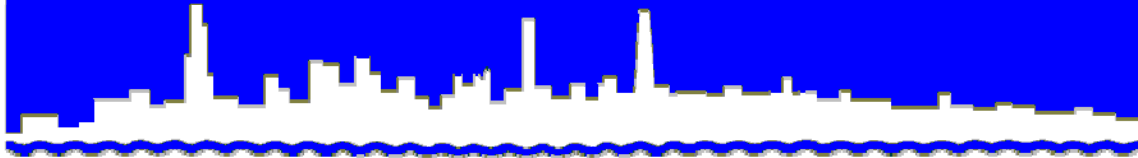


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

*MONITORING AND RESEARCH
DEPARTMENT*

REPORT NO. 13-2

ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR

2012

FEBRUARY 2013

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

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Chicago, Illinois 60611-3154

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February 19, 2013

Mr. Patrick Kuefler
Chief of Enforcement Section 2
United States Environmental Protection
Agency, Region 5
Water Enforcement and Compliance
Assurance Branch (WC-15J)
77 West Jackson Boulevard
Chicago, IL 60604-3590

Dear Mr. Kuefler:

Subject: 2012 Reporting Requirements Under the United States Environmental Protection Agency Code of Federal Regulations Title 40 Part 503

The Metropolitan Water Reclamation District of Greater Chicago (District) herein submits the 2012 records required under the United States Environmental Protection Agency Code of Federal Regulations Title 40 Part 503 (Part 503) at Section 503.18, entitled "Annual Biosolids Management Report for 2012."

We believe this report satisfies the reporting requirements under Part 503.

Certification Statement Required for Record Keeping

"I certify under penalty of law, that the information that will be used to determine compliance with the Class A pathogen requirements, Class B pathogen requirements, vector attraction reduction requirements, management practices, site restrictions, and requirements to obtain information as described in Sections 503.32a5, 503.32a6, 503.32a8, 503.32b2, 503.32b3, 503.33b1, 503.33b9, 503.33b10, 503.13, 503.14, and 503.16 for the District's land application sites was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate the information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

If you have any questions, please telephone me at (312) 751-5190.

Very truly yours,

Thomas C. Granato, Ph.D.

Director

Monitoring and Research

TCG:PL:cm

Attachment

cc w/att.: V. Aistars (USEPA)/T. Bramscher (USEPA)

A. Keller (IEPA)/B. Yurdin (IEPA)

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**ANNUAL BIOSOLIDS MANAGEMENT REPORT
FOR 2012**

By

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Special thanks are given to Ms. Coleen Maurovich for typing this report.

DISCLAIMER

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

FOREWORD

The data and information in this report fulfill the frequency of monitoring and the reporting requirements for 2012 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).

INTRODUCTION

The District herein reports the 2012 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. These programs are as follows:

1. Fulton County Dedicated Biosolids Application to Land Site (IEPA Permit No. 2009-SC-2921).
2. Hanover Park Fischer Farm Biosolids Application to Land Site (IEPA Permit No. 2012-SC-2255).
3. Controlled Solids Distribution Program (Biosolids Application to Land in the Chicago Area under IEPA Permit No. 2010-SC-0200).
4. Application to Farmland (Application of Biosolids from Calumet, Stickney, and John E. Egan (Egan) Water Reclamation Plants (WRPs) to Farmland under IEPA Permit Nos. 2009-SC-2056 and 2009-SC-2056-1).

In the following sections, we have prepared a short description of the sludge processing and biosolids management operations at the District's seven water reclamation plants (WRPs). The Lemont, James C. Kirie (Kirie), and Terrence J. O'Brien (O'Brien) (formerly North Side) WRPs do not produce a final biosolids product, while the Calumet, Stickney, Egan, and Hanover Park WRPs produced final biosolids products that were used beneficially in 2012. In addition, we discuss the uses for these biosolids, outline the data reporting requirements under Part 503, and present the required monitoring data in summary tables. The 2012 production and final disposition of sludges and biosolids generated by the District are summarized in Table 1. It should be noted that the total biosolids production in any given year may not equal the amount of the final biosolids product distributed, since biosolids may be distributed from production inventory from a previous year, or biosolids produced in a given year may be stored or aged for distribution at a later time.

TABLE 1: 2012 PRODUCTION AND USES OF SLUDGE AND BIOSOLIDS

| Production and Use | Water Reclamation Plants | | | | | | |
|----------------------------|--------------------------|----------------------|---------|---------------------|---------------------------|-------|--------|
| | Stickney ¹ | Calumet ¹ | O'Brien | Egan ^{1,2} | Hanover Park ¹ | Kirie | Lemont |
| | ----- Dry Tons ----- | | | | | | |
| Production ³ | 100,447 | 19,962 | 37,234 | 6,133 | 776 | 5,591 | 319 |
| Land Application | 115,904 | 13,934 | - | 6,130 | 1,241 | - | - |
| Agricultural land | 109,007 | 9,776 | - | 6,130 | - | - | - |
| Urban land | 6,897 | 4,158 | - | - | - | - | - |
| Surface Disposal | - | - | - | - | - | - | - |
| Landfill (Total) | 1,603 | 5,230 | - | - | - | - | - |
| Co-disposal | 874 | 215 | - | - | - | - | - |
| Final Cover | 729 | 5,015 | - | - | - | - | - |
| Incinerated | - | - | - | - | - | - | - |
| To Other WRPs ⁴ | - | - | 37,234 | 406 | - | 5,591 | 319 |
| Temporary storage | - | - | - | 381 | - | - | - |
| Other ⁵ | 36,955 | - | - | - | - | - | - |

¹Differences between biosolids production and total use or disposal in 2012 were due to a net withdrawal or storage in lagoons or drying areas, and processing of biosolids imported from other WRPs.

²Difference between amount produced and amount shipped was due to sampling anomalies.

³Stickney, Calumet, Egan, and Hanover Park produce biosolids while O'Brien, Kirie, and Lemont produce undigested sludge. Figures represent total solids generated at the end of each plant's processing train plus those imported from other plants for further processing.

⁴For further processing.

⁵Sent to pelletizing facility owned and operated by Metropolitan Biosolids Management, LLC, Stickney, Illinois, under Contract No. 98-RFP-10.

LEMONT WATER RECLAMATION PLANT

The Lemont WRP, located in Lemont, Illinois, has a design average flow of 3.4 million gallons per day (MGD). Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatment. In 2012, the Lemont WRP produced 319 dry tons of solids (Table 1), which were gravity concentrated and transported to the Stickney WRP for further processing.

No final biosolids product is produced at this WRP.

JAMES C. KIRIE WATER RECLAMATION PLANT

The Kirie WRP, located in Des Plaines, Illinois, has a design average flow of 72 MGD. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatment. In 2012, the Kirie WRP produced 5,591 dry tons of solids (Table 1), which were sent via force main to the Egan WRP for further processing.

No final biosolids product is produced 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. Wastewater reclamation processes at the O'Brien WRP include primary (primary settling) and secondary (activated sludge process) treatment. In 2012, the O'Brien WRP produced 37,234 dry tons 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 biosolids conveyed from the Egan WRP to the O'Brien WRP via sewer, which is described in detail in the next section.

No final biosolids product is produced 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. Wastewater reclamation processes include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatment. All solids managed at the Egan WRP are anaerobically digested. During some winters or when the centrifuges are not operating, liquid digested biosolids are sent via sewers to the O'Brien WRP. Centrifuge centrate containing biosolids are also sent via sewers to the O'Brien WRP.

In 2012, the total biosolids production at the Egan WRP was 6,133 dry tons (Table 1). This total includes biosolids generated from the processing of sludge originating at the Egan WRP as well as the sludge that was imported from the Kirie WRP for further processing. The measured amount of biosolids shipped out during the year was greater than the measured production due to sampling anomalies.

Summary of Biosolids Use and Disposal at Landfills

In 2012, none of the biosolids generated at the Egan WRP was sent to landfill.

Biosolids Conveyed to Other Water Reclamation Plants for Further Processing

In 2012, a total of 406 dry tons of biosolids was pumped as centrifuge centrate to the O'Brien WRP. In addition, 1,698 dry tons of centrifuge cake biosolids were trucked to the Harlem Avenue Solids Management Area, of which 381 dry tons have been temporarily stored until the 2013 land application season.

Land Application of Class B Centrifuge Cake Biosolids

In 2012, through a contract with Stewart Spreading, Inc., the Egan WRP applied a total of 6,130 dry tons of centrifuge cake biosolids to agricultural land under IEPA Permit Nos. 2009-SC-2056 and 2009-SC-2056-1. This total consisted of 4,124 dry tons hauled directly from the Egan WRP and 2,006 dry tons that were temporarily stored in 2011 (688 dry tons) and 2012 (1,318 dry tons) at the Harlem Avenue Solids Management Area before application. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

All Egan WRP centrifuge cake biosolids land applied in 2012 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 2), the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32b3 (Table 3), and

TABLE 2: CONCENTRATIONS OF NITROGEN AND METALS IN CENTRIFUGE CAKE BIOSOLIDS GENERATED AT THE JOHN E. EGAN WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|-----------------|--------------------|----|----|-------|-----------------|----|-----|-----|-----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 04/07/12 | 37,905 | 8,352 | 10 | 4 | 711 | 0.66 | 11 | 68 | 37 | <5 | 768 |
| 04/14/12 | 21,447 | 5,939 | 9 | 4 | 713 | NA ¹ | 11 | 63 | 37 | <5 | 761 |
| 04/21/12 | 41,939 | 8,783 | 10 | 4 | 737 | NA | 11 | 61 | 38 | <5 | 769 |
| 04/28/12 | 38,529 | 8,091 | 10 | 4 | 732 | NA | 11 | 59 | 40 | <5 | 780 |
| 05/19/12 | 52,201 | 9,671 | 9 | 3 | 708 | 0.98 | 10 | 55 | 38 | <5 | 797 |
| 06/09/12 | 45,354 | 8,249 | 10 | 3 | 716 | 1.0 | 11 | 57 | 30 | <5 | 770 |
| 07/07/12 | 38,821 | 4,603 | 9 | 3 | 700 | 0.57 | 15 | 66 | 35 | <5 | 832 |
| 08/11/12 | 43,681 | 6,815 | 8 | 3 | 693 | 1.6 | 18 | 58 | 31 | <5 | 860 |
| 09/08/12 | 39,185 | 4,600 | 9 | 3 | 688 | 0.97 | 14 | 61 | 32 | <5 | 858 |
| 10/13/12 | 33,117 | 4,800 | 11 | 3 | 716 | 1.5 | 15 | 57 | 30 | <5 | 854 |
| 11/10/12 | 20,560 | 4,456 | 11 | 3 | 711 | 1.2 | 15 | 65 | 34 | <5 | 851 |
| 12/08/12 | 41,066 | 6,331 | 12 | 4 | 758 | 0.89 | 14 | 66 | 32 | <5 | 847 |
| Minimum | 20,560 | 4,456 | 8 | 3 | 688 | 0.57 | 10 | 55 | 30 | <5 | 761 |
| Mean ² | 37,817 | 6,724 | 10 | 3 | 715 | 1.0 | 13 | 61 | 35 | <5 | 812 |
| Maximum | 52,201 | 9,671 | 12 | 4 | 758 | 1.6 | 18 | 68 | 40 | <5 | 860 |
| 503 Limit | NL ³ | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

¹Not analyzed.

²In calculating each mean, any value less than the reporting limit was considered the reporting limit.

³No limit.

TABLE 3: DIGESTER¹ TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE JOHN E. EGAN WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2012

| Month | Average Temperature | Average Detention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3 ² |
|-----------|---------------------|------------------------|-------------------------------------|--|
| | ----- °F ----- | ----- days ----- | | ----- days ----- |
| January | 97.4 | 30.2 | yes | 15.0 |
| February | 96.8 | 30.8 | yes | 15.0 |
| March | 97.4 | 30.4 | yes | 15.0 |
| April | 97.1 | 27.4 | yes | 15.0 |
| May | 97.2 | 27.3 | yes | 15.0 |
| June | 97.8 | 38.3 | yes | 15.0 |
| July | 97.3 | 22.1 | yes | 15.0 |
| August | 97.4 | 22.7 | yes | 15.0 |
| September | 97.2 | 26.8 | yes | 15.0 |
| October | 97.1 | 27.0 | yes | 15.0 |
| November | 98.0 | 29.4 | yes | 15.0 |
| December | 97.2 | 28.7 | yes | 15.0 |

¹Data are for primary Digesters A and C, and do not reflect additional digestion achieved in secondary Digesters B and D.

²For anaerobic digestion at average temperature achieved.

the vector attraction reduction requirements of Section 503.33b10. Table 2 also shows the bio-solids nitrogen concentrations that were used to compute the agronomic loading rates to farmland.

The Egan WRP had no additional requirement for reporting under Part 503 in 2012.

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. Wastewater reclamation processes at this WRP include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatment. All solids produced at the Hanover Park WRP are anaerobically digested and stored in lagoons. The digested biosolids stored in the lagoons are then applied by injection at the on-site Fischer Farm. All of the biosolids produced by the Hanover Park WRP are land applied at the on-site farm.

In 2012, the total biosolids production at this WRP was 776 dry tons (Table 1).

Land Application of Class B Liquid Biosolids

In 2012, the Hanover Park WRP land applied a total of 1,241 dry tons of biosolids at the Hanover Park Fischer Farm site under the IEPA Permit No. 2012-SC-2255. This included liquid biosolids and supernatant stored in a lagoon. The quantity of land applied biosolids was higher than the quantity of biosolids produced in 2012 due to the net removal of biosolids that were stored in a lagoon. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is once per year.

All Hanover Park WRP lagoon biosolids land applied in 2012 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 4), the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32b3 (Table 5), and the vector attraction reduction requirements of Section 503.33b1 (Table 6). Management practices at this land application site complied with Section 503.14 as previously described in a letter to the United States Environmental Protection Agency (USEPA) dated January 28, 1994 (Appendix I).

TABLE 4: CONCENTRATIONS OF NITROGEN AND METALS IN BIOSOLIDS¹ GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED TO THE FISCHER FARM SITE IN 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------------|-----------------------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| | ----- mg/dry kg ----- | | | | | | | | | | |
| 07/28/12 | 140,261 | 105,500 | 22 | <1 | 27 | 0.09 | 4 | 15 | 9 | 15 | 42 |
| 09/01/12 | 332,111 | 206,917 | 28 | <1 | 54 | 0.11 | 6 | 18 | 11 | 20 | 69 |
| 10/20/12 | 315,278 | 218,944 | 28 | <1 | 50 | 0.11 | 6 | 19 | 11 | 16 | 77 |
| 11/03/12 | 76,316 | 29,949 | 15 | 2 | 473 | 0.80 | 7 | 31 | 22 | <5 | 500 |
| 11/10/12 | 67,935 | 24,979 | 15 | 1 | 982 | 1.6 | 14 | 41 | 33 | <5 | 915 |
| 11/17/12 | 67,907 | 26,539 | 15 | 2 | 1,127 | 2.3 | 15 | 36 | 30 | 8 | 1035 |
| Minimum | 67,907 | 24,979 | 15 | <1 | 27 | 0.09 | 4 | 15 | 9 | <5 | 42 |
| Mean ² | 166,635 | 102,138 | 20 | 1 | 452 | 0.84 | 9 | 27 | 19 | 12 | 440 |
| Maximum | 332,111 | 218,944 | 28 | 2 | 1,127 | 2.3 | 15 | 41 | 33 | 20 | 1,035 |
| 503 Limit | NL ³ | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

¹Biosolids applied as supernatant from 7/28/12 to 10/20/12.

²In computing each mean, any value less than the reporting limit was considered the reporting limit.

³No limit.

TABLE 5: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED TO THE FISCHER FARM SITE IN 2012

| Month | Average Temperature | Average Detention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3 ¹ |
|-----------|---------------------|------------------------|-------------------------------------|--|
| | ----- °F ----- | ----- days ----- | | ----- days ----- |
| January | 94.9 | 32.7 | yes | 15.1 |
| February | 95.0 | 31.6 | yes | 15.0 |
| March | 95.0 | 29.9 | yes | 15.0 |
| April | 95.0 | 31.8 | yes | 15.0 |
| May | 95.3 | 38.3 | yes | 15.0 |
| June | 95.4 | 32.2 | yes | 15.0 |
| July | 95.6 | 35.0 | yes | 15.0 |
| August | 95.6 | 32.9 | yes | 15.0 |
| September | 95.4 | 33.1 | yes | 15.0 |
| October | 94.6 | 35.9 | yes | 15.6 |
| November | 94.2 | 31.8 | yes | 16.4 |
| December | 94.0 | 30.2 | yes | 16.7 |

¹For anaerobic digestion at average temperature achieved.

TABLE 6: VOLATILE SOLIDS REDUCTION IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED TO THE FISCHER FARM SITE IN 2012

| Month | Digester Feed | Digester Draw | Lagoon Biosolids ¹ | Volatile Solids Reduction ² |
|-----------|-------------------------------------|---------------|-------------------------------|--|
| | ----- % Total Volatile Solids ----- | | | ---- % ---- |
| July | 84.1 | 74.6 | 62.4 | 68.6 |
| September | 84.8 | 74.2 | 59.4 | 73.8 |
| October | 85.3 | 74.9 | 60.1 | 74.1 |
| November | 85.8 | 74.8 | 60.7 | 74.4 |

¹Biosolids applied as supernatant during July through October.

²Volatile solids reduction computed using total volatile solids of digester feed and lagoon biosolids data.

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. Wastewater reclamation processes at this WRP include primary (primary settling) and secondary (activated sludge process) treatment. 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 land as Exceptional Quality (EQ) biosolids under the District's Controlled Solids Distribution Permit.
 - b) Use at local municipal solid waste landfills as final landfill cover.
 - c) Disposal in local municipal solid waste landfills.
2. Placed in lagoons for dewatering to semi-dried and then applied to farmland by a private contractor as a Class B biosolids or used as daily landfill cover.

In 2012, the total biosolids production at the Calumet WRP was 19,962 dry tons (Table 1). The quantity of biosolids used (19,164 dry tons) was less than the total 2012 production for the Calumet WRP. A total of 798 dry tons was stored in lagoons or the drying cells.

Summary of Biosolids Use and Disposal at Landfills

In 2012, a total of 215 dry tons of biosolids generated at the Calumet WRP was co-disposed with municipal solid wastes in landfills. A total of 5,015 dry tons were used as final cover, and no biosolids were used as landfill daily cover.

Land Application of Class B Biosolids

In 2012, the Calumet WRP land applied 9,776 dry tons of semi-dried Class B biosolids to farmland under IEPA Permit Nos. 2009-SC-2056 and 2009-SC-2056-1 through a contract with Synagro Midwest, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

All Calumet WRP semi-dried Class B biosolids land applied in 2012 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 7), the vector attraction reduction requirements of Section 503.33b10, and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32b3 (Table 8). Table 7 also contains the biosolids nitrogen concentrations that were used to compute the agronomic loading rates to farmland.

TABLE 7: CONCENTRATIONS OF NITROGEN AND METALS IN SEMI-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|-----------------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 04/19/2012 | 28,260 | 2,499 | 6 | 2 | 340 | 0.95 | 8 | 24 | 78 | <5 | 864 |
| 04/19/2012 | 27,080 | 2,950 | 5 | 2 | 374 | 0.88 | 9 | 24 | 74 | <5 | 914 |
| 04/20/2012 | 24,526 | 4,015 | 6 | 2 | 369 | 0.64 | 8 | 25 | 78 | <5 | 915 |
| 04/24/2012 | 41,887 | 8,140 | 6 | 2 | 402 | 0.69 | 10 | 25 | 72 | <5 | 1,015 |
| 04/23/2012 | 23,545 | 3,622 | 6 | 2 | 382 | 0.76 | 10 | 26 | 74 | <5 | 942 |
| 05/22/2012 | 22,396 | 1,601 | 6 | 2 | 333 | 0.69 | 9 | 23 | 78 | <5 | 895 |
| 07/18/2012 | 28,170 | 9,404 | 7 | 2 | 433 | 0.90 | 10 | 27 | 80 | <5 | 1,075 |
| 07/26/2012 | 20,341 | 3,233 | 7 | 2 | 391 | 1.0 | 8 | 27 | 90 | <5 | 1,024 |
| 07/26/2012 | 18,009 | 2,362 | <5 | 2 | 417 | 0.78 | 7 | 26 | 75 | <5 | 1,004 |
| 09/27/2012 | 32,003 | 5,004 | 7 | 2 | 354 | 0.64 | 10 | 26 | 86 | <5 | 1,084 |
| 10/04/2012 | 29,318 | 5,011 | 7 | 2 | 398 | 0.75 | 11 | 27 | 85 | <5 | 1,120 |
| 10/15/2012 | 28,177 | 4,109 | 6 | 2 | 328 | 0.80 | 9 | 24 | 82 | <5 | 974 |
| 10/17/2012 | 29,376 | 4,342 | 10 | 2 | 363 | 0.93 | 6 | 26 | 81 | <5 | 1,077 |
| 11/02/2012 | 28,295 | 4,696 | <5 | 2 | 359 | 0.87 | 10 | 27 | 88 | <5 | 1,061 |
| 11/08/2012 | 28,016 | 3,459 | <5 | 2 | 331 | 0.89 | 9 | 24 | 79 | <5 | 964 |
| 11/08/2012 | 17,635 | 4,926 | <5 | 2 | 368 | 0.78 | 13 | 25 | 89 | <5 | 936 |
| Minimum | 17,635 | 1,601 | <5 | 2 | 328 | 0.64 | 6 | 23 | 72 | <5 | 864 |
| Mean ¹ | 26,690 | 4,336 | 7 | 2 | 371 | 0.81 | 9 | 25 | 81 | <5 | 992 |
| Maximum | 41,887 | 9,404 | 10 | 2 | 433 | 1.0 | 13 | 27 | 90 | <5 | 1,120 |
| 503 Limit | NL ² | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

¹In calculating each mean, any value less than the reporting limit was considered the reporting limit.

²No Limit.

TABLE 8: DIGESTER¹ TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2012

| Month | Average Temperature | Average Detention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3 ² |
|-----------|---------------------|------------------------|-------------------------------------|--|
| | ----°F ---- | ---- days ---- | | ---- days ---- |
| January | 96.6 | 69.6 | yes | 15.0 |
| February | 96.6 | 46.1 | yes | 15.0 |
| March | 96.8 | 48.1 | yes | 15.0 |
| April | 97.4 | 49.6 | yes | 15.0 |
| May | 96.9 | 39.7 | yes | 15.0 |
| June | 97.5 | 36.9 | yes | 15.0 |
| July | 97.3 | 39.0 | yes | 15.0 |
| August | 97.6 | 52.6 | yes | 15.0 |
| September | 97.1 | 56.1 | yes | 15.0 |
| October | 96.6 | 41.4 | yes | 15.0 |
| November | 97.1 | 68.6 | yes | 15.0 |
| December | 97.1 | 64.1 | yes | 15.0 |

¹Temperatures and detention times are for primary digesters 1 through 12 at the Calumet WRP.

²For anaerobic digestion at average temperature achieved.

Land Application of Exceptional Quality, Air-Dried Biosolids

In 2012, the Calumet WRP land applied a total of 4,158 dry tons of air-dried EQ biosolids through the District's Controlled Solids Distribution Program under IEPA Permit No. 2010-SC-0200 for maintenance of golf courses, recreation fields, landscaping, and for the construction of new recreation fields. The sites that utilized these biosolids under the Controlled Solids Distribution Program and how they were used are listed in Table 9. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is four times per year.

All Calumet WRP EQ biosolids that were land applied in 2012 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 10), the vector attraction reduction requirements of Section 503.33b1 (Table 9), and the Class A pathogen limits of Section 503.32a8 (Table 11) according to the District's site-specific Process to Further Reduce Pathogens (PFRP). Management practices complied with Section 503.14 as previously described in a letter to the USEPA dated January 28, 1994 (Appendix 1)

Site-Specific Process to Further Reduce Pathogens.

The USEPA Region 5 designated, on a site-specific basis for the Calumet and Stickney WRPs, two of the District's biosolids processing trains as equivalent to a PFRP. The PFRP equivalency commenced on August 1, 2002 (Appendix II). The current renewable certification of the PFRP designation is from August 1, 2012 – July 31, 2017 and requires that every year during this period, six samples be analyzed for helminth ova and virus. The analytical data for four samples (August 31, 2011 – April 4, 2012) reported in Table 12 are for PFRP-compliant biosolids utilized in 2012. These pathogen analytical results were generated for samples collected during August 1, 2011 – July 31, 2012, according to the PFRP certification for the Calumet WRP, as specified in the July 30, 2012 renewal letter and the September 14, 2012 clarification letter (Appendix II). Other biosolids utilized as Class A in 2012 were non-PFRP compliant due to a shorter (less than the required 18 months) lagoon-aging period for operational efficiency. The fecal coliform analysis of all Calumet WRP Class A biosolids prior to utilization on urban land is presented in Table 12.

TABLE 9: SITES THAT UTILIZED CALUMET WATER RECLAMATION PLANT AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2012

| User | Use/Location |
|--|--|
| Alsip Park District, Alsip | Athletic fields - Sears Park |
| Chicago Park District, Chicago | Athletic fields - Durkin, Hayes, Grand Crossing Parks |
| Chicago Park District, Chicago | Athletic fields - Minuteman, Union, Warren, Westlawn Parks |
| Cinder Ridge Golf Course, Cinder Ridge | Golf course |
| De La Salle High School, Chicago | Athletic fields |
| Downers Grove South High School, Downers Grove | Athletic fields |
| Evanston High School, Evanston | Athletic fields |
| Evergreen Cemetery, Evergreen Park | Landscaping |
| Evergreen Park Park District, Evergreen Park | Athletic fields - Yurich Park |
| Frankfort Park District, Frankfort | Athletic fields - Commissioners Park, Main Park |
| Frankfort Square Park District, Frankfort | Athletic fields - Square Links Park |
| Glendale Heights Park District, Glendale Heights | Athletic fields - Nazos Park |
| Glenwoodie Golf Course, Glenwood | Golf course |
| Hillcrest High School, Country Club Hills | Athletic fields |
| Hinsdale Park District, Hinsdale | Athletic fields - Robbins Park, Veeck Park |
| Irene H King Elementary School, Romeoville | Athletic fields |
| Lemont Park District, Lemont | Athletic fields - Bambrick Park |
| Luther South High School, Chicago | Athletic fields |
| Markham Park District, Markham | Athletic fields - Markham Park |

TABLE 9 (Continued): SITES THAT UTILIZED CALUMET WATER RECLAMATION PLANT AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2012

| User | Use/Location |
|---|--|
| McNulty Farm, Lemont | Soil amendment |
| Midlothian Park District, Midlothian | Athletic fields - Memorial Park |
| Oak Lawn Park District, Oak Lawn | Athletic fields - Centennial, Central, Lawn Manor, Sullivan and Worthbrook Parks, Pacetti Field, Stony Creek Golf Club |
| Posen Park District, Posen | Landscaping - Oak View Center |
| Reavis High School, Burbank | Athletic fields - Commissioners Park, Memorial Park |
| River Trails Park District, Mt. Prospect | Athletic fields |
| Romeoville High School, Romeoville | Athletic fields - Main Park, Willow Trails Park |
| St. Xavier University, Orland Park | Athletic fields |
| Ted's Greenhouse Inc., Tinley Park | Athletic fields |
| Thornton Fractional North High School, Calumet City | Nutrient source |
| Tinley Park Park District | Athletic fields |
| Twin Orchard Country Club, Long Grove | Athletic fields - Bristol Park, McCarthy Park |
| West Chicago Park District | Golf course |
| York Center Park District, Lombard | Athletic fields - Pioneer Park, Reed-Kepler Park |
| | Athletic fields - Knolls Park |

TABLE 10: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO LAND IN 2012

| Sample Date | TKN | NH ₃ -N | TVS | TVS ¹ Reduction | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------------|----------------------|--------------------|-------------|----------------------------|-----------------------|----|-------|------|----|-----|-----|-----|-------|
| | ----- mg/dry kg ---- | | -----%----- | | ----- mg/dry kg ----- | | | | | | | | |
| 04/09/12 | 24,100 | 3,115 | 42.9 | 72.3 | 5 | 2 | 372 | 0.70 | 10 | 26 | 80 | <5 | 970 |
| 04/11-12/12 | 28,294 | 2,437 | 43.2 | 71.9 | 5 | 2 | 372 | 0.93 | 11 | 25 | 79 | <5 | 944 |
| 05/15/12 | 29,665 | 2,356 | 44.2 | 70.8 | 5 | 1 | 372 | 0.89 | 7 | 24 | 70 | <5 | 914 |
| 05/29/12 | 23,664 | 2,124 | 43.6 | 71.5 | <5 | 2 | 379 | 0.69 | 8 | 23 | 69 | <5 | 931 |
| 05/30/12 | 26,165 | 1,762 | 42.5 | 72.7 | 6 | 2 | 358 | 0.59 | 9 | 25 | 82 | <5 | 935 |
| 06/05/12 | 24,388 | 2,058 | 39.7 | 75.7 | 5 | 2 | 365 | 0.99 | 7 | 25 | 84 | <5 | 940 |
| 06/21/12 | 22,233 | 3,036 | 39.1 | 76.3 | 6 | 2 | 384 | 0.79 | 9 | 26 | 86 | <5 | 994 |
| 07/02/12 | 20,284 | 2,153 | 39.6 | 75.8 | 7 | 2 | 375 | 0.74 | 9 | 27 | 90 | <5 | 1,052 |
| 07/11/12 | 32,294 | 3,748 | 47.1 | 54.9 | 6 | 2 | 437 | 0.64 | 9 | 29 | 70 | <5 | 1,159 |
| 07/16/12 | 24,296 | 5,244 | 46.6 | 55.8 | 7 | 2 | 403 | 0.75 | 8 | 26 | 69 | <5 | 1,038 |
| 08/02/12 | 27,637 | 3,380 | 43.9 | 60.4 | 6 | 2 | 425 | 0.86 | 9 | 27 | 73 | <5 | 1,060 |
| 08/10/12 | 26,064 | 3,521 | 43.6 | 60.8 | 7 | 2 | 390 | 0.70 | 8 | 27 | 74 | <5 | 1,036 |
| 09/06/12 | 18,730 | 3,866 | 41.5 | 64.1 | 8 | 2 | 402 | 0.68 | 9 | 27 | 81 | <5 | 1,071 |
| 09/11/12 | 25,158 | 3,644 | 42.5 | 62.6 | 5 | 2 | 399 | 0.90 | 8 | 25 | 72 | <5 | 1,019 |
| 10/12/12 | 19,075 | 3,040 | 42.0 | 63.4 | 9 | 2 | 432 | 1.1 | 4 | 28 | 77 | <5 | 1,127 |
| 10/30/12 | 26,591 | 2,997 | 37.1 | 70.1 | <5 | 2 | 407 | 0.94 | 9 | 28 | 76 | <5 | 1,060 |
| 11/05/12 | 19,871 | 3,171 | 41.6 | 63.9 | <5 | 2 | 437 | 0.93 | 10 | 28 | 79 | <5 | 1,103 |
| Minimum | 18,730 | 1,762 | 37.1 | 55 | <5 | 1 | 358 | 0.59 | 4 | 23 | 69 | <5 | 914 |
| Mean ² | 24,618 | 3,038 | 42.4 | 67 | 6 | 2 | 395 | 0.81 | 8 | 26 | 77 | <5 | 1,021 |
| Maximum | 32,294 | 5,244 | 47.1 | 76 | 9 | 2 | 437 | 1.1 | 11 | 29 | 90 | <5 | 1,159 |
| 503 Limit | NL ³ | NL | NL | 38 | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

¹Total volatile solids for digester feed processed during 2/18/09 – 1/31/12 were used to calculate TVS reductions.

²In calculating each mean, any value less than the reporting limit was considered the reporting limit.

³No limit.

TABLE 11: MICROBIOLOGICAL ANALYSIS OF CLASS A BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND SAMPLED PRIOR TO SHIPMENT TO URBAN LAND IN 2012

| Sample Date | Lagoon Source | Total Solids | Fecal Coliform |
|-------------|---------------|--------------|---------------------------------|
| | | ---- % ---- | ----- MPN ¹ /g ----- |
| 03/28/12 | 6 | 79.9 | 120 |
| 04/11/12 | 6 | 89.2 | 320 |
| 04/11/12 | 6 | 75.1 | 51 |
| 04/11/12 | 6 | 70.9 | 210 |
| 04/18/12 | 6 | 81.7 | 61 |
| 04/18/12 | 17 | 68.2 | 19 |
| 04/18/12 | 17 | 73.9 | 5 |
| 05/10/12 | 17 | 57.9 | 870 |
| 05/10/12 | 17 | 71.5 | 70 |
| 05/10/12 | 17 | 65.5 | 58 |
| 05/23/12 | 6 | 73.3 | 690 |
| 05/31/12 | 6 | 71.2 | 53 |
| 05/31/12 | 6 | 80.3 | 47 |
| 06/27/12 | 7 | 90.2 | 320 |
| 07/11/12 | 7 | 89.3 | 56 |
| 07/11/12 | 7 | 90.4 | 210 |
| 08/28/12 | 7 | 69.3 | 55 |
| 09/05/12 | 7 | 66.3 | 6 |
| 09/12/12 | 18 | 75.6 | 100 |
| 09/12/12 | 18 | 67.8 | 150 |
| 09/12/12 | 18 | 67.1 | 170 |
| 10/03/12 | 7 | 75.6 | 9 |
| 10/17/12 | 18 | 75.4 | 5 |
| 10/17/12 | 18 | 61.1 | 62 |

¹Most Probable Number.

TABLE 12: MICROBIOLOGICAL ANALYSIS OF BIOSOLIDS¹ GENERATED BY COMPLIANT AND NON-COMPLIANT PROCESS TO FURTHER REDUCE PATHOGENS-EQUIVALENT CODIFIED PROCESSING TRAINS AT THE CALUMET WATER RECLAMATION PLANT DURING AUGUST 2011 THROUGH JULY 2012

| Sample Date ² | Lagoon Source | Total Solids | Fecal Coliform | Sample Date ³ | Helminth Ova | Enteric Virus |
|--------------------------|---------------|--------------|---------------------------------|--------------------------|----------------|------------------------------|
| | | --- % --- | ----- MPN ⁴ /g ----- | | --- No./4g --- | --- PFU ⁵ /4g --- |
| 08/31/11 | 19 | 83.3 | 820 | 08/24/11 | <0.0800 | <0.8000 |
| 09/14/11 | 19 | 77.8 | 150 | 09/14/11 | <0.0800 | <0.8000 |
| 11/02/11 | 19 | 73.4 | 52 | 11/02/11 | <0.0800 | <0.8000 |
| 04/04/12 | 19 | 61.9 | 5 | 03/21/12 | <0.0800 | <0.8000 |
| 04/11/12 | 6 | 75.1 | 51 | 11/30/11 | <0.0800 | <0.8000 |
| 04/11/12 | 6 | 89.2 | 320 | 02/23/12 | <0.0800 | <0.8000 |
| 04/18/12 | 17 | 73.91 | 5 | 02/23/12 | <0.0800 | <0.8000 |
| 05/10/12 | 17 | 71.5 | 70 | 04/26/12 | <0.0800 | <0.8000 |
| 05/10/12 | 17 | 65.5 | 58 | 04/26/12 | <0.0800 | <0.8000 |
| 07/11/12 | 7 | 89.3 | 56 | 05/10/12 | <0.0800 | <0.8000 |

¹All biosolids satisfied Part 503 Class A requirements.

²Biosolids sampled 4/11 - 7/11/2012 were non-PFRP compliant with respect to the lagoon-aging period.

³Samples for HO and V analyses for each batch of non-PFRP biosolids were collected before the material was dried and used in 2012.

⁴Most probable number.

⁵Plaque-forming unit.

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. Wastewater reclamation processes include primary (Imhoff and primary settling) and secondary (activated sludge process) treatment. All solids produced at this WRP and from the O'Brien 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 land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 - b. Use at local municipal solid waste landfills as final landfill cover
 - c. Disposal in local municipal solid waste landfills.
2. Centrifuge dewatered to approximately 25 percent solids content and then applied to land by a private contractor as Class B biosolids.
3. Centrifuge dewatered to approximately 25 percent solids content, transported to paved cells, and air-dried prior to use as daily landfill cover.
4. Centrifuge dewatered to approximately 25 percent solids content and conveyed to Metropolitan Biosolids Management, LLC under Contract 98-RFP-10 for further processing.
5. Centrifuge dewatered 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 land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 - b. Application to farmland as semi-dried Class B biosolids
 - c. Use at local municipal solid waste landfills as final landfill cover.
 - d. Disposal in local municipal solid waste landfills.

In 2012, the total biosolids production at the Stickney WRP was 100,447 dry tons (Table 1). This total includes biosolids generated from processing of sludge originating at the Stickney WRP as well as the sludge that was imported from the O'Brien and Lemont WRPs for

further processing. The quantity of biosolids used (154,462 dry tons) was higher than the total 2012 production for the Stickney WRP due to the utilization of biosolids stored in lagoons and on drying cells.

Summary of Biosolids Use and Disposal at Landfills

In 2012, a total of 874 dry tons of biosolids generated at the Stickney WRP was co-disposed with municipal solid wastes in landfills. A total of 729 dry tons were used as final cover, and no biosolids were used as landfill daily cover.

Land Application of Class B Biosolids

In 2012, the Stickney WRP applied a total of 109,007 dry tons of centrifuge cake and semi-dried biosolids to agricultural land under IEPA Permit Nos. 2009-SC-2056 and 2009-SC-2056-1. These quantities were utilized through contracts with Synagro Midwest, Inc. and Stewart Spreading, Inc. The total does not include the centrifuge cake biosolids transported from the Egan WRP to the Harlem Avenue Solids Management Area prior to being applied to farmland by Synagro Midwest, Inc. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is 12 times per year.

All Stickney WRP centrifuge cake and semi-dried biosolids land applied in 2012 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 13), the vector attraction reduction requirements of Section 503.33b10, and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32b3 (Table 14). Table 13 also contains the biosolids nitrogen concentrations that were used to compute the agronomic loading rates to farmland.

Land Application of Exceptional Quality, Air-Dried Biosolids

In 2012, the Stickney WRP applied a total of 6,897 dry tons of air-dried EQ biosolids through the District's Controlled Solids Distribution Program under IEPA Permit No. 2010-SC-0200, for the construction and maintenance of golf courses and recreation fields. The sites that utilized these biosolids under the program and how they were used are listed in Table 15. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

The air-dried biosolids at the Stickney WRP were not generated by the codified PFRP-equivalent processing train. Therefore, the biosolids were tested for Class A compliance in accordance with Section 503.32a5.

All Stickney EQ biosolids land applied in 2012 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 16), the vector attraction reduction requirements of Section 503.33b1 (Table 16), and the Class A pathogen limits of Section 503.32a5 (Tables 17 and 18). Management practices complied with Section 503.14 as previously described in a letter to the USEPA dated January 28, 1994 (Appendix I).

TABLE 13: CONCENTRATIONS OF NITROGEN AND METALS IN CENTRIFUGE CAKE AND SEMI-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|-----------------------|--------------------|----|----|-----|------|----|----|-----|----|-----|
| | ----- mg/dry kg ----- | | | | | | | | | | |
| 01/10/12 | 52,886 | 4,101 | 6 | 3 | 373 | 1.1 | 8 | 36 | 102 | <5 | 744 |
| 01/11/12 | 35,520 | 5,044 | 7 | 4 | 391 | 1.2 | 9 | 39 | 115 | <5 | 768 |
| 01/11/12 | 26,708 | 5,186 | 9 | 3 | 410 | 0.88 | 7 | 38 | 112 | <5 | 816 |
| 01/31/12 | 34,991 | 6,535 | 7 | 4 | 385 | 0.83 | 10 | 41 | 118 | <5 | 795 |
| 01/31/12 | 30,497 | 2,990 | 9 | 3 | 415 | 0.91 | 11 | 41 | 124 | <5 | 830 |
| 02/07/12 | 38,944 | 4,235 | 6 | 3 | 359 | 0.77 | 13 | 35 | 83 | <5 | 658 |
| 02/23/12 | 37,109 | 6,844 | 7 | 3 | 410 | 0.67 | 11 | 41 | 87 | <5 | 752 |
| 02/23/12 | 56,759 | 11,297 | <5 | 3 | 629 | 1.0 | 7 | 64 | 30 | <5 | 738 |
| 03/07/12 | 50,439 | 6,786 | 5 | 3 | 363 | 0.67 | 12 | 39 | 77 | <5 | 652 |
| 03/07/12 | 34,790 | 5,843 | 8 | 4 | 399 | 1.3 | 10 | 40 | 114 | <5 | 801 |
| 03/19-22/12 | 30,528 | 6,263 | 6 | 4 | 379 | 1.2 | 11 | 39 | 124 | <5 | 799 |
| 03/27-30/12 | 34,645 | 7,514 | 6 | 4 | 391 | 0.87 | 11 | 40 | 116 | <5 | 805 |
| 03/31/12 | 35,099 | 9,472 | 8 | 4 | 373 | 0.98 | 9 | 38 | 116 | <5 | 738 |
| 04/02-07/12 | 37,986 | 10,050 | 8 | 4 | 385 | 1.0 | 10 | 39 | 115 | <5 | 750 |
| 04/03/12 | 35,276 | 6,585 | 5 | 3 | 390 | 0.74 | 11 | 38 | 89 | <5 | 741 |
| 04/03/12 | 29,364 | 4,496 | 7 | 3 | 364 | 0.71 | 9 | 37 | 97 | <5 | 753 |
| 04/04/12 | 43,330 | 4,859 | <5 | 3 | 374 | 0.63 | 13 | 41 | 86 | <5 | 737 |
| 04/09-12/12 | 33,523 | 9,296 | 6 | 4 | 371 | 1.1 | 10 | 38 | 103 | <5 | 761 |
| 04/10/12 | 22,161 | 1,599 | 9 | 3 | 422 | 1.2 | 11 | 39 | 121 | <5 | 793 |
| 04/10/12 | 27,010 | 3,950 | 10 | 3 | 429 | 0.75 | 9 | 39 | 113 | <5 | 819 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|----|-----|----|-----|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 04/12-13/12 | 26,185 | 9,522 | 7 | 4 | 399 | 0.98 | 12 | 41 | 119 | <5 | 791 |
| 04/16/12 | 20,586 | 676 | <5 | 3 | 289 | 0.49 | 7 | 30 | 79 | <5 | 584 |
| 04/16-21/12 | 35,921 | 10,487 | <5 | 3 | 367 | 0.66 | 13 | 39 | 85 | <5 | 666 |
| 04/18/12 | 26,356 | 3,366 | 6 | 3 | 432 | 0.85 | 9 | 38 | 94 | <5 | 829 |
| 04/18/12 | 29,013 | 3,017 | 6 | 3 | 380 | 1.1 | 7 | 36 | 105 | <5 | 773 |
| 04/23-24/12 | 33,739 | 8,626 | <5 | 3 | 354 | 0.54 | 11 | 39 | 94 | <5 | 693 |
| 04/24-27/12 | 35,900 | 10,119 | 7 | 3 | 325 | 2.2 | 9 | 48 | 121 | <5 | 678 |
| 04/24-27/12 | 52,586 | 14,391 | <5 | 2 | 577 | 0.56 | 9 | 67 | 37 | <5 | 751 |
| 05/01/12 | 27,574 | 4,437 | 7 | 3 | 410 | 0.74 | 11 | 40 | 99 | <5 | 783 |
| 05/01/12 | 28,422 | 5,235 | 7 | 3 | 428 | 0.69 | 11 | 40 | 101 | <5 | 807 |
| 05/08/12 | 42,878 | 6,464 | 7 | 2 | 323 | 0.87 | 9 | 36 | 92 | <5 | 674 |
| 05/10/12 | 29,331 | 8,606 | 5 | 2 | 355 | 1.1 | 12 | 35 | 91 | <5 | 687 |
| 05/10/12 | 30,490 | 9,204 | 5 | 3 | 414 | 1.4 | 12 | 42 | 124 | <5 | 817 |
| 05/14-16/12 | 27,015 | 2,503 | 7 | 3 | 421 | 0.74 | 9 | 38 | 123 | <5 | 804 |
| 05/14-16/12 | 36,958 | 9,809 | 6 | 3 | 374 | 0.95 | 12 | 37 | 94 | <5 | 704 |
| 05/14-17/12 | 33,336 | 7,109 | 5 | 4 | 382 | 1.3 | 11 | 40 | 123 | <5 | 765 |
| 05/14-18/12 | 29,996 | 3,943 | 6 | 3 | 399 | 1.1 | 8 | 37 | 109 | <5 | 776 |
| 05/15-16/12 | 51,552 | 3,304 | <5 | 2 | 283 | 0.57 | 7 | 29 | 81 | <5 | 561 |
| 05/16/12 | 31,697 | 5,280 | 8 | 3 | 429 | 0.77 | 9 | 38 | 110 | <5 | 831 |
| 05/16-17/12 | 22,695 | 2,829 | 9 | 3 | 431 | 0.99 | 9 | 40 | 114 | <5 | 825 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|----|-----|----|-----|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 05/16-17/12 | 41,783 | 8,662 | <5 | 3 | 361 | 1.1 | 11 | 37 | 92 | <5 | 671 |
| 05/18/12 | 26,611 | 4,026 | 5 | 3 | 425 | 1.0 | 11 | 40 | 116 | <5 | 774 |
| 05/18/12 | 67,939 | 8,758 | 6 | 3 | 427 | 0.85 | 12 | 40 | 103 | <5 | 828 |
| 05/21-29/12 | 35,065 | 8,914 | 6 | 3 | 358 | 0.88 | 9 | 44 | 100 | <5 | 708 |
| 05/22/12 | 32,268 | 4,807 | 7 | 3 | 429 | 0.86 | 12 | 42 | 107 | <5 | 838 |
| 05/22/12 | 30,331 | 4,955 | 7 | 3 | 415 | 0.82 | 12 | 41 | 110 | <5 | 803 |
| 05/22-24/12 | 29,854 | 4,170 | 7 | 3 | 423 | 0.85 | 12 | 42 | 109 | <5 | 815 |
| 05/22-24/12 | 23,077 | 3,816 | 7 | 3 | 400 | 0.89 | 10 | 38 | 107 | <5 | 785 |
| 05/22-24/12 | 28,199 | 1,260 | 7 | 3 | 433 | 0.98 | 9 | 39 | 116 | <5 | 807 |
| 05/23-31/12 | 32,813 | 8,158 | 6 | 3 | 383 | 0.77 | 10 | 39 | 97 | <5 | 730 |
| 05/25/12 | 36,202 | 9,223 | 6 | 3 | 352 | 0.71 | 8 | 36 | 94 | <5 | 690 |
| 05/25/12 | 36,988 | 5,080 | 6 | 3 | 426 | 0.84 | 12 | 45 | 104 | <5 | 804 |
| 05/29/12 | 25,684 | 3,227 | 5 | 3 | 409 | 0.74 | 10 | 40 | 90 | <5 | 747 |
| 06/05/12 | 39,868 | 4,603 | <5 | 3 | 341 | 0.61 | 9 | 32 | 81 | <5 | 655 |
| 06/06/12 | 39,886 | 8,703 | 6 | 3 | 366 | 0.97 | 9 | 38 | 98 | <5 | 713 |
| 06/11-13/12 | 16,839 | 2,009 | 6 | 4 | 389 | 0.69 | 9 | 38 | 97 | <5 | 752 |
| 06/12/12 | 37,945 | 7,264 | 6 | 3 | 359 | 0.72 | 9 | 37 | 96 | <5 | 713 |
| 06/20/12 | 19,977 | 4,534 | 7 | 4 | 390 | 1.3 | 9 | 40 | 121 | <5 | 786 |
| 06/20/12 | 20,688 | 4,342 | 6 | 3 | 396 | 0.95 | 8 | 37 | 107 | <5 | 780 |
| 06/21/12 | 20,239 | 5,415 | 7 | 3 | 393 | 0.91 | 9 | 35 | 91 | <5 | 721 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|---------------------|--------------------|----|----|-----|------|----|----|-----|----|-------|
| | -----mg/dry kg----- | | | | | | | | | | |
| 06/29/12 | 29,773 | 5,299 | 7 | 4 | 414 | 0.85 | 11 | 44 | 131 | <5 | 894 |
| 07/02/12 | 28,117 | 4,422 | 7 | 4 | 410 | 1.0 | 10 | 44 | 130 | <5 | 917 |
| 07/02-03/12 | 35,693 | 7,379 | 7 | 3 | 396 | 0.72 | 11 | 41 | 97 | <5 | 807 |
| 07/03/12 | 22,952 | 4,111 | 8 | 3 | 430 | 1.1 | 9 | 37 | 122 | <5 | 1,080 |
| 07/03-06/12 | 41,952 | 8,551 | 7 | 4 | 386 | 0.93 | 9 | 40 | 105 | <5 | 805 |
| 07/06-07/12 | 15,293 | 3,327 | 8 | 4 | 401 | 0.68 | 10 | 42 | 107 | <5 | 852 |
| 07/07/12 | 33,894 | 7,669 | 7 | 4 | 435 | 0.67 | 12 | 44 | 101 | <5 | 859 |
| 07/07/12 | 17,952 | 2,598 | 6 | 4 | 443 | 0.65 | 11 | 44 | 103 | <5 | 876 |
| 07/09/12 | 26,412 | 7,742 | 6 | 3 | 444 | 0.87 | 10 | 42 | 98 | <5 | 781 |
| 07/09-12/12 | 16,976 | 4,586 | 8 | 3 | 377 | 0.99 | 10 | 38 | 106 | <5 | 778 |
| 07/10/12 | 38,426 | 3,720 | 5 | 3 | 388 | 0.95 | 12 | 36 | 95 | <5 | 770 |
| 07/10-14/12 | 37,039 | 10,726 | 8 | 3 | 352 | 0.92 | 10 | 36 | 96 | <5 | 707 |
| 07/11-12/12 | 19,006 | 4,709 | 5 | 3 | 359 | 0.71 | 8 | 30 | 92 | <5 | 727 |
| 07/12-13/12 | 19,229 | 4,459 | 10 | 3 | 393 | 0.91 | 10 | 41 | 111 | <5 | 786 |
| 07/13/12 | 23,863 | 4,739 | 7 | 4 | 411 | 1.0 | 10 | 40 | 118 | <5 | 808 |
| 07/13/12 | 23,922 | 3,996 | 8 | 4 | 405 | 1.0 | 11 | 41 | 122 | <5 | 827 |
| 07/13-14/12 | 18,179 | 3,458 | 9 | 3 | 413 | 0.89 | 11 | 40 | 108 | <5 | 798 |
| 07/16-17/12 | 38,557 | 10,396 | 6 | 3 | 364 | 0.69 | 9 | 35 | 87 | <5 | 700 |
| 07/18/12 | 29,758 | 5,834 | 6 | 4 | 426 | 1.0 | 10 | 42 | 125 | <5 | 836 |
| 07/18/12 | 29,913 | 5,116 | 7 | 4 | 417 | 1.1 | 10 | 41 | 123 | <5 | 822 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|----|-----|----|-----|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 07/19/12 | 25,427 | 5,311 | 7 | 4 | 423 | 0.95 | 10 | 42 | 127 | <5 | 839 |
| 07/23/12 | 20,427 | 2,639 | 5 | 4 | 449 | 1.0 | 10 | 43 | 127 | <5 | 886 |
| 07/23/12 | 15,350 | 4,021 | 7 | 4 | 461 | 1.1 | 10 | 42 | 129 | <5 | 856 |
| 07/23-24/12 | 12,801 | 4,000 | 8 | 3 | 441 | 0.83 | 9 | 38 | 111 | <5 | 826 |
| 07/23-26/12 | 20,884 | 3,197 | 6 | 4 | 444 | 1.2 | 10 | 42 | 125 | <5 | 851 |
| 07/26/12 | 19,984 | 4,336 | 7 | 4 | 460 | 1.7 | 11 | 42 | 126 | <5 | 862 |
| 07/27/12 | 32,063 | 9,292 | 6 | 3 | 378 | 0.77 | 9 | 35 | 88 | <5 | 717 |
| 07/30/12 | 32,360 | 10,600 | 6 | 3 | 384 | 0.89 | 10 | 36 | 91 | <5 | 725 |
| 08/01-04/12 | 35,767 | 10,161 | 7 | 3 | 372 | 0.92 | 11 | 38 | 94 | <5 | 756 |
| 08/03/12 | 17,419 | 2,590 | 9 | 3 | 419 | 0.93 | 9 | 37 | 113 | <5 | 801 |
| 08/03/12 | 10,950 | 2,932 | 7 | 3 | 428 | 1.1 | 9 | 38 | 102 | <5 | 821 |
| 08/06-07/12 | 33,023 | 11,880 | 7 | 3 | 386 | 0.95 | 11 | 39 | 95 | <5 | 778 |
| 08/07/12 | 38,666 | 3,972 | <5 | 3 | 425 | 1.0 | 11 | 38 | 115 | <5 | 838 |
| 08/20-23/12 | 40,887 | 9,984 | 7 | 3 | 398 | 0.72 | 12 | 40 | 101 | <5 | 717 |
| 08/20-21/12 | 39,178 | 7,337 | 9 | 3 | 387 | 0.89 | 11 | 41 | 128 | <5 | 843 |
| 08/21-24/12 | 29,029 | 3,215 | 9 | 3 | 414 | 0.82 | 10 | 40 | 122 | <5 | 855 |
| 08/22/12 | 22,030 | 1,814 | 9 | 3 | 424 | 0.86 | 10 | 40 | 124 | <5 | 860 |
| 08/24/12 | 26,644 | 3,732 | 7 | 4 | 419 | 0.98 | 12 | 45 | 132 | <5 | 885 |
| 08/29/12 | 20,871 | 4,126 | 6 | 4 | 400 | 1.1 | 11 | 42 | 126 | <5 | 844 |
| 09/06/12 | 26,535 | 4,398 | 6 | 4 | 413 | 1.0 | 11 | 42 | 127 | <5 | 826 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|----|-----|----|-----|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 09/12/12 | 28,795 | 5,094 | 6 | 4 | 409 | 1.1 | 10 | 41 | 127 | <5 | 823 |
| 09/12-13/12 | 24,255 | 2,115 | 8 | 3 | 412 | 0.98 | 9 | 37 | 113 | <5 | 795 |
| 09/15/12 | 28,933 | 5,834 | 6 | 3 | 400 | 1.1 | 11 | 40 | 123 | <5 | 811 |
| 09/16/12 | 27,776 | 5,514 | 7 | 4 | 414 | 1.1 | 11 | 42 | 132 | <5 | 901 |
| 09/19/12 | 36,459 | 12,921 | 6 | 3 | 411 | 0.84 | 14 | 42 | 103 | <5 | 863 |
| 09/19/12 | 26,243 | 4,972 | 8 | 3 | 411 | 0.79 | 11 | 41 | 104 | <5 | 869 |
| 09/24/12 | 28,941 | 4,824 | 7 | 4 | 438 | 0.77 | 12 | 45 | 137 | <5 | 898 |
| 09/24-29/12 | 43,739 | 11,163 | 5 | 3 | 448 | 0.29 | 13 | 41 | 114 | <5 | 878 |
| 09/29/12 | 28,073 | 4,782 | 6 | 3 | 415 | 0.55 | 11 | 41 | 102 | <5 | 836 |
| 10/01/12 | 30,717 | 5,540 | 7 | 3 | 418 | 0.64 | 11 | 41 | 99 | <5 | 831 |
| 10/01-05/12 | 40,608 | 9,753 | <5 | 3 | 429 | 0.91 | 13 | 40 | 120 | <5 | 892 |
| 10/04/12 | 43,160 | 3,612 | <5 | 3 | 431 | 0.67 | 13 | 39 | 105 | <5 | 840 |
| 10/06/12 | 37,508 | 8,232 | 5 | 3 | 408 | 1.0 | 12 | 41 | 121 | <5 | 860 |
| 10/08-10/12 | 36,725 | 8,511 | 6 | 3 | 445 | 0.89 | 10 | 41 | 123 | <5 | 928 |
| 10/11-12/12 | 34,332 | 8,806 | 8 | 3 | 407 | 1.0 | 10 | 40 | 116 | <5 | 824 |
| 10/17/12 | 32,840 | 5,697 | 6 | 3 | 402 | 0.86 | 11 | 40 | 98 | <5 | 850 |
| 11/07/12 | 25,858 | 6,301 | 7 | 3 | 421 | 0.94 | 8 | 40 | 117 | <5 | 830 |
| 11/08/12 | 37,511 | 3,697 | <5 | 2 | 379 | 0.92 | 12 | 39 | 95 | <5 | 761 |
| 11/08-10/12 | 13,681 | 2,800 | 8 | 3 | 418 | 0.83 | 10 | 40 | 125 | <5 | 850 |
| 11/09-10/12 | 26,659 | 3,716 | 8 | 3 | 375 | 0.85 | 9 | 36 | 112 | <5 | 745 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|-----------------------|--------------------|----|----|-----|------|----|----|-----|----|-----|
| | ----- mg/dry kg ----- | | | | | | | | | | |
| 11/13/12 | 27,693 | 4,282 | 8 | 3 | 402 | 0.93 | 9 | 38 | 122 | <5 | 800 |
| 11/14-15/12 | 22,275 | 2,396 | 8 | 3 | 414 | 0.96 | 9 | 40 | 127 | <5 | 832 |
| 11/15/12 | 24,025 | 4,126 | 9 | 3 | 391 | 0.88 | 10 | 37 | 117 | <5 | 781 |
| 11/16/12 | 25,641 | 4,526 | 8 | 3 | 398 | 0.77 | 10 | 38 | 107 | <5 | 761 |
| 11/19/12 | 28,794 | 4,710 | 7 | 3 | 402 | 0.72 | 10 | 39 | 98 | <5 | 792 |
| 11/19-23/12 | 33,075 | 4,614 | 7 | 3 | 422 | 1.4 | 10 | 43 | 108 | <5 | 852 |
| 11/20-21/12 | 29,116 | 4,086 | 9 | 3 | 436 | 0.92 | 10 | 42 | 123 | <5 | 873 |
| 11/20/12 | 28,806 | 4,180 | 9 | 3 | 409 | 0.85 | 9 | 40 | 115 | <5 | 817 |
| 11/23/12 | 32,168 | 5,198 | 7 | 3 | 419 | 0.81 | 10 | 42 | 106 | <5 | 839 |
| 11/26/12 | 34,826 | 5,909 | 7 | 3 | 407 | 0.83 | 11 | 40 | 95 | <5 | 802 |
| 11/26-28/12 | 27,921 | 3,461 | 10 | 3 | 394 | 0.87 | 9 | 37 | 111 | <5 | 802 |
| 11/30/12 | 41,302 | 6,205 | 5 | 3 | 426 | 0.95 | 14 | 41 | 114 | <5 | 863 |
| 12/01/12 | 34,854 | 4,341 | <5 | 2 | 377 | 1.0 | 12 | 37 | 96 | <5 | 741 |
| 12/03/12 | 35,729 | 7,719 | 5 | 3 | 435 | 0.95 | 11 | 39 | 118 | <5 | 866 |
| 12/03/12 | 29,790 | 5,504 | 7 | 3 | 414 | 1.5 | 11 | 40 | 101 | <5 | 816 |
| 12/04/12 | 39,762 | 3,686 | <5 | 2 | 388 | 1.0 | 12 | 41 | 92 | <5 | 743 |
| 12/05/12 | 23,690 | 4,268 | 9 | 3 | 456 | 0.95 | 11 | 44 | 125 | <5 | 903 |
| 12/05/12 | 18,872 | 2,674 | 8 | 3 | 413 | 0.84 | 10 | 40 | 114 | <5 | 846 |
| 12/06/12 | 17,875 | 2,753 | 11 | 3 | 392 | 0.92 | 9 | 37 | 110 | <5 | 788 |
| 12/12/12 | 49,734 | 7,750 | <5 | 2 | 620 | 0.88 | 8 | 55 | 46 | <5 | 735 |

TABLE 13 (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 2012

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------------|-----------------------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| | ----- mg/dry kg ----- | | | | | | | | | | |
| 12/12/12 | 31,651 | 4,436 | 8 | 3 | 402 | 0.74 | 10 | 40 | 98 | <5 | 788 |
| Minimum | 10,950 | 676 | <5 | 2 | 283 | 0.29 | 7 | 29 | 30 | <5 | 561 |
| Mean ¹ | 30,920 | 5,723 | 7 | 3 | 405 | 0.91 | 10 | 40 | 107 | <5 | 794 |
| Maximum | 67,939 | 14,391 | 11 | 4 | 629 | 2.2 | 14 | 67 | 137 | <5 | 1,080 |
| 503 Limit | NL ² | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

¹In calculating each mean, any value less than the reporting limit was considered the reporting limit.

²No limit.

TABLE 14: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2012

| Month | Average Temperature | Average Detention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3 ¹ |
|-----------|---------------------|------------------------|-------------------------------------|--|
| | ---- °F ---- | --- days --- | | --- days --- |
| January | 97.2 | 35.8 | yes | 15.0 |
| February | 97.3 | 27.4 | yes | 15.0 |
| March | 97.7 | 25.3 | yes | 15.0 |
| April | 97.7 | 30.3 | yes | 15.0 |
| May | 97.4 | 24.4 | yes | 15.0 |
| June | 98.2 | 26.9 | yes | 15.0 |
| July | 98.8 | 35.4 | yes | 15.0 |
| August | 98.6 | 30.2 | yes | 15.0 |
| September | 98.5 | 54.1 | yes | 15.0 |
| October | 98.2 | 35.0 | yes | 15.0 |
| November | 97.9 | 33.6 | yes | 15.0 |
| December | 98.2 | 43.9 | yes | 15.0 |

¹For anaerobic digestion at average temperature achieved.

TABLE 15: SITES THAT UTILIZED STICKNEY WATER RECLAMATION PLANT AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2012

| User | Use/Location |
|--|---|
| Benet Accademy, Lisle | Athletic fields |
| Chicago Park District, Chicago | Athletic fields - Horner, Smith, West Lawn Parks |
| Cinder Ridge Golf Course, Wilmington | Golf course |
| Coyote Run Golf Course , Flossmoor | Golf course |
| Downers Grove High School, Downers Grove | Athletic fields |
| Frankfort Square Park District, Frankfort | Athletic fields - Union Creek Community Park |
| Franklin Park Park District, Franklin Park | Athletic fields - Birch, Chestnut, North Parks Park |
| Hanover Park Park District, Hanover Park | Athletic fields - Harbors Park East |
| Hinsdale Park District, Hinsdale | Athletic fields - KLM, Peirce, Veeck Parks |
| Hubble Middle School, Warrenville | Athletic fields |
| Joliet Township High School, Joliet | Athletic fields |
| Lemont Park District, Lemont | Athletic fields - Covington Knolls Park |
| Lisle Park District, Lisle | Athletic fields - Athletic Community Park |
| Lombard Park District, Lombard | Athletic fields - Lombard Park |
| Mid Iron Golf Course, Lemont | Golf course |
| Midlothian Park District, Midlothian | Athletic fields - Memorial Park |
| Northfield Park District, Northfield | Athletic fields - Willow Park |
| Oak Lawn Park District, Oak Lawn | Athletic fields - Centennial Park, Memorial Park |
| River Trails Park District, Mt. Prospect | Athletic fields, landscaping - Marvin S. Weiss Community Center |

TABLE 15 (Continued): SITES THAT UTILIZED STICKNEY WATER RECLAMATION PLANT AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2012

| User | Use/Location |
|--|--|
| River Trails Park District, Prospect Heights | Athletic fields - Willow Trails Park |
| River Trails Park District, Mt. Prospect | Athletic fields, landscaping - Burning Bush Community Center |
| Romeoville Park District, Romeoville | Athletic fields - Volunteer Park |
| St. Charles Park District, St. Charles | Athletic fields - James O. Breen Park |
| St. Linus School, Oak Lawn | Athletic fields |
| Stickney Water Reclamation Plant, Cicero | Landscaping |
| Tinley Park Park District, Tinley Park | Athletic fields - Bristol, Centennial, Vogt Wood Parks |
| Twin Orchard Golf Club, Long Grove | Golf course |
| Village Greens, Woodridge | Athletic fields |
| Village of Orland Hills | Athletic fields - Ridgegate Park |
| Waukegan Park District, Waukegan | Athletic fields - Waukegan Park |
| West Chicago Park District, West Chicago | Athletic fields - Cornerstone Park |
| York Center Park District, Lombard | Athletic fields - Lake Yelenich Park |

TABLE 16: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO LAND IN 2012

| Sample Date | TKN | NH ₃ -N | TVS | TVS ¹ | | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|-----------------------|--------------------|------|------------------|----|----|-----|------|----|----|-----|----|-----|----|
| | | | | Reduction | | | | | | | | | | |
| | ----- mg/dry kg ----- | | | ----- % ----- | | | | | | | | | | |
| 06/05/12 | 23,991 | 3,064 | 43.0 | 56.2 | 8 | 3 | 420 | 1.1 | 13 | 46 | 106 | <5 | 802 | |
| 06/06-08/12 | 25,402 | 2,854 | 43.8 | 49.0 | 7 | 3 | 397 | 0.67 | 10 | 38 | 93 | <5 | 730 | |
| 06/11-15/12 | 22,071 | 2,987 | 43.1 | 56.0 | 8 | 3 | 429 | 0.94 | 11 | 41 | 109 | <5 | 824 | |
| 06/26/12 | 25,005 | 3,614 | 42.9 | 56.2 | 8 | 3 | 476 | 0.95 | 11 | 45 | 113 | <5 | 929 | |
| 06/27-28/12 | 17,351 | 2,897 | 44.4 | 47.8 | 7 | 3 | 429 | 0.79 | 11 | 43 | 98 | <5 | 847 | |
| 07/30-31/12 | 10,478 | 2,137 | 40.3 | 52.3 | 8 | 3 | 448 | 1.4 | 10 | 40 | 122 | <5 | 836 | |
| 08/06/12 | 21,550 | 3,012 | 42.4 | 48.0 | 9 | 3 | 422 | 1.0 | 11 | 41 | 125 | <5 | 852 | |
| 09/12/12 | 21,452 | 696 | 40.2 | 52.5 | 7 | 3 | 408 | 0.92 | 9 | 38 | 116 | <5 | 797 | |
| 09/21/12 | 18,134 | 527 | 36.5 | 59.4 | 10 | 3 | 404 | 1.0 | 9 | 39 | 128 | <5 | 866 | |
| 09/26-28/12 | 21,152 | 793 | 40.9 | 51.1 | 10 | 3 | 444 | 0.95 | 10 | 40 | 126 | <5 | 871 | |
| 10/01-03/12 | 23,316 | 576 | 40.9 | 51.1 | 8 | 3 | 441 | 0.72 | 10 | 41 | 125 | <5 | 892 | |
| 10/03/12 | 34,070 | 5,083 | 46.1 | 39.7 | 8 | 3 | 434 | 0.83 | 12 | 41 | 115 | <5 | 846 | |
| 10/08-11/12 | 27,798 | 3,452 | 42.3 | 48.3 | 10 | 3 | 443 | 1.3 | 9 | 43 | 124 | <5 | 876 | |
| 10/11-12/12 | 26,576 | 3,479 | 42.0 | 48.9 | 11 | 3 | 421 | 1.1 | 8 | 39 | 124 | <5 | 826 | |
| 10/17/12 | 22,911 | 2,530 | 39.8 | 53.4 | 8 | 4 | 459 | 1.1 | 11 | 44 | 134 | <5 | 948 | |
| 11/01-02/12 | 23,463 | 3,194 | 41.7 | 49.6 | 7 | 3 | 415 | 1.1 | 9 | 39 | 121 | <5 | 812 | |
| 11/09/12 | 20,897 | 2,987 | 38.9 | 55.0 | 7 | 3 | 414 | 0.99 | 10 | 40 | 128 | <5 | 831 | |
| 11/13-16/12 | 22,854 | 2,753 | 43.3 | 46.1 | 8 | 3 | 414 | 0.93 | 10 | 39 | 125 | <5 | 820 | |
| 11/20/12 | 27,274 | 3,456 | 43.1 | 46.5 | 8 | 3 | 423 | 0.84 | 11 | 40 | 119 | <5 | 835 | |

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TABLE 16 (Continued): CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO LAND IN 2012

| Sample Date | TKN | NH ₃ -N | TVS | TVS ¹ | | | | | | | | | |
|-------------------|-----------------------|--------------------|---------------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| | | | | Reduction | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
| | ----- mg/dry kg ----- | | ----- % ----- | ----- dry kg ----- | | | | | | | | | |
| 11/28/12 | 29,646 | 3,345 | 40.9 | 51.1 | 10 | 3 | 414 | 1.1 | 11 | 39 | 117 | <5 | 814 |
| Minimum | 10,478 | 527 | 36 | 40 | 7 | 3 | 397 | 0.67 | 8 | 38 | 93 | <5 | 730 |
| Mean ² | 23,270 | 2,672 | 42 | 51 | 8 | 3 | 428 | 0.99 | 10 | 41 | 118 | <5 | 843 |
| Maximum | 34,070 | 5,083 | 46 | 59 | 11 | 4 | 476 | 1.4 | 13 | 46 | 134 | <5 | 948 |
| 503 Limit | NL ³ | NL | NL | 38 | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

¹Total volatile solids for digester feed processed during 9/9/07 – 11/30/11 were used to calculate TVS reductions.

²In calculating each mean, any value less than the reporting limit was considered the reporting limit.

³No limit.

TABLE 17: MICROBIOLOGICAL ANALYSIS OF BIOSOLIDS¹ GENERATED BY NON-COMPLIANT PROCESS TO FURTHER REDUCE PATHOGENS-EQUIVALENT CODIFIED PROCESSING TRAINS AT THE STICKNEY WATER RECLAMATION PLANT DURING AUGUST 2011 THROUGH JULY 2012

| Sample Date ² | Lagoon Source | Total Solids --- % --- | Fecal Coliform ----- MPN ⁴ /g ----- | Sample Date ³ | Helminth Ova --- No./4g --- | Enteric Virus --- PFU ⁵ /4g --- |
|--------------------------|---------------|---------------------------|---|--------------------------|--------------------------------|---|
| 08/17/11 | 27 | 76.3 | 8 | 08/17/11 | <0.0800 | <0.8000 |
| 08/24/11 | 25 | 73.1 | 80 | 08/17/11 | <0.0800 | <0.8000 |
| 04/26/12 | 25 | 67.1 | 150 | 10/19/11 | <0.0800 | <0.8000 |
| 05/31/12 | 29 | 89.0 | 2 | 05/23/12 | <0.0800 | <0.8000 |
| 06/27/12 | 27 | 84.8 | 130 | 05/09/12 | <0.0800 | <0.8000 |
| 07/11/12 | 27 | 83.6 | 81 | 06/14/12 | <0.0800 | <0.8000 |

¹All biosolids satisfied Part 503 Class A requirements.

²Sample dates apply to FC samples only.

³Samples for HO and V analyses for each batch of non-PFRP biosolids were collected before the material was dried and used in 2012.

⁴Most probable number.

⁵Plaque-forming unit.

TABLE 18: MICROBIOLOGICAL ANALYSIS OF CLASS A BIOSOLIDS
 GENERATED AT THE STICKNEY WATER RECLAMATION PLANT
 AND SAMPLED PRIOR TO SHIPMENT TO URBAN LAND IN 2012

| Sample Date | Lagoon Source | Total Solids | Fecal Coliform |
|-------------|---------------|---------------|--------------------------------|
| | | ----- % ----- | ----- MPN ¹ /g ---- |
| 04/26/12 | 25 | 67.1 | 150 |
| 05/23/12 | 25 | 76.8 | 650 |
| 05/31/12 | 29 | 89.0 | 2 |
| 06/27/12 | 27 | 84.8 | 130 |
| 07/11/12 | 27 | 83.6 | 81 |
| 08/08/12 | 27 | 60.0 | 840 |
| 08/22/12 | 27 | 65.3 | 100 |
| 09/05/12 | 27 | 59.0 | 9 |
| 10/03/12 | 27 | 71.2 | 40 |
| 10/03/12 | 27 | 58.4 | 5 |
| 10/17/12 | 27 | 57.4 | 66 |
| 11/07/12 | 27 | 64.8 | 44 |

¹Most probable number.

Site-Specific Process to Further Reduce Pathogens

As previously stated, the USEPA Region 5 designated, on a site-specific basis, two of the Stickney WRP biosolids processing trains as equivalent to a PFRP. All of the Stickney WRP's biosolids generated or utilized in 2012 were not compliant with the criteria in the codified operating parameters of the PFRP-equivalent process trains with respect to the digester holding time. No PFRP-compliant biosolids were available for testing according to the PFRP certification. Therefore, all biosolids generated were tested for pathogens according to Section 503.32a5.

Centrifuge Cake Biosolids to Pelletizing Facility

In 2012, the Stickney WRP sent a total of 36,955 dry tons of centrifuge cake biosolids to the pelletizing facility owned and operated by Metropolitan Biosolids Management, LLC, Stickney, Illinois under Contract No. 98-RFP-10. Metropolitan Biosolids Management is responsible for final utilization, monitoring, and reporting requirements for these biosolids.

**METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO
BIOSOLIDS DISTRIBUTED TO LANDFILLS UNDER 40 CODE OF FEDERAL
REGULATIONS PARTS 258 AND 261**

Biosolids from two of the District's WRPs (Stickney and Calumet) were sent to landfills in 2012 for disposal. Biosolids shipped to these landfills were analyzed as specified in 40 CFR Part 261 to establish the nonhazardous nature of this material for co-disposal. Analytical results, including toxic characteristic leaching procedure constituents, polychlorinated biphenyls, cyanide, sulfide, and paint filter test, are submitted to the landfill company to satisfy the requirements of their IEPA permit. District biosolids have 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). In 2012, a total of 1,089 dry tons of District biosolids (874 dry tons from the Stickney Plant and 215 dry tons from the Calumet Plant) was co-disposed with municipal solid wastes at non-hazardous waste landfills.

APPENDIX I

BIOSOLIDS MANAGEMENT PROGRAMS OF THE METROPOLITAN WATER
RECLAMATION DISTRICT OF GREATER CHICAGO UNDER
40 CODE OF FEDERAL REGULATIONS PART 503

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET

CHICAGO, ILLINOIS 60611

312 / 751-5600

Cecil Lue-Hing
Director of R & D
312 / 751-5190

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January 28, 1994

Mr. Michael J. Mikulka
Chief of Compliance Section
United States Environmental
Protection Agency
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Mr. Mikulka:

Subject: Sludge Management Programs of the Metro-
politan Water Reclamation District of
Greater Chicago Under 40 CFR Part 503

The Metropolitan Water Reclamation District of Greater Chicago (District) has three sludge management programs that employ sewage sludge applications to land under the 40 CFR Part 503 Regulations. These programs are the Fulton County, Illinois land application site, the Hanover Park Fischer Farm at the Hanover Park Water Reclamation Plant, and the Controlled Solids Distribution Program. The District feels that it is important to define its interpretation of the 40 CFR Part 503 Regulations with respect to each of these programs.

On July 22, 1993, we sent Mr. John Colletti, then Acting Sludge Coordinator, a letter (copy attached) expressing our concerns regarding compliance monitoring, record keeping and reporting under 40 CFR Part 503 for each of these programs.

The District believes that its existing sludge management programs are conservative, and that monitoring and environmental protection measures far exceed the requirements of the Part 503 Regulations. This letter is designed to inform you of the conservative nature of these sludge management programs, and the fact that they are in complete compliance with the spirit and specific language of the Part 503 Regulations.

AI-1

Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

Fulton County Illinois Site

The District considers the application of sewage sludge at its Fulton County, Illinois site to be under "Land Application" section (subpart B) of the Part 503 Regulations. Sewage sludge is applied at rates approved by the Illinois Environmental Protection Agency (IEPA) for reclamation of disturbed strip-mine spoils. Under the current permit with the IEPA (Permit No. 1993-SC-4294 issued December 3, 1993), sewage sludge is being applied at an agronomic rate to supply nutrients for productive crop yields.

Sewage sludge applied at the site will contain metal concentrations below the pollutant limits established in Table 3 of Part 503.13, subsection b(3) of the regulations. As a result, the Part 503 cumulative pollutant limits in Table 4 of Part 503.13 subsection b(4) will not apply to future applications of sewage sludge at the Fulton County site.

Sewage sludge applied at the Fulton County site will far exceed the Class B pathogen requirements by conservatively achieving operating temperature and detention times in excess of the Part 503 anaerobic digester operating requirements (§503.32b3).

The Part 503 vector attraction reduction requirements will be easily met since the District consistently reduces the volatile solids content of the Fulton County sludge far greater than the required 38 percent (§503.33b1).

The Part 503 Regulations do not specify what kind of crop can be grown under land application. Crops typically grown at the site are corn, winter wheat, and hay. Corn and winter wheat grown on sludge application fields are sold for ethanol production, and animal feed. Hay grown on application fields receiving supernatant from on-site lagoons containing sewage sludge is currently harvested three times per year, as specified under the existing IEPA permit. This hay is used as animal feed or mulch for project reclamation activities.

Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

The Class B pathogen requirements for the supernatant application field where hay is grown will be met by ensuring that supernatant application ceases 30 days before hay crop harvesting.

The Part 503 Regulations do not specify what kind of surface water protection system is required for land application. The permitting authority, on a case-by-case basis, may impose more stringent requirements when necessary to protect the public health and the environment. Sewage sludge application fields at the Fulton County site are bermed, and have runoff retention basins designed to capture all runoff.

Waters released from the 65 retention basins at the site must, and do meet standards specified in the existing IEPA discharge permit for pH, total suspended solids, fecal coliforms, and biochemical oxygen demand. Although not required in the Part 503 Regulations, these restrictions show that District operations at the Fulton County site are designed to minimize contamination of surface waters.

Supernatant application fields at the site are not bermed. However, supernatant application in the fields is controlled so that it does not contaminate indigenous ponds and strip-mined reservoirs. Although such restrictions are not required in the Part 503 Regulations, they prevent contamination of waters used by wildlife and water fowl.

The Class B pathogen requirements in the Part 503 Regulations dictate that public access to application fields be limited. The District will comply with the Class B pathogen requirement for restricted public access by a combination of fencing, posted signs, locked gates, and security guards. These measures are conservative and far exceed the public access requirements in the Part 503 Regulations.

The Part 503 Regulations prohibit the adverse modification or destruction of endangered species or their critical habitat. The District has no evidence to indicate that sludge applications have affected the habitat of wildlife species at the site.

Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

The Part 503 Regulations do not specifically prohibit bulk sewage sludge application to flooded, frozen, or snow covered lands. The regulations state, however, that any sludge applied to these lands may not enter surface waters or wet lands. The District does not apply sewage sludge to floodplains, frozen, or snow covered ground at the Fulton County site. The site permit with the IEPA prohibits applying sewage sludge under these conditions.

The Part 503 Regulations state that bulk sewage sludge may not be applied within 10 meters of a surface water body unless authorized by a permit. The District does not apply sewage sludge within 10 meters of the waters of the state. The District's IEPA permit specifies that sludge shall not be applied to land which lies within 200 feet (61 meters) of surface waters.

The Part 503 Regulations require that the land application of bulk sewage sludge may not exceed the agronomic rate for the particular agricultural, forest, or public contact site. In some cases the permitting authority may specifically authorize the application of sludge to a reclamation site at an annual rate that exceeds the agronomic rate. The District is currently applying sewage sludge at an application rate of 57 dry tons per acre per year on bermed sludge application fields, and 25 dry tons per acre per year on nonbermed fields. Technical justification for the sludge application rate of 57 dry tons per acre per year is given in the attachment entitled "Fulton County." This application rate is approved under the IEPA permit.

Hanover Park Fischer Farm

The District considers the application of sewage sludge at its Hanover Park Fischer Farm site to fall under the "Land Application" section (subpart B) of the Part 503 Regulations. Sewage sludge is applied at a rate of 20 dry tons per acre per year as specified in the IEPA permit (Permit No. 1992-SC-0942 issued August 18, 1992) for the site.

Sewage sludge applied at the site is far below the pollutant concentration limits established in Table 3 of Part 503.13, subsection b(3) of the regulations for metals.

Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

Sewage sludge applied at the Hanover Park Fischer Farm site conservatively meets the Class B pathogen requirements by either fecal coliform analysis (§503.32b2), or by meeting the Part 503 anaerobic digester operating temperature and detention time requirements (§503.32b3).

The District will ensure that the Part 503 vector attraction reduction requirements are met by electing to sub-surface inject all sludge applied to the site.

The Part 503 Regulations do not specify what kind of crop can be grown under land application. A straw crop is currently being grown at the site, with the straw removed and the grain left in the field.

The Part 503 Regulations do not state what type of surface and groundwater protection system is required. All fields at the site are bermed and all surface water is collected. The entire site is endowed with an extensive system of drainage tile, which collects all the soil percolate. The runoff and percolate are returned to the water reclamation plant for tertiary treatment.

The District's sludge application to land program at the Hanover Park Water Reclamation Plant far exceed any surface water and groundwater protection requirement specified in the Part 503 Regulations.

The Part 503 Class B pathogen requirements limit public access to the sludge application fields. The District operations at Hanover Park far exceed the Part 503 requirements since the entire site is fenced with locked gates and security guards.

The Part 503 Regulations prohibit the adverse modification or destruction of endangered species or their critical habitat. The District has no evidence that sludge applications have affected the habitat of wildlife species at the site.

The Part 503 Regulations do not prohibit bulk sewage sludge application to flooded, frozen, or snow covered lands.

Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

The regulations state, however, that any sludge applied to these lands may not enter surface waters or wetlands. The District does not apply sewage sludge to floodplains, frozen, or snow covered ground at the Hanover Park Fischer Farm. The site IEPA permit prohibits the application of sewage sludge under these conditions.

The Part 503 Regulations state that bulk sewage sludge may not be applied within 10 meters of a surface water body unless authorized by a permit. The District does not apply sewage sludge within 10 meters of the waters of the state. The site application fields are bermed and surface runoff is collected and returned to the plant for tertiary treatment. This management practice far exceeds the Part 503 requirements.

The Part 503 Regulations require that the land application of bulk sewage sludge may not exceed the agronomic rate for the particular agricultural, forest, or public contact site. The District is applying sewage sludge at an annual application rate of 20 dry tons per acre. Technical justification for this application rate is given in the attachment entitled "Hanover Park," and is approved under the IEPA permit.

Controlled Solids Distribution

The District has a sludge management program called the Controlled Solids Distribution Program. Sewage sludge under this program is given away for beneficial use at selected sites for landscaping and soil enrichment. The application of sewage sludge under this program is covered by IEPA Permit No. 1990-SC-1100.

Through the District's efforts to reduce the metals in the sludge with a vigorous industrial waste control program, the District's sewage sludge will be well below the metal limits specified in Part 503.13, subsection b(3), (Table 3). The anaerobic digesters producing sewage sludge for the District's Controlled Solids Distribution Program have detention times and operating temperatures which easily satisfy the Part 503 Class B pathogen requirements. The sewage sludge

Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

destined for the Controlled Solids Distribution Program receives extensive treatment to reduce its volatile solids content, which far exceed the 38 percent volatile solids reduction requirement of the Part 503 vector attraction reduction requirements.

The Part 503 Regulations for land application of sewage sludge do not specify what kind of vegetation can be grown at sites receiving sludge. The District requires that only nonfood chain vegetation be grown at all sites receiving sludge under the Controlled Solids Distribution Program. This far exceeds the Part 503 requirements.

The Part 503 Regulations under 503.32(b) for Class B pathogen reduction requires that public access be restricted for one year if the site has a high potential for public exposure, and public access be restricted for 30 days at a site with a low potential for public exposure. The District will post signs and/or other means to restrict public access to these sites.

The Part 503 Regulations prohibit the adverse modification or destruction of endangered species or their critical habitat. The District has no evidence that endangered species are present in areas receiving sewage sludge under the Controlled Solids Distribution Program.

The Part 503 Regulations do not prohibit bulk sewage sludge application to flooded, frozen, or snow covered lands. The regulations state, however, that any sludge application to these lands may not enter surface waters or wetlands. The District does not apply sewage sludge to floodplains, frozen, or snow covered ground at sites receiving sludge under its Controlled Solids Distribution Program. The District's IEPA permit prohibits these activities.

The Part 503 Regulations has a specific management practice that bulk sewage sludge may not be applied within 10 meters of a surface water body unless authorized by a permit. The District does not apply sewage sludge within 10 meters of the waters of the state. The District's IEPA permit is more restrictive in that it specifies that sludge cannot be applied to land which lies within 200 feet (61 meters) of surface waters.

January 28, 1994

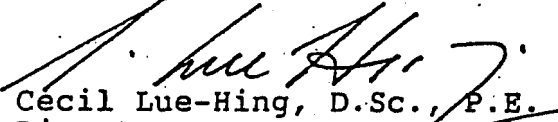
Subject: Sludge Management Programs of the Metropolitan Water Reclamation District of Greater Chicago Under 40 CFR Part 503

The Part 503 Regulations require that the land application of bulk sewage sludge may not exceed the agronomic rate for a particular agricultural, forest, or public contact site. In some instances, the permitting authority for a reclamation site may specifically authorize the application of sludge at an annual rate that exceeds the agronomic rate. At these sites, sewage sludge will either be applied at an agronomic application rate, or a reclamation rate depending upon the needs of the site. The District's current permit with the IEPA allows for a higher application rate related to site needs. Under the Part 503 Regulations, as noted in the attachment entitled "Fulton County," the permitting authority may authorize a variance from the agronomic rate by permit. The District has received this variance from the IEPA in its current permit for the Controlled Solids Distribution Program.

The above mentioned sludge management programs are an important part of the District's operations and planning requirements for future sludge management activities. As described, the District feels that these programs comply with the requirements described in the Part 503 Regulations.

If you require additional information or have questions, don't hesitate to telephone me at (312) 751-5190.

Very truly yours,


Cecil Lue-Hing, D.Sc., P.E.
Director
Research and Development

CLH:RIP:ns
Attachments
cc: Dalton
O'Connor
DiVita
Murray
Alan Keller, IEPA
Tim Kluge, IEPA
Ken Rogers, IEPA
Ash Sajjad, USEPA
Bill Tong, USEPA

APPENDIX II

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.

AII-1



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.

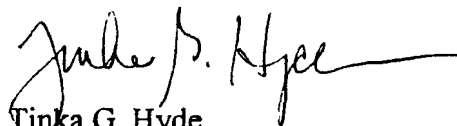
One of the Class A options is to treat the sewage sludge by a process equivalent to a process listed in the 503 Rules, Appendix B. To be equivalent, a sewage sludge treatment process must be able to consistently reduce pathogens to levels comparable with the processes listed in Appendix B. Under the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

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Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.5190 f: 312.751.5194

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

Ms. Tinka Hyde

2

September 14, 2012

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,

A handwritten signature in black ink, appearing to read "Tinka G. Hyde". The signature is stylized with a long horizontal line extending to the right.

for Tinka G. Hyde
Director, Water Division