

Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-6

ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR

2006

FEBRUARY 2007

Metropolitan Water Reclamation District of Greater Chicago
100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600

**ANNUAL BIOSOLIDS MANAGEMENT REPORT
FOR 2006**

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February 2007

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2006 REPORTING REQUIREMENTS
UNDER THE 40 CFR PART 503 REGULATIONS

Copies of this Report Number 07-6
are available on the District Web Site

Metropolitan Water Reclamation District of Greater Chicago

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February 16, 2007

Mr. Patrick Kuefler
Chief of Enforcement Section 2
USEPA – Region V
Water Enforcement and Compliance
Assurance Branch (WC-15J)
77 West Jackson Blvd.
Chicago, IL 60604-3590

Dear Mr. Kuefler:

Subject: 2006 Reporting Requirements Under the 40 CFR Part 503 Regulations

The Metropolitan Water Reclamation District of Greater Chicago (District) herein submits the 2006 records required under the 40 CFR Part 503 Regulations at Section 503.18, titled “Annual Biosolids Management Report for 2006.”

We believe this report satisfies the reporting requirements under the 40 CFR Part 503 Regulations.

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 503.32a6, 503.32a8, 503.32b2, 503.32b3, 503.33b1, 503.33b9, 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.”

Subject: 2006 Reporting Requirements Under the 40 CFR Part 503 Regulations

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

Very truly yours,

Louis Kollias
Director
Research and Development

LK:TCG:AC:spy

Attachment

cc w/att.: Aistars (USEPA)
Bramscher (USEPA)
Keller (IEPA)
Kluge (IEPA)
Garretson (IEPA)
Sulski (IEPA)
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Stuba
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ACKNOWLEDGEMENT

The assistance of the following individuals is greatly appreciated: Mr. Daniel Collins, Principal Civil Engineer, Lawndale Avenue Solids Management Area; Mr. Terrence Ballowe, Senior Civil Engineer, Calumet Solids Management Area; Ms. Katarzyna Lai, Assistant Engineer of Treatment Plant Operations I, John E. Egan Water Reclamation Plant (WRP); Mr. Carl Athas, Treatment Plant Operator II, Hanover Park WRP; Mr. George Kedl, Assistant Civil Engineer, Stickney WRP; Dr. Geeta Rijal, Microbiologist IV, Analytical Microbiology and Biomonitoring Section; Mr. John Chavich, Sanitary Chemist IV, John E. Egan Analytical Laboratory Section; Mr. Tom Liston, Sanitary Chemist IV, Calumet Analytical Laboratory Section; and Ms. Ellice Durham, Sanitary Chemist IV, of the Stickney Analytical Laboratory Section.

Special thanks are given to Ms. Sabina Yarn for the typing of 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.

FOREWORD

The data and information in this report fulfill the frequency of monitoring and the reporting requirements for Biosolids Management by the Metropolitan Water Reclamation District of Greater Chicago as specified in the United States Environmental Protection Agency's (USEPA) 40 CFR Part 503 Regulations for 2006.

INTRODUCTION

The Metropolitan Water Reclamation District of Greater Chicago (District) herein reports the 2006 records required under the 40 CFR Part 503 Regulations 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. 2005-SC-5073).
2. Hanover Park Fischer Farm Biosolids Application to Land Site (IEPA Permit No. 2002-SC-0672).
3. Controlled Solids Distribution Program (Biosolids Application to Land in the Chicago Area under IEPA Permit No. 2005-SC-3793).
4. Land Application to Farmland (Application of biosolids from Calumet, Stickney, and John E. Egan Water Reclamation Plants (WRPs) to farmland under IEPA Permit No. 2005-SC-5073).

The 40 CFR Part 503 Regulations require that the District report certain data. In the following sections, we have prepared a short description of the sludge processing and biosolids management operations at the District's seven WRPs. The Lemont, James C. Kirie, and North Side WRPs do not produce a final biosolids product, while the Calumet, Stickney, John E. Egan, and Hanover Park WRPs produced final biosolids products that were used beneficially or disposed of in 2006. In addition, we also discuss the uses for these biosolids, outline the data reporting requirements under the 40 CFR Part 503 Regulations, and present the required monitoring data in summary tables. The 2006 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 aged for distribution at a later time.

TABLE 1: 2006 PRODUCTION AND USES OF SLUDGE AND BIOSOLIDS

| Production and Use | Water Reclamation Plants | | | | | | |
|--------------------------------------|--------------------------|----------|------------|-------|---------------|-------|--------|
| | Stickney* | Calumet* | North Side | Egan* | Hanover Park* | Kirie | Lemont |
| | ----- Dry Tons ----- | | | | | | |
| Production** | 133,475 | 31,256 | 41,703 | 7,279 | 769 | 7,961 | 265 |
| Land Applied | 34,870 | 22,739 | 0 | 5,734 | 3,402 | 0 | 0 |
| Surface Disposal | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Landfill (Total) | 40,298 | 748 | 0 | 0 | 0 | 0 | 0 |
| Co-disposal | 2,427 | 748 | | | | | |
| Daily cover | 37,871 | 0 | | | | | |
| Final Cover | 0 | 0 | | | | | |
| Incinerated | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| To Other WRPs for Further Processing | 0 | 0 | 41,703 | 1,545 | 0 | 7,961 | 265 |
| Other*** | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

* Differences between biosolids production and total use or disposal in 2006 were due to a net withdrawal or storage in lagoons or drying areas, and processing of biosolids imported from other WRPs.

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

*** Trucked to Interstate Brands Corp., Schiller Park, Illinois, for seeding digesters.

LEMONT WRP

The Lemont WRP, located in Lemont, Illinois, has a design capacity of 3.4 mgd. Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatment. In 2006, the Lemont WRP produced 265 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 WRP

The James C. Kirie WRP, located in Des Plaines, Illinois, has a design capacity of 72 mgd. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatment. In 2006, the James C. Kirie WRP produced 7,961 dry tons of solids (Table 1), which were sent via force main to the John E. Egan WRP for further processing.

No final biosolids product is produced at this WRP.

NORTH SIDE WRP

The North Side WRP, located in Skokie, Illinois, has a design capacity of 333 mgd. Wastewater reclamation processes at the North Side WRP include primary (primary settling) and secondary (activated sludge process) treatment. In 2006, the North Side WRP produced 41,703 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 North Side WRP and biosolids conveyed from the John E. Egan WRP.

No final biosolids product is produced at this WRP.

JOHN E. EGAN WRP

The John E. Egan WRP, located in Schaumburg, Illinois, has a design 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 John E. Egan WRP are anaerobically digested. During winter or when the centrifuges are not operating, liquid digested biosolids are sent via sewers to the North Side WRP. Centrifuge centrate containing biosolids are also sent via sewers to the North Side WRP.

In 2006, the total biosolids production at the John E. Egan WRP was 7,279 dry tons (Table 1). This total includes biosolids generated from processing of sludge originating at the John E. Egan WRP as well as the sludge that was imported from the James C. Kirie WRP for further processing.

Summary of Use and Disposal at Landfills

In 2006, none of the biosolids generated at the John E. Egan WRP were sent to landfills.

Biosolids Conveyed to Other WRPs for Further Processing

In 2006, 948 dry tons of biosolids were pumped to North Side WRP. Of this amount, 760 dry tons were conveyed to the North Side WRP in centrifuge centrate and 188 dry tons were conveyed as liquid digested biosolids. In 2006, 597 dry tons of centrifuge cake biosolids were trucked to the Calumet Solids Management Area late in the year, and were placed in storage for the following application season.

Land Application of Centrifuge Cake Biosolids

In 2006, the John E. Egan WRP land applied a total of 5,734 dry tons of centrifuge cake biosolids to farmland under IEPA Permit No. 2005-SC-5073 through a contract with Synagro Midwest, Inc. This total consists of 4,092 dry tons trucked directly from the John E. Egan WRP and 1,642 dry tons that was temporarily stored at the Lawndale Avenue Solids Management Area before being land applied. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

All John E. Egan WRP centrifuge cake biosolids that were land applied in 2006 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 2), the Class B pathogen requirements of Section 503.32b2 (Table 3), and the vector attraction reduction requirements of Section 503.33b10. Table 2 also shows the biosolids nitrogen concentration data that were used by the land applier to compute the agronomic loading rates at the farmland sites.

The John E. Egan WRP did not have any additional requirement for reporting under Part 503 in 2006.

TABLE 2: NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|---------------------|--------|--------------------|------|-----|-----|------|----|-----|----|------|-------|
| -----mg/dry kg----- | | | | | | | | | | | |
| 01/25/2006 | 14,839 | 7,355 | <1.0 | 3.0 | 662 | 0.69 | 21 | 69 | 72 | <0.8 | 809 |
| 04/01/2006 | 32,445 | 5,843 | 4.1 | 3.4 | 794 | NA | 16 | 92 | 61 | <0.8 | 760 |
| 04/08/2006 | 35,836 | 4,879 | <1.0 | 3.7 | 840 | 2.3 | 17 | 96 | 65 | <0.8 | 802 |
| 04/15/2006 | 25,380 | 4,067 | <1.0 | 3.5 | 822 | NA | 15 | 90 | 53 | <0.8 | 770 |
| 04/22/2006 | 27,550 | 4,421 | <1.0 | 3.4 | 846 | NA | 17 | 89 | 50 | <0.8 | 780 |
| 04/29/2006 | 45,735 | 5,190 | <1.0 | 3.7 | 874 | NA | 17 | 89 | 56 | <0.8 | 803 |
| 05/03/2006 | 58,670 | 11,183 | <1.0 | 3.0 | 710 | 2.8 | 21 | 83 | 72 | 2.0 | 892 |
| 05/06/2006 | 32,280 | 4,138 | 1.3 | 3.5 | 888 | 1.4 | 17 | 127 | 57 | <0.8 | 768 |
| 05/13/2006 | 46,661 | 4,842 | 1.1 | 4.6 | 896 | NA | 18 | 87 | 48 | <0.8 | 844 |
| 05/20/2006 | 27,314 | 4,651 | <1.0 | 3.4 | 855 | NA | 17 | 83 | 46 | <0.8 | 832 |
| 05/27/2006 | 54,174 | 7,571 | <1.0 | 3.4 | 841 | NA | 16 | 78 | 44 | <0.8 | 817 |
| 06/03/2006 | 28,680 | 4,542 | 2.0 | 4.2 | 785 | NA | 16 | 82 | 55 | <0.8 | 806 |
| 06/06/2006 | 57,160 | 13,394 | <1.0 | 3.0 | 778 | 0.22 | 21 | 82 | 59 | 2.0 | 875 |
| 06/11/2006 | 42,884 | 4,395 | <1.0 | 3.9 | 859 | 2.5 | 16 | 79 | 44 | <0.8 | 865 |
| 06/17/2006 | 51,168 | 4,760 | 1.4 | 3.6 | 826 | NA | 15 | 73 | 47 | <0.8 | 854 |
| 06/24/2006 | 30,399 | 4,664 | 1.0 | 3.9 | 868 | NA | 18 | 80 | 47 | <0.8 | 967 |
| 07/01/2006 | 50,566 | 4,454 | <1.0 | 3.7 | 836 | NA | 19 | 82 | 45 | 5.9 | 1,042 |
| 07/08/2006 | 43,954 | 5,294 | 1.1 | 4.7 | 825 | 1.3 | 19 | 80 | 45 | 2.2 | 988 |
| 07/15/2006 | 41,303 | 5,865 | 4.7 | 4.2 | 802 | NA | 19 | 78 | 43 | <0.8 | 1,010 |
| 07/22/2006 | 34,821 | 5,845 | <1.0 | 3.3 | 856 | NA | 20 | 80 | 48 | 5.2 | 1,058 |

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TABLE 2 (Continued): NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|------|-----|-----|------|----|----|----|------|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 07/29/2006 | 41,815 | 5,923 | <1.0 | 3.3 | 874 | NA | 20 | 76 | 50 | 5.9 | 1,052 |
| 08/05/2006 | 42,355 | 6,592 | 1.6 | 3.1 | 812 | NA | 21 | 78 | 49 | <0.8 | 1,092 |
| 08/11/2006 | 51,043 | 5,287 | >1.0 | 3.2 | 710 | 2.0 | 19 | 91 | 60 | <0.8 | 722 |
| 08/12/2006 | 43,382 | 6,600 | 1.6 | 3.0 | 802 | 2.0 | 24 | 74 | 52 | <0.8 | 1,134 |
| 08/19/2006 | 40,931 | 6,079 | <1.0 | 3.2 | 815 | NA | 21 | 76 | 50 | <0.8 | 1,099 |
| 08/26/2006 | 30,288 | 5,088 | <1.0 | 3.3 | 811 | NA | 23 | 76 | 61 | <0.8 | 1,163 |
| 09/02/2006 | 19,465 | 2,761 | 1.1 | 3.4 | 825 | NA | 23 | 79 | 53 | <0.8 | 1,182 |
| 09/09/2006 | 22,196 | 3,117 | <1.0 | 3.3 | 903 | 1.7 | 23 | 79 | 58 | <0.8 | 1,236 |
| 09/16/2006 | 43,745 | 4,445 | <1.0 | 3.3 | 776 | NA | 23 | 70 | 58 | <0.8 | 1,120 |
| 09/23/2006 | 78,862 | 11,105 | <1.0 | 3.6 | 858 | NA | 24 | 79 | 87 | <0.8 | 1,134 |
| 09/30/2006 | 39,452 | 4,180 | <1.0 | 3.8 | 860 | NA | 25 | 75 | 58 | <0.8 | 1,107 |
| 10/07/2006 | 49,534 | 4,795 | 1.1 | 3.3 | 852 | 1.0 | 24 | 68 | 56 | <0.8 | 1,064 |
| 10/14/2006 | 51,439 | 5,076 | <1.0 | 3.6 | 762 | NA | 22 | 72 | 58 | <0.8 | 971 |
| 10/21/2006 | 30,783 | 3,427 | <1.0 | 3.4 | 847 | NA | 22 | 71 | 60 | 4.9 | 987 |
| 10/28/2006 | 34,622 | 7,009 | <1.0 | 3.4 | 784 | NA | 21 | 72 | 59 | <0.8 | 960 |
| 11/04/2006 | 35,422 | 4,099 | 5.2 | 3.3 | 746 | NA | 20 | 68 | 56 | <0.8 | 934 |
| 11/11/2006 | 20,446 | 4,418 | 5.1 | 3.0 | 698 | 0.68 | 18 | 60 | 51 | <0.8 | 857 |
| 11/18/2006 | 44,279 | 7,768 | 3.1 | 3.2 | 768 | NA | 21 | 67 | 60 | <0.8 | 932 |
| 11/25/2006 | 41,452 | 6,866 | 2.2 | 3.1 | 739 | NA | 19 | 64 | 62 | <0.8 | 858 |
| 12/02/2006 | 42,348 | 7,188 | 4.2 | 3.0 | 688 | NA | 18 | 64 | 47 | <0.8 | 823 |

TABLE 2 (Continued): NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|-----------------------|--------------------|------|-----|-------|------|----|-----|-----|------|-------|
| | ----- mg/dry kg ----- | | | | | | | | | | |
| Mean* | 39,642 | 5,709 | 2.5 | 3.5 | 810 | 1.5 | 20 | 79 | 55 | 1.4 | 944 |
| Minimum | 14,839 | 2,761 | <1.0 | 3.0 | 662 | 0.68 | 15 | 60 | 43 | <0.8 | 722 |
| Maximum | 78,862 | 13,394 | 5.2 | 4.7 | 903 | 2.5 | 25 | 127 | 87 | 5.9 | 1,236 |
| 503 Limit | NL | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

*In calculating the means, values less than the detection limit were considered as the detection limit.

NA = No analysis.

NL = No limit: not applicable.

TABLE 3: DIGESTER* TEMPERATURES AND DETENTION TIMES FOR BIOSOLIDS FROM THE JOHN E. EGAN WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Month | Average Temperature | Average Detention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3** |
|-----------|---------------------|------------------------|-------------------------------------|---|
| | ----°F---- | ----days---- | | ----days---- |
| January | 96 | 22.2 | yes | 15.0 |
| February | 96 | 23.2 | yes | 15.0 |
| March | 96 | 24.8 | yes | 15.0 |
| April | 96 | 25.7 | yes | 15.0 |
| May | 96 | 25.9 | yes | 15.0 |
| June | 96 | 25.9 | yes | 15.0 |
| July | 96 | 27.7 | yes | 15.0 |
| August | 97 | 32.7 | yes | 15.0 |
| September | 97 | 27.6 | yes | 15.0 |
| October | 96 | 28.0 | yes | 15.0 |
| November | 96 | 24.8 | yes | 15.0 |
| December | 97 | 24.6 | yes | 15.0 |

* Data are for primary Digesters A and C and do not include additional digestion achieved in secondary Digesters B and D.

** For anaerobic digestion at average temperature achieved.

HANOVER PARK WRP

Treatment Plant and Biosolids Process Train Description

The Hanover Park WRP, located in Hanover Park, Illinois, has a design capacity 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 an on-site farm, formerly the Fischer Farm. All of the biosolids produced by the Hanover Park WRP are land applied at the Fischer Farm, which is contained on the plant grounds.

Land Application of Liquid Biosolids

In 2006, the total biosolids production at this WRP was 769 dry tons (Table 1). In 2006, the Hanover Park WRP land applied a total of 3,402 dry tons of biosolids at the Hanover Park Fischer Farm site under the IEPA Permit No. 2002-SC-0672. This included 1,377 dry tons of liquid biosolids and supernatant stored in a lagoon and 2,025 dry tons of untreated sediment from a combined sewer overflow retention pond. The quantity of land applied biosolids (1,377 dry tons) was higher than the quantity of biosolids produced in 2006 due to 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 six times per year.

All Hanover Park WRP lagooned biosolids that were land applied in 2006 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 4), the Class B pathogen anaerobic digester time and temperature requirements 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 Mr. Michael J. Mikulka dated January 28, 1994 (Appendix I).

TABLE 4: NITROGEN AND METALS CONCENTRATIONS IN BIOSOLIDS FROM THE HANOVER PARK WATER RECLAMATION PLANT APPLIED TO THE FISCHER FARM SITE IN 2006

| Composite Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|---------|--------------------|----|------|-------|------|----|----|----|------|------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 02/04/06* | 539,538 | 569,231 | 20 | <0.5 | 207 | 0.37 | 5 | 42 | 7 | 4 | 265 |
| 04/01/06* | 478,563 | 412,125 | 15 | 1 | 150 | 0.26 | 2 | 31 | 3 | <2 | 194 |
| 07/15/06* | 280,182 | 200,627 | 13 | <0.3 | 120 | 0.17 | 3 | 28 | 4 | 5 | 146 |
| 07/22/06* | 289,944 | 253,383 | 14 | <0.3 | 152 | 0.18 | 3 | 34 | 4 | 4 | 178 |
| 08/05/06* | 337,625 | 367,688 | 14 | <0.4 | 119 | 0.26 | 3 | 35 | 4 | 2 | 145 |
| 08/12/06** | 3,076 | 999 | 12 | 7 | 219 | 0.96 | 3 | 40 | 48 | <0.8 | 238 |
| 08/19/06** | 3,818 | 425 | 7 | 5 | 96 | 0.53 | 1 | 35 | 31 | <0.8 | 145 |
| 08/19/06* | 435,750 | 408,250 | 17 | <0.5 | 108 | 0.12 | 3 | 42 | 6 | 10 | 132 |
| 08/26/06** | 2,188 | 427 | 6 | 5 | 115 | 0.30 | 2 | 37 | 33 | <0.8 | 161 |
| 08/26/06* | 353,500 | 344,357 | 19 | <0.4 | 84 | 0.12 | 3 | 36 | 6 | 5 | 109 |
| 09/09/06* | 376,125 | 306,500 | 16 | <0.4 | 59 | 0.15 | <1 | 29 | 4 | 2 | 71 |
| 09/16/06* | 429,643 | 365,000 | 15 | <0.4 | 73 | 0.11 | <1 | 30 | 4 | 8 | 88 |
| 09/23/06* | 291,556 | 303,389 | 15 | <0.3 | 77 | 0.12 | 2 | 23 | 4 | 4 | 89 |
| 10/14/06* | 382,923 | 369,692 | 15 | <0.5 | 92 | 0.20 | 3 | 23 | 5 | 5 | 104 |
| 11/18/06 | 121,995 | 20,880 | 7 | 2 | 1,267 | 4.93 | 20 | 76 | 36 | 9 | 1024 |
| 11/25/06 | 61,193 | 23,777 | 6 | 2 | 1,268 | 1.55 | 17 | 64 | 35 | 9 | 945 |
| 12/02/06 | 69,077 | 25,044 | 8 | 2 | 1,185 | 3.30 | 17 | 56 | 34 | 8 | 847 |

TABLE 4 (Continued): TABLE 4: NITROGEN AND METALS CONCENTRATIONS IN BIOSOLIDS FROM THE HANOVER PARK WATER RECLAMATION PLANT APPLIED TO THE FISCHER FARM SITE IN 2006

| Composite Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|--------------------------|---------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| Minimum | 2,188 | 425 | 6 | 1 | 59 | 0.11 | 1 | 23 | 3 | 2 | 71 |
| Mean ^{***} | 262,159 | 233,635 | 13 | 2 | 317 | 0.80 | 5 | 39 | 16 | 5 | 287 |
| Maximum | 539,538 | 569,231 | 20 | 7 | 1,268 | 4.93 | 20 | 76 | 48 | 10 | 1,024 |
| 503 Limit | NL | NL | 41 | 39 | 1,500 | 17.0 | 75 | 420 | 300 | 100 | 2,800 |

* Biosolids applied as supernatant.

** Retention pond sediment.

*** In calculating the mean, values less than the detection limit were considered as the detection limit.

NL = No limit: not applicable.

TABLE 5: DIGESTER TEMPERATURES AND DETENTION TIMES FOR BIOSOLIDS FROM THE HANOVER PARK WATER RECLAMATION PLANT APPLIED TO THE FISCHER FARM SITE IN 2006

| Month | Average Temperature | Average Detention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3* |
|-----------|---------------------|------------------------|-------------------------------------|--|
| | ----°F---- | ----days---- | | ----days---- |
| January | 96 | 25.8 | yes | 15.0 |
| February | 96 | 47.9 | yes | 15.0 |
| March | 95 | 36.6 | yes | 15.0 |
| April | 96 | 34.5 | yes | 15.0 |
| May | 96 | 28.4 | yes | 15.0 |
| June | 96 | 25.7 | yes | 15.0 |
| July | 96 | 25.4 | yes | 15.0 |
| August | 96 | 20.6 | yes | 15.0 |
| September | 96 | 22.4 | yes | 15.0 |
| October | 96 | 26.1 | yes | 15.0 |
| November | 96 | 24.7 | yes | 15.0 |
| December | 96 | 28.4 | yes | 15.0 |

*For anaerobic digestion at average temperature achieved.

TABLE 6: VOLATILE SOLIDS REDUCTION FOR BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED TO THE FISCHER FARM SITE IN 2006

| Month | Digester Feed | Digester Draw | Lagoon Biosolids | Volatile Solids Reduction* |
|-----------|-------------------------------------|---------------|------------------|----------------------------|
| | ----- % Total Volatile Solids ----- | | | ---- % ---- |
| February | 84.6 | 75.2 | 56.9 | 76.0 |
| April | 85.8 | 74.5 | 46.8 | 85.4 |
| July | 83.1 | 74.2 | 62.3 | 66.4 |
| August | 83.9 | 75.3 | 67.2 | 60.8 |
| September | 82.5 | 75.1 | 60.7 | 67.3 |
| October | 81.7 | 73.8 | 65.4 | 57.7 |
| November | 83.1 | 73.8 | 70.7 | 51.1 |
| December | 83.7 | 74.1 | 69.2 | 56.3 |

*Volatile solids reduction computed using digester feed and lagoon biosolids data, and only for the months that biosolids were applied to the fields.

CALUMET WRP

Treatment Plant and Biosolids Process Train Description

The Calumet WRP, located in Chicago, Illinois, has a design capacity 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:

- a. Placed into lagoons for dewatering, aging and stabilization, and then transported to paved cells and air-dried prior to:
 1. Application to land as Exceptional Quality (EQ) biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.
 3. Disposal in local municipal solid waste landfills.
- b. Dewatered by centrifuging to approximately 25 percent solids content, and then applied to farmland by a private contractor as a Class B cake.
- c. Dewatered by centrifuging to approximately 25 percent solids content, and then transported to paved cells and air-dried prior to use as daily landfill cover.
- d. Dewatered by centrifuging to approximately 25 percent solids content, placed into lagoons for aging and stabilization, and transported to paved cells and air-dried prior to:
 1. Application to land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.

In 2006, the total biosolids production at the Calumet WRP was 31,256 dry tons (Table 1). The quantity of biosolids that were used and disposed of in 2006 (23,486 dry tons) was lower than the total production for the Calumet WRP due to net storage of biosolids stored in lagoons or on drying cells.

Summary of Use and Disposal at Landfills

In 2006, the Calumet WRP sent 748 dry tons of biosolids to landfills as co-disposal with municipal solid wastes. This practice is exempt from the Part 503 Regulations and requires no further reporting.

Land Application of Centrifuge Cake Biosolids

In 2006, the Calumet WRP land applied 20,840 dry tons of centrifuge cake biosolids to farmland under IEPA Permit No. 2005-SC-5073 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 twelve times per year.

All Calumet WRP centrifuge cake biosolids that were land applied in 2006, met the pollutant concentration limits in Table 3 of Section 503.13 (Table 7), the Class B pathogen anaerobic digester time and temperature requirements of Section 503.32b3 (Table 8), and the vector attraction reduction requirements of Section 503.33b10. Table 7 also contains the biosolids nitrogen concentration data that were utilized by the land applicator to compute the agronomic loading rates at the farmland sites.

Land Application of Aged, Air-Dried Biosolids

In 2006, the Calumet WRP land applied a total of 1,899 dry tons of air-dried EQ biosolids through the District's Controlled Solids Distribution Program under IEPA Permit No. 2005-SC-3743 for maintenance of golf courses, landscaping, nurseries, and construction of recreation fields. The quantities of biosolids utilized by each site under the Controlled Solids Distribution Program and how they were used are shown in Table 9. In accordance with Table 1 of Section 503.16, the frequency of monitoring for this biosolids product is six times per year.

The USEPA Region V designated, on a site-specific basis for the Calumet and Stickney WRPs, two of the District's biosolids processing trains as equivalent to a Process to Further Reduce Pathogens (PFRP). The PFRP equivalency took effect on August 1, 2002 (Appendix III), and on this basis, all EQ biosolids produced by the Calumet WRP met the Part 503 Class A pathogen requirements of 503.32a8 in 2006.

All Calumet WRP EQ biosolids that were land applied in 2006 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 10), the Class A pathogen limits of Section 503.32a8 (Table 11), and the vector attraction reduction requirements of Section 503.33b1 (Table 10) or Section 503.33b2 (Table 12), management practices complied with Section 503.14 as previously described in a letter to Mr. Michael J. Mikulka dated January 28, 1994 (Appendix I).

TABLE 7: NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|----|-----|----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 3/27-3/30/06 | 51,068 | 1,919 | 6 | 3 | 454 | 0.71 | 20 | 49 | 95 | 10 | 1,010 |
| 04/10-13/06 | 61,859 | 1,902 | 2 | 3 | 455 | 1.01 | 19 | 48 | 93 | 11 | 1,047 |
| 04/24-4/27/06 | 47,597 | 2,278 | 3 | 3 | 449 | 2.25 | 17 | 37 | 88 | 9 | 942 |
| 06/20-6/21/06 | 31,339 | 2,317 | 6 | 4 | 447 | 1.02 | 14 | 46 | 84 | 12 | 985 |
| 07/10/06 | 43,157 | 1,412 | 6 | 3 | 450 | 1.18 | 12 | 44 | 87 | 8 | 961 |
| 07/19/06 | 19,371 | 1,551 | 8 | 7 | 410 | 0.69 | 14 | 37 | 105 | 13 | 1,173 |
| 07/17-7/18/06 | 41,681 | 2,667 | 7 | 3 | 367 | 1.24 | 11 | 32 | 82 | 4 | 788 |
| 07/19/06 | 36,887 | 2,089 | 7 | 7 | 392 | 1.13 | 14 | 35 | 105 | 15 | 1,191 |
| 07/24/06 | 32,930 | 1,663 | 6 | 8 | 463 | 1.55 | 18 | 44 | 122 | 16 | 1,338 |
| 07/25-07/27/06 | 37,839 | 2,291 | 6 | 4 | 427 | 1.19 | 14 | 39 | 114 | 11 | 1,041 |
| 07/31-08/05/06 | 31,074 | 1,907 | 8 | 4 | 418 | 1.22 | 17 | 47 | 112 | 13 | 1,165 |
| 08/05/06 | 28,825 | 1,453 | 11 | 9 | 479 | 1.05 | 16 | 46 | 128 | 15 | 1,373 |
| 08/07/06 | 35,698 | 2,123 | 7 | 3 | 413 | 1.27 | 15 | 45 | 116 | 5 | 1,158 |
| 08/07/06 | 29,501 | 1,285 | 7 | 8 | 458 | 1.67 | 17 | 43 | 129 | 17 | 1,332 |
| 08/14/06 | 28,742 | 1,237 | 4 | 8 | 416 | 2.21 | 15 | 42 | 126 | 15 | 1,274 |
| 10/02/06 | 17,057 | 782 | 8 | 9 | 459 | 0.54 | 14 | 36 | 122 | 9 | 1,162 |
| 10/02/06 | 18,451 | 545 | 4 | 8 | 455 | 0.71 | 14 | 35 | 135 | 5 | 1,171 |
| 10/13-10/14/06 | 21,144 | 821 | 10 | 8 | 459 | 0.74 | 15 | 44 | 123 | 10 | 1,168 |
| 10/08-10/10/06 | 20,954 | 1,127 | 8 | 3 | 429 | 0.82 | 15 | 48 | 132 | 10 | 1,224 |
| 10/25/06 | 21,476 | 992 | 7 | 8 | 416 | 2.62 | 13 | 38 | 111 | 9 | 1,080 |
| 10/26/06 | 27,078 | 1,606 | 9 | 9 | 449 | 1.84 | 14 | 36 | 111 | 15 | 1,141 |
| 10/30-11/01/06 | 20,057 | 1,162 | 3 | 3 | 353 | 1.27 | 14 | 37 | 109 | 12 | 963 |

TABLE 7 (Continued): NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
GENERATED AT THE CALUMET WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|-----------------------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| | ----- mg/dry kg ----- | | | | | | | | | | |
| Minimum | 17,057 | 545 | 2 | 3 | 353 | 0.56 | 11 | 32 | 82 | 4 | 788 |
| Mean* | 31,990 | 1,597 | 6 | 6 | 433 | 1.27 | 15 | 41 | 110 | 11 | 1,122 |
| Maximum | 61,859 | 2,667 | 11 | 9 | 479 | 2.62 | 20 | 49 | 135 | 17 | 1,373 |
| 503 Limit | NL | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

*In calculating the mean, values less than the detection limit were considered as the detection limit.
NL = No applicable limit.

TABLE 8: DIGESTER* TEMPERATURES AND DETENTION TIMES FOR CENTRIFUGE CAKE BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Month | Average Temperature ----°F---- | Average Detention Time ---days--- | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3** ---days--- |
|-----------|-----------------------------------|--------------------------------------|-------------------------------------|---|
| January | 96 | 21.9 | yes | 15.0 |
| February | 97 | 23.6 | yes | 15.0 |
| March | 97 | 20.4 | yes | 15.0 |
| April | 97 | 19.5 | yes | 15.0 |
| May | 97 | 18.3 | yes | 15.0 |
| June | 97 | 17.3 | yes | 15.0 |
| July | 96 | 18.7 | yes | 15.0 |
| August | 96 | 19.0 | yes | 15.0 |
| September | 97 | 24.4 | yes | 15.0 |
| October | 96 | 21.3 | yes | 15.0 |
| November | 97 | 22.5 | yes | 15.0 |
| December | 96 | 27.9 | yes | 15.0 |

*Temperatures and detention times are for primary digesters 1 through 8 at the Calumet WRP. All biosolids exiting these primary digesters also received additional processing in secondary digesters 9 through 12.

** For anaerobic digestion at average temperature achieved.

TABLE 9: QUANTITIES OF CALUMET WATER RECLAMATION PLANT BIOSOLIDS UTILIZED BY EACH SITE UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2006

| Site* | Quantity |
|---|----------------------|
| | ----- Dry Tons ----- |
| Westmont Park District Westmont, IL 60559 | 30 |
| Village of Evergreen Park Evergreen Park, IL 60805 | 97 |
| Longwood Country Club Crete, IL 60417 | 29 |
| St. Laurence High School Burbank, IL 60459 | 576 |
| University of Chicago Chicago, IL 60637 | 33 |
| Lakepoint Club Corp./DBA Cinder Ridge Golf Course Wilmington, IL 60481 | 198 |
| Chalet Hills Golf Course Cary, IL 60013 | 59 |
| Notre Dame High School Niles, IL 60714 | 281 |
| University of Illinois-Chicago Chicago, IL 60607 | 55 |
| Crete-Monee School District Crete, IL 60417 | 57 |
| Plainfield School District Plainfield, IL 60544 | 262 |
| Village of Steger Steger, IL 60475 | 222 |

* All biosolids were used as soil conditioner and nutrient source for turf growth.

TABLE 10: NITROGEN CONCENTRATIONS, VOLATILE SOLIDS REDUCTION, AND METALS CONCENTRATIONS IN AIR-DRIED BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO LAND IN 2006

| Sample Date | TKN | NH ₃ -N | TVS* | TVS* | | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|----------------------|--------|--------------------|------|-----------------------|----|----|-----|------|----|----|-----|----|-------|----|
| | | | | Reduction | % | | | | | | | | | |
| -----mg/dry kg ----- | | ----- % ----- | | ----- mg/dry kg ----- | | | | | | | | | | |
| 06/13-6/16/06 | 15,815 | 91 | 41 | 55 | 8 | 9 | 491 | 1.06 | 18 | 44 | 167 | 14 | 1,607 | |
| 06/19/06 | 19,066 | 88 | 40 | 56 | 12 | 9 | 483 | 1.72 | 19 | 46 | 166 | 18 | 1,617 | |
| 06/21/06 | 9,690 | 102 | 41 | 54 | 10 | 9 | 488 | 1.95 | 18 | 46 | 171 | 20 | 1,587 | |
| 07/06/06 | 21,034 | 109 | 41 | 51 | 9 | 8 | 476 | 1.54 | 17 | 45 | 153 | 16 | 1,508 | |
| 07/06/06 | 23,456 | 187 | 41 | 49 | 10 | 9 | 480 | 2.06 | 16 | 42 | 155 | 19 | 1,519 | |
| 07/18-07/19/06 | 36,544 | 137 | 39 | 53 | 6 | 8 | 420 | 1.62 | 13 | 36 | 147 | 17 | 1,433 | |
| 07/19/06 | 21,779 | 240 | 41 | 50 | 5 | 8 | 401 | 1.24 | 14 | 36 | 101 | 6 | 1,091 | |
| 07/24/06 | 23,434 | 3,423 | 44 | 42 | 6 | 9 | 490 | 2.80 | 16 | 42 | 127 | 19 | 1,435 | |
| 07/29/06 | 20,459 | 3,468 | 42 | 47 | 11 | 8 | 489 | 2.70 | 15 | 42 | 131 | 16 | 1,488 | |
| 07/31/06 | 22,804 | 3,112 | 41 | 50 | 9 | 8 | 492 | 0.85 | 14 | 38 | 129 | 21 | 1,463 | |
| 07/31/06 | 22,765 | 2,831 | 42 | 49 | 8 | 8 | 477 | 1.14 | 15 | 43 | 127 | 16 | 1,455 | |
| 08/28/06** | 21,007 | 1,058 | 42 | 36 | 6 | 8 | 481 | 1.93 | 13 | 42 | 127 | 20 | 1,478 | |
| 09/26/06** | 12,175 | 131 | 41 | 36 | 5 | 9 | 519 | 0.96 | 12 | 51 | 136 | 14 | 1,622 | |
| 09/26/06** | 14,141 | 137 | 41 | 36 | 6 | 9 | 523 | 1.36 | 12 | 42 | 139 | 15 | 1,621 | |
| 11/02/06 | 9,245 | 151 | 41 | 64 | 6 | 8 | 467 | 1.20 | 11 | 38 | 122 | 16 | 1,389 | |
| 11/02/06 | 8,506 | 800 | 41 | 65 | 9 | 8 | 447 | 1.58 | 12 | 34 | 123 | 12 | 1,295 | |
| 11/07/06 | 7,387 | 1,888 | 34 | 73 | 3 | 8 | 341 | 1.22 | 9 | 36 | 115 | 14 | 965 | |
| 11/14/06 | 7,000 | 549 | 41 | 64 | 5 | 8 | 478 | 1.47 | 12 | 33 | 121 | 21 | 1,360 | |
| 11/21-11/22/06 | 8,232 | 1,162 | 20 | 87 | 4 | 7 | 197 | 1.02 | 7 | 36 | 95 | 2 | 627 | |
| 11/21-11/22/06 | 10,875 | 610 | 41 | 64 | 9 | 8 | 474 | 1.58 | 13 | 37 | 126 | 17 | 1,423 | |
| 11/21-11/22/06 | 7,850 | 1,287 | 20 | 87 | 5 | 7 | 195 | 0.31 | 8 | 35 | 90 | 8 | 609 | |

TABLE 10 (Continued): NITROGEN CONCENTRATIONS, VOLATILE SOLIDS REDUCTION, AND METALS CONCENTRATIONS IN AIR-DRIED BIOSOLIDS FROM THE CALUMET WATER RECLAMATION PLANT APPLIED TO LAND IN 2006

| Sample Date | TKN | NH ₃ -N | TVS* TVS* | TVS* Reduction | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-------------|--------------------|--------------------|---------------|-----------------------|----|----|-------|------|----|-----|-----|-----|-------|
| | ----mg/dry kg ---- | | ----- % ----- | ----- mg/dry kg ----- | | | | | | | | | |
| Minimum | 7,000 | 88 | 20 | 36 | 3 | 7 | 195 | 0.31 | 7 | 33 | 90 | 2 | 609 |
| Mean *** | 16,346 | 1,027 | 39 | 56 | 7 | 8 | 443 | 1.49 | 13 | 40 | 132 | 15 | 1,362 |
| Maximum | 36,544 | 3,468 | 44 | 87 | 12 | 9 | 523 | 2.80 | 19 | 51 | 171 | 21 | 1,622 |
| 503 Limit | NL | NL | NL | 38 | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

*TVS = Total Volatile Solids.

** Biosolids did not meet vector attraction reduction requirements in Section 503.33b1, but they were managed in accordance with requirements in 503.33b10.

*** In calculating the mean, values less than the detection limit were considered as the detection limit.

NL = No limit: not applicable.

TABLE 11: DATA FOR MONITORING PART 503 CLASS A PATHOGEN COMPLIANCE
AT THE CALUMET WATER RECLAMATION PLANT IN 2006

| Sample Date | Lagoon Source | Total Solids | Fecal Coliform |
|-------------|---------------|--------------|----------------|
| | | ----%---- | ----No./g---- |
| 06/21/06 | 17 | 67.8 | 10 |
| 07/18/06 | 7 | 69.7 | 97 |
| 07/25/06 | 7 | 76.6 | 660 |
| 08/15/06 | 7 | 69.7 | 720 |
| 10/19/06 | 6 | 78.0 | 87 |
| 10/19/06 | 6 | 79.7 | 120 |
| 10/19/06 | 6 | 66.0 | 150 |
| 10/31/06 | 6 | 77.4 | 58 |
| 11/07/06 | 6 | 80.7 | 35 |
| 11/29/06 | 7 | 70.9 | 40 |

TABLE 12: SUMMARY OF RESULTS OF ADDITIONAL ANAEROBIC DIGESTION TESTS FOR VOLATILE SOLIDS REDUCTION AT THE CALUMET WATER RECLAMATION PLANT FOLLOWING OPTION 2 OF SECTION 503.33(b)

| Test Start Date | Before Test | | After Test | | Volatile Solids Reduction | |
|-----------------|---------------|-------|------------|-------|---------------------------|---------|
| | TS* | TVS* | TS | TVS | By Equation** | By Mass |
| | ----- % ----- | | | | | |
| 01/05/2006 | 1.95 | 61.57 | 1.78 | 57.85 | 14.3 | 14.6 |
| 02/02/2006 | 2.09 | 60.48 | 1.90 | 56.03 | 16.7 | 16.0 |
| 03/02/2006 | 2.10 | 59.38 | 1.89 | 56.75 | 10.2 | 14.3 |
| 04/06/2006 | 2.40 | 56.91 | 2.18 | 52.50 | 16.3 | 16.1 |
| 05/04/2006 | 2.53 | 53.29 | 2.34 | 49.73 | 13.3 | 13.6 |
| 05/18/2006 | 2.56 | 51.10 | 2.39 | 47.16 | 14.6 | 13.9 |
| 06/01/2006 | 2.55 | 49.00 | 2.44 | 45.27 | 13.9 | 11.5 |
| 07/06/2006 | 2.67 | 49.22 | 2.53 | 44.93 | 15.8 | 13.4 |
| 08/03/2006 | 2.80 | 49.29 | 2.69 | 44.59 | 17.2 | 12.8 |
| 08/24/2006 | 3.14 | 43.72 | 2.97 | 41.85 | 7.4 | 9.3 |
| 09/07/2006 | 3.28 | 43.78 | 3.12 | 42.05 | 6.8 | 8.5 |
| 10/05/2006 | 2.93 | 43.46 | 2.81 | 42.90 | 2.3 | 5.5 |
| 11/09/2006 | 2.63 | 47.37 | 2.43 | 44.49 | 11.0 | 13.1 |
| 12/07/2006 | 2.00 | 51.18 | 1.87 | 47.44 | 13.9 | 13.3 |

*TS = Total Solids content, TVS = Total Volatile Solids content.

**The Van Kleeck Equation was used in calculations.

STICKNEY WRP

Treatment Plant and Biosolids Process Train Description

The Stickney WRP, located in Stickney, Illinois, has a design capacity 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 are anaerobically digested. Stickney WRP biosolids are then:

- a. Placed into lagoons for dewatering, aging, and stabilization, and then transported to paved cells and air-dried prior to:
 1. Application to land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.
 3. Disposal in local municipal solid waste landfills.
- b. Dewatered by centrifuging to approximately 25 percent solids content, and then applied to land by a private contractor as a Class B cake.
- c. Dewatered by centrifuging to approximately 25 percent solids content, transported to paved cells, and air-dried prior to use as daily landfill cover.
- d. Dewatered by centrifuging to approximately 25 percent solids content, placed into lagoons for aging and stabilization, and transported to paved cells and air-dried prior to:
 1. Application to land as EQ biosolids under the District's Controlled Solids Distribution Permit.
 2. Use at local municipal solid waste landfills as final landfill cover.
 3. Disposal in local municipal solid waste landfills.

In 2006, the total biosolids production at the Stickney WRP was 133,475 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 North Side and Lemont WRPs for further processing. The quantity of biosolids that were used and disposed of (75,168 dry tons) was less than the total 2006 production for the Stickney WRP due to a net storage of biosolids in lagoons and on drying cells.

Summary of Use and Disposal at Landfills

In 2006, the Stickney WRP sent 40,298 dry tons of biosolids to landfills. Of this amount, 37,871 dry tons were used as daily cover, and 2,427 dry tons were co-disposed with municipal solid waste. These practices are exempt from the Part 503 Regulations and require no further reporting.

Land Application of Centrifuge Cake Biosolids

In 2006, the Stickney WRP land applied 34,870 dry tons of centrifuge cake biosolids to farmland under IEPA Permit No. 2005-SC-5073 through contracts with Synagro Midwest, Inc. This does not include the 1,642 dry tons of centrifuge cake that was transported from the John E. Egan WRP to the Lawndale 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 biosolids that were land applied in 2006 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 13), the Class B pathogen anaerobic digester time and temperature requirements of Section 503.32b3 (Table 14), and the vector attraction reduction requirements of Section 503.33b10. Table 13 also contains the biosolids nitrogen concentration data that were used by the land applier to compute the agronomic loading rates at the farmland sites.

Land Application of Aged, Air-Dried Biosolids

In 2006, no air-dried EQ biosolids from the Stickney WRP were land applied through the District's Controlled Solids Distribution Program under IEPA Permit No. 2005-SC-3793.

TABLE 13: NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS
FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|-----|-----|----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 01/02/06 | 56,460 | 7,504 | 6 | 3 | 360 | 0.53 | 22 | 52 | 91 | <4 | 691 |
| 01/25/06 | 14,068 | 7,355 | <5 | 3 | 146 | 0.69 | 21 | 69 | 72 | <4 | 809 |
| 02/07/06 | 48,195 | 6,604 | <5 | 4 | 388 | 1.04 | 16 | 51 | 103 | <4 | 835 |
| 02/07/06 | 38,866 | 8,064 | <5 | 5 | 189 | 1.02 | 25 | 61 | 156 | <4 | 1,157 |
| 03/06/06 | 52,376 | 7,419 | <5 | 4 | 372 | 1.66 | 16 | 55 | 103 | 5 | 822 |
| 03/22/06 | 52,516 | 11,796 | <5 | 3 | 401 | 0.46 | 13 | 48 | 107 | <4 | 802 |
| 04/03/06 | 48,362 | 6,191 | <5 | 3 | 374 | 1.63 | 13 | 47 | 116 | <4 | 770 |
| 04/05/06 | 49,189 | 8,471 | <5 | 3 | 161 | 1.47 | 16 | 51 | 112 | <4 | 825 |
| 04/28-29/06 | 38,113 | 7,480 | <5 | 4 | 419 | 0.79 | 22 | 104 | 131 | <4 | 904 |
| 05/03/06 | 42,669 | 9,288 | <5 | 4 | 184 | 1.74 | 22 | 64 | 123 | <4 | 1,010 |
| 05/08/06 | 42,902 | 4,652 | <5 | 4 | 415 | 1.53 | 15 | 55 | 117 | 4 | 912 |
| 05/09-10/06 | 51,230 | 11,622 | <5 | 4 | 434 | 1.20 | 22 | 50 | 136 | <4 | 928 |
| 05/24/06 | 47,856 | 8,534 | <5 | 4 | 437 | 0.94 | 21 | 70 | 129 | <4 | 909 |
| 05/24/06 | 46,991 | 6,789 | <5 | 5 | 162 | 0.38 | 14 | 48 | 138 | <4 | 1,028 |
| 05/24/06 | 36,932 | 7,248 | <5 | 5 | 160 | 0.69 | 21 | 51 | 122 | <4 | 1,019 |
| 06/05/06 | 37,304 | 5,219 | <5 | 4 | 409 | 0.50 | 15 | 50 | 148 | <4 | 976 |
| 06/05/06 | 45,614 | 10,546 | <5 | 4 | 452 | 0.63 | 23 | 73 | 130 | <4 | 913 |
| 06/06/06 | 51,934 | 13,845 | <5 | 4 | 169 | 0.68 | 21 | 56 | 128 | 7 | 1,018 |
| 07/04/06 | 40,570 | 4,486 | <5 | 4 | 393 | 0.44 | 16 | 45 | 166 | <4 | 926 |
| 07/06/06 | 31,754 | 4,387 | <5 | 4 | 220 | 0.96 | 17 | 66 | 138 | <4 | 914 |
| 07/06/06 | 52,479 | 12,034 | <5 | 4 | 173 | 0.76 | 19 | 59 | 109 | 5 | 821 |

TABLE 13 (Continued): NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-----|------|----|----|-----|----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 08/02/06 | 42,759 | 11,787 | 5 | 4 | 385 | 0.99 | 16 | 67 | 140 | <4 | 935 |
| 08/07/06 | 36,940 | 3,587 | <5 | 4 | 405 | 1.13 | 16 | 43 | 153 | <4 | 957 |
| 08/08-10/06 | 37,695 | 10,136 | 7 | 4 | 394 | 0.92 | 15 | 47 | 146 | <4 | 938 |
| 08/11/06 | 45,457 | 8,002 | <5 | 5 | 162 | 1.18 | 16 | 59 | 109 | <4 | 783 |
| 08/15-18/06 | 40,810 | 10,117 | 6 | 4 | 388 | 0.56 | 15 | 46 | 134 | <4 | 919 |
| 08/21-23/06 | 34,507 | 10,205 | 6 | 4 | 374 | 0.97 | 14 | 44 | 135 | <4 | 877 |
| 08/22/06 | 26,684 | 11,041 | <5 | 4 | 175 | 1.54 | 18 | 55 | 137 | <4 | 957 |
| 08/23/06 | 41,130 | 10,480 | 6 | 4 | 423 | 0.44 | 21 | 50 | 134 | <4 | 927 |
| 08/31/06 | 52,641 | 16,989 | <5 | 5 | 452 | 1.42 | 19 | 67 | 129 | <4 | 894 |
| 09/01-02/06 | 47,035 | 15,465 | <5 | 4 | 430 | 0.42 | 18 | 56 | 120 | <4 | 898 |
| 09/06-09/06 | 49,881 | 16,032 | <5 | 4 | 417 | 1.77 | 18 | 56 | 117 | <4 | 899 |
| 09/15/06 | 36,166 | 9,010 | <5 | 4 | 363 | 0.59 | 17 | 49 | 112 | <4 | 802 |
| 09/15-16/06 | 46,312 | 13,547 | <5 | 4 | 421 | 0.26 | 17 | 54 | 116 | <4 | 873 |
| 09/18-22/06 | 41,079 | 10,692 | <5 | 4 | 433 | 0.29 | 20 | 57 | 128 | <4 | 924 |
| 09/22/06 | 35,248 | 3,944 | <5 | 4 | 400 | 2.08 | 14 | 43 | 149 | <4 | 929 |
| 09/26-28/06 | 35,920 | 8,760 | <5 | 4 | 398 | 1.54 | 18 | 53 | 114 | <4 | 840 |
| 09/28/06 | 54,487 | 15,121 | <5 | 2 | 782 | 0.92 | 21 | 96 | 57 | <4 | 823 |
| 09/29/06 | 18,575 | 169 | 7 | 5 | 338 | 1.85 | 16 | 57 | 211 | <4 | 1,105 |
| 10/02/06 | 49,012 | 8,361 | <5 | 3 | 742 | 1.80 | 20 | 81 | 70 | <4 | 870 |
| 10/03/06 | 35,317 | 3,835 | <5 | 4 | 402 | 1.16 | 16 | 48 | 153 | <4 | 984 |
| 10/11/06 | 30,845 | 6,162 | <5 | 4 | 199 | 0.86 | 19 | 61 | 147 | <4 | 1,002 |

TABLE 13 (Continued): NITROGEN AND METALS CONCENTRATIONS IN CENTRIFUGE CAKE BIOSOLIDS FROM THE STICKNEY WATER RECLAMATION PLANT APPLIED TO FARMLAND IN 2006

| Sample Date | TKN | NH ₃ -N | As | Cd | Cu | Hg | Mo | Ni | Pb | Se | Zn |
|-----------------------|--------|--------------------|----|----|-------|------|----|-----|-----|-----|-------|
| ----- mg/dry kg ----- | | | | | | | | | | | |
| 10/11/06 | 38,617 | 9,796 | <5 | 4 | 202 | 0.91 | 16 | 59 | 147 | <4 | 882 |
| 10/11/06 | 40,394 | 7,032 | <5 | 5 | 223 | 0.68 | 24 | 65 | 140 | <4 | 1,017 |
| 11/02-04/06 | 30,198 | 6,571 | 6 | 5 | 433 | 1.49 | 19 | 55 | 178 | <4 | 1,023 |
| 11/04/06 | 36,529 | 7,047 | 6 | 4 | 375 | 1.09 | 15 | 44 | 147 | <4 | 914 |
| 11/06/06 | 35,057 | 4,148 | <5 | 4 | 368 | 1.65 | 14 | 48 | 136 | <4 | 835 |
| 11/06-09/06 | 26,836 | 6,977 | <5 | 5 | 449 | 1.83 | 21 | 56 | 166 | <4 | 1,003 |
| 11/07/06 | 35,392 | 5,625 | <5 | 4 | 180 | 1.81 | 14 | 46 | 141 | <4 | 891 |
| 11/07/06 | 36,195 | 4,777 | <5 | 4 | 187 | 1.66 | 14 | 48 | 156 | <4 | 897 |
| 11/10/06 | 40,754 | 7,854 | 5 | 4 | 382 | 1.14 | 14 | 49 | 139 | <4 | 887 |
| 11/22/06 | 30,865 | 7,255 | 5 | 5 | 412 | 1.37 | 18 | 52 | 148 | <4 | 932 |
| 11/24-25/06 | 39,741 | 7,770 | 6 | 4 | 353 | 1.18 | 14 | 46 | 136 | <4 | 840 |
| 11/27-29/06 | 33,629 | 6,697 | 6 | 4 | 399 | 1.23 | 17 | 52 | 121 | <4 | 856 |
| 12/05/06 | 40,752 | 5,608 | <5 | 4 | 383 | 0.87 | 15 | 47 | 123 | <4 | 841 |
| Minimum | 1,468 | 169 | <5 | 2 | 159 | 0.26 | 13 | 43 | 57 | <4 | 691 |
| Mean* | 40,543 | 8,339 | <5 | 4 | 331 | 1.09 | 18 | 56 | 129 | <4 | 905 |
| Maximum | 56,460 | 16,989 | 7 | 5 | 782 | 2.08 | 25 | 104 | 211 | 7 | 1,157 |
| 503 Limit | NL | NL | 41 | 39 | 1,500 | 17 | 75 | 420 | 300 | 100 | 2,800 |

*In calculating the mean, values less than the detection limit were considered as the detection limit.

NA= No analysis.

NL = No limit; not applicable.

TABLE 14: DIGESTER TEMPERATURES AND DETENTION TIMES FOR CENTRIFUGE
 CAKE BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION
 PLANT APPLIED TO FARMLAND IN 2006

| Month | Average Temperature | Average Retention Time | Meets Part 503 Class B Requirements | Minimum Detention Time Required by 503.32b3* |
|-----------|------------------------|------------------------------|---|--|
| | ---- °F ---- | --- days --- | | --- days --- |
| January | 97 | 19.0 | yes | 15.0 |
| February | 97 | 22.6 | yes | 15.0 |
| March | 97 | 20.7 | yes | 15.0 |
| April | 98 | 21.6 | yes | 15.0 |
| May | 98 | 20.4 | yes | 15.0 |
| June | 98 | 23.0 | yes | 15.0 |
| July | 98 | 22.2 | yes | 15.0 |
| August | 99 | 22.2 | yes | 15.0 |
| September | 98 | 25.1 | yes | 15.0 |
| October | 97 | 22.3 | yes | 15.0 |
| November | 97 | 25.3 | yes | 15.0 |
| December | 98 | 23.8 | yes | 15.0 |

*For anaerobic digestion at average temperature achieved.

DISTRICT BIOSOLIDS DISTRIBUTED TO LANDFILLS UNDER 40 CFR PARTS 258 AND 261

Biosolids from two of the District's WRPs (Stickney and Calumet) were sent to landfills in 2006 for co-disposal with municipal solid waste, use as daily cover, and use as final cover. Biosolids going to these landfills are either processed to meet the requirements of AS 95-4, AS 98-5, and AS 03-02 (Adjusted Standards) approved by the Illinois Pollution Control Board for biosolids used as a final vegetative cover, or they are centrifuged and air-dried to various end points, and analyzed as specified in 40 CFR Part 261 to establish the nonhazardous nature of this material for biosolids used as daily cover and co-disposed. Analytical results, including TCLP constituents, PCB, 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).

Stickney WRP

A total of 40,298 dry tons of biosolids from the Stickney WRP were co-disposed, used as daily cover with municipal solid waste, or used as a final vegetative cover at nonhazardous waste landfills in 2006.

A total of 2,427 dry tons were co-disposed at Land and Lakes River Bend Prairie Landfill at 801 East 138th Street, Dolton, Illinois.

A total of 37,871 dry tons were used as daily cover at Onyx Orchard Hills Landfill in Davis Junction, Illinois.

Calumet WRP

In 2006, a total of 748 dry tons of biosolids from the Calumet WRP were co-disposed with municipal solid waste at Land and Lakes River Bend Prairie Landfill at 801 East 138th Street, Dolton, Illinois.

APPENDIX I

BIOSOLIDS MANAGEMENT PROGRAMS OF THE METROPOLITAN WATER
RECLAMATION DISTRICT OF GREATER CHICAGO UNDER
40 CFR PART 503

APPENDIX II

REDUCTION IN FREQUENCY OF MONITORING FOR PATHOGENS
IN BIOSOLIDS

APPENDIX III

DESIGNATION OF SITE-SPECIFIC EQUIVALENCY TO PFRP FOR DISTRICT
BIOSOLIDS PROCESSING TRAINS

Metropolitan Water Reclamation District of Greater Chicago

100 East Erie Street Chicago, IL 60611-2803 (312) 751-5600

2006 REPORTING REQUIREMENTS

UNDER THE 40 CFR PART 503 REGULATIONS

Copies of this Report Number _____
are Available on the District Web Site Under