieved.
[2]Due to lower concentrations of solids in liquid biosolids causing faster movement of sludge in digester.

TABLE 4: VOLATILE SOLIDS REDUCTION IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2018

Month	Digester Feed	Digester Draw	Lagoon Biosolids[1]	Volatile Solids Reduction[2]
	---------- % Total Volatile Solids ----------			------- % --------
May	84.3	74.1	63.6	67.5
July	84.9	74.3	57.1	76.4
August	84.9	75.6	51.9	80.8
September	85.0	73.7	50.4	82.1
September	84.5	73.7	69.0	59.2

[1]Biosolids applied as supernatant 5/5 through 9/1/2018; liquid biosolids applied 9/8 through 9/15/2018.
[2]Volatile solids reduction computed using total volatile solids data for digester feed and lagoon biosolids.

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 2018 was 247 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. 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.

2. Placed in lagoons for dewatering and transported to paved cells for air-drying, then applied to farmland as semi-dried Class B biosolids by a private contractor or used as daily landfill cover.

3. During 2018, centrifuge cake from the Egan WRP was composted with woodchips and cured at the CALSMA. Class A pathogen reduction was achieved using the open windrow composting process through which all the requirements of Section 503.32(a)(7) were met. The temperature of the compost piles in 2018 was maintained at $\geq 55^0$C for at least 15 days and the piles were turned five times during this period (Table 5). Vector attraction reduction was achieved through the same open windrow composting process and met the established standards of Section 503.33(b)(5) by achieving the temperature and time requirements ($\geq 45^0$C for at least 14 days) in the open windrows (Table 5).

In 2018, a total of 23,065 DT of biosolids was produced at the Calumet WRP (Table 1). The total quantity of 11,762 DT of biosolids utilized (11,595 DT land-applied and 167 DT disposed of at landfills), which includes 3,426 DT of the Egan WRP biosolids, was less than the total 2018 production for the Calumet WRP. Hence, a total of 11,303 DT was stored in lagoons or on drying cells for further processing and/or later use.

Summary of Biosolids Use and Disposal at Landfills

In 2018, a total of 1,727 DT of biosolids generated at the Calumet WRP was applied as final cover at the Land and Lakes Landfill, Dolton, Illinois. A total of 167 DT of unsuitable solids, which includes solids from the Egan WRP, was co-disposed with municipal solid wastes at the Waste Management's Laraway Landfill site, Joliet, Illinois. No biosolids were used as daily cover.

Application of Class B Biosolids to Farmland

In 2018, the Calumet WRP land-applied 7,459 DT of semi-dried Class B biosolids to farmland under IEPA Permit No. 2018-SC-63703 through contracts with Synagro Midwest, Inc.

TABLE 5: SUMMARY OF TEMPERATURE READINGS AND TURNING DATES OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED BIOSOLIDS AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2018

Pile ID Number[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature, ^{0}C (range)
18-1	5/07 - 6/06	5/11	5/15	5/19	5/29	6/02	62 - 73
18-2	5/07 - 6/06	5/11	5/15	5/19	5/29	6/02	60 - 75
18-3	5/08 - 6/06	5/11	5/15	5/19	5/29	6/02	55 - 75
18-4	5/09 - 6/06	5/11	5/15	5/19	5/29	6/02	59 - 72
18-5	5/24 - 7/05	5/29	6/02	6/06	6/14	6/21	60 - 74
18-8	6/12 - 7/15	6/14	6/21	6/30	7/06	7/11	61 - 73
18-9	6/12 - 7/15	6/14	6/21	6/30	7/06	7/11	62 - 77

[1]All piles reported are certified to fulfill the temperature and turning-time requirements.
[2]Dates are month/day in 2018.

(Contract No. 18-692-11) and Stewart Environmental, Inc. (Contract No. 14-690-11). Of this total amount, approximately 3,426 DT of centrifuge cake biosolids were transported from the Egan WRP to the CALSMA sites and utilized for farmland application. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

All Calumet WRP semi-dried Class B biosolids land-applied in 2018 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 6), the vector attraction reduction 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 7). The biosolids nitrogen concentrations (Table 6) were used to compute the agronomic rates for farmland application.

Application of Exceptional Quality Biosolids to Urban Land

In 2018, a total of 2,409 DT of air-dried and composted EQ biosolids generated at the Calumet WRP was applied to urban land and District property for various uses such as for maintenance of golf courses and recreation fields, landscaping, and for the construction of new recreation fields. The sites and method of utilization of these biosolids are listed in Table 8.

Air-Dried Exceptional Quality Biosolids. In 2018, a total of 2,358 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 2018 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 9), the vector attraction reduction requirements of Section 503.33(b)(1) (Table 9), and the Class A pathogen limits of Section 503.32(a)(5) (Tables 10 and 11). Enteric viruses and helminth ova were analyzed before biosolids were dried (Table 10). The fecal coliform analysis (Table 11) was 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 2018, a total of 51 DT of composted EQ biosolids generated at the Calumet WRP during 2017 was applied to urban land. All composted biosolids land-applied in 2018 met composting temperature and time requirements in 2017, and they met the pollutant concentration limits in Table 3 of Section 503.13 (Table 12). The fecal coliform analysis was performed after the composted EQ biosolids were cured and prior to utilization on urban land (Table 13). In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is once per year

TABLE 6: CONCENTRATIONS OF NITROGEN AND METALS IN SEMI-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2018

Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
07/06/18	49,578	11,528	14	3	394	0.58	10	30	66	<5	1,051
07/06/18	20,998	2,875	7	7	584	1.2	9	70	29	<5	643
07/12/18	20,373	2,793	14	4	398	0.47	10	29	67	<5	1,097
08/02/18	33,532	5,372	16	4	381	0.95	12	31	65	<5	1,138
09/05/18	26,657	2,980	14	3	413	0.41	11	29	66	<5	1,078
09/05/18	25,171	2,248	16	3	424	0.50	11	30	62	<5	1,168
10/03/18	22,553	2,391	15	4	462	0.34	15	36	81	<5	1,387
10/03/18	23,295	2,009	18	4	476	0.32	14	37	83	<5	1,333
10/03/18	33,498	2,018	16	4	479	0.32	15	38	83	<5	1,456
10/03/18	23,640	460	20	4	476	<0.25	15	38	87	<5	1,433
10/03/18	25,996	5,113	15	3	423	0.34	15	35	82	<5	1,322
Minimum	20,373	460	7	3	381	0.32	9	29	29	<5	643
Mean[1]	27,754	3,617	15	4	447	0.54	13	37	70	<5	1,191
Maximum	49,578	11,528	20	7	584	1.2	15	70	87	<5	1,456
503 Limit	NL[2]	NL	41	39	1,500	17	75	420	300	100	2,800

[1]In calculating each mean, any value less than the detection limit was considered the detection limit.
[2]No limit.

TABLE 7: DIGESTER[1] TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2018

Month	Average Temperature	Average Detention Time	Minimum Detention Time Required by 503.32(b)(3)[2]	Meets Part 503 Class B Requirements
	---- °F ----	----- days -----	----- days -----	
January	96.1	44.7	15.0	yes
February	96.2	53.7	15.0	yes
March	96.0	58.5	15.0	yes
April	96.6	57.7	15.0	yes
May	96.2	40.4	15.0	yes
June	94.7	42.6	15.4	yes
July	93.6	37.7	17.3	yes
August	93.9	40.9	16.8	yes
September	94.0	36.0	16.6	yes
October	93.9	28.6	16.9	yes
November	95.7	29.2	15.0	yes
December	97.4	36.9	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 8: SITES THAT UTILIZED CALUMET WATER RECLAMATION PLANT EXCEPTIONAL QUALITY AIR-DRIED AND COMPOSTED BIOSOLIDS IN 2018

User	Use
Composted Biosolids	Topdressing
North Shore Country Club, Glenview	Topdressing
Arthur Dixon Elementary School, Chicago	Topdressing
Salem Baptist Church, Chicago	Topdressing
City Colleges of Chicago, Chicago	Topdressing
Air Dried Biosolids	
North Shore Country Club, Glenview	Topdressing
Reavis High School, Burbank	Topdressing
Wilmette Golf Course, Wilmette	Topdressing
Tinley Park Park District, Tinley Park	Topdressing
Wilmette Golf Course, Wilmette	Topdressing
West Leyden High School, Northlake	Topdressing
Bremen Township, Markham	Topdressing
Chicago Park District, Chicago[1]	Topdressing

[1]Douglas, Marquette, Washington, and Calumet Parks.

TABLE 9: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2018

Sample 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											
06/05/18	39.7	70.5	24,476	1,002	727	12	3	417	1.1	14	30	84	<5	1,307
07/12/18	38.0	72.6	18,252	677	97	14	4	397	0.89	10	30	72	<5	1,262
07/17/18	31.4	79.5	13,514	1,060	36	11	4	340	0.75	8	29	67	<5	1,056
08/02/18	40.2	68.8	25,625	24	1,526	13	4	409	0.84	10	31	68	<5	1,110
08/28/18	36.5	73.3	27,588	9	3,933	12	3	416	0.46	11	29	68	<5	1,101
09/12/18	39.5	69.6	24,208	915	804	13	3	403	0.39	11	29	68	<5	1,076
09/17/18	37.6	72.1	23,134	1,371	194	15	3	423	0.42	12	31	70	<5	1,126
09/24/18	40.2	68.8	23,262	1,128	847	12	3	419	0.25	10	29	69	<5	1,115
Minimum	31.4	68.8	13,514	9	36	11	3	340	0.25	8	29	67	<5	1,056
Mean[3]	37.9	71.9	22,507	773	1,021	13	3	403	0.64	11	30	71	<5	1,144
Maximum	40.2	72.1	27,588	1,371	3,933	15	4	423	1.1	14	31	84	<5	1,307
503 Limit	NL[4]	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]Total volatile solids for digester feed during 2017 were used to calculate TVS reduction.
[3]In calculating each mean, any value less than the detection limit was considered the detection limit.
[4]No limit.

TABLE 10: PATHOGEN ANALYSIS OF BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2018

Sample Date	Lagoon No.	Enteric Virus	Helminth Ova
		-- PFU[1]/4g --	-- Viable Ova/4g --
08/15/17	8	<0.8000	<0.0800
10/18/17	8	<0.8000	<0.0800
11/21/17	8	<0.8000	<0.0800
03/21/18	8	<0.8000	<0.0800
05/02/18	8	<0.8000	<0.0800
05/24/18	17	<0.8000	<0.0800

[1]Plaque-forming unit.

TABLE 11: FECAL COLIFORM ANALYSIS OF EXCEPTIONAL QUALITY BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2018

Sample Date	Lagoon No.	Total Solids	Fecal Coliform
		--- % ---	--- MPN[1]/dry g ---
05/02/18	8	56.5	170
05/09/18	8	63.5	45
05/09/18	8	59.7	170
05/30/18	8	68.4	85
05/30/18	8	64.8	44
06/06/18	8	74.2	5
06/18/18	17	76.1	311
06/18/18	8	68.6	3
07/02/18	8	76.0	<3
07/18/18	8	71.8	44
07/31/18	17	78.6	652
07/31/18	17	73.6	403
08/14/18	17	70.3	411
08/28/18	17	79.7	10

[1]Most probable number.

TABLE 12: CONCENTRATIONS OF NITROGEN AND METALS IN COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2017AND APPLIED TO URBAN LAND IN 2018

Sample Date[1]	TKN	NO_3^-+NO_2^--N	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/kg											
07/09/18	19,363	90	14	7	3	262	0.35	2	22	61	<5	528
10/04/18	18,144	343	51	6	5	452	0.44	6	45	56	<5	691
Minimum	18,144	90	14	6	3	262	0.35	2	22	56	<5	528
Mean[2]	18,754	216	33	7	4	357	0.39	4	34	58	<5	610
Maximum	19,363	343	51	7	5	452	0.44	6	45	61	<5	691
503 Limit	NL[3]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Materials produced in 2017 and tested in 2018 prior to utilization.
[2]In calculating each mean, any value less than the detection limit was considered the detection limit.
[3]No limit.

TABLE 13: FECAL COLIFORM ANALYSIS OF CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2017 AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2018

Sample Date[1]	Total Solids	Fecal Coliform
	-- % --	--MPN[2]/dry g--
03/28/18	41.1	920
05/02/18	46.1	130
06/05/18	45.9	68

[1]Materials produced in 2017 and tested in 2018 prior to utilization.
[2]Most probable number.

Site-Specific Process to Further Reduce Pathogens

For the Calumet and Stickney WRPs, the USEPA Region 5 designated, on the 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 current renewable certification of the PFRP designation is valid from August 1, 2017, through July 31, 2022, and requires 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**.**

All of the Calumet WRP air-dried EQ biosolids generated or utilized in 2018 were not 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 2018 were tested for pathogen compliance in August, October, and November 2017, and March and May 2018 (Tables 10 and 11) according to Section 503.32(a)(5).

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 MGD. The annual average treated flow in 2018 was 775 MGD. Wastewater reclamation processes include primary (Imhoff and primary settling) and secondary (activated sludge process) treatments. All solids produced at this WRP and those pipelined from the O'Brien, Egan, Kirie, and Lemont WRPs are anaerobically digested. Stickney 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. Application to farmland as semi-dried Class B biosolids.
    c. Use at local municipal solid waste landfills as final landfill cover.

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.

4. Dewatered by centrifuging to approximately 25 percent solids content and conveyed to MBM for further processing into pellets under Contract 98-RFP-10.

5. Dewatered by centrifuging to approximately 25 percent solids content and transported to the Harlem Area Solids Management Area for co-composting with woodchips and yard waste prior to application to urban land as EQ biosolids compost. 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 2018 was maintained at $\geq 55^0$C for at least 15 days, and the piles were turned five times during this period (Table 14). Vector attraction reduction 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 ($\geq 45^0$C for at least 14 days) in the open windrows (Table 14).

6. 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.

TABLE 14: SUMMARY OF TEMPERATURE READINGS AND TURNING DATES OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED BIOSOLIDS AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2018

Pile ID Number[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature ^{0}C (Range)
18-1	04/24-05/17	04/26	05/01	05/05	05/08	05/14	62 - 78
18-2	05/15-06/05	05/18	05/22	05/25	05/29	06/01	68 - 79
18-3	05/08-06/01	05/14	05/18	05/22	05/25	05/29	62 - 76
18-4	05/14-06/02	05/18	05/22	05/25	05/29	06/01	63 - 74
18-5	05/13-06/05	05/18	05/22	05/25	05/29	06/01	61 - 80
18-6	05/30-06/19	06/01	06/05	06/08	06/11	06/14	58 - 76
18-7	05/19-06/12	05/22	05/25	05/29	06/01	06/05	60 - 76
18-8	05/23-06/12	05/25	05/29	06/01	06/05	06/08	64 - 77
18-9	05/29-06/18	06/01	06/05	06/08	06/11	06/14	65 - 78
18-10	06/12-07/02	06/14	06/18	06/21	06/25	06/28	61 - 80
18-11	06/05-06/27	06/08	06/11	06/14	06/18	06/21	65 - 80
18-12	06/06-06/27	06/08	06/11	06/14	06/18	06/21	59 - 78
18-13	06/22-07/12	06/25	06/28	07/02	07/05	07/09	56 - 78
18-14	06/11-07/02	06/11	06/14	06/18	06/21	06/25	61 - 77
18-15	06/14-07/06	06/14	06/18	06/21	06/25	06/28	57 - 74
18-16	06/16-07/06	06/18	06/21	06/25	06/28	07/02	58 - 69
18-17	06/19-07/10	06/21	06/25	06/28	07/02	07/05	59 - 74
18-18	07/03-07/22	07/05	07/09	07/12	07/15	07/19	61 - 73
18-19	07/03-07/22	07/05	07/09	07/12	07/15	07/19	63 - 74
18-20	07/05-07/25	07/09	07/12	07/15	07/19	07/22	63 - 77
18-21	07/15-08/07	07/15	07/19	07/22	07/26	07/30	62 - 79
18-22	07/15-08/07	07/15	07/19	07/22	07/26	07/30	63 - 79
18-23	07/18-08/10	07/19	07/23	07/26	07/30	08/02	57 - 75
18-24	07/23-08/12	07/26	07/30	08/02	08/06	08/09	56 - 73
18-25	07/26-08/17	07/30	08/02	08/06	08/09	08/13	57 - 80
18-26	08/03-09/07	08/04	08/06	08/13	08/16	08/20	66 - 77
18-27	08/13-09/04	08/16	08/20	08/23	08/27	08/30	60 - 78
18-28	08/17-09/07	08/20	08/23	08/27	08/30	09/04	58 - 79
18-29	08/20-09/14	08/23	08/27	08/30	09/04	09/10	55 - 76
18-30	08/23-09/18	08/27	08/30	09/04	09/10	09/14	57 - 74
18-31	08/27-09/21	08/30	09/04	09/10	09/14	09/17	59 - 72
18-32	09/07-10/06	09/10	09/14	09/17	09/20	09/24	57 - 72
18-33	09/14-10/06	09/17	09/20	09/24	09/27	10/01	59 - 70
18-34	09/14-10/06	09/17	09/20	09/24	09/27	10/01	70 - 80

TABLE 14 (Continued): SUMMARY OF TEMPERATURE READINGS AND TURNING DATES OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED BIOSOLIDS AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2018

Pile ID Number[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature °C (Range)
18-35	09/19-10/11	09/24	09/27	10/01	10/04	10/08	66 - 77
18-36	09/26-10/18	10/01	10/04	10/08	10/11	10/15	64 - 76
18-37	09/26-10/18	10/01	10/04	10/08	10/11	10/15	59 - 77
18-38	09/29-10/18	10/01	10/04	10/08	10/11	10/15	57 - 78
18-39	09/29-10/18	10/01	10/04	10/08	10/11	10/15	57 - 74
18-40	10/11-11/02	10/15	10/18	10/22	10/25	10/29	64 - 76
18-41	10/13-11/02	10/15	10/18	10/22	10/25	10/29	63 - 79
18-42	10/10-11/02	10/15	10/18	10/22	10/25	10/29	59 - 77
18-43	10/23-11/10	10/25	10/29	11/01	11/05	11/08	59 - 78
18-44	10/24-11/13	10/29	11/01	11/05	11/08	11/11	62 - 74
18-45	10/26-11/13	10/29	11/01	11/05	11/08	11/11	67 - 78
18-46	10/29-11/16	11/01	11/05	11/08	11/11	11/14	62 - 74
18-47	10/31-12/06	11/05	11/08	11/14	11/20	11/23	55 - 78
18-48	10/31-11/27	11/05	11/08	11/11	11/14	11/20	58 - 73
18-49	10/31-11/27	11/05	11/08	11/11	11/14	11/20	55 - 76
18-50	10/31-11/27	11/05	11/08	11/11	11/14	11/20	62 - 79
18-51	10/31-11/27	11/05	11/08	11/11	11/14	11/20	68 - 83
18-52	11/05-12/06	11/09	11/11	11/14	11/20	11/23	58 - 75
18-53	11/03-12/06	11/08	11/14	11/20	11/23	11/29	61 - 79
18-54	11/03-12/06	11/08	11/14	11/20	11/23	11/29	56 - 76

[1]All piles reported are certified to fulfill the temperature and turning time requirements.
[2]Dates are month/day in 2018.

b. Use at local municipal solid waste landfills as final landfill cover.

7. Dewatered by centrifuging to approximately 25 percent solids content and heat-dried to produce biosolids pellets. The biosolids pellets were marketed to users by MBM. The analysis of these biosolids is presented in Table 15.

In 2018, the Stickney WRP produced a total of 102,097 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 O'Brien, Egan, Kirie, and Lemont WRPs for further processing. The quantity of biosolids used and disposed of (87,578 DT) was lower than the total 2018 production (102,097 DT) for the Stickney WRP. Hence, 14,519 DT were stored in lagoons and/or on drying cells for further processing or later use.

Summary of Biosolids Use and Disposal at Landfills

In 2018, a total of 490 DT of biosolids generated at the Stickney WRP was co-disposed with municipal solid wastes at the Laraway Landfill, Joliet, Illinois. No biosolids were used as final cover.

Application of Class B Biosolids to Farmland

In 2018, a total of 33,986 DT of centrifuge cake and semi-dried biosolids generated at the Stickney WRP was applied to agricultural land under IEPA Permit No. 2018-SC-63703. 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 centrifuge cake and semi-dried biosolids land applied in 2018 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 16), the vector attraction reduction 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 17). The biosolids nitrogen concentrations (Table 16) were used to compute the agronomic rates for farmland application.

Application of Exceptional Quality Biosolids to Urban Land

In 2018, a total of 13,766 DT of Stickney WRP air-dried EQ (6,339 DT) and composted EQ (7,427 DT) biosolids was 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 18.

Air-Dried Exceptional Quality Biosolids. In 2018, a total of 6,339 DT of Stickney WRP air-dried, EQ biosolids was applied to urban land. All Stickney air-dried biosolids applied to urban land in 2018 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 19) and the vector attraction reduction requirements of Section 503.33(b)(1) (Table 19).

TABLE 15: CONCENTRATINS OF NITROGEN AND METALS IN HEAT-DRIED BIOSOLIDS PELLETS GENERATED BY METROPOLITAN BIOSOLIDS MANAGEMENT AT THE STICKNEY WATER RECLAMATION PLANT IN 2018

Date	TKN	NO2+NO3	NH3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	----------	----------	----------	----------	mg/dry kg	----------	----------	----------	----------	----------	----------	----------
01/16/18	50,000	400	3,100	6.6	3.2	432	0.65	16	41	64	5	729
02/13/18	51,600	100	1,000	5.4	0.5	17	0.59	1	40	7	5	706
03/13/18	49,300	100	1,400	10.8	2.7	390	0.39	13	40	66	5	706
04/10/18	51,500	200	2,700	9.3	2.5	380	0.50	14	39	65	5	733
05/08/18	52,200	100	3,000	10.7	2.7	431	0.70	15	37	65	6	726
06/12/18	43,200	100	3,000	15.8	2.4	282	0.93	12	33	76	11	647
07/10/18	39,500	100	2,600	8.5	1.6	257	0.69	9	30	72	5	503
08/07/18	40,400	100	1,700	11.4	2.9	442	0.69	14	43	104	5	852
09/13/18	40,000	300	1,200	9.6	2.8	399	0.68	12	39	103	4	801
10/09/18	41,000	100	2,400	10.1	2.8	445	0.66	14	43	105	5	846
11/13/18	44,500	100	2,800	11.2	3.1	442	0.59	15	47	104	6	863
12/13/18	49,400	100	2,900	12.9	2.5	416	0.57	14	43	90	5	790
Minimum	39,500	100	1,000	5.4	0.5	17	0.39	1	30	7	4	503
Mean	46,050	150	2,316	10.2	2.5	361	0.64	13	39	77	6	742
Maximum	52,200	400	3,100	15.8	3.2	445	0.93	16	47	105	11	863
503 Limit	NL[1]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]NL = No limit.

TABLE 16: CONCENTRATIONS OF NITROGEN AND METALS IN CENTRIFUGE CAKE AND SEMI-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2018

Sample Date	TKN	NH_3-N	As[1]	Cd	Cu	Hg	Mo	Ni	Pb	Se[1]	Zn
	---------- mg/dry kg ----------										
04/26/18	34,234	10,806	10	4	443	0.58	13	46	128	<5	943
04/26/18	31,122	8,689	10	4	385	0.38	14	43	96	<5	817
05/08/18	30,746	7,068	<10	5	487	0.68	13	47	96	<10	925
05/08/18	42,402	13,197	<10	4	399	0.37	15	46	102	<10	869
05/15/18	50,074	14,823	<10	4	406	ND[2]	14	45	102	<10	853
05/15/18	25,268	4,836	<10	5	474	ND	13	48	99	<10	922
05/15/18	43,171	14,225	<10	4	460	ND	13	44	115	<10	941
05/15/18	30,760	4,957	<10	5	482	0.41	12	48	97	<10	921
05/15/18	38,690	11,265	<10	4	427	0.52	14	43	103	<10	862
05/15/18	50,167	12,629	<10	4	399	0.70	14	44	92	<10	820
05/15/18	37,976	9,090	<10	4	435	0.60	14	43	93	<10	856
05/22/18	39,676	15,021	<10	4	433	0.61	14	43	108	<10	896
05/22/18	25,656	6,772	<10	4	450	0.80	13	45	87	<10	861
06/06/18	51,111	14,946	<10	4	387	0.57	15	45	95	<10	819
06/06/18	35,742	9,128	<10	4	465	0.77	15	47	115	<10	956
06/06/18	41,814	9,727	10	4	434	0.29	15	45	96	<10	866
06/13/18	37,656	10,455	<10	3	395	0.77	14	40	88	<10	789
06/13/18	36,721	9,336	10	4	382	0.75	14	42	93	<10	806
06/13/18	28,994	5,329	11	5	443	0.88	14	45	105	<10	922
07/10/18	44,246	11,703	13	4	436	0.56	13	47	90	<5	868
07/10/18	50,974	17,271	10	5	462	1.01	12	50	84	<5	889
07/12/18	42,242	10,415	10	4	431	0.56	13	44	84	<5	834
07/12/18	29,393	6,542	9	4	412	0.53	10	43	82	<5	798
07/12/18	41,172	9,903	8	5	438	0.64	11	45	77	<5	838
07/17/18	53,025	14,050	8	3	390	0.54	12	40	63	<5	735
07/17/18	34,804	10,282	9	4	403	0.76	11	41	88	<5	817
07/17/18	33,894	7,652	11	5	416	0.84	11	43	93	<5	858
07/24/18	35,916	7,882	11	4	423	0.94	11	45	84	<5	795
07/24/18	63,040	22,426	8	3	391	0.64	12	39	58	<5	721
08/01/18	65,178	21,923	8	4	397	0.71	11	39	65	<5	752
08/10/18	44,251	14,076	11	5	389	0.55	12	44	90	<5	795
08/10/18	40,835	10,510	12	4	415	0.53	12	44	81	<5	774
08/10/18	34,724	5,447	10	5	433	0.58	10	45	85	<5	822
09/04/18	55,934	19,974	12	3	389	0.36	11	36	61	<5	762
09/10/18	30,969	6,560	8	5	459	0.61	10	44	87	<5	832
09/10/18	35,470	8,542	8	3	442	0.34	12	43	79	<5	818
09/10/18	57,916	18,851	8	3	408	0.35	11	38	60	<5	748
10/02/18	30,961	7,569	9	5	493	0.57	13	52	102	<5	966
10/02/18	34,274	7,366	8	5	493	0.64	13	53	104	<5	974
10/09/18	48,628	12,731	15	4	479	1.2	15	50	118	<5	971

TABLE 16 (Continued): CONCENTRATIONS OF NITROGEN AND METALS IN CENTRIFUGE CAKE AND SEMI-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2018

Sample Date	TKN	NH_3-N	As[1]	Cd	Cu	Hg	Mo	Ni	Pb	Se[1]	Zn
	---------- mg/dry kg ----------										
10/09/18	54,552	19,434	12	3	452	0.54	15	45	94	<5	937
10/09/18	26,215	5,823	13	6	539	0.56	15	62	124	<5	1,087
11/06/18	35,641	6,685	10	5	461	1.0	12	48	99	<5	924
11/06/18	34,478	7,329	8	5	449	0.73	11	46	98	<5	875
11/06/18	45,769	14,736	7	3	378	0.37	10	38	97	<5	823
11/08/18	42,634	16,629	12	3	408	0.87	10	40	95	<5	822
11/08/18	51,566	13,364	12	3	422	0.78	12	38	83	<5	897
12/05/18	48,863	14,797	9	4	407	0.42	11	39	102	<5	869
12/13/18	44,108	12,874	12	3	385	ND[2]	10	37	95	<5	763
12/13/18	25,587	4,057	10	5	481	ND	11	47	100	<5	882
Minimum	25,268	4,057	7	3	378	0.29	10	36	58	<5	721
Mean[3]	40,585	11,194	10	4	431	0.63	12	44	93	<7	858
Maximum	65,178	22,426	15	6	539	1.2	15	62	128	<10	1,087
503 Limits	NL[4]	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Different reporting limits were due to analyses conducted at different District labs.

[2]Not determined.

[3]In calculating each mean, any value less than the detection limit was considered the detection limit.

[4]No limit.

TABLE 17: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2018

Month	Average Temperature	Average Retention Time	Minimum Detention Time Required by 503.32(b)(3)1	Meets Part 503 Class B Requirements
	---- °F ----	--- days ---	------ days ------	
January	97.5	21.7	15.0	yes
February	98.6	21.0	15.0	yes
March	96.8	22.5	15.0	yes
April	98.6	25.7	15.0	yes
May	98.0	19.1	15.0	yes
June	97.5	28.0	15.0	yes
July	99.2	36.7	15.0	yes
August	98.7	38.3	15.0	yes
September	98.2	38.7	15.0	yes
October	98.7	34.2	15.0	yes
November	98.2	36.5	15.0	yes
December	97.7	31.5	15.0	yes

[1]For anaerobic digestion at average temperature achieved.

TABLE 18: SITES THAT UTILIZED STICKNEY WATER RECLAMATION PLANT EXCEPTIONAL QUALITY AIR-DRIED AND COMPOSTED BIOSOLIDS IN 2018

User	Use
Composted Biosolids	
Bethany Retirement Community	Gardening
Corazon Community Services	Landscaping
Drexel Ingleside Group Community Garden	Landscaping
Envision Unlimited	Landscaping
I-Grow Chicago	Gardening
JLM Community Center	Landscaping
Neighbourspace	Landscaping
Chicago Park District	Landscaping and Trees
Chicago Urban Farms	Gardening
Children's Home & Aid	Landscaping
City Colleges of Chicago	Landscaping
City of Evanston	Landscaping and Trees
Coyote Run Golf Course	Landscaping and Trees
Illinois Tollway	Landscaping and Trees
MWRDGC	Landscaping
Olympia Fields Park District	Landscaping
Packers - 3W Enterprises (Midwest Sandbags)	Landscaping
Eric Wanger	Landscaping
Saje-Gro	Gardening
School District 201	Landscaping
Elmhurst College	Landscaping
Governors State University	Landscaping
Northeastern Illinois University	Landscaping
South Suburban College	Landscaping
Skokie Park District	Landscaping
United Human Service Center	Landscaping
Village of Franklin Park	Landscaping
Village of Hanover Park	Landscaping
Village of La Grange Park	Landscaping
Village of Oak Lawn	Landscaping
Village of Oak Park	Landscaping
Village of Richton Park	Landscaping
West Woodlawn Botanic Garden and Village Farm Initiative	Gardening

TABLE 18 (Continued): SITES THAT UTILIZED STICKNEY WATER RECLAMATION PLANT EXCEPTIONAL QUALITY AIR-DRIED AND COMPOSTED BIOSOLIDS IN 2018

User	Use
Air Dried Biosolids	
Chicago Park District, Chicago[1]	Topdressing
Gwendolyn Brooks Prep School, Chicago	Topdressing
Mid-Iron Club, Lemont	Topdressing
Illinois Tollway - Illinois Tollway	Topdressing
Tim Cooling & Sons Inc., Cherry Valley	Topdressing
Northbrook Park District, Northbrook	Topdressing
Park Ridge Recreation and Park District, Park Ridge	Topdressing
School District 201-U, Crete-Monee	Topdressing
Tinley Park Park District, Tinley Park	Topdressing
Village of Lincolnwood, Lincolnwood	Topdressing
Wilmette Golf Course, Wilmette	Topdressing

[1]Diversey Harbor, Garfield, Harrison, Horner, Humboldt, La Villita, Lincolnwood Centennial, Marquette, McKinley, Olympia, Oriole, Pottawatamie, Union, Warren, and Washington Parks.

TABLE 19: 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 2018

Date	TKN	NO_3^-+NO_2^--N	NH_3-N	TVS[1]	TVS[2] Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se[3]	Zn
	---------- mg/dry kg ----------			%	%	---------- mg/dry kg ----------								
05/15/18	14,084	180	2,137	29.5	64.9	<5	6	454	ND[4]	13	47	128	<10	985
05/22/18	9,833	371	2,098	34.5	55.9	11	6	427	0.71	13	43	124	<10	931
06/06/18	12,123	84	1,762	33.0	65.5	11	6	455	0.94	15	47	124	<10	975
07/10/18	13,539	706	53	35.6	61.3	12	5	471	0.74	11	48	114	<5	932
08/01/18	9,584	705	298	36.3	60.2	10	5	455	1.2	10	49	107	<5	897
09/04/18	9,481	881	663	36.8	57.3	9	4	451	0.66	11	45	91	<5	859
09/04/18	8,583	515	335	36.1	60.5	7	5	452	0.45	10	45	102	<5	863
10/02/18	18,058	1,781	789	38.8	53.5	9	5	503	0.53	13	54	105	<5	1,009
11/06/18	11,512	901	577	38.1	54.9	11	5	455	0.90	12	48	95	<5	908
12/05/18	8,894	983	144	39.6	51.8	11	5	502	0.64	13	51	97	<5	941
Minimum	8,583	84	53	29.5	51.8	7	4	427	0.45	10	43	91	<5	859
Mean[5]	11,569	711	885	35.8	58.6	10	5	462	0.76	12	48	109	<5	930
Maximum	18,058	1,781	2,137	39.6	65.5	12	6	503	1.2	15	54	128	<5	1,009
503 Limit	NL[6]	NL	NL	NL	38	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids as percentage of total solids.
[2]Total volatile solids for digester feed during 2017 were used to calculate TVS reductions, since biosolids were stored during the previous year for later use.
[3]Different reporting limits were due to analyses conducted at different District labs.
[4]Not determined.
[5]In calculating each mean, any value less than the detection limit was considered the detection limit.
[6]No limit.

All of the air-dried EQ biosolids met the Class A pathogen limits of Section 503.32(a)(5) (Tables 20 and 21). Enteric viruses and helminth ova were analyzed before biosolids were dried (Table 20). The fecal coliform analysis was performed after the biosolids were dried and prior to utilization on urban land (Table 21). 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.

All of the Stickney WRP air-dried EQ biosolids generated or utilized in 2018 were not 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 2018 were tested for pathogen compliance in August, October, and November 2017 and March and May 2018 (Tables 20 and 21) according to Section 503.32(a)(5).

Composted Exceptional Quality Biosolids. In 2018, a total of 7,427 DT of composted EQ biosolids generated at the Stickney WRP during 2017 was applied to urban land. The composted EQ biosolids applied to urban land in 2018 met composting temperature and time requirements in 2017, and they met the pollutant concentration limits in Table 3 of Section 503.13 (Table 22). The fecal coliform analysis was performed after the composted EQ biosolids were cured and prior to utilization on urban land (Table 23). In accordance with Table 1 of Section 503.16, the frequency of monitoring for the biosolids is six times per year.

TABLE 20: PATHOGEN ANALYSIS OF EXCEPTIONAL QUALITY AIR-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND DURING 2018

Sample Date	Lagoon No.	Enteric Virus	Helminth Ova
		---PFU[1]/4g---	---Viable Ova/4g---
09/07/17	26	<0.8000	<0.0800
10/10/17	26	<0.8000	<0.0800
11/28/17	26	<0.8000	<0.0800
03/20/18	23	<0.8000	<0.0800
04/17/18	23	<0.8000	<0.0800
05/15/18	23	<0.8000	<0.0800

[1]Plaque-forming unit.

TABLE 21: FECAL COLIFORM ANALYSIS OF EXCEPTIONAL QUALITY AIR-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2018

Sample Date	Lagoon No.	Total Solids	Fecal Coliform
		---- % ----	----- MPN[1]/g -----
05/03/18	27	81.2	4
05/17/18	26	84.0	23
06/13/18	26	65.3	<3
07/10/18	26	80.0	<3
07/25/18	23	85.6	12
07/25/18	23	86.3	58

[1]Most probable number.

TABLE 22: CONCENTRATIONS OF NITROGEN AND METALS IN COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2017 AND APPLIED TO URBAN LAND IN 2018

Date[1]	TKN	NO_3^-+NO_2^--N	NH_3-N	As[2]	Cd	Cu	Hg	Mo	Ni	Pb	Se[2]	Zn
	mg/dry kg											
04/06/18	13,022	506	360	7	2	305	0.68	6	30	82	<5	659
04/06/18	11,587	740	1,056	6	3	342	0.70	6	36	68	<5	645
05/15/18	11,121	178	58	10	2	232	ND[3]	6	25	62	<10	479
05/22/18	10,694	87	46	10	3	260	0.34	8	26	76	<10	548
06/06/18	14,308	120	35	<10	3	241	0.40	9	24	73	<10	500
07/03/18	ND	ND	ND	10	3	267	0.40	5	26	74	<5	531
07/24/18	18,122	33	40	5	3	272	0.55	5	28	70	<5	542
08/01/18	18,352	28	105	6	3	232	0.39	4	21	67	<5	453
10/02/18	18,473	684	1,067	9	2	206	<0.25	4	26	80	<5	466
11/15/18	17,630	1,278	517	11	2	193	0.34	3	24	73	<5	445
11/15/18	15,691	1478	1,236	10	3	238	0.39	4	27	84	<5	544
11/15/18	17,580	937	476	8	2	190	0.26	4	22	66	<5	484
11/15/18	14,758	1,608	70	10	2	201	0.29	5	24	77	<5	476
Minimum	14,053	2	3	5	2	184	<0.25	1	19	56	<5	379
Mean[4]	15,459	25	32	5	2	218	0.34	2	23	77	<5	453
Maximum	17,690	82	80	8	3	268	0.55	5	28	217	<5	587
503 Limit	NL[5]	NL	NL	41	39	1,500	17	75	420	300	100	2,800

[1]Materials produced in 2017 and tested in 2018 prior to utilization.
[2]Different reporting limits were due to analyses conducted at different District labs.
[3]Not determined.
[4]In calculating each mean, any value less than the detection limit was considered the detection limit.
[5]No limit.

TABLE 23: FECAL COLIFORM ANALYSIS OF COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS PRODUCED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2017 AND SAMPLED PRIOR TO UTILIZATION ON URBAN LAND IN 2018

Sample Date[1]	Total Solids	Fecal Coliform
	--------- % --------	--------- MPN[2]/g ---------
03/29/18	48.2	240
03/29/18	44.8	64
05/03/18	42.0	110
05/03/18	44.2	260
06/06/18	44.2	130
06/06/18	44.7	100
09/18/18	53.3	59
10/17/18	53.3	320
10/31/18	52.2	730

[1]Materials produced in 2017 and tested in 2018 prior to utilization.
[2]Most probable number.

BIOSOLIDS SENT TO LANDFILLS FOR CO-DISPOSAL UNDER 40 CODE OF FEDERAL REGULATIONS PARTS 258 AND 261

In 2018, a total of 657 DT of the District's biosolids, (490 DT from the Stickney WRP and 167 DT from the Calumet WRP), was classified as unsuitable for land application because they contained gravel, wood debris, and dust from the sweeping of roads at biosolids processing sites. These materials were co-disposed with municipal solid wastes at a non-hazardous waste landfill, Laraway in Joliet, Illinois. All biosolids sent to landfills are usually analyzed as specified in 40 CFR Part 261 to establish the nonhazardous nature of these biosolids for co-disposal. Analytical results, including toxic characteristic leaching procedure constituents, polychlorinated biphenyls, cyanide, sulfide, and paint filter tests, were submitted in August 2018 to the landfill company to satisfy the requirements of their IEPA permit. The analytical data generated in 2018 should be valid until 2021. District sludge has always met the requirements of 40 CFR Parts 258 and 261 and the Illinois nonhazardous waste landfill regulations (Title 35, Subtitle G, Chapter I, Subchapter H, Part 810).

APPPENDIX

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. Haury
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