METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

2016 BIOSOLIDS PROGRAM AND ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) PERFORMANCE REPORT (Final)

Report Date: April 27, 2017

Viewable by accessing the District's Biosolids website, www.mwrd.org, and by navigating through Departments >Maintenance & Operations >EMS for Biosolids

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Summary

The Biosolids Program and EMS Performance Report is intended to provide an annual review of information regarding the focus and status of the District's EMS for biosolids implementation activities during the previous year.

The Water Reclamation Plants (WRPs), which generate biosolids, continued to track progress towards reaching established goals and objectives. The District continued to provide a high quality biosolids product for farmland application and Controlled Solids Distribution, while adhering to sound management practices.

Introduction

Purpose of the Report

As specified in the requirements for Element 15 of the EMS, the District is required to prepare an annual report detailing the Biosolids Program and any performance related to EMS for Biosolids activities. The Biosolids Program and EMS Performance Report is intended to provide an annual review of information regarding the focus and status of the District's EMS implementation activities as well as its environmental and EMS performance. This report covers the following topics:

1. EMS for Biosolids Manual
2. Reporting on Annual EMS Tasks
3. Progress Towards Meeting Biosolids Goals and Objectives
4. Biosolids Utilization
5. Internal Audit
6. Third Party Audit
7. Other Various EMS Activities
8. Continual Improvement

Background

The District entered into the EMS for Biosolids Program on February 17, 2004 by signing a Letter of Understanding with the "National Biosolids Partnership" (NBP). The EMS Coordinator soon began the developmental stage of the EMS. This included committing the District to the Code of Good Practice, establishing a biosolids policy, and developing an EMS manual. The developmental stage concluded on December 28, 2005, at which time the Director of M&O approved the EMS manual. In 2007, the District continued implementing the EMS for Biosolids Program. The Third Party Verification Audit took place from May 27 through June 5, 2008. The District's Biosolids EMS was independently verified on August 4, 2008 by the audit firm, NSF International, making the District the first wastewater agency to be certified in Illinois. In August of 2009 the District

achieved Tier 4 Platinum certification. In 2013, the District's program was re-verified as a Platinum certified agency by a third party auditor.

EMS for Biosolids Manual

The master copy of the EMS Manual is kept on file with the EMS Coordinator. All elements and documents of the manual can be found electronically on the District's server at \\District\Falcon\M&O\Biosolids – EMS or on the District's website at www.mwrd.org and by navigating through Services & Facilities >> Biosolids Program >> EMS for Biosolids

In 2016, modifications to the EMS for Biosolids Manual were primarily related to the critical control point tables and permit updates.

Reporting on Annual EMS Tasks

The annual EMS tasks have been combined into the Annual Internal Audit Report (Appendix C). The scope of the audit, conducted during the first quarter of 2017, included a review of the following:

1. The EMS manual and supporting documents. (Element 1)
2. Commitment and implementation of the Code of Good Practice. (Element 2)
3. Progress toward meeting Goals and Objectives for 2016. (Element 5)
4. Critical Control Point Tables and operational SOPs. (Elements 3, 7, 10, 13)
5. 2017 Goals and Objectives, established. (Element 5)
6. Public outreach programs conducted by contractors and the District. (Element 6)
7. Verification of Training (Element 8)
8. Verifying the corrective actions to the Third Party Interim Audit, 2016. (Element 14)
9. Contractor Activities for Land Application
10. Review of Emergency Preparedness and Response (Element 11)
11. Daily Non-Conformance to Operations (Element 14)
12. Opportunities for Improvement (OFI)

Assignments for items 3, 4, 5, 6 and 9, 10, 11 and 12 were distributed to the Internal Audit Team and EMS Field Representatives. The EMS Coordinator audited Items 1, 2, 7 and 8.

The CCP tables were reviewed and minor revisions were made, such as typos, incorrect phone numbers on the tables and changes to various position titles. Reporting Requirements under Element 4 were updated for several plants.

Progress Towards Meeting Biosolids Goals and Objectives

The Maintenance and Operations (M&O) and Monitoring and Research (M&R) Departments established goals and objectives (G&O) for the four District plants that produce biosolids (Stickney WRP, Calumet WRP, Hanover Park WRP, and Egan WRP), and for biosolids processing sites, Lawndale Avenue and Calumet Solids Management Areas. The Public Affairs Section, Monitoring and Research Department and Maintenance and Operations combined efforts to meet goals set by the Executive Director. The G&O were tracked and progress reports submitted each quarter. Also, as required by the EMS program, input from interested parties regarding the G&O was solicited by way of a letter sent on June 5, 2016.

The G&O were developed by the EMS Field Representatives and approved by the EMS Coordinator, the Director of M&O and the Division Heads. Descriptions of established G&O for each plant and the progress towards meeting the G&O were as follows:

Executive Director

Goal – Increase use of Biosolids within Cook County and 125 community service areas of the District

General Division – Biosolids Section has a 2016 goal to distribute 25% of the Biosolids utilized through the Controlled Solids Distribution (CSD) or District Utilization Programs and to distribute the remaining 75% through the Farmland Application/Beneficial Reuse Program. A total of 15,313 DT of CSD was distributed during 2016, which represents 25% of total utilization. The goal was met.

Goal – Create EQ Compost Biosolids Program

The 2016 goal was to create 10,000 tons of final compost which is equivalent to approximately 20,000 CY. A total of 18,321 tons of EQ Compost was produced in 2016. The goal was exceeded.

The Public Affairs Section promoted biosolids through interactions at 179 public meetings, events and schools throughout Cook County with a total attendance over 42,000. In addition, 180 tours were organized for the public and attended by 3,600 attendees, which included biosolids conveyance systems at various plants and the lab and greenhouse where biosolids are used to grow plants for research and demonstration purposes. Marketing materials continued to be revised. Several press releases were distributed throughout the year regarding biosolids. Social media was utilized to reach potential customers. Public Affairs staff held two photo shoots: one of biosolids-mulch blend in use at a Hyde Park community garden and the second took place at Centennial Hill, a future biking and hiking destination along MWRD property that is leased to the Forest Preserves of Cook County. Biosolids were used to cover spoil from construction of the nearby McCook Reservoir. The District held its 4th “Sustainability Summit” at Maggie

Daley Park attended by over 100 interested parties to learn about and share information related to Resource Recovery. Awards were given for exceptional use of biosolids to Dave Ward, Superintendent of Coyote Run Golf Course in Flossmoor and the Tinley Park-Park District. Summary of Activities for the Office of Public Affairs Office are attached as Appendix A.

Stickney WRP

Goal – Conversion of Imhoff Battery A to nine circular primary tanks, replacement of the grit facilities, and the improvement of sludge feed to the digesters via new thickening facilities

The construction of primary and grit tanks under Contract 04-128-3P is estimated to be substantially complete in August 2018.

Goal – Maintain low solids pumping to LASMA at 25,000 DT in 2016

The total low solids pumped to LASMA by the end of the 4th quarter of 2016 was 39,585 DT. This goal has been dropped due to operational constraints.

Goal – Convert two new Gravity Thickening Tanks to primary sludge fermenters to improve the enhanced biological phosphorus removal (EBPR) process and increase phosphorus removal and recovery. In addition, convert existing Gravity Concentration Tanks to a WASSTRIP process to increase phosphorus recovery with the Ostara reactors

The conversion of Gravity Thickening Tanks to fermenters under Contract 15-124-3P is estimated to be advertised in April 2017 and completed in Fall 2018. The conversion of Gravity Concentration Tanks to the WASSTRIP process under Contract 15-120-3P has begun and is estimated to be completed in December 2017.

Calumet WRP

Goal - Utilize All Biogas

Efforts continue with the Engineering Department to identify a successful proposal to achieve consistent 100% utilization of digester gas. The current outlook is that operation of a utilization facility may begin in May 2019. Funding for this project is available in the Engineering Department budget.

Goal – Usage of the Central Boiler Facility for heating digestion

Engineering project 06-213-3M is still awaiting vetting committee action to move forward. Once completed, M&O operations personnel will continue tracking sludge temperatures for improved control over temperature variation.

Hanover Park WRP

Goal – To Prevent Heavy Metal Overloads in Soil at Fischer Farm

Under Contract 15-753-12 Oros & Busch harvested 93 acres of corn on October 12, 2016, then injected 7 million gallons of Biosolids in accordance with Part 503 regulations evenly at Fischer Farm. An excellent yield of over 15,000 bushels or 165 bushels/acre resulted. This corn was sold and the profit was split with the contractor and MWRD each receiving $20,279.00. Staff sampled and analyzed the subsurface field drain water bi-weekly and the groundwater monitoring wells at each field on November 29, 2016. Groundwater Monitoring Well 7 had a high concentration of NH3. An investigation was conducted in November 2016 where staff purged the well with clean water for 60 minutes. The result was still a high, 74 mg/L of NH3. Three temporary monitoring wells will be installed in the vicinity of well 7 to aid in determining the source of NH3. Staff has also sampled and analyzed the soil in each field at multiple depths. Reports of all sampling is on file with the EMS Field Representative of Hanover Park WRP.

Goal – Digester Gas Capture and Reuse

Piping improvement jobs have been completed including Engineering Contract 08-530-3P Digester Facility Improvements, and a District Work Order, WO#09C20535, replacing the existing waste gas burner piping with stainless steel and the addition of condensate receiver tanks. The result is improved digester gas capture. The plant produced 1% more digester gas in Q4 – 2016 versus Q4 – 2015. The plant utilized 42% more digester gas in Q4 – 2016 versus Q4 – 2015. The plant purchased 11% less natural gas in Q4 – 2016 versus Q4 – 2015. The plant reduced unnecessary emergency venting since the new piping installation and continued increased digester gas utilization, %, and decreased natural gas purchased.

Egan WRP

2016-2020 Goal – Maximize Digester Gas Usage at the Egan WRP

The specific objective of this goal is to improve digester gas reuse for building and digester heat, prevent releases to the atmosphere, and reduce flaring, resulting in money saved.

After all ongoing digester rehabilitation, cleaning and repair work, under the existing Engineering Contract 11-403-3P is completed, Egan will evaluate success in reaching this goal and objective. Thus far, through the 4th quarter of 2016, Egan has purchased a total of 303,171 therms of natural gas; produced 862,132 therms of and utilized 654,751 therms of digester gas, resulting in an overall 76% digester gas utilization rate.

As part of the Engineering contract work all four Egan digesters (two primary and two secondary) are to be cleaned. The contract work began in late spring of 2015. The secondary Digester D was cleaned and had its five worn mixing guns and the membrane cover replaced in 2015. The cleaning and the additional repairs to primary Digester C, which was removed from service in July 2015,

were completed in May 2016. The Digester was returned to normal operation in June 2016. The secondary Digester B which was removed from service on May 11, 2016, was cleaned, had its six worn mixing guns and the membrane cover replaced. It was returned to service on August 26, 2016. Since turning over Digester A to the contractor on August 24, 2016, it was cleaned, the ceiling was repaired and repainted. The M&O trades have finished cleaning all of the mixing cannons. Before returning this digester to service however, additional roof repairs identified by Engineering must be completed. The completion of all digester work is anticipated by March 2017 with startup by late April/early May 2017. The contract CPM for 11-403-2P is on file with the EMS Field Representative at the Egan WRP.

2012-2016 Goal – Improve Dewatering Facility at Egan WRP

Under Engineering Contract 06-494-3P, the existing conveyor system with a proven track record of high maintenance costs and poor reliability was replaced with a new conveyance system. Additional Biosolids storage capacity was also provided by replacing two existing hoppers with four silos. The new system is expected to improve the Dewatering facility performance and reduce operations and maintenance costs of the existing conveyor system. It is expected to reduce odors by being an enclosed system and reduce cleanup costs.

The work under contract 06-464-3P was started in December of 2013. Due to the extra work completed under a change order, the new equipment testing and startup began in December 2015. During the operating/testing phase additional issues were identified that are being addressed in 2016 to make the system more reliable and robust. This would allow the extension of the centrifuge operation to be 24/7 and provide steady centrate feed to ANITA Mox process at Egan.

The operation and testing of the new equipment in Dewatering building was mostly completed in the 1st quarter of 2016. The Egan WRP also extended the centrifuge operating hours to limit pumping sludge to OWRP. However, as of April 13, 2016, Egan Dewatering Facility operation was stopped and pumping digested sludge to the OWRP resumed. This is due to one of the two primary, heated digesters being out of service for contract work under Engineering Contract 11-403-2P. That resulted in Egan's inability to produce class B biosolids (the primary digester holding time being less than 15 days).

The centrifuge operation resumed the week of August 15, 2016 to provide centrate to the ANITA Mox process currently undergoing startup operation with increasing processing capabilities. The Egan WRP is extending the centrifuge operating hours enough to support the operation of ANITA Mox process.

Due to continuing work on primary Digester A and continuous inability to produce class B biosolids, the centrifuge operation was curtailed to one day per week, sufficient only to support minimum operation of ANITA Mox process. The normal operation of the Dewatering facility will not resume until all Digester work is

complete and Egan produces class B biosolids again. This is anticipated to occur sometime in late April/early May 2017.

Kirie WRP

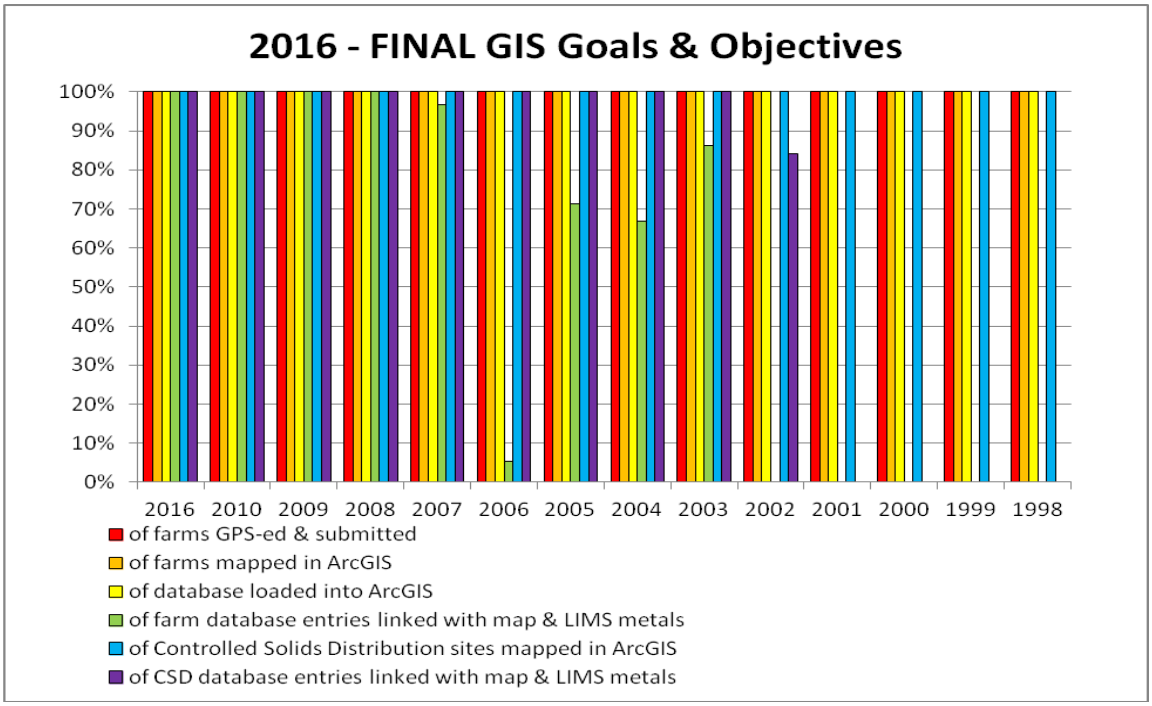
Goal - Upgrade Instrumentation (Magnetic Meter) for Flow Measurement of Waste Activated Sludge (WAS) Transmission to the Egan WRP
This goal has been met.

Goal - Improve Cathodic Protection of the Waste Activated Sludge Transmission Pipeline to the Egan WRP
This goal has been met.

General Division

Goal – Increase Customer Direct Pickup of Class A Biosolids Products
The 2016 goal is to increase the direct pickup of Class A biosolids products by 25% each year. In 2015, 1,860 dry tons of products were picked up by end users. The 2016 goal was a minimum of 2,325 dry tons. A total of 833 DT was directly picked up during 2016. The goal was not met due to less than expected acquired end users interested in pickup.

Goal – GIS Mapping for Biosolids
In 2016, the GIS was kept up to date by mapping farms & CSD site. In addition, historical entries were completed. This goal has been met.



Monitoring and Research (M&R)

Goal – Oversee the Composted Biosolids Production

The M&R Department actively worked with the M&O Department in monitoring composting pile temperature, compiling data, and providing suggestions to personnel for the composting operation. All fourteen (14) windrows composted during the 4th quarter of 2016 met the targeted composting temperature (maintained at 55°C for at least full 18 days with five times of turning, during which there was no more than 24 hours of temperature below 55°C.)

The M&R Department sampled composting piles 11 to 53 (from HASMA) and piles 3 to 5 (from CALSMA), which completed composting and four months curing, and measured parameters related to stability, including odor and CO_2 evolution, in those samples.

Results:

Site	Pile No	CO_2 Evolution (mg CO_2-C/g organic matter/day)	Odor Rating (on the scale of 1-10)
HASMA	Pile 11	1.1	2.4
"	Pile 12	0.8	0.9
"	Pile 13	1.7	0.9
"	Pile 14	1.2	1.1
"	Pile 15	0.8	3.9
"	Pile 16	0.8	1.6
"	Pile 17 to 19 composite	1.2	1.8
"	Pile 20 to 22 "	1.6	0.9
"	Pile 23 to 24 "	1.2	1.3
"	Pile 25 to 28 "	0.6	1.1
"	Pile 29 to 32 "	1.0	1.6
"	Pile 33 to 39 "	0.8	1.7
"	Pile 40 to 45 "	1.1	1.7
"	Pile 46 to 49 "	1.1	1.3
"	Pile 50 to 53 "	2.4	0.9
CALSMA	Pile 3 to 5	1.3	0.8
Target		< 2	< 5

Throughout the year, sixty-eight (at HASMA) and twelve (at CALSMA) windrows of biosolids composting were completed.

Goal – Locate Three New Significant Industrial Users (SIUs) and/or Large Commercial Industrial Users (LCIUs) that discharge to any of the District's WRPs.

During the 4th quarter, the Field Services Section of the Industrial Waste Division identified and classified no new SIUs but four new LCIUs as follows:

LCIU Company Name	User Number	LCIU Effective Date
Westlake Hospital	14773	10/12/2016
Alpha Baking-Fullerton	27786	11/08/2016
Olympia Foods	27717	11/23/2016
GCP Applied Technologies, Inc.	27802	12/15/2016

A total of eleven (11) SIUs and sixteen (16) LCIUs were located in 2016.

Public Affairs

Goal – Identify Potential Customers:

Public Affairs utilized community outreach events, press releases/social media and tours to aid in identifying potential customers. Activities of the Public Affairs group were very extensive in 2016. See Appendix A for a summary of activities for the Office of Public Affairs.

Biosolids Utilization

Farmland Application

The farmland application program includes land application of centrifuge cake, dried biosolids and liquid biosolids. The use of centrifuge cake for farmland application has been reduced due to the high cost of centrifuge operations. The operation, which consisted of direct hauling from the centrifuges or cake storage areas, will continue to diminish as the use of centrifuges is reduced.

Biosolids which had been dewatered in centrifuges is now pumped to aging lagoons. The solids settle out of the water over a period of time. The water is pumped back to the plant for retreatment. The biosolids are removed from the lagoon and thickened on drying beds, increasing the solids content from approximately 8%TS to 35%TS. The biosolids are then hauled to farmland.

In the liquid biosolids land application program, all biosolids produced at the Hanover Park WRP are utilized on the District's Fischer Farm, which is a 130-acre site located on the grounds of the WRP. The liquid biosolids are held in storage lagoons and a contractor applies the material by subsurface injection once a year after harvesting in the fall. Corn is grown on the farm annually and the harvested crop is used for either animal feed or ethanol production. This land application program is conducted under a permit issued by the IEPA.

Liquid injection of biosolids from the lagoons at SWRP and CWRP, low in solids content, began in 2013. This process is inherently less cost effective than the land application of other biosolids products but reduces the potential for odor complaints. This practice will help ensure a sustainable Land Application Program.

Dried biosolids, 60%TS and greater, has become a positive aspect of the land application program due to the lack of odor when land applying and reduction in truck traffic to the farms.

In 2016, 45,298 dry tons of biosolids were used on as Farmland Application.

The farmland application contracts have the most significance in relation to the principles and practices of the EMS for Biosolids. Summaries of activities performed by the District and the District's land application contractors in 2016 are attached as Appendix B.

Controlled Solids Distribution

In the Controlled Solids Distribution (CSD) program, Class A biosolids are utilized as 1) a nutrient-rich soil amendment for construction or renovation of recreational areas (such as golf courses, athletic fields, and parks) and 2) as a fertilizer and/or topdressing on those areas. This program allows the use of biosolids under the CSD permit issued by the IEPA and removes the permitting burden from the individual biosolids users. The District has committed to use only Class A biosolids under this program. In addition, the District distributed 1,672 dry tons of composted biosolids through an approved pilot program by the IEPA under the District's CSD permit.

In 2016, a total of 15,313 dry tons of biosolids products from the Stickney and Calumet WRPs were distributed to various sites through the District's CSD program.

A total of 18,321 tons of composted biosolids were produced in 2016.

Details pertaining to the end user locations and type of use can be found in Appendix E, Annual Biosolids Program Report for 2016 by M&R.

Use and Disposal at Landfills

Biosolids can be utilized in non-hazardous waste landfills as a daily cover and as a final cover. Biosolids utilization under this program is conducted in accordance with 40 CFR Parts 258 and 261. Biosolids utilization in these outlets is usually conducted through contracts with the landfill owners or operators in which the District pays the tipping fees and costs for hauling. However, in 2008 the District eliminated "Landfill" from the title of the contract, opting to have a contract for "Utilization and Transportation" of Biosolids. This change was made in an effort to ensure additional opportunities for beneficial reuse and to eliminate landfill

tipping fees as public acceptance of biosolids has increased. The biosolids products most commonly utilized as landfill daily cover are air-dried, un-aged cake or air-dried, un-aged low solids. Biosolids used as landfill final cover must meet the specifications of IPCB AS 03-02. This includes the aged air-dried cake and aged air-dried low solids materials. Class A pathogen criteria are not required for landfill final cover.

In 2016, no biosolids from the Stickney and Calumet WRP areas were used as daily cover for municipal solids waste. The District utilized 2,238 dry tons of biosolids as a final vegetative cover at non-hazardous waste landfills. A total of 855 dry tons were co-disposed with municipal solid waste as unsuitable material at landfills.

Use on District Land

The District also uses dried biosolids on its own properties for ground under repair due to construction and for research. In 2016, a total of 2,205 dry tons of biosolids were utilized in this manner.

Internal Audit

The District conducted an internal audit of the MWRDGC's EMS from January 4, 2016 through March 3, 2016. The audit was scheduled through an assignment from the Director of Maintenance and Operations to the Division Heads and ultimately carried out by the Lead Auditor and the Audit Team. The results of the Internal Audit are attached as Appendix C.

Third Interim Party Audit

An Interim Audit took place in 2016. The results of the Interim Audit are attached as Appendix D.

Other EMS Activities

Element 4 – Legal and Other Requirements

The Monitoring and Research Department prepared Report 17-20, Annual Biosolids Management Report for 2016. This report details any legally required monitoring, measuring and laboratory testing. Report 17-20 is attached as Appendix E.

Element 6 and 9 – Public Participation in Planning and EMS Communications

In 2016, the District's Monitoring and Research Department, Public Affairs Department and Maintenance and Operations Department work together to provide a pro-active public outreach program. The departments made contact with potential users via phone and email, promoted biosolids at public meetings and events, schools, park districts and country clubs. The M&R and M&O Departments provided assistance in utilizing the compost product in Community Gardens and on vacant lots. In addition, the District's program entitled "Restore

the Canopy" utilized composted biosolids in the pots in which trees were planted prior to public disbursement. The program allowed for greater than 20,000 trees to be distributed. Presentations were provided at different venues and a Biosolids Nutrient Workshop was held. A complete list of Public Affairs activities will be included in the Biosolids Management Report.

One odor complaint was received for LASMA related to the Marathon site. The cause of the odors was identified, corrective action was taken to reduce the odors and eliminate further complaints. No odor complaints were received for CALSMA.

The District's land application contractors continued their public relations program (PRP). Summary of Activities for the Office of Public Affairs Office are attached as Appendix A. Summary of Activities of the District's Land Application Program are attached as Appendix B.

Element 17 – Management Review

On May 16, 2016, a meeting was held with the Executive Director, Director of Maintenance and Operations and the EMS Coordinator to discuss the 2015 Biosolids Program and EMS Performance Report, the internal and external audit activities, changing circumstances, and the District's commitment to continual improvement. Additionally, the meeting addressed changes to the District's Biosolids Policy, goals and objectives, and the Biosolids Management Program. The Executive Director requested that the policy be altered by removing specific reference to Land Application and insert commercial use. This was completed and updated versions will be posted throughout the District.

Continual Improvement

There were many meaningful biosolids management activities in 2016 which were conducted in the spirit of continual improvement as highlighted in the Executive Director's Goals and Objectives. The District passed a resource recovery ordinance to provide for the recovery and beneficial reuse of the resources admitted to the Water Reclamation Plants. The ordinance was adopted by the Board of Commissioners of MWRDGC on September 1, 2016 and as amended to, and including, October 20, 2016.

The District's planning group in Monitoring and Research has been instrumental in the continual improvement by researching processes for improved efficiency and odor reduction. In addition, by reviewing the activities of the previous year, the District will be able to continually improve its EMS for Biosolids Program in subsequent years.

Compost Windrow Turner

The M&R Department and Public Affairs Section will continue to host various events which provide opportunities to showcase the District's biosolids products and biosolids management program. These events provide opportunities for the District to continually improve its relations with interested parties.

Biosolids Goals & Objectives for 2017 have been established and can be found on the District's Website at www.mwrd.org, and navigating through Departments >Maintenance & Operations >EMS for Biosolids

Appendix A

Summary of Activities for the Office of Public Affairs

Viewable by accessing the District's Biosolids website, www.mwrd.org, and by navigating through Departments >Maintenance & Operations >EMS for Biosolids

INTEROFFICE MEMORANDUM

Metropolitan Water Reclamation District of Greater Chicago

DEPARTMENT: GA – Office of Public Affairs **DATE:** February 2, 2017

To: John Murray, Director of Maintenance and Operations

From: Allison Fore, Public & Intergovernmental Affairs Officer

Subject: EMS for Biosolids – Goals & Objectives: 4th Quarter and Annual Report

Public Affairs Biosolids EMS Goals and Objectives for 2016
Element 5 – December 31, 2016 update

Goal - Identify potential customers

Below is a summary of progress towards meeting Public Affairs Goals and Objectives during the fourth quarter and 2016 in its entirety. This report includes:

1. Community Outreach
2. Educational Presentations
3. Tours
4. Marketing Materials
5. Website
6. Letters
7. Press Releases/Social Media
8. Media Coverage
9. Event

1. Community Outreach

Public Affairs staff promoted biosolids through interactions at public meetings, events and schools throughout Cook County that reached **36,463** attendees.

1st Quarter- Staff participated in **40** events that reached **5,132** attendees.

2nd Quarter- Staff participated in **64** events that reached **10,317** attendees.

3rd Quarter - Staff participated in **43** events that reached **15,855** attendees.

4th Quarter - Staff participated in **32** events that reached **5,159** attendees.

2016 Total = Staff participated in **179** events that reached **36,463** attendees

2. Educational Presentations

Staff from Public Affairs and agency-wide lead presentations to elementary schools, high schools, colleges, and community groups.

1st Quarter – Staff conducted **27** educational presentations which reached **1,066** individuals.

2nd Quarter - Staff conducted **25** educational presentations which reached **2,581** individuals.

3rd Quarter - Staff conducted **26** educational presentations which reached **1,507** individuals.

4th Quarter - Staff conducted **24** educational presentations which reached **1,765** individuals.

2016 Total = Staff conducted **102** educational presentations, reaching **6,919** individuals.

3. Tours

Staff organized and led tours for the public at MWRD Water Reclamation Plants, facilities and waterways; the conveyor belts that carry biosolids away from the treatment facility to either the Lawndale Avenue Solids Management Area or Calumet Avenue Solids Management Area, and the labs where plants are grown in biosolids at the Stickney plant were featured.

1st Quarter – **26** tours, **513** visitors

2nd Quarter – **50** tours, **1398** visitors

3rd Quarter – **57** tours, **641** visitors

4th Quarter – **50** Tours, **1071** visitors

2016 Total – **183** Tours, **3623** visitors

4. **Marketing Materials**
   - Beginning in April, the MWRD instituted a new initiative called "Restore the Canopy, Plant a Tree." A free 18" oak tree sapling contained in a one gallon pot filled with biosolids/mulch compost is distributed with a brochure Public Affairs developed.
     1st Quarter – N/A
     2nd Quarter - Staff distributed 10,974 trees;
     3rd Quarter - Staff distributed 5,640 trees.
     4th Quarter - Staff distributed 4,570 trees.
     2016 Total = Staff distributed **21,184** trees
   - Public Affairs developed the inaugural "Recovering Resources, Transforming Water" booklet and video (found at www.mwrd.org). Biosolids are mentioned as part of our resource recovery initiative.
   - To promote a biosolids/compost naming competition, Public Affairs created a "Students, Help us Name that Biosolid!" flier. (See attachment.)

5. **Website**
   The MWRD website is routinely updated with pertinent biosolids information. Visit www.mwrd.org/irj/portal/anonymous/biosolids.

6. **Letters**
   Approx. 500 letters were mailed to schools, summer camps and municipal leaders to promote the Restore the Canopy, Plant a Tree program. Approx. 1500 letters were mailed to schools about the Name the Biosolid contest. (See Attachments.)

7. **Press Releases/Social Media** - To reach potential customers through press releases and social media, Public Affairs issued 6 press releases in the fourth quarter referencing biosolids; in 2016, 18 press releases were issued. (See Attachments.)

1st Quarter - Press releases were issued on Feb. 16 and Feb. 26.

February 16, 2016 - "Biosolids nutrient management workshop begins work to develop best management practices, confront phosphorus loss from agricultural land"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0216_Biosolids_Nutrient_Workshop.pdf

February 26, 2016 - "MWRD soil scientists' biosolids paper earns IWEA acclaim"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0226_IWEA_Wale_Biosolids.pdf

2nd Quarter – One press release was issued on May 19.

May 19, 2016 - "MWRD soil enriches South Side community garden projects"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0519_ChicaGRO_Intergenerational_Garden.pdf

3rd Quarter – Press releases were issued on July 5, July 6, July 12, July 29, August 5, August 15, August 31, September 6 and September 23. (Issued twice: July 5, 2016 and August 5, 2016)

July 5 and August 5, 2016 - "MWRD seeks applicants for Sustainable Landscaping and Biosolids User awards; *Applications due September 2, 2016"*
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0705_Biosolids_user_award_advisory.pdf

July 6, 2016 - "New MWRD video highlights agency efforts to recover resources"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0706_Resource_Recovery_Video.pdf

July 12, 2016 - "Surpassing 10,000 milestone in tree distribution, MWRD working to restore canopy"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0712_Restore_the_Canopy.pdf

July 29, 2016 - "Name That Biosolid: The MWRD opens naming contest to public; *Contest deadline is August 30"*
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0729_%20Biosolids_Naming.pdf

August 15, 2016 - "Name that biosolid: The MWRD extends naming contest to public to include school participation; *Contest deadline extended to September 30"*

www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0815_%20Biosolids_Naming_Extended.pdf

August 31, 2016 - "IL Rep. Tabares, IL Farm Bureau tour MWRD's Stickney Water Reclamation Plant
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0831_Rep_Tabares.pdf

September 6, 2016 - "Platinum awards put MWRD atop the charts in meeting clean water standards"

www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0906_NACWA_Platinum_Awards.pdf

September 23, 2016 - "Growing MWRD tree program shelters region from storms"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_0923_Growing_MWRD_tree_program.pdf

4th Quarter – Press releases were issued on Oct. 11, Oct. 14, Oct. 31, Nov. 21, Nov. 22, and Dec. 7.

October 11, 2016 - "Metropolitan Water Reclamation District of Greater Chicago recognized as 'Utility of the Future'; ***61 water sector organizations show success in innovative and sustainable utility management practices"***
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/161011_WEFTEC-UtilityoftheFutureToday.pdf

October 14, 2016 – "MWRD's 4th Annual Sustainability Summit honors green landscaping, biosolids users"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_1014_Sustainability_Summit_REVpix.pdf

October 31, 2016 - "MWRD receives Chicago Region Trees Initiative award"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_1031_Tree_Initiative.pdf

November 21, 2016 - "Looking to lease MWRD real estate? New online mapping system of available properties now available"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_1121_Real%20Estate_atlas.pdf

November 22, 2016 - "Perspectives at the Water-Energy-Climate Nexus: Anticipating changes to come"
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_1122_NU_Climate_Change_Symposium.pdf

December 7, 2016 - "President's Annual Message 2016" (pertinent sections included below)
By Mariyana T. Spyropoulos

Working Toward Energy Neutrality
In September, the Board of Commissioners unanimously supported an amendment to the Resource Recovery ordinance, which allows us to begin accepting organics that will help us grow our energy production and reach our goal of energy neutrality by 2023. We are currently developing a program that will allow us to receive organic waste at our Stickney and Calumet WRPs that will help us produce biogas, which can offset the energy demands of the treatment plants. Our Calumet WRP has digester capacity to process 400 tons of food waste daily, and we are building a processing facility and a receiving station that will help expedite the process. Through the ordinance, we would also be able to receive high strength organic materials for biological phosphorus removal and organic feedstock, such as yard waste, tree trimmings, and wood chips to strengthen and add to our biosolids compost blend. These are critical initiatives that protect our planet and produce savings for our taxpayers.

Biosolids

Part of the waste that is being hauled each day to landfills is wood chips and yard waste. By combining it with our Class A biosolids, we are developing another reuse opportunity through a high-value compost. Since receiving state authority last year, we continued to develop this product and move it closer to the market. We produced approximately 145,000 dry tons annually over each of the past five years and are targeting a distribution goal of 90,000 dry tons per year. Given the demand for this product on golf courses and at park districts, we know there is a similar value to making biosolids available to the public. We held a naming contest for a product we hope to market soon. We received 726 creative submissions that will help us market our resource and educate the public on the many benefits of biosolids reuse. Receiving the materials to create the compost and selling the finished product will provide another revenue stream for the MWRD. This compost blend will assist soil for plants, helping to increase water retention and promote root development.

Restoring the Canopy

In April we launched a new program designed to inspire Cook County residents to adopt a more traditional form of green infrastructure that will truly add green to our communities while retaining stormwater. Driven by the devastation caused by the emerald ash borer and extreme weather events that have led to the loss of approximately 13 million trees, staff embarked on an ambitious plan to help restore the Cook County tree canopy. In only a few months, more than 25,000 free oak tree saplings were distributed as part of the Restore the Canopy, Plant a Tree program. This program will work toward restoring the region's tree canopy and managing local stormwater which will help reduce flooding, improve local water quality by lessening the load of water overwhelming our sewer system, and promote resource recovery by planting the trees in our composted biosolids blend. To distribute these trees, the MWRD has forged partnerships with more than 25 different municipalities, 30 schools and nearly 50 community groups.
www.mwrd.org/irj/go/km/docs/documents/MWRD/internet/News&Media/Newsroom/Media/Press_Releases/2016/16_1206_Presidents_Message_2016.pdf

8. Media Coverage

1st Quarter - There were five media hits.

"MWRD Biosolids Workshop," *IWEA e-News,* Jan. 6, 2016
http://www.memberleap.com/Calendar/moreinfo.php?eventid=1184

"Soil in the City (Special Section)," Papers published by MWRD researchers, including: "Soil in the City: Sustainably Improving Urban Soils," "Greening a Steel Mill Slag Brownfield with Biosolids and Sediments: A Case Study" and "Restoring Ecosystem Function in Degraded Urban Soil Using Biosolids, Biosolids Blend, and Compost," Journal of Environmental Quality, January 11, 2016
\\Mustang\Gen Admin\PUBLIC\IN_THE_NEWS\16 0111_Journal of Environmental Quality_Biosolids.pdf

"Planners Hope Canal Shores' Redesign will be a Legacy," *Evanston Round Table,* February 11, 2016
http://www.evanstonroundtable.com/main.asp?SectionID=15&SubSectionID=26&ArticleID=11586

"MWRD: Biosolids Grow in Popularity for Nurturing Plants," *Cook County Chronicle,* February 19, 2016

http://chronicleillinois.com/news/cook-county-news/biosolids-grow-in-popularity-for-nurturing-plants/

"Residuals and Biosolids 2016," *WEF e-News*, February 23, 2016
http://www.wef.org/ResidualsBiosolids/

2nd Quarter - There were six media hits.

"8 Steps to Energy Neutral Wastewater Operations," *Water Innovations Digital Publication By Allison Fore, Public & Intergovernmental Affairs Officer, MWRD,* April 4, 2016
http://www.wateronline.com/doc/steps-to-energy-neutral-wastewater-operations-0001

"MWRD Enriches South Side Community Gardens With Biosolids," *Water and Wastes Digest,* May 9, 2016
http://www.wwdmag.com/mwrd-enriches-south-side-community-gardens-biosolids

"City of Second Chance Soils," *Soil Science Society of America, Crop Science Society of America, American Society of Agronomy,* May 18, 2016
https://www.agronomy.org/science-news/city-second-chance-soils

"The Crappiest Place on Earth, Stickney Water Reclamation Plant," *Atlas of the Future,* May 24, 2016
http://atlasofthefuture.org/project/stickney-water-reclamation-plant/

"MWRD Enriches South Side Community Garden Projects," *Water Online,* May 24, 2016
http://www.wateronline.com/doc/mwrd-soil-enriches-south-side-community-garden-projects-0001

"Using Biosolids to Fix Cities," *My Central Nebraska, Soil Science Society of America (VA), My Central Nebraska,* June 1, 2016
http://www.newswise.com/articles/using-biosolids-to-fix-cities
http://www.mycentralnebraska.com/2016/06/01/using-biosolids-to-fix-cities/

3rd Quarter – There were 12 media hits.

"New MWRD Video Highlights Agency Efforts to Recover Resources," *Water Online,* July 6, 2016
http://www.wateronline.com/doc/new-mwrd-video-highlights-agency-efforts-recover-resources-0001

"Help Us Rename Our Biosolid, But Be Nice, Says Water Reclamation District," *DNA Info (IL),* July 30, 2016
https://www.dnainfo.com/chicago/20160730/downtown/help-us-rename-our-biosolid-but-be-nice-says-water-reclamation-district#.V5zrqPVZKn0.mailto

"Hanover Park Water Reclamation Plant Profile," *The IWEA Clarifier,* Summer, 2016
http://pepportal.mwrd.local:50100/irj/go/km/docs/MWRD_in_the_News/16%20Summer_Clarifier_HPWRP_Profile.pdf

"PARTNER SPOTLIGHT: MWRD Recovering Resources in the Region," *Millennium Reserve, July 2016*
http://www.millenniumreserve.org/Priorities/mwrd/

"Name That Biosolid: The MWRD Opens Up Naming Contest To Public," *Water Online* July 29, 2016
http://www.wateronline.com/doc/name-that-biosolid-the-mwrd-opens-up-naming-contest-to-public-0001

"Name that Biosolid: The MWRD opens Up Naming Contest to Public," Treatment Plant Operator Magazine Aug. 3, 2016
http://www.tpomag.com/online_exclusives/2016/08/name_that_biosolid_mwrd_opens_naming_contest_to_public

"Constable: Metro Water District holding contest to name our poop," *Daily Herald* Aug. 9, 2016
http://www.dailyherald.com/article/20160808/news/160809112/

"The Metropolitan Water Reclamation District of Greater Chicago (MWRD) is accepting applications for its 2016 Sustainable Landscaping and Biosolids Beneficial Reuse Awards until September 2," *Millennium Reserve Monthly* Aug. 15, 2016
http://us9.campaign-archive2.com/?u=52c09c80aae494a01311c8614&id=ff1ab21f57&e=d46ccac95b

"Sewer bosses want a new name for $@&*," *Chicago Tribune,* August 16, 2016
http://www.chicagotribune.com/news/chicagoinc/ct-sewage-renamed-mwrd-0816-chicago-inc-20160813-story.html

"What is this Crap? City Wastewater Agency Wants Help Naming New Fertilizer," *Chicagoist,* August 16, 2016
http://chicagoist.com/2016/08/15/help_chicagos_wastewater_agency_ren.php

"Residents complain of bad odors in Lyons," *Cook County Chronicle, August 16, 2016*
http://chronicleillinois.com/news/cook-county-news/residents-complain-bad-odors-lyons/

"Measuring The Impact Of Phosphorous Recovery — From The Midwest To The Gulf Of Mexico," *Water Online,* August 31, 2016
http://www.wateronline.com/doc/measuring-the-impact-of-phosphorous-recovery-from-the-midwest-to-the-gulf-of-mexico-0001

4th Quarter – There was one media hit.

"The Village of Skokie receives an honorable mention," *Skokie Review*, October 19, 2016
http://www.chicagotribune.com/suburbs/skokie/community/chi-ugc-article-the-village-of-skokie-receives-an-honorable-m-2016-10-19-story.html

9. Event

Sustainability Summit 2016

Experienced landscapers, expert environmentalists and responsive local governments developing programs that utilize local resources, save money and improve the environment were praised for their sustainable measures at the MWRD's 4th Annual Sustainability Summit. Held at Maggie Daley Park, a biosolids user, in Chicago on Oct. 7, the Summit offers an opportunity to empower and equip these partnering municipalities and environmental advocates with the latest trends and information in resource recovery and stormwater management. The event is also an opportunity to spotlight some of the best work taking place across the county that promotes a sustainable environment and speaks to the MWRD's mission in renewable resources, flood control and water quality improvements.

Two award winners were dedicated to the concept of resource recovery and the beneficial reuse of biosolids that can improve turf quality and reduce carbon footprints. Dave Ward, superintendent of Coyote Run Golf Course in Flossmoor, and the Tinley Park-Park District were honored for their work implementing MWRD biosolids onto their grounds. The MWRD has been successfully using biosolids for fertilizing golf courses and athletic fields at both schools and public parks, like Maggie Daley Park, in the Chicago area for more than 30 years.

The 100-member audience included:

a. Mayors, City Councilmen, county leaders
b. Public Works Directors
c. City Managers
d. Watershed Planning Council members
e. Forest Preserve Districts
f. Turf Managers
g. Legislators
h. Park District Managers
i. Golf Club Managers
j. Landscaping business representatives

Buckets of biosolids compost were distributed to guests, along with the "Recovering Resources, Transforming Water" booklet. (The program, press release and other literature are attached.)

Dave Ward, Superintendent, Coyote Run Golf Course in Flossmoor, receives a plaque from Commissioner Frank Avila for using biosolids since 2006.

Chad Hofstra and Sandra Ardolino of the Tinley Park-Park District received an award for using MWRD biosolids.

Chicago Park District Project Manager Nichole Sheahan gave a tour of Maggie Daley Park as part of the 4th Annual Sustainability Summit.

Allison Fore

Allison Fore

Cc: Daniel Collins (EMS File)

Attachments

- Sustainability Summit Save the Date Card
- Sustainability Summit Invitation
- Sustainability Summit Program
- Sustainability Summit Participation Credit Certificate
- Inaugural "Recovering Resources, Transforming Water" Annual booklet
- "Students, Help us Name that Biosolid!" flier
- Restore the Canopy outreach letter
- Name the Biosolids outreach letter
- Press Releases

May 20, 2016

The Honorable Patrick E. Kitching
Village of Alsip
4500 W. 123rd St.
Alsip, Illinois 60803

Dear President Kitching:

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) has launched a new program that will help replenish Cook County's tree canopy and mitigate flooding. The region's tree canopy has been decimated by emerald ash borer and severe weather, and planting a tree is a great way to help restore the canopy. Trees absorb rain and carbon gasses while producing oxygen.

The *Restore the Canopy, Plant a Tree* program provides free 18" oak saplings delivered to municipalities, community groups and schools to distribute and plant throughout your community. You are welcome to order bare root saplings in bags or pre-potted saplings. For best results, bare root saplings should be planted within a few days of delivery.

To place your order, please call our Office of Public Affairs at (312) 751-6633 or email public.affairs@mwrd.org. You will simply need to indicate the number of trees you want to order (minimum of 100), the delivery address, and requested dates. Please allow 2-4 weeks for delivery.

We are creating a GIS map that can be found on our website at www.mwrd.org. We ask that you provide each tree's location to us whenever possible so that we can map where the canopy is being restored.

As you distribute the saplings, please encourage recipients to name them, take selfies and share their tree's progress with the MWRD on social media. Using #MyMWRDTree, tweet us @mwrdgc, tag us on Facebook or email a photo and caption to public.affairs@mwrd.org.

Thank you for your consideration. If you have any questions, my office is always available for assistance at (312) 751-5650.

Sincerely,

Mariyana T. Spyropoulos
President

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312.751.5600

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August 25, 2016

Mr. Tony Chalmers
Montefiore Special Education Academy
1310 S. Ashland Ave.
Chicago, IL 60606

Dear Mr. Chalmers,

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) is holding a *Name that Biosolids* contest and asking the public to help us name both our *Exceptional Quality (EQ)* biosolids and *EQ biosolids blend* that is composted with woodchips. The contest is steadily increasing in popularity, so we have decided to extend the deadline and open this contest up to school administrators, teachers and students of all ages.

Participants can enter the contest by submitting their ideas via email to *Public.Affairs@mwrd.org* or by posting their ideas to our Facebook or Twitter pages (@mwrdgc). Use #NamethatBiosolid when submitting entries. Please be creative but appropriate as well. Multiple submissions are welcomed, and all entries will be considered; however, the MWRD reserves discretion in naming this product. The deadline to enter is September 30, 2016.

We understand that most students may ask, "What are biosolids?" They are a natural product of an interesting and unusual cycle of which we all play a part. For parents and guardians asking about the safety of our products, we're proud to say they are safe to use.

The MWRD produces its biosolids as part of the water treatment process. Our biosolids are a high-quality product that can be recovered and turned into a valuable resource for plants. Air-dried biosolids look like dark, fine-textured topsoil and are a sustainable alternative to chemical fertilizers. Biosolids can be used almost anywhere soil amendments and chemical fertilizers would be used, only more effectively and at a fraction of the cost. Golf courses, athletic fields, parks and recreational facilities, and agricultural and farm fields have used MWRD biosolids.

Legislation, signed last year by Gov. Bruce Rauner, amends the Illinois Environmental Protection Act to create the new definition of EQ biosolids. The MWRD worked with the IEPA, Illinois Department of Agriculture and several environmental groups to develop the legislation after gaining approval from the US EPA and other environmental regulators. **The approval affirms the rigorous testing EQ biosolids have undergone and ensures its safety and effectiveness.**

We looking forward to all the creative ideas that stem from your school!

Sincerely,

Allison Fore

Allison Fore

Enclosure: 2

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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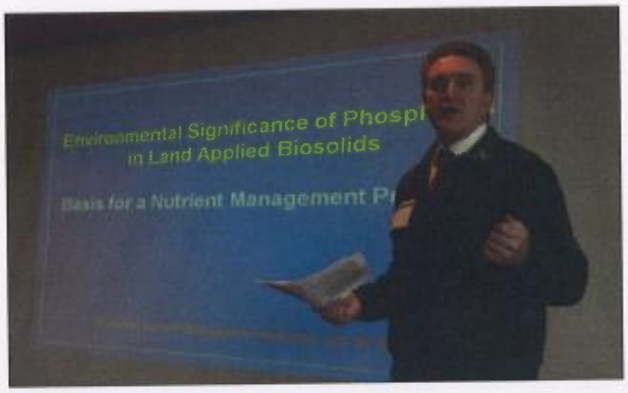
For immediate release
February 16, 2016

Biosolids nutrient management workshop begins work to develop best management practices, confront phosphorus loss from agricultural land

Randy Stein, executive director of the Bloomington-Normal Water Reclamation District, leads a discussion on potential best management practices for a biosolids nutrient management program. Much of the conversation focused on what land appliers have experienced in farm fields and the potential of reducing biosolids application rates and establishing vegetative buffers.



Dr. Thomas Granato, director of the Monitoring and Research Department at the Metropolitan Water Reclamation District of Greater Chicago (MWRD), welcomed 50 participants to MWRD to address how to implement best management practices to reduce loss of phosphorus from land applied biosolids.

Representatives of wastewater treatment agencies, biosolids land appliers and consultants from across the state joined the Metropolitan Water Reclamation District of Greater Chicago (MWRD) to lay the groundwork for developing a biosolids nutrient management program for agricultural land. Biosolids are a nutrient-rich product of the water treatment process and are used by farmers, golf course managers, landscapers, municipalities and park districts.

During a one-day workshop held at the MWRD's Lawndale Avenue Solids Management Area Visitors Center in Willow Springs, IL, participants discussed best management practices (BMPs) that could be implemented to reduce the potential for nutrient loss, especially phosphorus, from biosolids applied to agricultural land.

This effort is driven by the Illinois Nutrient Loss Reduction Strategy developed by the Illinois Environmental Protection Agency to reduce the discharge of nutrients in the Mississippi River Watershed which impact the Gulf of Mexico. Implicated as a contributor to Gulf hypoxia, an overabundance of nutrients can result in reduced water clarity, depleted oxygen, changes in fish populations and growth of toxic algae. Illinois is one of 31 states contributing to the Mississippi River Watershed which reaches 41 percent of the United States, includes 250 tributaries and covers more than 1.25 million square miles and two Canadian provinces.

"We commend our staff and sister agencies for taking the proactive measures to develop a plan that is environmentally responsible and yet fruitful for farmers and agricultural production," said MWRD President Mariyana Spyropoulos.

"Utilities are expending considerable effort and expense to enhance nutrient removal at their treatment plants to recover a valuable resource and reduce the nutrient loading to surface water," said Dr. Thomas Granato, director of the Monitoring and Research Department at the MWRD. "These efforts will be short-circuited if biosolids are then loaded on land in a manner such that nutrient losses to surface water occur. Therefore, biosolids nutrient management is completing the resource recovery and environmental stewardship loop."

(continued)

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
February 16, 2016

Biosolids nutrient workshop *(continued)*

Among the nearly 50 participants in attendance were soil scientists, researchers, farming experts, engineers and contractors and consultants involved in land application of biosolids. Wastewater treatment districts from Peoria, Joliet, Bloomington-Normal, Wheaton and other Illinois communities shared information on how implementation of BMPs will work in their biosolids land application programs. The group discussed a list of core BMPs and identified a team to devise a biosolids nutrient management guidance document, define the key components and activities for the nutrient management program, and explore how to gain statewide participation in the program.

Essential for life, phosphorus is a non-renewable resource that has less than 100 years of reserves remaining worldwide. To reduce the amount of phosphorus entering the waterway system after treatment, the MWRD is building the world's largest phosphorus recovery system to return a usable phosphorus product for use as an environmentally-friendly fertilizer. The MWRD partnered with Ostara Nutrient Recovery Technologies and Black & Veatch to design and construct the nutrient recovery system at the Stickney Water Reclamation Plant that will produce between 9,000 and 10,000 tons of Crystal Green fertilizer annually and reduce the MWRD's nutrient load to the receiving waterways.

To learn more about the MWRD's work in reducing and collecting phosphorus and the MWRD's biosolids program, visit www.mwrd.org.

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Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
February 26, 2016

MWRD soil scientists' biosolids paper earns IWEA acclaim

Mr. Wale Oladeji, Associate Environmental Soil Scientist at MWRD's Stickney plant in Cicero, Illinois. His presentation entitled "Biosolids Beneficial Reuse Programs: SWOT and PEST Evaluations to Ensure Sustainability," which he co-authored with fellow MWRD soil scientists Lakhwinder Hundal, Dominic Brose, Kuldip Kumar and Dan Collins, is being recognized for giving the "IWEA Best Technical Presentation."

The MWRD is expanding the use of biosolids by mixing them with tree debris provided by the city of Chicago. This debris mix is composted into an organic material for use as a substitute for fertilizer, compost and soil amendment. This material is used for maintaining or establishing turf grass in parks, athletic fields and public access areas throughout Cook County.

New legislation has sparked heightened interest in and accessibility to biosolids, the nutrient-rich product of the Metropolitan Water Reclamation District of Greater Chicago's (MWRD's) water treatment process. Biosolids are in popular demand by farmers, golf course managers, landscapers, municipalities and park districts, but re-using these soil enhancers can be a challenge in the context of urban sprawl, regulatory restrictions, public perceptions and other opposition.

Academic papers written by MWRD soil scientists address these issues, and in the process, the scientists have drawn rave reviews from experts in the field for their ability to tackle the complex hurdles in creating a sustainable practice.

The Illinois Water Environment Association (IWEA) recognized MWRD environmental soil scientist Wale Oladeji for his presentation entitled "Biosolids Beneficial Reuse Programs: SWOT and PEST Evaluations to Ensure Sustainability," which he co-authored with fellow MWRD soil scientists Lakhwinder Hundal, Dominic Brose, Kuldip Kumar and Dan Collins. The team is being recognized for giving the "IWEA Best Technical Presentation" at the 2015 Annual Conference. The IWEA Awards Banquet will be held Feb. 29 at the Colonnade Club at Memorial Stadium in Champaign.

In the paper, the soil scientists evaluated the SWOT (Strengths, Weaknesses, Opportunities, and Threats) and the PEST (Political, Economic, Social, and Technological) attributes of MWRD's biosolids beneficial reuse programs. They also assessed biosolids' reuse for farmland, composting, pelletizing and controlled solids distribution through the urban use of exceptional quality biosolids approved by the Illinois Environmental Protection Agency (IEPA). The paper documented both the opportunities and weaknesses of each program that must be addressed to ensure long-term sustainability. The paper asserts that understanding this information is critical in designing and maintaining a biosolids reuse program to achieve desired goals.

"Congratulations to our team of soil scientists for their proactive leadership and adept knowledge for the range of issues involving biosolids," said MWRD President Mariyana Spyropoulos. "This group of soil scientists have been working to address the many implications of reuse programs."

(continued)

Metropolitan Water Reclamation District *of* Greater Chicago

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For immediate release
February 26, 2016

IWEA award *(continued)*

The beneficial reuse of biosolids provides a safe and friendly alternative to chemical fertilizers and has also proven to be a sustainable and cost-effective option in resource recovery following the water treatment process. Not only do the biosolids contribute toward the natural development of plant life and other agricultural benefits, but by better managing biosolids for reuse, the MWRD is eliminating the cost of hauling it to landfills.

The MWRD worked with the IEPA, Illinois Department of Agriculture and several environmental groups to develop legislation to amend the Illinois Environmental Protection Act to create the new definition of exceptional quality biosolids and make this recovered resource more accessible. In July 2015, Gov. Bruce Rauner signed the bill into law, allowing recognition of exceptional quality biosolids in the state of Illinois to be consistent with federal rules. The law helps establish the MWRD's biosolids program as a bona fide resource recovery model. The MWRD is working on a plan to make biosolids more readily available.

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The MWRD environmental soil scientist group includes (from L-R) Lakhwinder Hundal, Dan Collins, Wale Oladeji, Dominic Brose and Kuldip Kumar. They are being recognized by the Illinois Water Environment Association for their research on how to best grow a sustainable program for the reuse of biosolids in the context of many challenges.

The end result of biosolids' use is beautifully maintained landscapes, such as the new Maggie Daley Park, where the Chicago Park District has used this valuable recovered resource from the water treatment process. After 18 months of storage for thickening and stabilization to improve quality and reduce volatile organic compounds and pathogens, the biosolids are then air-dried and resemble a dark, fine-textured topsoil that is a sustainable alternative to chemical fertilizers.

Recovering Resources, Transforming Water

Established in 1889, the MWRD (www.mwrd.org) is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
May 19, 2016

MWRD soil enriches South Side community garden projects

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) has formed a new partnership with an urban gardening organization that will foster sustainable farming practices that will soon lead to a bountiful harvest.

The MWRD will provide its exceptional quality (EQ) composted biosolids to be incorporated at 72 community gardens overseen by the ChicaGRO Intergenerational Growing Projects organization. The EQ biosolids are produced during the water treatment process by composting biosolids with woodchips, which makes for an excellent soil enhancer.

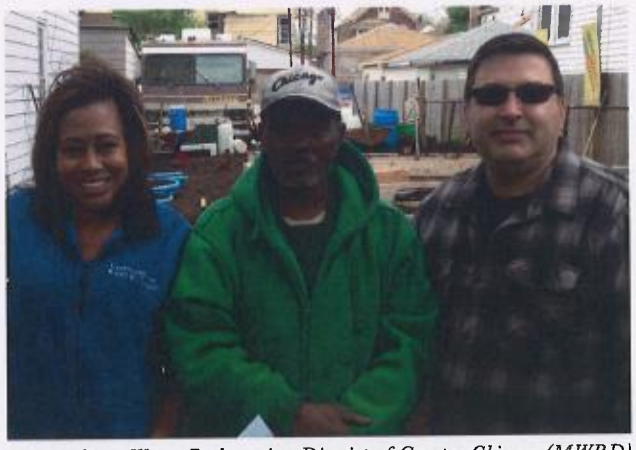
On May 14, the MWRD Commissioner Kari Steele and other MWRD staff joined the ChicaGRO Intergenerational Growing Project as it turned a vacant South Chicago neighborhood lot into a backyard community garden. Located at 8450 S. Escanaba Ave., the garden will become a source of fresh produce for many residents living in what is considered a food desert.

"Because of partnerships like this, the sustainable practices started at the Metropolitan Water Reclamation District of Greater Chicago can be transferred straight to our very own communities," said Commissioner Steele, who was on hand to kick off the planting day event in South Chicago. "We are happy to play a role in supporting ChicaGRO Intergenerational Growing Projects and look forward to assisting future efforts like this throughout Illinois. We thank them for their commitment to providing urban gardens and cultivating a wealth of nourishing opportunities for so many communities in the Chicago area."

ChicaGRO Intergenerational Growing Projects is an urban vegetable garden initiative that manages 75 community gardens, ranging in size of a third of an acre to 3.5 acres. The gardens stretch beyond the Chicago city limits, extending all the way from Robbins on the south to Evanston on the north. The largest space is at 57th Street and Lafayette Avenue in the Englewood neighborhood, where ChicaGRO grew 15,000 pounds of vegetables last year alone and donated it to the city of Chicago, according to ChicaGRO Executive Director Gregory Bratton. But growing all those crops requires a fair amount of soil. That is why Bratton reached out to Commissioner Steele. Working with the commissioner, MWRD Associate Environmental Soil Scientist Dominic Brose and Managing Civil Engineer Dan Collins helped coordinate the delivery of the product. The compost was used in raised planting beds, while the MWRD also provided recycled woodchips that were placed around the planting beds.

Neighbors and their children also helped prepare the garden and planted carrots, tomatoes, bell pepper, cabbage, sweet potatoes, onions, radishes, corn, sweet peas, okra, and lettuce

(continued)



Metropolitan Water Reclamation District of Greater Chicago (MWRD) Commissioner Kari Steele, ChicaGRO Intergenerational Growing Project Executive Director Gregory Bratton and MWRD Managing Civil Engineer Dan Collins participated in a planting day in the South Chicago neighborhood.

(L-R) Mrs. Knight, a resident on the block, Commissioner Kari Steele, Gregory Bratton, MWRD Managing Civil Engineer Dan Collins, and area youths turn a barren spot of land 125 feet by 25 feet into a lively and productive community garden.

MWRD soil enriches South Side community garden projects *(continued)*

seeds. They also planted a banana tree grown inside a hoop house. According to Bratton, the garden will help teach area residents about sustainable growing and how to care for and maintain a community backyard garden. Once the vegetables are ready for harvest, Bratton says he will host a day when residents can stop by to help enjoy the fruits of their labor. He also plans to incorporate lessons for healthier lifestyles into each event hosted at the garden to teach residents about the importance of eating nutritious foods. The garden is one of more than 20 ChicaGRO Intergenerational Growing Projects Bratton has developed in South Chicago alone.

Working hard on prepping the composted biosolids.

By using tree debris as a bulking agent, the composting process raises the temperature of the biosolids and woodchip mixture and destroys pathogens to create an EQ composted biosolids product. The MWRD has a goal of producing 10,000 tons of composted biosolids in 2016. Biosolids are a product of the water treatment process in which organic solids that have settled out during treatment are sent to temperature-controlled digesters where microorganisms break them down in a process similar to composting. At the MWRD, EQ biosolids and EQ composted biosolids are generated by following USEPA-approved processes. In recent years, the biosolids have been made popular by users like farmers, golf course managers, landscapers, municipalities and park districts.

In 2015, Gov. Bruce Rauner signed legislation that amended the Illinois Environmental Protection Act to recognize EQ biosolids as a resource and not a waste. This legislation makes biosolids more accessible and recognized that biosolids are a safe, beneficial and renewable resource that should be used locally. This legislative amendment makes nutrient rich EQ biosolids available to the public for growing food crops and maintaining healthy lawns. To learn more about MWRD's biosolids program, visit www.mwrd.org or call (708) 588-4201, or email biosolids@mwrd.org. To learn more about ChicaGRO Intergenerational Growing Projects, visit their page on Facebook.

Volunteers, friends and neighbors joined together through the ChicaGRO Intergenerational Growing Projects to plant an array of seeds.

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Recovering Resources, Transforming Water

Established in 1889, the MWRD (www.mwrd.org) is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

Allison Fore
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For immediate release
July 5, 2016

MWRD seeks applicants for Sustainable Landscaping and Biosolids User awards

Applications due September 2, 2016

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) is accepting applications for its 2016 Sustainable Landscaping and Biosolids Beneficial Reuse Awards until September 2.

The awards will recognize the activities and innovations of individuals and organizations such as park districts, villages, schools, golf courses, and athletic clubs in two separate categories: sustainable landscaping and beneficial use of biosolids. Biosolids are a product of the MWRD's water treatment process and are a sustainable alternative to chemical fertilizers.

The beneficial use of biosolids may be demonstrated through any one or a combination of the following:

- Continuous commitment to maximize and improve the cost-effectiveness of using biosolids.
- Promotion such as, but not limited to, referrals and field demonstrations.
- Educational efforts on the environmental/economic benefits of using biosolids.

Qualifications for the Sustainable Landscaping award may be demonstrated through the innovative use of green infrastructure, capital investment, and how an individual or organization promotes green landscaping to educate the community.

The goal is to present an award to an individual or community that integrates sustainable practices in the environment that manages stormwater.

Green infrastructure includes:

- Rainwater Harvesting, i.e. through rain barrels
- Rain Gardens
- Native Landscaping
- Stormwater Trees
- Porous Pavement
- Bio-Swales
- Green Roofs
- Greenways
- Wetlands
- Green Alleys, Streets, and Parking Lots

Activities completed after January 1, 2011 are eligible for an award, and an individual or organization is eligible once every five years. There is no formal application form. Documentation should include figures, illustrations, narrative, and photos to help further explain the efforts. The evaluation process may include a site visit.

Submit application packages to TianG@mwrd.org or mail to:
Guanglong Tian
Monitoring & Research Department
Metropolitan Water Reclamation District of Greater Chicago
6001 W. Pershing Road
Cicero, IL 60804

Awards will be presented at the MWRD's fourth annual Sustainability Summit later this year. For more information about the biosolids program, awards or Sustainability Summit, contact (312) 751-6633.

###

Metropolitan Water Reclamation District *of* Greater Chicago

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For immediate release
July 6, 2016

New MWRD video highlights agency efforts to recover resources

Wastewater treatment is no longer simply about preventing pollution. Over the evolution of the Metropolitan Water Reclamation District of Greater Chicago's (MWRD's) 127-year history of water management, the agency has undergone major transformation: from protecting the waterways and Lake Michigan to improving the environment and now recovering valuable resources. To document many of the MWRD's latest initiatives in resource recovery, a new video was developed, "Recovering Resources, Transforming Water" and is posted online at www.mwrd.org.

In the photo (L-R): Lab Tech I Maricela Sabido and Assistant Director of Engineering Tom Kunetz demonstrate the algae process for nutrient removal.

"These efforts will reduce greenhouse gases, promote a cleaner and more sustainable environment and provide a return on investment that will benefit taxpayers," said MWRD President Mariyana Spyropoulos in the video.

While the MWRD designs and operates treatment processes with an eye towards energy efficiency, the agency aspires to become energy neutral by 2023. This accomplishment will provide a return on investment that will benefit taxpayers and the environment. These exciting innovations in renewable energy and energy savings provide another illustrious chapter in the MWRD's history in which no small plans are made. By exploring and embracing technology, the MWRD is taking control of its energy future and moving towards its next technological adventure as the utility of the future.

Some of these recovered resources highlighted in the video include:

- Developing ways to reuse water produced at plants; this water can be reused by the industrial sector, which is paying higher prices to use valuable fresh water from Lake Michigan.
- Pursuing the sale of biosolids through a premium compost product to the marketplace.
- Recovering phosphorus in a slow release fertilizer for environmentally friendly reuse.
- Developing an algae process for nutrient removal and harvest that can be utilized in the manufacture of a variety of products, such as biofuels and bioplastics, which can also reduce the reliance on petroleum. *(continued)*

New MWRD video highlights agency efforts *(continued)*

Senior Civil Engineer Mwende Lefler, P.E., explains the Ostara phosphorus recovery process.

MWRD President Mariyana Spyropoulos explains in the video about the work the MWRD is engaged in to recover resources and transform water.

- Implementing food to energy and doubling gas production and maximizing use of digester capacity.
- Marketing electrical capacity at the Lockport Powerhouse to maximize return on investment.
- Optimizing aeration processes and reducing energy consumption by 25 percent as a result.
- Introducing solar thermal and sewer thermal systems to heat water at MWRD treatment plants and provide savings.

The video can be viewed on www.mwrd.org or on YouTube at https://youtu.be/LHhJ--BNffw.

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Established in 1889, the MWRD (www.mwrd.org) is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
July 12, 2016

Surpassing 10,000 milestone in tree distribution, MWRD working to restore canopy

In only two months, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) has distributed more than 10,000 oak tree saplings as part of the agency's new initiative called "Restore the Canopy, Plant a Tree." Visitors to the MWRD's website (www.mwrd.org) can view an interactive map depicting where the trees have been distributed. This map identifies the areas of Cook County that will see a future growth in canopy protection, shielding property owners from stormwater and assisting the MWRD in its efforts to eliminate flooding.

Launched in April, the program helps restore the urban canopy through the free distribution of18-inch oak tree saplings to municipalities, community groups and schools in Cook County.

"The instant success of our tree program speaks to the many tangible benefits trees provide and the enthusiasm residents across Cook County share for improving our environment and managing today's water," said MWRD President Mariyana Spyropoulos. "While these saplings have a long way to grow to truly restore the canopy, we know we are planting a legacy in stormwater management for a better tomorrow and many years to come."

By the end of June, the MWRD distributed 10,850 saplings to 22 municipalities, 26 schools, 14 community groups, as well as MWRD open houses, ribbon cuttings and community events.

A single inch of rainfall across the MWRD's service area, covering nearly all of Cook County, will yield approximately 16 billion gallons. By employing oak trees to consume this inundation of stormwater, the MWRD has a new tool in its arsenal to protect the region from flooding. A medium-sized oak tree can help prevent flooding by absorbing 2,800 gallons of rainfall per year. If 10,000 trees are planted, the MWRD has the potential to provide more than 28 million gallons of storm water storage, and these numbers are expected to grow.

Not only does a tree serve as an effective form of green infrastructure to reduce flooding, but trees also reduce city heat island effects, absorb carbon gases, produce oxygen, improve the habitat for wildlife and remain an important part of the ecosystem. The tree population of the Chicago region, however, has been decimated in recent years by emerald ash borer infestations and extreme weather, spurring the MWRD into action.

The MWRD oak tree saplings are available in bulk bags of 100 bare root saplings or distributed in one-gallon pots that include a biosolids compost blend, a sustainable alternative to chemical fertilizers that is recovered from the water treatment process.

The MWRD trees saplings are available in individual pots or in bulk bags of 100 bare root saplings. Planting and care instructions, along with additional information regarding the benefits of trees, will be provided with each delivery. With advanced notice, the saplings can be picked up at MWRD facilities or delivered.

To learn how to receive an oak tree sapling or participate in the program, visit www.mwrd.org, or contact MWRD Public Affairs at (312) 751-6633 or public.affairs@mwrd.org. The MWRD also distributes free trees every Wednesday from 9 a.m. to noon, at the following water reclamation plants:

- Calumet (400 E. 130th St., Chicago)
- Egan (550 S. Meacham Rd., Schaumburg)
- Hanover Park (1220 Sycamore Ave., Hanover Park)
- Kirie (701 West Oakton St., Des Plaines)
- O'Brien (3500 Howard St., Skokie)
- Stickney (6001 W. Pershing Rd., Cicero)

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Recovering Resources, Transforming Water

Established in 1889, the MWRD (www.mwrd.org) is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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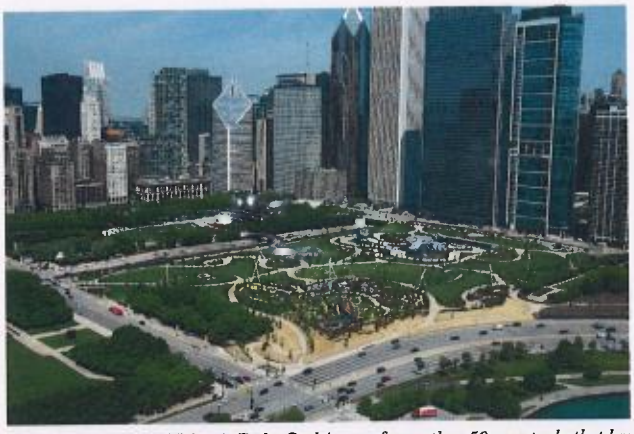
For immediate release
July 29, 2016

Name that biosolid: The MWRD opens up naming contest to public

Contest deadline is August 30

The Milwaukee Metropolitan Sewerage District in Wisconsin markets their biosolids as "Milorganite." DC Water in Washington, DC recently launched "Bloom." The Metropolitan Water Reclamation District of Greater Chicago (MWRD) is looking to join these and other sister water agencies in naming the locally-produced products.



The new and heralded Maggie Daley Park is one of more than 50 area parks that has benefited from biosolids. The soil enhancer stimulates plant growth and lasts three to five years longer than regular chemical fertilizers and the Metropolitan Water Reclamation District of Chicago (MWRD) has the opportunity to make it available to the public for the first time. Now the MWRD just needs a name.

Due to recent changes in Illinois law, MWRD biosolids, for the first time, can be made available and sold to the general public. The MWRD produces the biosolids as part of the water treatment process and is turning to the public for help in naming both the Exceptional Quality (EQ) biosolids and EQ biosolids blend that is composted with woodchips.

Contestants are urged to be appropriate but creative. The deadline is August 30, 2016. To submit a name, contact public.affairs@mwrd.org or find the MWRD on Facebook or Twitter.

"At a time when there is growing scrutiny over fertilizers and pesticides, we are supporting a natural trend that is both resourceful to our environment and also our taxpayers," said MWRD President Mariyana Spyropoulos. "We encourage the public to enter the contest today and have fun knowing they are part of this most interesting and unusual cycle of life."

MWRD biosolids are a high-quality product of the water treatment process that can be recovered and turned into a valuable resource for plants. Air-dried biosolids look like dark, fine-textured topsoil and are a sustainable alternative to chemical fertilizers. Instead of being trucked to a landfill or deposited in waterways like practiced many years ago, the biosolids can be used almost anywhere soil amendments and chemical fertilizers would be used, only more effectively and at a fraction of the cost. Golf courses, athletic fields, parks and recreational facilities and agricultural and farm fields have used MWRD biosolids. The biosolids have also been used to restore brownfields and other disturbed lands.

The legislation, which was signed last year by Gov. Bruce Rauner, amends the Illinois Environmental Protection Act (IEPA) to create the new definition of EQ biosolids. The MWRD worked with the IEPA, Illinois Department of Agriculture and several environmental groups to develop the legislation after gaining approval from the US EPA and other environmental regulators. The approval affirms the rigorous testing EQ biosolids have undergone and ensures its safety and effectiveness.

Despite the social stigma imposed on biosolids, the recovered product from the water treatment process has actually proven safe enough for public use through many channels. More importantly, this all natural fertilizer is proven to be more effective than chemical fertilizers and other soil enhancers.

The MWRD reserves discretion in naming this product.

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Recovering Resources, Transforming Water

Established in 1889, the MWRD (www.mwrd.org) is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
August 5, 2016

MWRD seeks applicants for Sustainable Landscaping and Biosolids User awards

Applications due September 2, 2016

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) is accepting applications for its 2016 Sustainable Landscaping and Biosolids Beneficial Reuse Awards until September 2.

The awards will recognize the activities and innovations of individuals and organizations in Cook County such as park districts, villages, schools, golf courses, and athletic clubs in two separate categories: sustainable landscaping and beneficial use of biosolids. Biosolids are a product of the MWRD's water treatment process and are a sustainable alternative to chemical fertilizers.

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Qualifications for the Sustainable Landscaping award may be demonstrated through the innovative use of green infrastructure, capital investment, and how an individual or organization promotes green landscaping to educate the community.

The goal is to present an award to an individual or community that integrates sustainable practices in the environment that manages stormwater.

Green infrastructure includes:

- Rainwater Harvesting, i.e. through rain barrels
- Rain Gardens
- Native Landscaping
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Activities completed after January 1, 2011 are eligible for an award, and an individual or organization is eligible once every five years. There is no formal application form. Documentation should include figures, illustrations, narrative, and photos to help further explain the efforts. The evaluation process may include a site visit.

Submit application packages to TianG@mwrd.org or mail to:
Guanglong Tian
Monitoring & Research Department
Metropolitan Water Reclamation District of Greater Chicago
6001 W. Pershing Road
Cicero, IL 60804

Awards will be presented at the MWRD's fourth annual Sustainability Summit later this year. For more information about the biosolids program, awards or Sustainability Summit, contact (312) 751-6633.

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Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

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For immediate release
August 15, 2016

Name that biosolid: The MWRD extends naming contest to public to include school participation

Contest deadline extended to September 30

The new and heralded Maggie Daley Park (top left) is one of more than 50 area parks that has benefited from biosolids. Other benefiting sites include Harborside International Golf Center (top right, clockwise) on the Far South Side, Horner Park on the North Side and Ping Tom Park on the near South Side. The soil enhancer stimulates plant growth and lasts three to five years longer than regular chemical fertilizers and the Metropolitan Water Reclamation District of Greater Chicago (MWRD) has the opportunity to make it available to the public for the first time. Now the MWRD just needs a name.

The Milwaukee Metropolitan Sewerage District in Wisconsin markets their biosolids as "Milorganite." DC Water in Washington, DC recently launched "Bloom." The Metropolitan Water Reclamation District of Chicago (MWRD) is looking to join these and other sister water agencies in naming the locally-produced products. Based on popular demand and to accommodate the upcoming school year, the MWRD is expanding its contest to students of all ages to participate and learn more about their environment.

Due to recent changes in Illinois law, MWRD biosolids, for the first time, can be made available and sold to the general public. The MWRD produces the biosolids as part of the water treatment process and is turning to the public for help in naming both the Exceptional Quality (EQ) biosolids and EQ biosolids blend that is composted with woodchips.

Contestants are urged to be appropriate but creative. The deadline is September 30, 2016. To submit a *(continued)*

Name that biosolid: The MWRD extends naming contest *(continued)*

name, contact public.affairs@mwrd.org or find the MWRD on Facebook or Twitter.

"At a time when there is growing scrutiny over fertilizers and pesticides, we are supporting a natural trend that is both resourceful to our environment and also our taxpayers," said MWRD President Mariyana Spyropoulos. "We encourage the public to enter the contest today and have fun knowing they are part of this most interesting and unusual cycle of life."

MWRD biosolids are a high-quality product of the water treatment process that can be recovered and turned into a valuable resource for plants. Air-dried biosolids look like dark, fine-textured topsoil and are a sustainable alternative to chemical fertilizers. Instead of being trucked to a landfill or deposited in waterways like practiced many years ago, the biosolids can be used almost anywhere soil amendments and chemical fertilizers would be used, only more effectively and at a fraction of the cost. Golf courses, athletic fields, parks and recreational facilities and agricultural and farm fields have used MWRD biosolids. The biosolids have also been used to restore brownfields and other disturbed lands.

The legislation, which was signed last year by Gov. Bruce Rauner, amends the Illinois Environmental Protection Act (IEPA) to create the new definition of EQ biosolids. The MWRD worked with the IEPA, Illinois Department of Agriculture and several environmental groups to develop the legislation after gaining approval from the US EPA and other environmental regulators. The approval affirms the rigorous testing EQ biosolids have undergone and ensures its safety and effectiveness.

The MWRD reserves discretion in naming this product.

The popularity of the contest is evident based on the amount of quality names already submitted and increasing media exposure.

"That popularity and the educational value led us to consider opening up the contest a few weeks more to allow schools to participate and consider naming those biosolids that draw our attention and improve our environment," said MWRD Commissioner Frank Avila.

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Metropolitan Water Reclamation District *of* Greater Chicago

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For immediate release
August 31, 2016

State Representative Tabares, Illinois Farm Bureau tour MWRD's Stickney Water Reclamation Plant

Illinois State Representative Silvana Tabares, 21st Legislative District, and members of the Illinois Farm Bureau recently toured the Metropolitan Water Reclamation District of Greater Chicago's (MWRD's) Stickney Water Reclamation Plant, the world's largest wastewater treatment facility. The Stickney WRP cleans on average 700 million gallons of water per day with the capacity to treat up to 1.44 billion gallons per day.

Rep. Tabares (sixth from left) is joined by members of her staff, the Illinois Farm Bureau and MWRD staff for a tour of the Stickney Water Reclamation Plant in Cicero, Ill. on Aug. 13.

During the Aug. 11 tour, the group saw first-hand the impact of two legislative initiatives that Rep. Tabares and other members of the Illinois General Assembly supported: one item allowed the MWRD to produce exceptional quality (EQ) biosolids for use as a natural alternative to fertilizer; the other initiative supported MWRD's phosphorous recovery facility which was made possible in part by the MWRD Resource Recovery legislation that was signed into law last year.

Biosolids are the nutrient-rich, organic material developed through the extensive wastewater treatment process. They are a superior, yet less expensive alternative to chemical fertilizers that are used in landscaping and for fertilizing turf grass at parks and athletic fields and row crops in farmers' fields.

Chicagoland soil can be too compacted for good root development, and it can lack the vital nutrients and organic matter that plants need to thrive. Heavy summer rains can wash fertilizers away, and long dry spells can leave grass parched. Using biosolids can help create a beautiful landscape. In the meantime, excess phosphorus enters bodies of water from a number of sources, including urban water treatment facilities and farm run-off. Phosphorus in waterways can cause algae to grow and bloom, creating toxic conditions that threaten aquatic life and severely limit recreational enjoyment of lakes and rivers. The Illinois Farm Bureau was specifically interested in the MWRD's water treatment process as its members are also looking at how to address water treatment and runoff issues on agricultural land.

"Thanks to Rep. Tabares and the Illinois General Assembly, the District was allowed to construct the world's largest phosphorus recovery facility which opened earlier this year," said MWRD Commissioner David J. Walsh.

"I'd like to thank the hard working men and women of the Water Reclamation District's Stickney plant for welcoming myself and visitors with the Illinois Farm Bureau during our recent tour of the facility," said Rep. Tabares. "The work of the water reclamation district is vitally important to the region's residents and the overall environment, and seeing the important work first-hand was a great experience for myself as well as for our visitors from Central Illinois." *(continued)*

State Representative Tabares, Illinois Farm Bureau tour MWRD's Stickney Water Reclamation Plant *(continued)*

Rep. Tabares (2nd from left) and her group examine the settling tanks at the Stickney Water Reclamation Plant in Cicero, IL.

Rep. Tabares and her group examine plants grown in MWRD's Exceptional Quality Biosolids, a product of the wastewater treatment process.

Toni Glymph, Senior Environmental Microbiologist, explains the work that goes into monitoring the microorganisms that are cultivated to "eat" sewage.

Representative Tabares explains how the Illinois General Assembly created the MWRD in 1889 to protect the source of the region's drinking water, Lake Michigan.

"We are always appreciative whenever our legislative leaders take time out of their busy schedules to tour our processes and facilities," said MWRD President Mariyana Spyropoulos. "It was the Illinois General Assembly that created the District in 1889 so it is important that we continue to engage in operations as the legislature intended."

Rep. Tabares is serving her second term, and her district includes portions of Bedford Park, Cicero, Forest View, Lyons, McCook, Riverside, Stickney and Summit, and the Chicago neighborhoods of Archer Heights, Brighton Park, Garfield Ridge, Lower West Side, McKinley Park and South Lawndale.

###

Metropolitan Water Reclamation District *of* Greater Chicago

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For immediate release
September 6, 2016

Platinum awards put MWRD atop the charts in meeting clean water standards

Cleaner waters and a strong record of compliance has led to new honors for the Metropolitan Water Reclamation District of Greater Chicago (MWRD). All seven MWRD water reclamation plants (WRP) were 100 percent compliant in meeting National Pollutant Discharge Elimination System permits. The Egan WRP (above) received a Gold Award from the National Association for Clean Water Agencies for a second consecutive year.

The industrious water reclamation plants (WRP) that the Metropolitan Water Reclamation District of Greater Chicago (MWRD) enlists to clean the region's wastewater are meeting compliance and receiving awards in the process. The seven WRPs and the MWRD staff that monitors them continue working to improve area water quality while advancing a resource recovery model that protects the environment and reduces energy usage.

For these efforts, the MWRD was recognized by the National Association for Clean Water Agencies (NACWA) with awards for each WRP, including five Platinum Peak Performance Awards that have been given annually to the MWRD over two decades for the agency's record in meeting compliance for water treatment.

"The Metropolitan Water Reclamation District of Greater Chicago is an outstanding example of environmental efforts. NACWA is honored to showcase the achievements of the Metropolitan Water Reclamation District of Greater Chicago and our nation's public wastewater utilities through the Peak Performance Awards Program," said NACWA Chief Executive Officer Adam Krantz.

The Calumet WRP received the platinum award for 24 years of 100 percent compliance; followed by the Lemont WRP for 19 years; James C. Kirie WRP in Des Plaines for 11 years; Terrence J. O'Brien in Skokie for 10 years; and Hanover Park WRP in the northwest suburb for eight years. The Egan WRP in Schaumburg and Stickney WRP in Stickney in Cicero also earned the gold award for the second straight year. Platinum

(continued)

Platinum awards put MWRD atop the charts in meeting clean water standards *(continued)*

Awards recognize 100 percent compliance with National Pollutant Discharge Elimination System (NPDES) permits over a consecutive five-year period. If 100 percent compliance is maintained beyond the initial award, Platinum Award status is continued. Should 100 percent compliance not be maintained, member agency facilities must receive four consecutive Gold Awards to again be eligible for another Platinum Award in their fifth year of compliance. All seven MWRD WRPs have earned 99.6 percent or higher compliance since 2007.

"Whatever challenges that have been thrown the way of our seven water reclamation plants, the Metropolitan Water Reclamation District of Greater Chicago has been prepared to handle," said MWRD President Mariyana Spyropoulos. "We thank the National Association for Clean Water Agencies for the recognition and thank residents and businesses owners within the District that are cautious about what enters the sewers so as not to overwhelm the system."

The Calumet WRP is the oldest of the seven WRP facilities, treating water from a 300 square mile area in Chicago and the south suburbs. The plant provides primary, secondary and tertiary treatment, thanks to its latest disinfection technologies. Calumet recently introduced a chlorination and de-chlorination process to disinfect its treated water that will reduce the amount of pathogenic bacteria in the water released from the plant into the Calumet River system. Disinfection technologies neutralize or kill bacteria and microorganisms in treated water and reduce the risk of health problems resulting from direct contact with the water while recreating on a waterway. O'Brien WRP also unveiled a disinfection facility in 2016 that uses ultraviolet (UV) radiation to disinfect water as a final layer to its treatment process to reduce pathogenic bacteria in the water released into the North Shore Channel. By using the two distinct technologies, the MWRD will have saturated the Chicago Area Waterway System (CAWS) with disinfected water entering the waterways from both the north and south ends of the CAWS, while protecting the region's drinking water supply in Lake Michigan. In addition to directly benefiting the water environment, the disinfection projects created hundreds of jobs for tradespeople during construction.

Although treating water and improving the local water environment is a daily responsibility of the seven WRPs, other roles are emerging on a daily basis in resource recovery.

"The MWRD is working to become energy neutral by 2023 through the introduction of several WRP projects that will reduce greenhouse gases, promote a cleaner and more sustainable environment and provide a return on investment that benefits taxpayers," said MWRD Commissioner Michael Alvarez.

The WRPs are implementing several innovations in renewable energy, while also recovering and developing reuse opportunities for water, biosolids, algae, phosphorus and other nutrients collected during the water treatment process. Each of the seven plants has made strides in helping the MWRD meet its goal of becoming a utility of the future in resource recovery. Through these opportunities, the MWRD will add value in traditional and non-traditional ways, while protecting the region's water quality.

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Metropolitan Water Reclamation District *of* Greater Chicago

Press Release

Allison Fore
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For immediate release
September 23, 2016

Growing MWRD tree program shelters region from storms

It has been four months since the Metropolitan Water Reclamation District of Greater Chicago (MWRD) introduced a free tree distribution program, and leaves are already sprouting in hopes of restoring the region's tree canopy and managing local stormwater.

Driven by the devastation of the emerald ash borer and extreme weather events that have led to the loss of approximately 13 million trees, the MWRD staff set off on an ambitious plan to help restore the Cook County canopy. In distributing more than 14,000 oak tree saplings as part of the Restore the Canopy, Plant a Tree program, the program has garnered instant attention thanks to the support of MWRD Vice President Barbara McGowan and the MWRD Board of Commissioners. The Board endorsed the program to offer trees to the public as an aid in coping with overwhelming storm events. Vice President McGowan is leading by example. Her sapling has already grown about a foot and sprouted leaves in a few short months.

"In restoring the canopy, we are working to prevent flooding, improve local water quality and promote resource recovery," said MWRD Vice President Barbara McGowan. "We thank the thousands of homeowners, schools and community groups that have participated in this program to protect our water environment and plant a promising future for many beautiful tree-lined streets and backyards."

Since launching the program in April, the MWRD has forged partnerships with 25 different municipalities, 30 schools and 46 community groups to distribute more than 14,000 free tree saplings to restore the canopy.

Trees reduce city heat island effects, absorb carbon gases, produce oxygen, improve the habitat for wildlife, and serve as an effective form of green infrastructure to reduce flooding. Promoting trees became a natural fit in the MWRD's pursuit of improving stormwater management. Since the Illinois General Assembly delegated the MWRD as the stormwater management authority of Cook County in 2004, the agency has studied and introduced creative solutions to meet this challenge. The MWRD has distributed over 72,000 rain barrels, constructed massive stormwater reservoirs, transformed Chicago Public School grounds to better contain stormwater, implemented various green infrastructure programs and flood control projects and is now distributing tree saplings. A large oak can reduce 5,400 gallons of stormwater runoff. If 14,000 trees are planted, more than 75 million gallons of stormwater storage will be provided. These numbers are expected to grow as the number of distributed trees grows.

MWRD Vice President Barbara McGowan encourages homeowners and business owners to participate in the MWRD's Restore the Canopy, Plant a Tree program. Her sapling is already sprouting leaves and looks to be a valuable form of green infrastructure to contain future stormwater and help the agency in mitigating flooding.

The program has also allowed the MWRD to combine its goals of resource recovery with stormwater management by planting the tree saplings in the MWRD's biosolids compost blend, a sustainable alternative to chemical fertilizers derived from the MWRD wastewater treatment process. The MWRD trees saplings are available as red oaks, bur oaks, pin oaks and shingle oaks and come in individual pots or in bulk bags of 100 bare root saplings. Planting and care instructions, along with additional information regarding the benefits of trees, will be provided with each delivery. With advanced notice, the saplings can be picked up at MWRD facilities or delivered.

To participate in the program, visit www.mwrd.org or contact MWRD Public Affairs at (312) 751-6633 or public.affairs@mwrd.org. The MWRD also distributes free trees every Wednesday from 9 a.m. to noon at the following water reclamation plants:

Calumet (400 E. 130th St., Chicago)
Egan (550 S. Meacham Rd., Schaumburg)
Hanover Park (1220 Sycamore Ave., Hanover Park)
Kirie (701 W. Oakton St., Des Plaines)
O'Brien (3500 Howard St., Skokie)
Stickney (6001 W. Pershing Rd., Cicero)

Recovering Resources, Transforming Water

Established in 1889, the MWRD (www.mwrd.org) is an award-winning, special purpose government agency responsible for wastewater treatment and stormwater management in Cook County, Illinois.

Metropolitan Water Reclamation District *of* Greater Chicago

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For immediate release
October 11, 2016

Metropolitan Water Reclamation District of Greater Chicago recognized as "Utility of the Future"

61 water sector organizations show success in innovative and sustainable utility management practices

Commissioner Kari K. Steele represented the MWRD on stage to accept the Utility of the Future certificate and flag.

Vice President Barbara J. McGowan and Commissioner Timothy Bradford display the new certificate and flag at the Utility of the Future Recognition Program ceremony.

The Metropolitan Water Reclamation District of Greater Chicago and 60 other utilities from across the U.S., Canada, and Denmark were recently selected by a peer committee of utility leaders to receive the inaugural "Utility of the Future" (UOTF) designation. Vice President Barbara McGowan and Commissioners Frank Avila, Timothy Bradford, and Kari Steele were among the recipients who were honored during a September 27 ceremony held in conjunction with the Water Environment Federation's (WEF's) 89th annual technical exhibition and conference in New Orleans, LA. The recipients received a display flag and a special certificate to further identify and promote their outstanding achievement as a Utility of the Future organization.

"This is a tremendous honor," said MWRD Vice President Barbara McGowan. "It is satisfying to know that the work of the District sets an example for hundreds of organizations across the country."

The selection committee determined that the MWRD meets the criteria by taking into consideration organizational culture, beneficial biosolids use, community partnering and engagement, energy efficiency, energy generation and recovery, nutrient and materials recovery, water reuse and watershed stewardship.

The UOTF Recognition Program is a partnership of water sector organizations—the National Association of Clean Water Agencies (NACWA), WEF, the Water Environment & Reuse Foundation (WE&RF) and the WateReuse Association with input from the U.S. Environmental Protection Agency (EPA). The program celebrates the progress and exceptional performance of wastewater utilities while supporting the widespread adoption of the innovative UOTF business model.

The UOTF concept was introduced in 2013 to guide utilities of all sizes toward smarter, more efficient operations and a progression to full resource recovery with enhanced productivity, sustainability, and resiliency.

"As we embrace this concept of becoming a utility of the future, the District is actively forming new partnerships, reducing energy usage, investing in green infrastructure, and recovering and reusing valuable resources," said Commissioner Kari Steele. "We thank the selection committee for this recognition and will continue to strive for innovation and improvements in water quality that make us a utility of the future today."

The MWRD has worked to improve the environment and protect public health for 127 years; however, its work *(continued)*

Metropolitan Water Reclamation District of Greater Chicago recognized

(continued)

has evolved. Sewage is no longer a waste product but is instead a collection of resources to be recovered and reused; similarly, it has become a proactive agency that prides itself on many partnerships and collaborative efforts to improve the quality of life throughout Cook County.

"While the MWRD designs and operates treatment processes with an eye towards energy efficiency, the agency aspires to become energy neutral by 2023," said MWRD President Mariyana Spyropoulos. "This achievement will provide a return on investment that will benefit taxpayers and the environment. Through resource recovery efforts, the MWRD is also providing a similar return to taxpayers and the environment."

The MWRD partnered with others to successfully amend legislation to qualify exceptional quality biosolids as a sustainable fertilizer for public use. The MWRD is producing safe, beneficial, and renewable composted biosolids to be distributed to community gardens and other landscaping organizations with a goal of 50,000 cubic yards for sale by 2017. Other highlights include the unveiling of the world's largest nutrient recovery facility that recovers phosphorus and nitrogen to create a high value fertilizer, marketed as Crystal Green. In addition, the MWRD is pursuing the sustainability of growing algae in a "vertical revolving" fashion; this would reduce the footprint to grow an equivalent algae biomass in a surface pond and simplify the harvesting process. The algae could remove at least 50 percent of phosphorus from wastewater and can be commoditized for production of bioplastics, biochemicals, biofuels, or aquaculture feed.

Commissioner Frank Avila discusses resource recovery during WEFTEC.

"NACWA applauds all the recipients of the inaugural Utility of the Future Recognition Program," said NACWA CEO Adam Krantz. "Utility leaders are engaged in unparalleled innovation and this recognition will inspire the sector as a whole to achieve still untapped economic and environmental benefits for their communities and the nation."

To learn more about the Utility of the Future (UOTF) Today Recognition Program, visit www.wefnet.org/utilityrecognition or contact UtilityRecognition@wef.org. A list of the 61 water sector organizations can be found at this link: http://www.wef.org/uotf-today-2016-recipients/.

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For immediate release
October 14, 2016

MWRD's 4th Annual Sustainability Summit honors green landscaping, biosolids users

Chicago Park District Project Manager Nichole Sheahan leading a tour of Maggie Daley Park as part of the 4th Annual Sustainability Summit.

Dave Ward, Superintendent, Coyote Run Golf Course in Flossmoor, receives a plaque from Commissioner Frank Avila for using biosolids since 2006.

Experienced landscapers, expert environmentalists and responsive local governments developing programs that utilize local resources, save money and improve the environment were praised for their sustainable measures at the Metropolitan Water Reclamation District of Greater Chicago's (MWRD's) 4th Annual Sustainability Summit.

Held at the Maggie Daley Park in Chicago on Oct. 6, the Summit is an opportunity to empower and equip these partnering municipalities and environmental advocates with the latest trends and information in resource recovery and stormwater management. The event is also an opportunity to spotlight some of the best work taking place across the county that promotes a sustainable environment and speaks to the MWRD's mission in renewable resources, flood control and water quality improvements.

"We congratulate our award winners for their dedication to protecting our environment and investing in these sustainable resources and projects that make their fields and facilities destinations to enjoy for many years to come," said President Mariyana Spyropoulos. "We are happy to partner with municipalities all across Cook County to take advantage of our resource recovery projects, and it is fulfilling to single out the best work that has come as a result of these partnerships."

Many of the award winners were dedicated to the concept of resource recovery and the beneficial reuse of biosolids that can improve turf quality and reduce carbon footprints. This year, Dave Ward, superintendent of Coyote Run Golf Course in Flossmoor, and the Tinley Park-Park District were honored for their work implementing MWRD biosolids into their grounds. The MWRD has been successfully using biosolids for fertilizing golf courses and athletic fields at both schools and public parks, like Maggie Daley Park, in the Chicago area for more than 30 years.

MWRD biosolids are a high-quality product of the water treatment process that can be recovered and turned into a valuable resource for plants. Air-dried biosolids look like dark, fine-textured topsoil and are a sustainable alternative to chemical fertilizers. Composted biosolids can be used as any compost would be, as a soil amendment or conditioner for establishing turf grass, for mixing into custom topsoil blends, and in planter beds and pots for establishing flowers and trees in nurseries. Due to recent changes in Illinois law, MWRD biosolids can be made available and sold to the general public. The MWRD produces the biosolids as part of the water treatment process.

Other award winners included:

- For their landscaping work, the City of Des Plaines Public Works and Engineering Department were honored for a project that replaced deteriorating public alleys with new pervious concrete pavement. Also known as green *(continued)*

MWRD's 4th Annual Sustainability Summit honors *(continued)*

On behalf of the Village of Glenview, Robyn Flakne, Judy Beck and Henrietta Saunders accepted their award for green landscaping from Commissioner Frank Avila.

Chad Hofstra and Sandra Ardolino of the Tinley Park-Park District received an award for using MWRD biosolids.

alleys, the new pavement will increase water infiltration and alleviate basement flooding.

- The Village of Glenview was recognized for implementing projects dedicated to streambank stabilization, detention basin retrofits, tree planting, rain gardens, permeable pavement, bioswales and green roofs.
- The Villages of Skokie, La Grange and Midlothian received honorable mention awards for their landscaping projects. Skokie recently made improvements of alleys with permeable pavers, leading to reduction in stormwater runoff and improvement of water quality. La Grange completed a parking lot reconstruction project with interlocking permeable concrete pavers that has led to a reduction in suspended solids, nitrogen and phosphorus in stormwater. Midlothian was recognized for the implementation of rain gardens that have led to improved stormwater management in the village.
- The Historic Chicago Bungalow Association (HCBA) was recognized with a certificate of appreciation for the organization's work as a facilitator for rain barrels. Partnering with the MWRD, the HCBA has helped distribute more than 8,500 MWRD rain barrels to area homeowners.

"The City of Des Plaines is proud to partner with the District in order to make sustainable projects more commonplace in today's construction world," said Jon Duddles, Des Plaines Assistant Director of Public Works and Engineering.

"To manage stormwater runoff and utilize recovered resources, it takes many partners like these municipalities and organizations that we chose to recognize at the Sustainability Summit," said MWRD Chairman of Finance Frank Avila. "Their best management practices in sustainability should be commended, as they show us the long-term value of protecting our planet and embrace the goals of our agency that make our communities a better place to live."

Participants at the Summit also learned about free and low-cost resources available to them and heard success stories from community leaders. They were also given a tour of Maggie Daley Park by Chicago Park District Project Manager Nichole Sheahan.

Jon Duddles and Timothy Oakley from the City of Des Plaines received their green landscaping award from Commissioner Frank Avila.

Mary Ellen Guest of the Historic Chicago Bungalow Assoc. receives a special certificate for rain barrel distribution.

Adam James of Baxter and Woodman accepts the Honorable Mention certificate on behalf of the Village of LaGrange.

Adam James of Baxter and Woodman, Commissioner Frank Avila, and Max Slankard from the Village of Skokie display Honorable Mention certificates.

Commissioner Frank Avila presented Midlothian Village Trustee Karen Kreis and Floodlothian leader Helen Lekavich with Honorable Mention certificates.

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For immediate release
October 31, 2016

MWRD receives Chicago Region Trees Initiative award

The Chicago Region Trees Initiative honored the Metropolitan Water Reclamation District of Greater Chicago (MWRD) by presenting the organization with the "Most Sustainable commercial tree program." The award ceremony was held at Promontory Point in Chicago on Oct. 5.

In six months, the MWRD distributed more than 20,000 oak tree saplings as part of the agency's Restore the Canopy, Plant a Tree program. During this time, the MWRD reached out to the 129 municipalities it serves about the importance of the tree population, while coordinating partnerships with 25 of those municipalities, 30 schools and 46 community groups to distribute free tree saplings and work together to restore the canopy and encourage a renewed commitment to the environment.

The MWRD's tree program provides the opportunity to educate the region about the importance of trees and the lasting benefits trees provide in assisting property owners and the MWRD in managing the influx of stormwater flowing through local communities due to changing weather patterns. Given the 21st century challenges in flooding, the MWRD sought trees as one tool to manage excess water, while also attempting to restore the oak tree population, which has been depleted over the last century despite its contributions to vital biodiversity in the region to support a wide range of plants and animals. The program has also allowed the MWRD to combine its goals of resource recovery with stormwater management by planting the tree saplings in the MWRD's biosolids compost blend, a sustainable alternative to chemical fertilizers derived from the MWRD wastewater treatment process.

By introducing the Restore the Canopy program, the MWRD has also opened up the region's eyes to many more tree benefits that extend beyond stormwater.

"Not only does a tree serve as an effective form of green infrastructure to reduce flooding, but trees also reduce city heat island effects, absorb carbon gases, produce oxygen, improve the habitat for wildlife and remain an important part of the ecosystem," explained MWRD President Mariyana Spyropoulos.

The Chicago region's canopy has fallen to 21 percent compared to the national average of 27 percent. To make matters worse, invasive species like buckthorn comprise 28 percent of total tree stems and most communities do not have trained professionals caring for trees or any urban forest management plan.

"The time is now to reverse these trends, and the MWRD's Restore the Canopy, Plant a Tree program is a fitting example of how the region can start changing attitudes, changing perspectives and changing the earth for the better," said Commissioner Cynthia Santos.

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For immediate release
November 21, 2016

Looking to lease MWRD real estate? New online mapping system of available properties now available

When the Metropolitan Water Reclamation District of Greater Chicago (MWRD) began its quest to reverse the flow of the Chicago River in 1889, among its first actions was to acquire property on which to build the Chicago Sanitary and Ship Canal, the North Shore Channel and the Calumet-Sag Channel. In acquiring these lands, the MWRD ultimately became the second largest landowner in Cook County. Some of this property is available for leasing to public and private entities.

The MWRD has launched a new online mapping tool that displays parcels available for lease. Users can search by desired acreage, by channel and by parcel number. An aerial photograph overlay of the property is also available on the system.

"As the landlord of 24,000 acres of property throughout Cook, DuPage, Will and Fulton counties, we strive to be a good steward," said MWRD President Mariyana Spyropoulos.

The MWRD categorizes its property into three categories: corporate use land; non-corporate use land in Cook and neighboring counties; and non-corporate use land in Fulton County. Approximately 4,800 acres are used for MWRD corporate purposes; these include the main office and annex buildings in downtown Chicago, seven water reclamation plants, 22 pumping stations, five sidestream elevated pool aeration stations and the Lockport Powerhouse in Will County.

Of the non-corporate use lands, 3,352 acres are under lease for public access by other public entities such as park districts, schools and local governments for nominal fees in Cook, DuPage, Will and Fulton Counties.

The MWRD leases 250 acres in DuPage, 750 acres in Will County, and 5.072 acres in Fulton County. This western Illinois land was a remediated strip mine property that was previously used for biosolids management. It is now used for best management nutrient control practice demonstrations and research.

"Whether someone is looking for a small or large parcel, we have several available for lease and our real estate department is very accommodating," said Commissioner Michael Alvarez.

To access the online mapping tool, visit https://gispub.mwrd.org/leasingproperty/. For additional information contact 312-751-6582.

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For immediate release
November 22, 2016

Perspectives at the Water-Energy-Climate Nexus: Anticipating changes to come

Dating back to 1950, it was believed that economic growth was inextricably linked to the nation's carbon dioxide emissions. The more the U.S. produced, manufactured, provided and even polluted the more wealth there was to go around. Then courses were altered. In the last few years, carbon emissions stayed flat and are now predicted to decline over the next decade as new environmental regulations take hold and more conscientious minds begin to consider the effects on the planet. At the same time, however, the nation's gross domestic product has continued to rise. Breaking up this union gives hope for simultaneous prosperity and environmental stewardship in the face of climate change. "We used to think we needed both to succeed," said Jessica Hellmann, PhD., director of the Institute on the Environment at the University of Minnesota. "That decoupling changes everything."

Despite that promise, serious challenges await, and many of those topics were brought to the forefront at Northwestern University's 2016 Climate Change Symposium: Perspectives at the Water-Energy-Climate Nexus. As Hellmann pointed out, water flows right to the center of the discussion. When polled about their greatest concerns over the next 10 years, global leaders responded that water crises attracted their biggest concern at 39.8 percent, followed by failure of climate change mitigation and adaption (36.7 percent), extreme weather events (26.5 percent), food crises (25.2 percent) and profound social instability (23.3 percent).

Before leading-edge scientists, researchers, government officials and other experts could weigh in on the topic, there was the startling admission that there was still a faction of Americans slowing these advancements. Not everyone believes in the existence of climate change, U.S. Rep. Mike Quigley said in his opening keynote address. Quigley said it will continue to be an uphill battle to change these ideologies, "until there is a better political solution." He suggested that you can push the pendulum only so far without strong support in the middle of a polarized world. Legitimate debate has turned to "reality TV" in Washington, D.C., and strong leadership will be needed in the middle to confront climate change.

U.S. Rep. Mike Quigley (5th) spoke of climate action in the face of climate denial.

"Everything else in a noisy world is noise," said Quigley.

Hellman said that the effects of climate change are devastating, and the resulting changing weather patterns could trigger massive migration of people as temperatures and ocean levels both rise. Hellmann said greenhouse gases are not projected to decrease for a decade, but once they do the question then becomes how aggressive should the world be in reaching the goals laid out for 2050 in the Paris Agreement that strives to hold the increase in the global average temperature to well below 2°C above pre-industrial levels. Also in that agreement, developed countries like the U.S. are jointly expected to provide $100 billion by 2020 for mitigation and adaption.

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Perspectives at the Water-Energy-Climate Nexus (continued)

Joseph Ryan, PhD., director of the Air-Water-Gas Sustainability Research Network at the University of Colorado, Boulder, talked about how unconventional oil and gas extractions through developments like fracking have also paid a toll on water usage.

In addition, a considerable amount of dollars must be spent domestically to ensure the U.S. is doing its part to reduce emissions. Hellmann argues that the nation should protect its natural assets. She said that projects that work to promote less reliability on freshwater for agriculture and restore wetlands to recharge groundwater are two examples of how water plays a role. Governmental, social and economic readiness will play key roles in protecting the vulnerable resources like water when faced with the growing impacts of climate change, Hellmann said.

Congressman Quigley recently helped pass legislation to expedite the completion of the construction on the Metropolitan Water Reclamation District of Greater Chicago's (MWRD's) McCook Reservoir to prevent pollution in local waterways and mitigate flooding in Chicago and 36 other communities that are experiencing an increasing frequency of intense rain events soaking the Midwest. Water continues to be a central point of interest in the Great Lakes, home to 20 percent of the world's freshwater, said Drew Gronewold, PhD., physical scientist for the National Oceanic and Atmospheric Administration, Great Lakes Environmental Research Laboratory. What most fail to recognize is that the Great Lakes are so massive that that there are 4,530 miles of Great Lakes coastline, more than double the Atlantic coastline (2,170 miles) and triple that of the Pacific (1,300 miles). The surface areas of Michigan-Huron and Superior are also greater than any other freshwater area in the world, but the Great Lakes are "often overlooked" in the climate change discussion, Gronewold said. Across the world, there is a finite amount of freshwater. Of the world's water, 97.5 percent is saltwater from the oceans, and of that remaining 2.5 percent, it almost all comes in the form of ice caps and glaciers (79 percent) and groundwater (20 percent). Of that remaining 1 percent, a little more than half is freshwater found in lakes, Gronewold said. That's why scientists are paying particularly close attention to the dramatic fluctuations in lake levels over the history of the Great Lakes that are not experienced on other bodies of water and rivers and oceans around the world. The far more dramatic fluctuating water levels, which

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Perspectives at the Water-Energy-Climate Nexus (continued)

A field of experts gathered to discuss climate change in the context of water and energy innovation and issues at Northwestern University's 2016 Climate Change Symposium. The event was coordinated by the Northwestern Center for Water Research, the Department of Earth & Planetary Sciences, the Institute for Sustainability and Energy at Northwestern (ISEN) and the Northwestern-Argonne Institute of Science and Engineering.

have been recorded back as far as 150 years, stem from changes in the magnitude of precipitation, ice melting in the region and suppressed evaporation. After the frigid temperatures experienced in the famed "Polar Vortex" winter of 2014, the lake levels surged.

"Very cold water loses energy and doesn't evaporate," said Gronewold showing aerial images of portions of the frozen Great Lakes in 2014 and pictures of a snow storm that forced a state of emergency in Buffalo, N.Y. in 2014. "If a previous winter is colder and there is more precipitation, there will be less evaporation."

But while a few winters may lead to surges in lake levels, under higher emissions scenarios predicted, the lake levels will instead decrease on the order of 0.5 to nearly 2.0 feet toward the end of this century. For now, scientists can gather data and determine whether projects and simulations can predict or offer any insight. "How do we take lessons learned on a global scale and translate to a regional scale and how do we take regional lessons learned to other parts of the world where relevant," Gronewold said.

This unpredictable precipitation has led to a new battle waged against urban flooding. Harriet Festing, director of CNT's Water Program, discussed the nature of urban flooding and various forms it takes while impacting more and more people. Slides of her presentation showed images of flooding impacting even State Farm Insurance and Perma-Seal buildings, proving that even companies that provide insurance and basement waterproofing can inevitably fall prey to flooding. Further, it also speaks to the inability to be prepared. She said flooding claims have been filed in 99 percent of Illinois counties, but over 90 percent of these claims were filed outside of mapped floodplains.

"The highest damage payouts are in places where FEMA does not recognize the risk," Festing said.

CNT's work motivated elected officials to enact legislation requiring FEMA to conduct a national study on urban flooding. Based on its many partnerships, CNT, also known as the Center for Neighborhood Technology, has been able to deliver more sustainable practices that come to the aid of homeowners and communities to mitigate flooding. Through CNT's popular RainReady initiative, homeowners and municipalities save money by installing green infrastructure solutions like rain gardens and bioswales for stormwater management. The pain can be better managed, she said.

"Engineers can learn from doctors to identify and interpret risk, and then design and finance solutions," Festing said.

One of those alliances was formed with the MWRD to implement and assess the value of green infrastructure to mitigate flooding, said Thomas Kunetz, PhD., assistant director of Engineering at the MWRD. The Illinois General Assembly in 2004 delegated the MWRD as the stormwater management authority for Cook County, as conditions became more unpredictable and more outside-the-box thinking was required to assess the situation going forward. The MWRD quickly recognized that simply digging a hole in the ground to contain more water only created more holes into

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building a reputable plan.

"We're all part of the problem, so maybe we can be part of the solution," said Kunetz. "But we can't just put holes in the ground. That's Swiss cheese."

The MWRD has taken steps closer to completing its massive Tunnel and Reservoir Plan to build 109 miles of Deep Tunnels and the two largest combined sewer reservoirs in the world, while distributing more than 100,000 free rain barrels, and currently investing in nearly 100 different stormwater projects across the county that include green alleys, streambank stabilizations and a schoolyard redesign and construction partnership that works to accommodate more stormwater retention. In 2014, the MWRD introduced the Watershed Management Ordinance, which provides uniform stormwater management regulations to prevent future com¬mercial, municipal, and residential development and redevelopment projects from exacerbating flooding and protects environmentally sensitive areas.

In its role as wastewater treatment operator, the MWRD has found that there is very little waste to go around during the process. The agency is incorporating renewable energy production through its anaerobic digesters and hydroelectric power generated at its Lockport Powerhouse, just to name a few sources on its way to reaching energy neutrality by 2023. In addition to energy, the MWRD is also recovering phosphorus, biosolids, algae and water, which is being reused through the industrial sector. Even breweries are experimenting with the idea of brewing beer through reclaimed water, Kunetz said.

"Don't judge water on its history. Let's judge it on its quality," Kunetz said.

Mark Johnson, PhD., director of the Advanced Manufacturing Office for the U.S. Department of Energy (DOE), said there is a growing focus on energy efficient manufacturing. Officials are attempting to develop a robust U.S. clean energy economy where products are developed and manufactured through a competitive manufacturing sector that is more energy productive. They aim to meet these goals by doubling the amount of clean energy research and development. The challenge is that manufacturing accounts for roughly 25 percent of energy consumed in the U.S. Johnson said production efficiencies will come with improved information technology that comes in the form of computing abilities and big data analytics to create advanced sensors, controls, modeling and platforms. He said that will require infusions of research and private sector participation.

"As a globe we are betting on innovation," Johnson said. "We can double research and development investment and mobilize private sector development to leverage it. We have the best universities and best labs in the world. The question becomes how do we turn it loose and break down the silos?"

The U.S. investment of $500 million in research and development has catalyzed over $1.2 billion from a consortia of DOE-supported institutes from the National Network for Manufacturing Innovation, Johnson said. These institutes have attracted hundreds of companies and universities as active partners from across the country to find ways to save on energy costs and spark innovation in projects that include desalination and freshwater transport. It's these types of public-private partnerships that will reap positive yields for energy and water usage in the face of climate change. Investment in this research leverages innovation for future needs facing the environment, economy and community, he said.

"Investing in research opens new avenues," Johnson said.

He was not alone in this perspective. Scientists at the symposium repeatedly reflected on this research that aided in the understanding of this nexus between water and energy. Water and energy are symbiotically relying on each other to be produced and delivered, and in the face of climate change they are inherently impacted together, and it becomes imperative that one cannot be addressed without the other. The speakers also repeatedly referenced the students in the room as future leaders to quell these seemingly insurmountable issues.

Aaron Packman, director of the Northwestern Center for Water Research, told the crowd that they can take many actions to respond to the growing crisis. He said addressing climate change starts at home and at the polling booths. Through events like the symposium, he said he hopes to see connections made on the local level through partnerships between Northwestern and CNT, the MWRD and the DOE's Argonne National Laboratory and others to work together and develop solutions to climate change.

"Our students are interested in climate change," Packman said. "We are trying to make a difference and we're all part of that here at Northwestern."

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Metropolitan Water Reclamation District of Greater Chicago

President's Annual Message 2016

The year 2016 was a great one at the MWRD. The MWRD is raising the bar on water quality initiatives, recovering resources, neutralizing energy usage, managing stormwater and improving the planet. Our size and scope make us a world leader in the water utility field and a pioneer in implementing initiatives that impact our environment. Our staff's ingenuity and unbridled passion for protecting the environment and our residents has expanded our footprint, elevated our performance and sparked many achievements in 2016. Here are a few highlights from this inspiring year.

Mariyana T. Spyropoulos
President of the Board of Commissioners

Financial Savings

In September, the GFOA again bestowed the MWRD with the GFOA Distinguished Budget Presentation Award for 2016 and for the 32nd consecutive year. This award includes special performance measures recognition for providing objective measures of progress toward accomplishing the government's mission and goals and objectives for specific units and programs. The MWRD again received the Certificate of Achievement for Excellence in Financial Reporting (CAFR) marking 40 consecutive years putting the MWRD in the top two percent of governments receiving a consecutive award. The MWRD's CAFR documents our ability to provide assurance to investors, regulators, rating agencies and the public that the MWRD's financial condition and results of operations are fully and fairly presented. This is critically important because in July we closed on a $427 million bond sale. We achieved savings in excess of $120 million on future debt service. The MWRD maintains a AAA rating with Fitch Ratings and a AA+ rating from Standard and Poor's. We continue to be a national leader in cost savings. In fact, at $197 per Chicago resident, the average cost for the MWRD's wastewater services is less than half the cost of the national average of $452.

The MWRD has continued to support its mission by implementing sustainable practices in resource recovery and energy efficiency while strengthening our financial foundation. We continue to maintain strong general fund balances and reserve balances for the capital improvement budget.

Legislative Assistance Advances Crucial Project

The McCook Reservoir, part of the Tunnel and Reservoir Plan (TARP), took a major step closer to becoming the world's largest combined sewage reservoir in 2016. With Phase 1 of the McCook Reservoir set for completion in 2017, our Illinois delegation successfully introduced an amendment to the Water Resources Development Act of 2016 which requires the U.S. Army Corps of Engineers to expedite the completion of McCook Reservoir Phase 2. Adopted in 1972, TARP has been instrumental in protecting the region's drinking water supply in Lake Michigan, improved water quality of local rivers and streams and provided

an outlet for floodwaters to reduce street and basement sewage backup flooding. The first phase of the McCook Reservoir will provide 3.5 billion gallons of storage. Phase 2 will be completed in 2029 and will provide an additional 6.5 billion gallons of storage. The reservoir will protect the waterways from pollution and provide more than $114 million per year in flood damage reduction benefits to 5 million people in Chicago and 36 suburbs.

Praise for Thornton Composite Reservoir

Although McCook is on schedule to become the world's largest combined sewage reservoir, this distinction for now belongs to the MWRD's Thornton Composite Reservoir (TCR) which went online in the fall of 2015. This reservoir serves a 90-square-mile area in Cook County by holding up to 7.9 billion gallons of water before it can be treated at the nearby Calumet Water Reclamation Plant (WRP). TCR protects 556,000 people from flooding in 14 communities, including the South Side of Chicago and 13 suburban communities. Since it was brought into service, there has only been one combined sewer overflow in the Calumet River System, a prime example of the reservoir's effectiveness in protecting our waterways from pollution and our basements from flooding. The MWRD received multiple awards and honors for the reservoir: the Illinois Department of Natural Resources' Office of Mines and Minerals 2016 Illinois Mined Land Reclamation Award; the Illinois Association for Floodplain and Stormwater Management 2016 Flood Reduction Project Award; the American Public Works Association (APWA), Chicago Metro Chapter's 2016 Project of the Year; the APWA Chicago Metro Chapter's 2016 Public Works Project Excellence Award; the APWA National Conference's 2016 Project of the Year; Water and Wastes Digest's Top Projects for 2016 Award; Friends of the Chicago River's 2016 Green Ribbon Award; and the ASCE Illinois Section's 2016 Project of the Year.

Disinfection Facility Unveiled at O'Brien WRP

The new disinfection facility at the O'Brien WRP went online in time for this year's recreation season. The O'Brien WRP utilizes ultraviolet (UV) radiation to disinfect water as a final layer to its treatment process to reduce bacteria in the water that is released from the plant into the North Shore Channel. Together with the Calumet WRP disinfection system the quality of water throughout the Chicago Area Waterway System (CAWS) will dramatically improve.

Eradicating Drugs from our Water

We have always known that safer and cleaner waterways start at home. The MWRD once again partnered with the U.S. Drug Enforcement Administration (DEA) to collect hundreds of pounds of pharmaceuticals. The success of these collections prompted the MWRD to permanently house drug drop-off boxes at four locations, including three WRPs and the Main Office Building. While educating the general public about the potential for abuse of medications and harm to the environment, we are also working to reduce accidental contamination of streams, rivers and lakes. We also partnered with the Cook County Sheriff's Office to expand their Prescription Drug Take-Back Program. In addition, we continue to push for the elimination of pesticides, microbeads, chlorides and other harmful pollutants to our waters.

Chicago Area Waterways System (CAWS) Microbiome Research

The MWRD is partnering with the U.S. Department of Energy's Argonne National Laboratory to study the typical sources and distribution of microbial communities in the CAWS. Microbial communities are key players in maintaining the CAWS' health. This seven-year study aims to understand the composition and sources of the CAWS microbial population using state-of-the-art metagenomic science. Since 2012, Argonne scientists have been analyzing samples taken monthly from the Chicago River between March and November and running the samples through a DNA sequencer to identify and count the microbes in the river. The work is measuring and recording changes in microbial communities as we begin disinfecting secondary treated water at O'Brien and Calumet WRPs and as the Thornton reservoir and the first phase of the McCook reservoir are completed. The entire study will be completed in 2019 and will record the improvements that occur as the MWRD takes steps to manage its outflow.

Resource Recovery

NUTRIENT RECOVERY UNDERWAY

In 2016, we opened the world's largest nutrient recovery facility to improve conditions as far away as the Gulf of Mexico. The new Ostara facility at the Stickney Water Reclamation Plant works to recover nutrients, such as phosphorus and nitrogen, from the wastewater treatment process. Excess phosphorus in waterways can cause algae to grow and bloom, creating toxic conditions that destroy aquatic life and severely limit recreational enjoyment of lakes and rivers. The MWRD's nutrient recovery facility will greatly reduce its nutrient effluent load to the Chicago/Calumet river system, upstream of the Mississippi river basin, and as a result, will reduce its impact on hypoxia in the Gulf of Mexico. Phosphorus and nitrogen are being recovered to create a high value fertilizer, marketed as Crystal Green. The process is both economically and environmentally viable. The new facility has a production capacity of 10,000 tons of Crystal Green per year. As part of the commercial sale of Crystal Green, the

MWRD receives revenue for every ton of fertilizer it produces. By removing phosphorus from the water and returning it to farmers and other agricultural producers, this facility represents a significant shift in the wastewater industry from treatment to recovery for reuse.

WATER REUSE

In addition to phosphorus, we are creating new opportunities to recover water through a new partnership with American Water to supply clean, reusable water to the industrial sector at the rate of about 10 million gallons per day. We have also experimented with the recovery of algae, which we can produce 24 tons daily. The algae can be harvested and converted for use in bioplastics, biochemicals, biofuels, pharmaceuticals and dyes, or used as fertilizer or as aquaculture feed, returning the phosphorus to the nutrient cycle.

WORKING TOWARD ENERGY NEUTRALITY

In September, the Board of Commissioners unanimously supported an amendment to the Resource Recovery ordinance, which allows us to begin accepting organics that will help us grow our energy production and reach our goal of energy neutrality by 2023. We are currently developing a program that will allow us to receive organic waste at our Stickney and Calumet WRPs that will help us produce biogas, which can offset the energy demands of the treatment plants. Our Calumet WRP has digester capacity to process 400 tons of food waste daily, and we are building a processing facility and a receiving station that will help expedite the process. Through the ordinance, we would also be able to receive high strength organic materials for biological phosphorus removal and organic feedstock, such as yard waste, tree trimmings, and wood chips to strengthen and add to our biosolids compost blend. These are critical initiatives that protect our planet and produce savings for our taxpayers.

BIOSOLIDS

Part of the waste that is being hauled each day to landfills is wood chips and yard waste. By combining it with our Class A biosolids, we are developing another reuse opportunity through a high-value compost. Since receiving state authority last year, we continued to develop this product and move it closer to the market. We produced approximately 145,000 dry tons annually over each of the past five years and are targeting a distribution goal of 90,000 dry tons per year. Given the demand for this product on golf courses and at park districts, we know there is a similar value to making biosolids available to the public. We held a naming contest for a product we hope to market soon. We received 726 creative submissions that will help us market our resource and educate the public on the many benefits of biosolids reuse. Receiving the materials to create the compost and selling the finished product will provide another revenue stream for the MWRD. This compost blend will assist soil for plants, helping to increase water retention and promote root development.

Utility of the Future

Expanding our mission beyond water treatment to an array of environmental causes has made us a leader in the industry. In 2016, we were one of 61 utilities from across the U.S., Canada, and Denmark that were selected by a peer committee of utility leaders to receive the inaugural "Utility of the Future Today" designation. The recipients received a display flag and a special certificate to further identify and promote their outstanding achievement as a Utility of the Future organization. The Utility of the Future program is a partnership of water sector organizations that celebrate the progress and exceptional performance of wastewater utilities while supporting the widespread adoption of an innovative business model. Through our many endeavors in water management, resource recovery and community partnering, we are setting a national trend as a utility of the future.

Stormwater Management

As watershed stewards during a time of changing weather patterns, one of the growing issues facing our region is flooding. Since the Illinois General Assembly granted authority to the MWRD to manage stormwater for Cook County, we have extended our resources to fight the danger of flooding to the point we now have 100 projects in stormwater management currently ongoing. We are performing preliminary engineering and design work on several alternatives recommended for phase I projects, including flood control projects and streambank restorations, while also constructing drainage improvements in phase II, moving forward with the flood prone property acquisition program and green infrastructure improvements. Many of these green infrastructure projects are drawing major acclaim while contributing to quality of life improvements for communities. The trade magazine Stormwater Solutions recently named a green infrastructure project implemented by the MWRD in Blue Island as a top 10 stormwater project in the nation. The magazine recognized the innovative green infrastructure project for its work in managing water and preventing flooding in the community. For the project, the MWRD installed six rain gardens and two permeable parking lots in flood prone areas to capture more than 150,000 gallons of stormwater per rain event and assist in mitigating flooding damages.

The MWRD has invested in and is currently working on about 20 green infrastructure projects throughout Cook County. The MWRD partners with various municipalities on these projects that use natural landscaping to manage water and provide environmental and community benefits, while preventing stormwater from entering the sewer system. We are currently

finalizing five studies across Cook County that examine the potential use of green infrastructure as a solution to managing excess stormwater. As a result of some of these findings, we are partnering with the city of Chicago on a pilot study that will gain insight into the effectiveness of various technologies aimed at reducing basement backups. The proposed dataset will be comprised of approximately 40 residential properties in the Chatham neighborhood to evaluate the effectiveness of low-cost improvements in reducing basement backups, such as downspout disconnection and extension, rain gardens and backflow preventers.

Space to Grow

No MWRD conversation about green infrastructure would be replete without a mention of our award-winning partnership known as Space to Grow. The collaborative program converts Chicago schoolyards into community spaces for physical activity, outdoor learning, environmental literacy and engagement with art, while addressing neighborhood flooding issues. This joint venture, formed between the MWRD, Chicago Department of Water Management, Chicago Public Schools, Healthy Schools Campaign and Openlands constructed three new schoolyards in 2016: Wadsworth Elementary School in the Woodlawn neighborhood, Gunsaulus Scholastic Academy in the Brighton Park neighborhood and Corkery Elementary School in the Little Village neighborhood. The program received the 2016 Best of Green School Award for Collaboration by the Center for Green Schools at the U.S. Green Building Council (USGBC) in collaboration with the Green Schools National Network (GSNN) in Pittsburgh in March, and then again in August, Space to Grow partners received the National Association of Flood and Stormwater Management Agencies' (NAFSMA) first place Green Infrastructure award in Portland, Oregon.

Rain Barrels

The free rain barrel program continued to be extremely popular among residents, municipalities, and community groups. Between January 2014 and December 2016, the MWRD worked with 88 municipal partners and two dozen non-governmental organizations to distribute more than 120,000 barrels. This demand has cultivated a newfound understanding and appreciation for managing water in addition to providing communities with a tool to combat flooding. When we started this program, we knew that a few barrels may not make a drastic difference in the amount of water overwhelming our drainage and storm sewer systems, but 120,000 rain barrels capturing rain in a one-inch event is equivalent to 6.6 million gallons of water, enough to fill 10 Olympic size swimming pools.

Restoring the Canopy

In April we launched a new program designed to inspire Cook County residents to adopt a more traditional form of green infrastructure that will truly add green to our communities while retaining stormwater. Driven by the devastation caused by the emerald ash borer and extreme weather events that have led to the loss of approximately 13 million trees, staff embarked on an ambitious plan to help restore the Cook County tree canopy. In only a few months, more than 25,000 free oak tree saplings were distributed as part of the Restore the Canopy, Plant a Tree program. This program works toward restoring the region's tree canopy and managing local stormwater which will help reduce flooding, improve local water quality by lessening the load of water overwhelming our sewer system, and promote resource recovery by planting the trees in our composted biosolids blend. To distribute these trees, the MWRD has forged partnerships with more than 25 different municipalities, 30 schools and nearly 50 community groups.

Board Changes

Commissioners Michael Alvarez and David Walsh completed their terms on the Board. Both were instrumental in guiding the vision of the MWRD during their tenure, and their presence will be missed. In 2017, we welcome two new commissioners, Josina Morita and Martin J. Durkan, to serve on the Board and look forward to their collaboration as we continue to work on behalf of the residents of Cook County.

Looking Ahead to 2017

Next year we will continue working toward our ambitious goals of transforming water and recovering resources, all while continuing to explore cost saving measures for the residents of Cook County. We have some exciting initiatives moving forward, from capturing energy from our renewable resources to promoting business opportunities for those who served through a veteran's preference policy. Our pledge to meet energy neutrality will have our engineers and scientists testing and applying the latest technologies, while our plant managers and treatment plant operators will continue to push for the best and most resourceful ways to treat water and keep operations running smoothly on a daily basis. Our team of stormwater experts will continue to develop community partnerships and find solutions that will continue to make the Chicago region a phenomenal place to call home. We realize we cannot protect our water environment all by ourselves. The water quality we have worked so hard to attain in our waterways and Lake Michigan affords us this wonderful home, and through the MWRD and our various partners we aim to keep it that way for a long time to come.

STUDENTS, HELP US

NAME THAT BIOSOLID!

Hurry! The deadline to enter is September 30, 2016

Students of all ages and all grades, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) is seeking your help to name its Exceptional Quality (EQ) biosolids and EQ biosolids blend that is composted with woodchips.

YOU COULD WIN A GREAT PRIZE!

So what exactly are biosolids, you might be asking yourself? Well, the MWRD biosolids are a natural product derived from an interesting and unusual cycle of which we all play a part. Let's just say, the process can typically begin at your home or in your school and continue on to one of our seven water reclamation plants. The rest, as they say, is history. So, since we all help to make it, why not help us give it a name?

How do you use biosolids and are they safe? We're proud to say that our products are safe and can be used almost anywhere soil amendments and chemical fertilizers would be used, including golf courses, athletic fields, parks and recreational facilities, and agricultural and farm fields.

How does the contest work? If you are a creative or not-so-creative genius waiting for your one big break to show off your awesome talents, raise your juice box, your milk box or your glass. This is your moment of opportunity! Don't waste it!

Submit your idea(s) via email to Public.Affairs@mwrd.org or post them to our Facebook or Twitter pages (@mwrdgc). Be sure to enter the #NamethatBiosolid when submitting your entries and let us know where you attend school. Enter multiple times, be creative, yet appropriate.

GOOD LUCK!

The MWRD reserves discretion in naming this product.

Appendix B

Summary of Activities of the District's Land Application Program

Viewable by accessing the District's Biosolids website, www.mwrd.org, and by navigating through Departments >Maintenance & Operations >EMS for Biosolids

EMS for Biosolids - Element 15
Biosolids Management Report Summary of Activities of the District's Land Application Program - 2016

LASMA/CALSMA

There were two Contractors specifically used for the land application program:

- Stewart Spreading (14-690-11)
- Synagro (14-692-12)

Stewart Spreading

Stewart Spreading submitted 160 requests (113 farms) for application of biosolids. M&R approved 158 requests (111 farms) for application of biosolids. Stewart Spreading shipped biosolids to 44 farms under Contract 14-690-11.

Quantity Utilized under 14-690-11

LASMA shipped 150,566 wet tons at an average of 23.64 % total solids for beneficial reuse under these contracts during 2016.

Location	Quantity (wet Tons)
HASMA	0
Marathon	21,705
Cells	9,071
Lagoons	119,789

CALSMA shipped 5,974 wet tons at an average of 25.64 % total solids for beneficial reuse under these contracts during 2016.

Location	Quantity (wet Tons)
East	2,450
West	3,524

Field and Truck Route Inspections

Inspections were performed on all of the farms in which our biosolids were applied. In addition, 9 truck route inspections and 58 truck fleet inspections were performed.

Public Relations Program

Stewart Spreading conducted door to door visits and dropped off information packets to the residents adjacent to application sites to educate and inform them prior to land application. Stewart Spreading also held a Field Day for the local community in September to educate and promote the use of biosolids.

EMS for Biosolids - Element 15
Biosolids Management Report Summary of Activities of the District's Land Application Program - 2016

Synagro

Synagro submitted 26 requests (21 farms) for application of biosolids. M&R approved all of the requests. Synagro shipped biosolids to 4 farms under Contract 14-692-12.

Quantity Utilized under 14-692-12

LASMA shipped 8,403 wet tons at an average of 26.04 % total solids for beneficial reuse under this contract during 2016.

Location	Quantity (wet Tons)
HASMA	0
Lagoons	6172
Cells	1,856
Marathon	376

CALSMA shipped 10,755 wet tons at an average of 55.62 % total solids for beneficial reuse under this contract during 2016.

Location	Quantity (wet Tons)
East	4,298
West	6,457

Field and Truck Route Inspections

Inspections were performed on all of the farms in which our biosolids were applied. In addition, 7 truck fleet inspections were performed.

Public Relations Program

Synagro conducted door to door visits and dropped off information packets to the residents adjacent to application sites to educate and inform them prior to land application.

Both land application contractors provide monthly newsletters summarizing the previous month activities. The newsletters are posted on the MWRD website.

Appendix C

Internal Audit Report

Viewable by accessing the District's Biosolids website, www.mwrd.org, and by navigating through Departments >Maintenance & Operations >EMS for Biosolids

MWRDGC
ENVIRONMENTAL MANAGEMENT SYSTEM FOR BIOSOLIDS
INTERNAL AUDIT REPORT

Metropolitan Water Reclamation District
Of Greater Chicago

Audit conducted by

Lead Auditor
John McNamara, Quality Assurance Coordinator

Audit Team
Ahmad Laban, Principal Engineer
Dan Collins, EMS Coordinator


Compost utilized in a community garden in Chicago, IL

Final Report – March 22, 2017

INTRODUCTION

The purpose of the Internal Audit is to verify that the Environmental Management System (EMS) conforms to requirements, is being implemented as intended, and is producing the results desired. The goal of the Internal Audit is to gather objective evidence to substantiate whether the MWRDGC has properly implemented, and are maintaining, the BMP. The internal audit evaluates the organization's performance relative to established biosolids program goals, objectives, and performance measures and will review the District's biosolids management activities including those performed by contractors.

AUDIT SCOPE

The District conducted an internal audit of the MWRDGC's EMS from January 4, 2016 through March 3, 2016. The audit was scheduled through an assignment from the Director of Maintenance and Operations to the Division Heads and ultimately carried out by the Lead Auditor and the Audit Team.

The primary objective of the Internal Audit is to ensure the entire EMS for Biosolids program is operating as required by the EMS documents. This was accomplished by reviewing the following:

1. The EMS manual and supporting documents. (Element 1)
2. Commitment and implementation of the *Code of Good Practice*. (Element 2)
3. Progress toward meeting Goals and Objectives for 2016. (Element 5)
4. Critical Control Point Tables and operational SOPs. (Elements 3, 7, 10, 13)
5. 2017 Goals and Objectives, established. (Element 5)
6. Public outreach programs conducted by contractors and the District. (Element 6)
7. Verification of Training (Element 8)
8. Verifying the corrective actions to the Third Party Interim Audit, 2016. (Element 14)
9. Contractor Activities for Land Application
10. Review of Emergency Preparedness and Response (Element 11)
11. Daily Non-Conformance to Operations (Element 14)
12. Opportunities for Improvement (OFI)

Assignments for items 3, 4, 5, 6 and 9, 10, 11 and 12 were distributed to the Internal Audit Team and EMS Field Representatives. The EMS Coordinator audited Items 1, 2, 7 and 8.

INTERNAL AUDIT FINDINGS

<u>Positive Observations</u>
The District's EMS has realized many improvements throughout 2016. There has been continual progress in tracking of Opportunities for Improvements (OFI's), operational non-conformances and overall reporting on Element review assignments.

Element 2 - The Executive Director altered the District's Biosolids Policy by removing specific reference to Land Application and inserting commercial use.

Element 6 - The District has a strong PR program upheld by various departments working together to promote the use of biosolids products and to educate the public. The District Public Affairs Department stepped up efforts in utilizing social media to increase public awareness of the District Class A Compost Program. Open House events took place at various plants on May

21, 2016 and the District hosted a weekly tree give away program weekly at participating plants throughout the summer in an effort to encourage the public to "Restore the Canopy" in the Chicagoland area. In May of 2016 the Hanover Park Plant provided a tour to the Hanover Highlands Elementary School Science Club and provided a tree sapling, potted in composted biosolids, to each student to take home and plant.

Applying compost for planting grass at a vacant lot in 2016. Midlothian, Illinois

Element 14 - The District began tracking operational non-conformances and opportunities for improvement by keeping an electronic file with the EMS Field Representative at each WRP. In 2016 42 non-conformances were reported, an increase from 35 in 2015. This is a positive observation as it is evident that tracking of such items is improving. For example, the Stickney WRP reported 11 non-conformances, addressed with 11 Work Orders for maintenance. This standard for plant operations/maintenance tracking sets a standard for other WRP's. Additionally, the Kirie Plant used a non-conformance related to out of service WAS pumps to identify an OFI and then immediately addressed it by creating an outline agreement with a vendor for parts and subsequent repairs.

Element 16 – The Internal Audit was streamlined by the EMS Coordinator. The Internal Audit is now carried out by an Internal Audit Team comprised of the Quality Assurance Coordinator (QAC), a Principal Engineer, and the EMS Coordinator. In 2016, the QAC Coordinator and the Principal Engineer received formal Internal Auditor Training.

Minor Non-conformances

Element 2 – Biosolids Management Policy

The revised Biosolids Management Policy was approved by the Director of M&O, Director of M&R and the Executive Director and a signed copy dated June 21, 2016 is on file with the EMS Coordinator. However, Step 3 of the Element 2 procedure states that the policy will be posted at various locations. The audit found that the revised policy has not yet been posted at any locations.

Element 11 – The Emergency Manual for the O'Brien Plant was said to be reviewed and revised as necessary. However, the website version dates back to 2012 and is therefore outdated.

Daily non-conformances to operations were found in Biosolids operations at various locations. A total of 42 non-conformances were reported and addressed. Reported non-conformances are kept on file with the respective EMS Field Representative.

Opportunities for Improvement

Opportunities for improvements in operations were identified in various areas of the District. A total of 5 OFI's were identified by staff and reported to the EMS Field Representatives. Reported OFI's are kept on file with the respective EMS Field Representative. One of the OFI's in Biosolids Operations at CALSMA was implemented as an odor neutralizing chemical was mixed with low solids at the time of pumping into trucks to reduce potential odors at the CALSMA-West Drying Site. The success of this pilot test has resulted in a budget item for 2017 related to this style of odor control.

A review of the critical control point tables resulted in OFI's to primary persons responsible and permit updates at various plants. General Division also requested updates be made to Monitoring/Measurement and Record Keeping for Landfill Disposal. These changes will be incorporated and updated Elements will be posted on the District's portal.

However, not all WRP's identified OFI's or non-conformances to operations. Operations managers should encourage staff to submit OFI's.

2016 THIRD PARTY AUDIT - CAP's

The third party auditor identified minor non-conformances related to the competency and training of the Internal Audit Team. There was no evidence available to demonstrate the auditing competence of various individuals assigned auditing tasks. Formal audit training was attended by the Quality Assurance Coordinator and Principal Engineer.

GOALS AND OBJECTIVES

Biosolids Environmental Management System Goals and Objectives (G&O's) were established using input solicited through a memo from the Director of Maintenance and Operations to the Division Heads as well as input from interested parties. Quarterly and final progress reports for 2016 G&O's were submitted to the Director of Maintenance and Operations. The audit team reviewed and approved the final status of 2016 G&O's.

A complete summary of progress toward meeting goals and objectives will be included in the Biosolids Management Report submitted during the second quarter of 2017.

The 2017 Goals and Objectives have been approved and can be viewed on the District's website at mwrd.org and clicking on the following: Departments >> Maintenance & Operations >> EMS for Biosolids.

PUBLIC PARTICIPATION IN PLANNING AND EMS COMMUNICATION

The District's Monitoring and Research Department, Public Affairs Department and Maintenance and Operations Department work together to provide a pro-active public outreach program. The departments made contact with potential users via phone and email, promoted biosolids at public meetings and events, schools, park districts and country clubs. The M&R and M&O Departments provided assistance in utilizing the compost product in Community Gardens and on vacant lots. In addition, the District's program entitled "Restore the Canopy" utilized composted biosolids in the pots in which trees were planted prior to public disbursement. The program allowed for greater than 20,000 trees to be distributed. Presentations were provided at different venues and a Biosolids Nutrient Workshop was held. A complete list of Public Affairs activities will be included in the Biosolids Management Report.

Staff organized and led tours for the public at MWRD Water Reclamation Plants and Solids Management Areas. In total, there were over 180 tours and 3,600 visitors in 2016. There were 179 Community Outreach events, 102 educational presentations throughout the year. These events reached over 40,000 individuals.

The District held its 4th "Sustainability Summit" at Maggie Daley Park attended by over 100 interested parties to learn about and share information related to Resource Recovery. Awards were given for exceptional use of biosolids to Dave Ward, Superintendent of Coyote Run Golf Course in Flossmoor and the Tinley Park-Park District.

MWRD biosolids were used for landscaping on Chicago's acclaimed 606 Trail, a linear park built on a former elevated rail line. The landscaping contractor blended biosolids with sand for the project to create a rich soil that supports a variety of plants, bushes and trees along the 2.9 mile trail.

CONTRACTOR ACTIVITIES FOR LAND APPLICATION

The District utilized two contractors for the land application of Class A and B biosolids. The contractors performed door to door visits and dropped off information packets to residents near land application sites. One of the contractors, Stewart Spreading, hosted an event for the local community and interested parties to educate and promote the use of biosolids. The District's land application contractors submitted monthly public relations reports throughout the year. The reports covered new public outreach for the month, a weather summary, biosolids application volumes and more. All monthly PR reports are now located on the District's website.

EMERGENCY PREPAREDNESS AND RESPONSE

A review of the Emergency Response Procedures was conducted at each of the WRP's. Updated manuals have been posted on the District Portal.

CONCLUSIONS

The results of the Internal Audit show MWRDGC reflect a mature and continually improving EMS program. The EMS Field Representatives continue to improve tracking daily operational non-conformances and Opportunities for Improvement (OFI's). It is evident that upper management of the District is involved in setting goals and objectives and in ensuring that they are strived to be met.

Appendix D

Third Party Interim Audit Report

Viewable by accessing the District's Biosolids website, www.mwrd.org, and by navigating through Departments >Maintenance & Operations >EMS for Biosolids

NATIONAL BIOSOLIDS PARTNERSHIP
BIOSOLIDS MANAGEMENT SYSTEM
INTERIM AUDIT REPORT

Metropolitan Water Reclamation District
Of Greater Chicago

Chicago, Illinois

Audit conducted by

NSF-International Strategic Registrations

William R. Hancuff, Lead Auditor
Alan Cassel, Auditor

References:
National Biosolids Partnership (NBP) ***EMS Elements***
NBP ***Third Party Verification Auditor Guidance – November 2001***
(Latest Revision August 2011)
NBP ***Code of Good Practice***
Metropolitan Water Reclamation District
Of Greater Chicago EMS Manual
(Core Documents – Various dates)

Final Report – June 20, 2016

INTRODUCTION

The purpose of the Biosolids Management Program (BMP) interim audits are to verify through regular reviews the system's health and effectiveness between verification audits. The third party on-site interim audits provide independent reviews and support credibility between re-verification audits. The goal of the audit is to collect and evaluate objective evidence related to a portion of the BMP such that over the course of the four interim audits conducted between verification audits all 17 elements are addressed.

The goal of this audit is to determine whether the Metropolitan Water Reclamation District Of Greater Chicago (MWRD) BMP is functioning as intended, that practices and procedures are conducted as documented, and that the BMP as implemented conforms to the NBP's Code of Good Practice and the BMP requirements of the National Biosolids Partnership (NBP) program objectives.

RECOMMENDATION

The results of the MWRD BMP interim audit and review of corrective action notices are positive. The minor non-conformance corrective action plan has been reviewed and approved. It is therefore the recommendation of the audit team that the MWRD BMP retain its Platinum Level Recognition Certification status.

AUDIT SCOPE

The NSF-International Strategic Registrations, Ltd. (NSF-ISR) conducted a third party interim audit of the MWRD BMP from May 23, 2016 through May 27, 2016. The on-site interim audit team consisted of Dr. William R. Hancuff, Lead Auditor and Alan Cassel, Auditor.

The primary objective of the annual interim audit was to ensure the environmental management system health by reviewing:

- Progress toward goals and objectives,
- Corrective and preventive action requests and responses.
- Actions taken to correct minor non-conformances,
- Management review process, and
- BMP outcomes (environmental performance, regulatory compliance, interested party relations, and quality practices)

The first four items identified above involved reviewing procedures, activities, processes and products that have general requirements found in the NBP standard elements 5, 14, 15, 16 and 17. The fifth item, BMP outcomes, had the potential of involving other NBP standard elements, namely: 1, 2, 4, 6, 9, 10 and 13.

In addition to evaluation of the system as outlined above, the present interim audit scope included the review and verification of the maintenance and implementation of the MWRD BMP relative to standard elements 3, 8, 15, and 17.

In general terms, the scope of the Third Party interim audit encompassed the entire biosolids value chain (pretreatment, collection and treatment, through final end use) at selected MWRD facilities with special attention on those practices and management activities that directly support biosolids-related operations, processes, and activities within the biosolids value chain.

The physical biosolids facilities and land application sites included in the audit and visited during the interim audit included the following facilities: Stickney Water Reclamation Plant and Monitoring and Research Offices; Lawndale Avenue Solids Management Area (LASMA); Calumet Water Reclamation Plant and Calumet Solids Management Area (CALSMA); Harlem Avenue Solids Management Area (HASMA) composting operations, John E. Egan Water Reclamation Plant; Hanover Park Water Reclamation Plant, James C. Kirie Water Reclamation Plant, three community gardens in South Side Chicago, Lyons Township Parks and Recreation baseball and soccer fields application sites, and Stewart Spreading – farm land application site in Lisbon Township, Kendall County, IL (field code – KE KACO 3C).

The following individuals were interviewed or otherwise participated in meetings as part of the audit process:

David St. Pierre, Executive Director – Metropolitan Water Reclamation District Of Greater Chicago
John Murray, Director Maintenance and Operations (M&O) Division
Sergio Serafino, Assistant Director Maintenance and Operations (M&O) - North
Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator – LASMA
Ahmad Laban, Principal Engineer – LASMA
Raphael Frost, Senior Civil Engineer - CALSMA
Steve Hall, Senior Civil Engineer - CALSMA
Sharon Sopcak-Phelan, Field Operations Officer – M & R Department, Industrial Waste Div. Field Services – Stickney WRP (Industrial Waste Division)
Brett Garelli, Deputy Director of Maintenance and Operations (M&O) – Plant Manager – Stickney WRP
Reed Dring, Engineer of Treatment Plant Operations 1 – Operations Manager – Stickney WRP
Henry Marks, Chief Operating Engineer – Stickney WRP
Steve Carmody, Maintenance Manager – Stickney WRP
Mark Kwan, Operating Engineer II – Stickney WRP
Mike Doyle, Operating Engineer I – Stickney WRP
Tom Conway, Assistant Director Maintenance and Operations (M&O) Division – Calumet WRP
Brian Perkovich, Managing Engineer – Calumet WRP
Neil Dorigan, Managing Engineer – Calumet WRP\

Patrick Connolly, Principal Engineer – Calumet WRP
Aruch Poonsapaya, Principal Engineer – Terrence J. O'Brien WRP
Jim Cloonan, Assistant Chief Operating Engineer – Kirie WRP
Jim Kaminski, Treatment Plant Operator III – Kirie WRP
Albert Cox, Manager EM&R – Stickney WRP
Lakhwinder Hundal, Ph.D, Supervising Environmental Soil Scientist, M&R Department, Stickney WRP
Guanglong Tian, Senior Environmental Soil Scientist, M&R Department, Stickney WRP
Katarzyna (Kathy) A. Lai, Principal Engineer, Operations Manager – Egan WRP
Hitesh Shah, Plant Manager – Egan WRP
Sanjay Patel, Egan WRP
John Lazicki, Plant Manager – Hanover Park WRP
Rob Pogorney, Engineering Technician V. Hanover Park WRP
Dan Mikso, Chief Operator, Hanover Park WRP
Al Eswani, Senior Civil Engineer, Hanover Park WRP
Greg Firrantello, Agronomy Manager – Steward Spreading
Michelle Stewart, Field Coordinator – Stewart Spreading
Gregg Bratton, Executive Director ChicaGRO Intergenerational Growing Project (Community gardens South Side Chicago)
Ed Staudacher, Managing Engineer - Storm water
Ruth Joplin, Risk Manager, Risk Management Section, General Administration Division
Allison Fore, Officer Public and Intergovernmental Affairs – Public Affairs Office
Dan Wendt, Assistant Public and Intergovernmental Affairs Specialist – Public Affairs Office
Pat Thomas, Public Affairs Specialist – Graphic Artist – Public Affairs Office

INTERIM AUDIT FINDINGS

The interim audit included document of the latest versions of the MWRD BMP element procedures, Standard Operating Procedures, reports and records. During the on-site audit these documents were reviewed to verify conformance with the National Biosolids Partnership (NBP) BMP Elements using the most current NBP Third Party Verification Auditor Guidance dated August 2011. Additionally interviews were conducted with various personnel to obtain supplemental objective evidence on the effectiveness of the implementation of the BMP. The interim audit found 4 positive observations, no major non-conformances, 1 minor non-conformance and 14 opportunities for improvement. Attachment 1 summarizes the documents and other objective evidence associated with each element that was evaluated during the interim audit.

The following is a review of the observations made during the interim audit. The positive observations are presented first, followed by the minor non-conformance and opportunities for improvement. The latter two categories are listed by item number, which correspond to the element minimum conformance requirements found in the NBP Third Party Verification Auditor Guidance and are presented in the sequence of the NBP standard elements.

Commendation

The continued efforts and dedication of the EMS Team must be acknowledged. Maintaining the BMP Platinum Certification goal is obviously a team effort, but the guidance and direction provided by the biosolids coordinator, Dan Collins to ensure continuous improvement must be recognized. Additionally, the support, encouragement and active participation of the Executive Director, David St. Pierre, in the BMP process have guaranteed the continual improvement of the program. The following are the positive observations identified for recognition since the last interim audit.

Positive Observations

- The Executive Director, David St. Pierre, has established an aggressive goal of having 100 percent of the District's biosolids processed into a Class A Exceptional Quality product that can be used for any beneficial purpose without restriction. Additionally, the goal includes ensuring that 100 percent of this resource will be used exclusively to benefit Chicagoland (i.e. within Cook County and the District Service areas).

- The District has responded to the request from a Chicago urban gardening organization for help in providing assistance with community gardens in South Side Chicago by forming a partnership with ChicaGRO. The District will provide a composted biosolids blend to 72 gardens as soil amendment to promote the growth of healthy garden vegetables for consumption by the neighborhood residents. This is a major breakthrough in public acceptance of biosolids, which is of national significance.

- The Executive Director has taken an active role in ensuring the Biosolids Management Program is effective and results in continual improvement. He revised the Policy Statement to ensure advancements in beneficial use of biosolids through including Commercial Use of this resource. He has also personally established several District goals and objectives to put Chicago in the forefront of recovering resources.

- MWRD has developed a comprehensive online GIS-enabled Citizen Incident Reporting System to improve communication between the public and MWRD through submittal of complaints. The incidents are sorted into three categories: odor, flood, and general. This program represents a significant accomplishment in open two-way communication. It is especially relevant to the biosolids management program since odor is the most frequently cited concern with biosolids production and utilization. The complaint form indicates that the MWRD staff will investigate the reported issue within 24 hours and if the origin of the odor is within their system MWRD will work to find a resolution to the issue.

Minor Nonconformance

Requirement 16.3 and 8.1 – The standard requires that the organization maintains at a minimum documents and records that identifies the lead auditor(s) and their qualifications. Interviews indicated that field auditors have not received any formal training in EMS auditing. (Note: the Quality Assurance Coordinator (QAC), who is identified as the lead EMS auditor in the procedure has not received Environmental Management System lead auditor training.) Additionally requirement 8.1 of the standard requires that a training program be established and maintained to ensure that employees responsible for implementation of various EMS functions are competent in performing their assigned tasks and duties. There was no evidence available to demonstrate the auditing competence of various individuals (EMS Field Representatives) assigned auditing tasks.

Opportunities for Improvement

Requirement 1.1 – The standard requires the organization to have an EMS manual that describes policy, programs, plans, procedures and management practices. Consider developing a master schedule for all required actions of the Biosolids environmental management system. (Note: as a separate consideration some organizations identify within each procedure all the actions associated with the words shall, will, must, is/are required, etc. and placing them on a timeline chart with the dates of completion. Then use "Outlook" or a similar program to distribute reminders to individuals who have responsibilities for accomplishing the tasks.)

Requirement 2.1 – The standard requires the establishment of a Biosolids Management Policy that commits the organization to following the principles set forth in the "Code of Good Practice." One of the principles of conduct of the Code is "Preventive Maintenance" which requires the preparation and implementation of a plan for preventive maintenance for equipment used to manage biosolids and wastewater solids. While MWRD has a robust preventive and corrective maintenance program using a MMS program there was no reference in the biosolids management procedures to its existence or how it functions. Consider including a complete description of this program (i.e. a PM/CM SOP) as a reference in either the Operational Controls Procedure or the Nonconformance: Preventive and Corrective Action procedure, or another appropriate procedure of the EMS.

Requirement 2.1 – The standard requires the establishment of a Biosolids Management Policy that commits the organization to following the principles set forth in the "Code of Good Practice." One of the principles of conduct of the Code is "Continual Improvement" in all aspects of biosolids management. It was observed that there were delays in progress on several of the goals and objectives that resulted in significant impacts on continual improvement. Consider having the status of the Biosolids Management Program Goals and Objectives reviewed by the Executive Director at the same time as the Executive Director goals are reviewed. Note that many of the Biosolids Goals and Objectives include or support the ED's District-wide Goals.

Requirement 4.1 – Review the regulatory requirements for the development of an SDS (formerly known as an MSDS) for each of the District's biosolids products, including those to be sold in the future. (See Louisville Green Biosolids MSDS as an example.)

Element 5 – Consider preparing a simple single page summary list of all current goals and objectives along with the outcome areas they impact, responsible individuals, SMART criteria, and any other information considered critical.

Element 5 – Consider having the Executive Director review and approve each of the biosolids management system goals and objectives.

Element 5 – Continue to observe the progress on the odor mitigation investigations involving Odowatch and at the appropriate time consider establishing a goal and objective for odor control.

Requirement 5.7 – One of the goals at Hanover WRP is to "Prevent nutrient overloads" in the soil at Fischer Farm. Groundwater samples are collected and monitored quarterly. However, soil samples are collected and analyzed only once every four years. Consider increasing the frequency of soil sampling to once annually, which would allow staff to track changes and correct any overload situations in a timely manner.

Requirement 8.1 –The Element 8 – Training procedures does not currently address the on-line method used for awareness training, and Document 08-2, which lists the employees required to attend EMS awareness training, is not current.

Requirement 8.2 – Consider documenting all of the job training performed relative to EMS job functions for new, transferred and promoted employees.

Requirement 10.1 – The gravity thickener improvements at Stickney made to date include modifying the operation of the primary sludge withdrawal system, and reducing the number of thickeners in service from 8 to 3. Consider if the dilution water, which is presently being added to the thickeners is of sufficient quantity. Also, samples are taken once daily from the thickener underflow. Consider increasing the sampling frequency to once per shift until the thickeners are stabilized. Also, consider sampling the overflow from each thickener every shift and analyzing for total suspended solids (TSS). (Note: a well-operated thickener is normally 90% capture of solids in the underflow.)

Requirement 14.4 – The standard requires the development of corrective action plans to address nonconformities identified during routine monitoring and measurement. During the last interim audit conducted in 2015, it was observed at the Hanover Park facility that the current boilers in the digester area create an unsafe condition, as they are open-flame in an area where open flames are prohibited. None of the electrical gear in that zone is rated for use in an explosion-proof area. There is potential for a methane explosion or fire. An elementary school is located across the street from the plant. Engineering is

evaluating the most cost effective solution to this issue, but a corrective action plan has not yet been finalized.

Requirement 16.1 – The standard requires that the organization establish and maintain an internal audit program to periodically analyze the EMS for biosolids and determine whether it is effectively meeting its biosolids management policy. In the "key areas of interpretation" of this requirement it indicates the internal audit should review its commitment and implementation of the Code of Good Practice as part of the internal audit program. Consider including in the internal audit procedure a review of how the BMP is being implemented to meet the intent of the Policy and Code of Good Practice.

Requirement 16.1 – Ensure that the scope of the internal audit includes checking and evaluating the implementation of each element procedure and document listed in the EMS Manual for each element of the standard being audited. The audit needs to assure that practices and procedures are conducted as documented.

Requirement 16.1 – The District prepared and conducted an internal audit that meets the intent of assessing its biosolids program goals and objectives as well as performance evaluation. However, the current Internal Audit procedures (Element 16 – Biosolids EMS Internal Audit procedure and Document 16.1 – Biosolids Internal EMS Audit Guidance) do not reflect the scope, frequency, and methodology of the audits, assignment of responsibility for conducting the audits and communicating the findings, which were used to conduct the audit.

Requirement 17.1 – Consider having an additional Management Review of the Biosolids Management System Performance shortly after the third party interim audit. Consider including in this review having the Biosolids Coordinator presents to the Executive Team the results of the third party audit and the proposed corrective actions along with the schedules to address each finding.

Summary and Closure

The NBP Third Party Verification Auditor Guidance indicates that when the auditor identifies minor nonconformances during the on-site audit, the organization must resolve the nonconformances and provide documentation to the auditor within 30 days of the audit. NBP acknowledges that biosolids organizations may not be able to fully correct some minor nonconformances within 30 days, in which case NBP requires that the audited organization develop an action plan with time frames. This plan and schedule for correcting minor nonconformances must be approved by the lead auditor.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO COMMENT

The District's Environmental Management System (EMS) continual improvement in 2015 revolved around the Internal Audit process, and tracking of non-conformances to daily operations and opportunities for improvement (OFI's). The tracking of non-

conformances and OFI's was not a part of the program previously. The result of this tracking has resulted in improved information sharing in all levels of reporting and with outside contractors.

The Third Party Audits provide an insight for continual improvement of the District's Biosolids management program at various plants. As a result of the 2015 Interim Audit operations staff began to communicate their ideas for continual improvement. One of the ideas, market the direct pickup of biosolids and biosolids related products, resulted in a savings of over $30K in truck hauling in 2015. In addition, a goal has been established for 2016 and beyond to increase the quantity of products picked up by the end user each year. The EMS provides an opportunity for direct communication among the Executive Director, the Director of M&O and EMS Coordinator, through Element 17 - Management Review, which ensures continual improvement begins with upper management direction.

An example of continual improvement in the program is the legislative change related to the removal of restrictive use of EQ Biosolids. The passing of the bill in July of 2015 supports the District's efforts of creating Class A biosolids through composting and, as a result, the District procured equipment to formally begin a composting program in 2016. The District's Biosolids program is strong due to the support of the Executive Director and the dedication of all members of the EMS team working together. The District strives for excellence in all areas of resource recovery and the EMS employed by the District supports that effort.

OUTCOMES MATTER

The MWRD Biosolids Environmental Management System established goals and objectives through requests to the Division Heads and Field EMS representative inputs. Subsequent to the development and approval the EMS coordinator distributes the goals and objectives to a list of interested parties and requests input on future goals. The MWRD Biosolids goals for its EMS were established cognizant of each of the four outcome focal points of the NBP program as identified below:

1. Environmental Performance,
2. Regulatory Compliance,
3. Relations with Interested Parties, and
4. Quality Biosolids Management Practices.

While it is not a requirement to attain all the objectives established, it is a critical component of the system to make progress towards accomplishing the overall goals. Initially in June 2013 the MWRD established eighteen (18) goals and objectives for 2013, which carried through until the third party interim audit conducted in May 2014. Many of the goals were long term and carried over from year to year. The goals for the most part were established using Specific, Measurable, Achievable, Relevant, and Time Bound (SMART) criteria, although some did not completely capture the measurable criteria (including costs). The District worked to improve the specific measurability of goals and objectives and tracking of progress using these measurements. Some of the goals and

objectives were accomplished and dropped, others were modified and new ones were identified. Progress has been made on the goals and objectives and, where performed, measurable accomplishments were tracked quarterly through 2015.

In his management role the Executive Director initially established three long term goals in 2013, namely 1) becoming energy neutral, 2) beneficially using 100% of MWRD biosolids within Cook County (and the District's service areas), and 3) Odor mitigation throughout the District. All of these top-level goals impact the outcome areas of Environmental Performance, Relations with Interested Parties, Regulatory Compliance and Quality Biosolids Management Practices. In mid-2014 the Executive Director added another goal of creating a composted biosolids program, which will support his second long-term goal mentioned above. And in 2015 the Executive Director added another goal of establishing a tree farm and native prairie landscape nursery at Hanover Park's Fisher Farms, which again will support the ED's long-term goal of beneficially using 100% of MWRD biosolids within Cook County (and the District's service areas).

Individual goals and objectives were established for each of the water reclamation plants that produce biosolids. In addition, the General Division, Monitoring and Research and Public Affairs established goals. Many of these goals and objectives were initially developed in support of the Executive Directors goals and may in the future be continued as targets or part of action plans needed to attain the ED's goals. The District's performance relative to the above outcome areas are addressed below and identified immediately after the discussion of each goal.

Executive Director Goal 1 – Become Energy Neutral

While this goal is involves many operations throughout the District, the activity with the highest potential not attributable to energy conservation is related to energy generation through biosolids processing; that is, the conversion of organic materials to methane gas during the anaerobic digestion solids stabilization process.

Since this goal is District-wide and is not completely controlled within the Biosolids Management Program's Environmental Management System the progress is not currently tracked through the BMP; however several of the EMS goals and objectives contribute to moving towards this goal. These BMP goals include the Stickney goal of improving solids concentration to the digesters, which should increase the production of methane gas in the digesters for potential recovery; the utilization of all biogas at Calumet; the usage of the central facility boiler facility for heating digester gas at Calumet; to utilize as much digester gas as possible at Hanover Park; and the General Divisions goal of increasing customer direct pickup of Class A biosolids products, which will not only reduce the energy associated with transportation of biosolids but eliminate the energy consumed by the field equipment used to spread the solids.

Outcome areas impacted: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

Executive Director Goal 2 – Beneficially use 100% of MWRD biosolids within Cook County and the 125 Service Areas of the District

The achievement of this goal is the General Division's responsibility with the support of Public Affairs and Monitoring and Research. The ultimate disposition of biosolids produced by the district is through the Controlled Solids Distribution Program and the Beneficial Use on Farmland Application Program. Application as a landfill cover is the last option when all other options for biosolids use have been exhausted.

The objective is to increase the utilization of Class A biosolids in the local community and decrease the use of Class B biosolids utilization on Farmland. The near term EMS Goal for 2015 was to beneficially use 100% of solids production, and to use 15% of the overall utilization in Cook County. The General Division received a total of 87,362 dry tons of biosolids from various plants and the total utilization was 71,021 dry tons. This represents 81% of the total production. However, the controlled solids distribution within Cook County was 16,350 dry tons, which represents 18.3 % of the total solids production and 23 % of the total beneficial utilization; both of which exceed the 15% goal of use in the District's service area.

Several other efforts support this initiative including the Public Affairs Section's goal to identify potential customers; the General Division's goals of creating EQ composted biosolids and increasing customer direct pickup of Class A biosolids products; and the executive director's goal of establishing a tree nursery and farm at Hanover Park's Fisher Farm.

It is anticipated that the intermediate targets for this goal will increase significantly from 15% in 2015, to 40% in 2016, to 70% in 2017 and to 100% in 2018. To aid in this increase the Executive Director has changed the BMP Policy to reflect commercial utilization of biosolids products.

Outcome areas impacted: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

Executive Director Goal 3 – Odor Mitigation Throughout the District

The single most effective change, which will mitigate odors throughout the District, associated with biosolids, is the creation and implantation of an EQ compost biosolids program. The creation of this program in 2015 was highly successful and immediate implementation is schedule for 2016 and beyond. An aggressive program has been established with production targets of 10,000 tons in 2016, 50,000 tons in 2017 and 100,000 tons in 2018. Other programs that do not yet have measureable targets include odor control at the WRPs currently being researched; and use of the online incident reporting system (public site, which can be used for reporting odor complaints) as a method for quick response to concerns.

Outcome areas impacted: Environmental Performance, Regulatory Compliance, Relations with Interested Parties, and Quality Biosolids Management Practices.

Stickney Water Reclamation Plant (WRP) Goal 1 - Improve West Side Solids Feed to Digesters:

This goal is to improve the solids concentration to the digesters and is an extension of a long-term project, which began in 2009 and was carried forward to 2010 and 2011 and expanded to include improvement of the West Side solids feed to the digesters. The near-term objective is to improve solids feed to the digesters by constructing eight circular gravity concentration tanks (GCT) followed by installation of new pre-digestion centrifuges. This contract, 09-176-3P, was awarded in March 2010, and after extensive change orders regarding power feed, the GCTs were put into service on January 27, 2015 via the O'Brien solids line. Currently O'Brien and Stickney WAS/Primary solids are being fed into the GCTs. It is anticipated that the solids streams will be separated and only WAS will be centrifuged and primary solids will be pumped to the GCTs. The installation of pre-digestion centrifuges has been extended and is scheduled for completion in the fall of 2016.

The described benefits include increasing the feed concentration to the digesters (through new primary thickeners and new WAS centrifuges), which thereby increases the digester detention time and ensures better stabilization of the solids. Some measureable parameters for environmental performance improvement would include feed concentration (percent solids), detention time increase, and increased stabilization, e.g. percent reduction in volatile solids and increase in digester gas generated (cubic feet or therms) and cost savings associated with increased energy self sufficiency.

The current status is that three Imhoff tanks have been removed and replacement with 9 new primary clarifiers is currently under construction and progressing to a completion date of August 2018. When operational, the new primary tanks will have an additional benefit of improving volatile solids feed to the digesters.

The measureable objective of this goal is: 1) to increase the West Side plant primary volatile solids from approximately 40% to 60%; 2) to increase digester gas production from 3,500 Mcf/day to 6,700 Mcf/day, and 3) to increase the volatile solids reduction from the historic level of 31% to a range of 40% to 50%.

The percent solids feed to the digesters is planned for improvement, and new gravity concentration tanks (GCT) are in operation for primary solids. These have the goal of increasing percent solids to approximately 5%. However, further work as noted below is required to optimize this process. Currently the percent solids ranges between 2.5 to 4.5%, while the waste activated sludge (WAS) is thickened to about 5.5% solids in centrifuge thickeners.

This goal and objective supports the MWRD Executive Director's EMS goal of becoming energy neutral.

Outcome Areas Impacted: Environmental Performance and Quality Biosolids Management Practices.

Stickney Water Reclamation Plant (WRP) Goal 2 – Minimize Polymer and Electrical Use at Post-Centrifuge Building:

This goal and objective is to increase low solids pumping from Stickney WRP to Lawndale Avenue Solids Management Area (LASMA) to 45,000 tons. This shift eliminates the need for centrifugation of those solids at the Stickney WRP and reduces the quantity of polymer and electricity used resulting in considerable cost savings. As a side note it was observed that transferring the low solids to LASMA reduces the operating cost for the Stickney plant but increases the cost of processing those solids at the LASMA facilities. To demonstrate the true cost saving to the Districts the reduced costs for Stickney combined with the increased cost for LASMA should provide the net savings to MWRD. The cost savings calculated for electricity is $4.22 per dry ton; for polymer is $51 per dry ton and for CO2 is 4.94 per dry ton; resulting in a total cost savings of $60.16 per dry ton.

These were the historic costs, which were expected to be lower in 2014 and 2015. Nevertheless Stickney increased its low solids pumping to an all time record high of 75,987 dry tons. The plant did an excellent job of tracking the details of all of the cost components on a monthly basis, including polymer, CO2, and power along with the quantity of low solids in dry tons sent to the LASMA lagoons. The total savings for 2014 was approximately $4.5 million. No costs were immediately available to compare the additional costs of solids handling at LASMA.

While the goal of transferring 45,000 tons of dry solids from Stickney to LASMA was maintained for 2015, it was not achieved because by mid-2015 the M&O staff realized that unseasonably wet conditions would result in exceeding the lagoons' capacity. As a result is it was decided to centrifuge more solids at Stickney and retain lagoon capacity for the winter season, when it is most needed. In spite of these adjustments a total of 29,600 dry tons were transferred to the lagoons in 2015.

This goal was adjusted for 2016 to reflect new operating conditions. Additionally, the new phosphorus removal system, Ostera, began operations in late May 2016, which will require more centrifugation and perhaps development of new goals.

Outcome Areas Impacted: Environmental Performance and Quality Biosolids Management Practices.

Calumet Water Reclamation Plant (WRP) Goal 1 – Utilize all biogas:

This goal is to utilize 100% of the biogas produced. This objective includes measuring digester gas production and utilization to establish a baseline for comparison in addition to establishing a baseline cost to be able to evaluate reduction in operation and maintenance costs. Measurable quantities of methane gas production have been quantified in millions of cubic feet and therms, and operation and maintenance costs have been quantified in dollars. The method of tracking identified in the goals and objectives template indicates monthly tracking of digester gas utilization will be performed from 2013 to 2016 to create a baseline. The tracking of digester gas production and utilization for 2015 showed 100% of the digester gas produced being used in January, February, March, November and December. The remaining months showed an average based on totals of approximately 80%. Other data tracked included digester temperature variation, total natural gas usage, maintenance cost of CBF and maintenance cost of digester boilers.

The improvement in environmental performance with this goal and objective was not specifically established, i.e. defining the theoretical amount of gas to be produced in millions of cubic feet or therms was not presented in the quarterly progress reports. Also no cost savings were found in the progress reports. Additional environmental benefits to be quantified (estimated) include greenhouse gas impacts avoided.

Funding for this project is available in the Engineering Department, although the Engineering Department rejected the proposals for 100% utilization of digester gas, and they will be reissuing a Request for Proposal in early 2016 to achieve 100% utilization.

This goal and objective supports the MWRD Executive Director's EMS goal of becoming energy neutral.

Outcome Areas Impacted: Environmental Performance and Quality Biosolids Management Practices.

Calumet Water Reclamation Plant (WRP) Goal 2 – Employ the Central Boiler Facility for Digester Heating:

This was a completely new goal and objective established mid-year for 2014. The purpose of this goal is to use steam produced at the Central Boiler Facility to heat the biosolids in the anaerobic digester. Currently the digester temperatures vary over a wide range causing an inefficient use of energy, sometimes overheating the digesters sometime not heating the digesters enough. As discussed this improvement will require replacing the boilers with new efficient heat exchanger and temperature controls. The defined improvement will be realize in the more efficient use of digester gas thus reducing the amount of natural gas needed for supplemental digester heating. In order to measure more precisely the benefits of this goal it was identified that tracking the biosolids temperatures to show fluctuations is critical to demonstrate improved performance. Additionally it was indicated there would be a reduction in operation and maintenance costs. Once again no baseline temperature measurements, such as temperature variations, quantity of natural

gas supplemented, and cost of heating operations (including maintenance) were presented in quarterly progress reports.

A project has been designed to use steam from recently constructed Central Boiler Facility to heat the solids with better fuel economy and replace the aging hot water to solids heat exchangers. The vetting panel approved project 06-213-3M on May 21st 2015, but the project was withdrawn from presentation to the Executive Team at the request of the Engineering Department sponsor. No progress has been made since that time.

Outcome Areas Impacted: Environmental Performance and Quality Biosolids Management Practices.

Hanover Park Water Reclamation Plant (WRP) Goal 1 – Prevent Nutrient Overload in Soil at Fischer Farm:

The objective of this goal is to improve the distribution system used to apply lagoon supernatant to the Fischer Farm fields. This originally was a short-term objective that has been on the books since 2007 and has been carried forward each year through 2012 with no progress until 2013. The estimated amount of supernatant produced at Hanover Park is seven million gallons per year. The specific objective is to apply one million gallons of supernatant per year to each of seven farm fields. Until last year the supernatant was applied to only three of the seven fields due to damaged piping and valves. This distribution has the effect of overloading those fields that receive the supernatant and could impair groundwater quality in the long term. Funding has been allocated to this objective for several years running and then reallocated to other projects resulting in no progress. However, in 2013 the funding was approved and construction was completed replacing valves and risers on the supernatant piping system in the fourth quarter of 2014. Replacement of damaged equipment allows a more even distribution among all seven fields and improves environmental performance.

Operations applied supernatant and biosolids evenly across seven fields in 2015. In early August 2015 a crop of oats was planted and successfully produced 50 bushels/acre, which were harvested in November. In December 7 million gallons of Biosolids were injected into the soil with no odors or complaints received.

The contractor planted corn on all seven fields in early May 2016. Sampling of the soil for nutrients and metals content was scheduled to take place in Spring 2016 and was completed for nutrients in April 2016 at 4 to 6 locations. Results will be compared with 2012 samples.

(Note: To meet the Executive Director's new goal of establishing a tree nursery, one of the 7 fields at the farm is being set aside for this purpose. Eight acres will be converted to a design, build, operate contract for trees and native plants. The contract has been bid and is scheduled for opening early June 2016. This will have minimal impact on the normal farm operations.)

Outcome Areas Impacted: Environmental Performance, Relations with Interested Parties, Regulatory Compliance and Quality Biosolids Management Practices.

Hanover Park Water Reclamation Plant (WRP) Goal 2 – To Utilize as Much Digester Gas as Possible (2015 – 2016):

The second goal for Hanover Park WRP was originally established in 2009. It was expanded through combining it with another past objective and carrying it forward through 2014. The goal and objective currently includes digester facility improvements to capture the digester gas, which is wasted through flaring, and to use it as a substitute for natural gas that currently heats the plant. The project was planned for two stages; first to improve the digester facilities piping and second to construct digester gas storage facilities. Contract # 08-530-3P for digester facility improvements began in the fall of 2012 and was completed in 2014. A work order #C20535 was created to replace the existing gas burner piping with stainless steel.

All gas piping was replaced with stainless steel resulting in a significant improvement by reducing gas lost to the atmosphere and reduction in odors. Digester gas utilization is now ranges from 70+% use in winter, and 40% to 50% in summer. There was a 40% decrease in natural gas purchased in 2015 from 2014, even though the total gas utilization rate increased by 2.41%.

This goal and objective supports the MWRD Executive Director's EMS goal of becoming energy neutral, and odor mitigation throughout the district.

Outcome Areas Impacted: Environmental Performance Relations with Interested Parties and Quality Biosolids Management Practices.

John E. Egan Water Reclamation Plant (WRP) Goal 1 – Maximize Digester Gas Usage

The objective of this goal is to improve the digester gas use for building and digester heat in order to reduce costs associated with purchasing natural gas for the same purposes. Additionally, as a side benefit improvements will reduce flaring and releases to the atmosphere. To accomplish this the digesters must be cleaned and mixing of primary digesters must be restored to full capacity.

A baseline was established in 2014, which indicated that 394,276 therms of natural gas were purchased; 741,308 therms of gas were produced by the digesters and 610,054 therms of digester gas were used. Historically, digester gas utilization has been between 82% and 92% for digester heating, to heat the buildings in the winter and to operate chillers in summer.

Engineering Contract 11-403-2P is in process and improvements in digester gas generation and use will follow. If the cleaning contract can be expedited then all digesters can be available in early 2017.

Outcome Areas Impacted: Environmental Performance Relations with Interested Parties and Quality Biosolids Management Practices.

John E. Egan Water Reclamation Plant (WRP) Goal 2 – Improve Dewatering Facility at the Egan WRP:

The objective of this goal is to replace the existing conveyor system with a new system that will allow an increase in efficiency by reducing the number of outages (reduce the number of outages from the 2012 – 2014 average of 10 total and 6 unscheduled) and lower the maintenance costs (2009 – 2012 average conveyor cost of $76,000). It was also an objective to increase the dewatered biosolids storage capacity to allow for longer uninterrupted period of centrifuge operation (from 19 hours five days per week to 24 hours six days per week).

This system will also reduce odors by being an enclosed system and reduce cleanup cost from historic 4 hours per day to approximately 1 hour daily allowing the staff to be assigned to other tasks at Egan. The 2010 IIT odor study and also the eight-week study by the Districts M&R staff in December 2013/January 2014 recorded reading of H2S and ED50. These will be used as a baseline to determine the reduction of the odors in the dewatering facility upon completion of the improvement project.

Construction has been completed on the dewatering/conveying/truck loading system, however, there have been many problems with the equipment that have delayed the completion of this project.

Evaluation of progress as measured by the impacts on performance as discussed in the paragraphs above are ongoing and will be summarized and discussed in each quarterly report on goals and objectives.

Outcome Areas Impacted: Environmental Performance, Relations with Interested Parties, and Quality Biosolids Management Practices.

Kirie Water Reclamation Plant (WRP) Goal 1 – Upgrade Instrumentation (Magnetic Meter Installation) for Flow Measurement of Waste Activated Sludge (WAS) Transmission to the Egan WRP

This goal and objective was created mid-year 2013 as a 2014 goal. It is anticipated that improved accuracy may result along with redundancy in flow measurement. Also, it is anticipated that maintenance cost and reliability of flow measurement will result. It is projected that maintenance cost will be reduced by 66% and solids transmissions interruptions will be lowered by 70%. Progress has been made and completion of the operation was originally anticipated to be June 2015. The meter has been delivered and will be installed by plant forces in June or July 2016. Work is being coordinated with the Toll way rerouting of the WAS line. Maintenance costs associated with flow measurement and solids transmission interruptions (hours) continue to be tracked.

Outcome Areas Impacted: Environmental Performance and Quality Biosolids Management Practices.

Kirie Water Reclamation Plant (WRP) Goal 2 – Improve Cathodic Protection of the Waste Activated Solids Transmission to the Egan WRP

This goal and objective was created mid-year 2013 as a 2014 goal. The objective is to reduce corrosion, which will extend the life expectancy of the pipeline and reduce the loss of solids dewatering production at the Egan WRP due to pipeline failure.
A contract has been awarded and work is expected to be complete by July 2016.

Outcome Area Impacted: Environmental Performance.

General Division Goal 1 – Increase Use of Biosolids within Cook County:

This goal represents the combination of three separate goals developed in the past, namely Beneficial Use of Solids Production at Calumet Solids Management Area (CALSMA), Beneficial Use of Solids Production at Lawndale Avenue Solids Management Area (LASMA), and Beneficially use 100% of MWRD biosolids within Cook County and the 125 Service Areas of the District, and is primarily to implement the action plan required to accomplish the Executive Directors overarching goal to beneficially utilize 100% of the Districts biosolids within Cook County and the District service areas.

The original 2013 objective of this goal was to increase the percentage of the 125 Community Service Areas of the District where biosolids could be beneficially used and to increase the number of significant users in the District by 10 each year over the next 5 years. Also an earlier objective was to increase the quantity of biosolids beneficially used by 1,500 tons each year over the next five years. This goal and objective went through a mid-year clarification and redefinition in 2014 and the objective was to increase the utilization of Class A biosolids in the local community and decrease Class B utilization on farmland. The measureable goal for 2014 was to have at least 10% of the total 2014 biosolids utilization applied locally with Class A biosolids. This goal was exceeded with 15% of the total production being applied locally and 85% applied to farmland.

The 2015 status of this goal is discussed in greater detail within the Executive Director Goal 2.

Outcome Areas Impacted: Environmental Performance, Relations with Interested Parties, and Quality Biosolids Management Practices

General Division Goal 2 – Increase Customer Direct Pickup of Class A Biosolids Products

The purpose of this goal is to establish a direct pickup program for Class A biosolids products by end users. This goal has the benefit of eliminating the cost of transporting biosolids and in most cases reducing the cost of land applying those solids at the delivery site. It also has the benefit of increasing the use of biosolids locally in Cook County because all current customer pickups are used exclusively within the county.

The action plan involves contacting landscapers, golf courses, and current customers to inform them of the advantage of pickup at anytime without awaiting scheduling for District transportation. Measurements to be made include: tonnage picked up; ton-miles eliminated with costs saved, application equipment use avoided (hours and costs) and total cost savings.

The objective of the first year of this goal was to establish a baseline upon which expansion of distribution could be based. The measureable goal is to increase the direct pickup by 25% each year over the baseline year of 2015. In 2015, end users picked up 1,860 tons of product, which sets the goal for 2016 of 2,325 tons. A preliminary estimate of cost savings associated with the direct pickup of 2449 wet tons (1616 dry tons) of biosolids from May 14, 2015 to December 15, 2015 showed a savings of $26,940.

Outcome Areas Impacted: Environmental Performance, Relations with Interested Parties, and Quality Biosolids Management Practices

General Division Goal 3 – Create and Produce Exceptional Quality (EQ) Composted Biosolids:

This is a new goal that resulted from the M & R goal of increasing biosolids compost production by 1000 dry tons each year. The initial action plans involved determining the optimal ratio of combining woodchips and biosolids for composting, using Gore cover technology for reducing odors and evaluating green waste for improving heat generation and reducing costs. The total 2015 EQ composted biosolids delivered was 2,052 dry tons.

This goal has been greatly influenced by the Executive Director's (ED) overarching goal of beneficially using 100% of MWRD biosolids within Cook County and the 125 service areas of the district. The ED has established an aggressive set of targets as follows:

2016 - 10,000 tons of product
2017 – 50,000 tons of product
2018 – 100,000 tons of product

Outcome Areas Impacted: Environmental Performance, Regulatory Compliance, Relations with Interested Parties and Quality Biosolids Management Practices

General Division Goal 4 – GIS Mapping for Biosolids:

This objective is associated with a long-term goal that was originally established in 2011 and continued through 2015. This objective involved providing GIS mapping for all biosolids beneficial uses, including land application, controlled distribution and final utilization of biosolids from LASMA, CALSMA and Egan WRP dating back to 1998. Federal and state regulations require long term (sometimes lifetime) tracking of land application of certain classifications of biosolids. While the District has maintained hard copies of all records they are susceptible to damage or loss. The GIS mapping provides easy access to all historic records for any land application site, controlled distribution points, and landfill applications. The farmland application data entered includes mapping showing the property and application areas and application data, such as delivery dates, biosolids quantities, application areas, and metal loading history. This system facilitates the preparation of regulatory reports such as the Monthly EPA Controlled Solids Distribution Reports. The project is making progress and the mapping of all farm fields and controlled solids distribution from 1998 – 2010 have been mapped on the GIS program. In 2014 emphasis was on keeping up to date with the current year and completing the mapping and linking of 2011 Controlled Solids Distribution (CSD) sites. The following was accomplished in 2014; closing out 2011 (mapping and linking CSD sites) and closing out 2013 (mapping farms& linking all sites). This goal is basically compete with continuing efforts in 2016 to map and link any remaining CSD sites.

Outcome Areas Impacted: Environmental Performance, Regulatory Compliance and Relations with Interested Parties.

Public Affairs Goal – Identify Potential Customers:

This goal is carried forward from 2013 and 2014. It is fully complementary to the executive director's goal of beneficially using 100% of MWRD biosolids within Cook County and the 125 service areas of the district. The measurability has changed over the pass three years and now does not quantify the results of the outreach methods, such as: community outreach, Student/teacher/administrator educational visits, tours, marketing materials, website, letters, press releases/social media coverage, and event planning; as it used to do. This goal appears to be evolving to a quantifiable action plan that supports the Executive Directors goal.

The Public Affairs Section promoted biosolids through interactions at 165 public meetings, events and schools though Cook County with t total attendance of over 32,400. In addition, 100 tours were organized for the public and attended by 1,636 attendees, which included biosolids conveyance systems at various plant ant the lab and greenhouse were biosolids are used to grow plants for research and demonstration purposes.

Marketing materials continued to be revised. Several press releases were distributed though the year regarding biosolids. Social media was utilized to reach potential customers. And Public Affairs held the third annual Sustainability Summit on November 10, 2015. The event attracted local community leaders, elected officials and municipal staff from throughout Cook County and offered information and testimonials pertaining to biosolids.

Outcome Areas Impacted: Relations with Interested Parties.

Monitoring and Research Goal 1 – Increase Biosolids Compost Production by 1000 dry tons each year:

The 2015 goal was carried over from 2014 and was to produce a biologically stable and odor-free biosolids compost using woodchips having a consistent nutrient content to be made available to users throughout the year. (Note: the quantity of compost production was incidental to the goal.) The advantage is that biosolids compost can be stored for extended periods of time at solids drying areas and utilization sites without the potential for odors.

In 2015 the environmental performance benefits were identified as specifically quantifiable by R&D using the following measurable criteria: biologically stable may be measured by vector attraction reduction and pathogen elimination; odor free may be measured using an odor panel and the ED50 method of evaluation. Results of odor testing are quantified by a numerical value of 0 to 10. Measurability of the compost nutrient content consistency was determined to be defined by concentration of nitrogen, phosphorus, and potassium. The targeted levels and results of test conducted in December 2015 were as follows: CO2 production – less than 2.0 mg CO2-C/g/d as a measure of biological stability (results 0.24); total Kjeldahl N – 1.5 – 2.0 percent (results 1.64%); total phosphorus – 1.5 to 2.0 percent (results 1.24%); total potassium – 0.05 – 0.3 percent (results 0.55%), odor scoring units – less than 5 (results 2.1) and fecal coliform as a measure of pathogen elimination – less than 1000 MPN/g (results 433).

This goal and objective supports the MWRD Executive Director's EMS goal of using 100% of the biosolids in Cook County and odor mitigation throughout the district.

This goal has been accomplished and the results demonstrated that full-scale composting of biosolids is feasible and safe. This resulted in a follow-on goal of creation and implantation of an EQ composted biosolids program. The creation of this program was initiated in mid-2014, equipment was purchased and composted biosolids production began in 2015. The program is highly successful and expansion of the program is schedule for 2016 and beyond. An aggressive program has been established with production targets of 10,000 tons in 2016, 50,000 tons in 2017 and 100,000 tons in 2018.

Outcome Areas Impacted: Environmental Performance, Relations with Interested Parties, Regulatory Compliance and Quality Biosolids Management Practices.

Monitoring and Research Goal 2 – Locate three (3) new Significant Industrial Users (SIUs) and/or Large Commercial Industrial Users that discharge to MWRD system:

This goal and objective was carried over from 2014, specifically to further the control of contaminants that may have a potentially adverse impact on biosolids quality. The Field Services Section of M&R located over 10 new SIUs.

Outcome Areas Impacted: Environmental Performance, Regulatory Compliance and Relations with Interested Parties.

CONCLUSIONS AND RECOMMENDATIONS

The results of the third party interim audit show MWRD has a strong mature Biosolids Management Program (BMP). There have been considerable improvements in the District BMP since the last external third party audit and this continuous improvement is expected in the future, especially in the goals, objectives and programs area, internal audits, and the facilities corrective and preventive action programs.

For the minor non-conformance District personnel prepared a Corrective Action Notice (CAN) and Corrective Action Work Plan, and will implement corrective actions according to their BMP procedures to provide continual improvements to their biosolids program. All proposed corrective action work plans were reviewed by the lead auditor and found to be acceptable and final closure will be verified during the next external third party interim audit. As a further measure to demonstrate continuous improvement the opportunities for improvement will be addressed to the maximum extent possible.

It is the recommendation of the audit team that MWRD's Biosolids Environmental Management Program (BMP), Chicago, Illinois retain its certification and "Platinum Level Recognition."

As was mentioned, a BMP is a continuously improving process, and retention of the platinum level recognition is not the end. The results of this and future audits will provide value added to the system and should be viewed as an overall opportunity to improve. Every audit is a snapshot in time, and does not, or cannot, identify each and every area for improvement. And yet, while no single audit identifies all of the areas for improvement the results of each audit provide an additional incremental step in the overall system's improvement.

Based on discussions between the facility's BMP Coordinator and the third party auditor the interim audit schedule listed below was proposed for the four years of interim audits and next re-verification audit.

The scope of each interim audit will include a review of the organization's progress toward goals and objectives; BMP outcomes (environmental performance, regulatory compliance, interested party relations, and quality practices); actions taken to correct minor non-conformances; the management review process; and corrective and preventive action requests and responses. This review generally includes requirements found in elements 1, 2, 5, 6, 9, 14, 15, 16 and 17.

In order to address each element of the NBP standard over the four years of interim audits the following elements are tentatively scheduled over the period between verification audits:

Year 6 (completed) – Elements 5, 6, 9, 14, 16

Year 7 (completed) – Elements 1, 10, 12, 13

Year 8 (completed) – Elements 3, 8, 15, 17

Year 9 (third party) – Elements 2, 4, 7, 11

Year 10 (third party) – Re-verification – All elements

Attachment 1

Documents and Other Objective Evidence Reviewed During Interim Audit

Element 1. BMP Manual

- Document 00.1 – EMS Manual Document Control Summary – 5/3/15
- Document 00.5 – District Organizational Chart (Revised 7/1/13) – Version 3, 10/13/11
- EMS Manual Element 01 – Biosolids EMS Manual – Version 3, 10/13/11
- Interview with Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator and Ahmad Laban, Principal Engineer – LASMA
- Interview with Greg Firrantello, Agronomy Manager – Steward Spreading (contractor)

Element 2. Biosolids Management Policy

- EMS Manual Element 02 – Biosolids Management Policy – Version 7, 3/16/15
- Document 02.1 – MWRD Biosolids Policy (containing Code of Good Practice) – Version 2, 10/13/11
- Interview with David St. Pierre, Executive Director
- Interview with John Murray, Director Maintenance and Operations (M&O) Division
- Interview with Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator and Ahmad Laban, Principal Engineer – LASMA
- Interviews with various personnel with biosolids value chain responsibilities (see list presented in the Audit Scope section of this report)

Element 3. Critical Control Points

- EMS Manual Element 03 – Critical Control Points – Version 5, 10/17/11
- Hanover Park WRP CCP Table – Version 12, 2/16/16
- John E. Egan WRP CCP Table – Version 15, 3/24/16
- James C. Kirie WRP CCP Table – Version 12, 1/22/16
- Terrence J. O'Brien WRP CCP Table – Version 11, 5/19/14
- Stickney WRP CCP Table – Version 12, 2/19/14
- Calumet WRP CCP Table – Version 12, 2/20/14
- Interviews with:
  Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator – LASMA
  Ahmad Laban, Principal Engineer – LASMA
  Steve Hall, Senior Civil Engineer - CALSMA

Sharon Sopcak-Phelan, Field Operations Officer – M & R Department, Industrial Waste Div. Field Services – Stickney WRP (Industrial Waste Division)
Brett Garelli, Deputy Director of Maintenance and Operations (M&O) – Plant Manager – Stickney WRP
Reed Dring, Engineer of Treatment Plant Operations 1 – Operations Manager – Stickney WRP
Henry Marks, Chief Operating Engineer – Stickney WRP
Steve Carmody, Maintenance Manager – Stickney WRP
Mark Kwan, Operating Engineer II – Stickney WRP
Mike Doyle, Operating Engineer I – Stickney WRP
Tom Conway, Assistant Director Maintenance and Operations (M&O) Division – Calumet WRP
Brian Perkovich, Managing Engineer – Calumet WRP
Neil Dorigan, Managing Engineer – Calumet WRP\
Patrick Connolly, Principal Engineer – Calumet WRP
Aruch Poonsapaya, Principal Engineer – Terrence J. O'Brien WRP
Jim Cloonan, Assistant Chief Operating Engineer – Kirie WRP
Jim Kaminski, Treatment Plant Operator III – Kirie WRP
Lakhwinder Hundal, Ph.D, Supervising Environmental Soil Scientist, M&R Department, Stickney WRP
Guanglong Tian, Senior Environmental Soil Scientist, M&R Department, Stickney WRP
Katarzyna (Kathy) A. Lai, Principal Engineer, Operations Manager – Egan WRP
Hitesh Shah, Plant Manager – Egan WRP
John Lazicki, Plant Manager – Hanover Park WRP
Rob Pogorney, Engineering Technician V. Hanover Park WRP
Dan Mikso, Chief Operator, Hanover Park WRP
Al Eswani, Senior Civil Engineer, Hanover Park WRP
Greg Firrantello, Agronomy Manager – Steward Spreading

Element 4. Legal and Other Requirements

- EMS Manual Element 04 – Legal and Other Requirements – Version 3, 10/17/11.
- Interview with Dan Collins, Supervising Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator
- Interview with Ahmad Laban, Principal Engineer – LASMA and CALSMA
- Interview with Sharon Sopcak-Phelan, Field Operations Officer – M & R Department, Industrial Waste Div. Field Services – Stickney WRP
- Interview with Ruth Joplin, Risk Manager, Risk Management Section, General Administration Division
- Interview with Allison Fore, Officer Public and Intergovernmental Affairs – Public Affairs Office
- Interview with Dan Wendt, Assistant Public and Intergovernmental Affairs Specialist – Public Affairs Office
- Interview with Pat Thomas, Public Affairs Specialist – Graphic Artist – Public Affairs Office

- Interview with Lakhwinder Hundal, Ph.D, Supervising Environmental Soil Scientist, M&R Department, Stickney WRP
- Interview with Guanglong Tian, Senior Environmental Soil Scientist, M&R Department, Stickney WRP

Element 5. Goals and Objectives

- EMS Manual Element 05 – Goals and Objectives – Version 8, 3/16/15
- Document 05.1 – Goals and Objectives Guidance – Version 1, 10/13/11
- Monitoring and Research Goals and Objectives for 2015
- General Division's Goals and Objectives for 2015
- Calumet WRP's Goals and Objectives for 2015
- Egan WRP's Goals and Objectives for 2015
- Kirie WRP - Goals and Objectives for 2015
- Hanover Park WRP's Goals and Objectives for 2015
- Division 900's Goals and Objectives for 2015
- Public Affairs Biosolids EMS Goals and Objectives for 2015
- 2015 Biosolids Program and Environmental Management System (EMS) Performance Report – Final – May 2, 2016
- First Quarterly Status Report on Biosolids Goals and Objectives – 2016 (May 2016).
- Summary of MWRD's Biosolids EMS Goals and Objectives for 2015
- Summary of Activities for the Office of Public Affairs for 2015
- Summary of Activities of the Districts Land Application Program for 20154
- Interviews with:
    - David St. Pierre, Executive Director – Metropolitan Water Reclamation District of Greater Chicago
    - Dan Collins, Managing Supervising Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator
    - Ahmad Laban, Principal Engineer – LASMA and CALSMA
    - Brett Garelli, Deputy Director of Maintenance and Operations (M&O), Plant Manager – Stickney WRP
    - Reed Dring, Engineer of Treatment Plant Operations 1, Operations Manager – Stickney WRP
    - Tom Conway, Assistant Director Maintenance and Operations (M&O) Division – Calumet WRP
    - Brian Perkovich, Managing Engineer – Calumet WRP
    - Aruch Poonsapaya, Principal Engineer – Terrence J. O'Brien WRP (by phone)
    - Jim Cloonan, Assistant Chief Operating Engineer – Kirie WRP
    - Hitesh Shah, Plant Manager – Egan WRP
    - Katarzyna (Kathy) A. Lai, Principal Engineer, Operations Manager – Egan WRP
    - John Lazicki, Plant Manager – Hanover Park WRP
    - Dan Mikso, Chief Operator – Hanover Park WRP

- Sharon Sopcak-Phelan, Field Operations Officer – M & R Department, Industrial Waste Division Field Services – Stickney WRP
- Lakhwinder Hundal, Ph.D, Supervising Environmental Soil Scientist, M&R Department, Stickney WRP
- Allison Fore, Officer – Public and Intergovernmental Affairs Office
- Dan Wendt, Assistant Public and Intergovernmental Affairs Specialist

Element 6. Public Participation in Planning

- EMS Manual Element 06 – Public Participation in Planning – Version 6, 3/16/15
- Document 06.1 – Public Input Opportunities, including table of marketing and education activities – Version 6, 3/14/14
- Document 06.2 – Public Relations Program for Farmland Application – Version 2, 10/13/11
- Interview with Allison Fore, Officer Public and Intergovernmental Affairs – Public Affairs Office
- Interview with Dan Wendt, Assistant Public and Intergovernmental Affairs Specialist – Public Affairs Office
- Interview with Pat Thomas, Public Affairs Specialist – Graphic Artist – Public Affairs Office
- Interview with Dr. Lakhwinder Hundal – Supervising Environmental Soil Scientist – Monitoring and Research Department – Stickney WRP
- Interview with Gregg Bratton, Executive Director, ChicaGRO Intergenerational Growing Project (Community gardens South Side Chicago)
- Visited three composted biosolids community gardens in South Side Chicago
- MWRD website - https://www.mwrd.org/irj/portal/anonymous/Home
- Biosolids Program and EMS Performance Report – May 2, 2016
- MWRD Recovering Resources, Transforming Water Brochure – May 2016
- MWRD Online Incident Reporting System (public site for reporting odor complaints)
- Notification Mailing List – City Managers and Mayors
- Press Release – "MWRD is working with communities to replenish our green canopy." April 15, 2016.
- Press Release – "MWRD soil enriches South Side community garden projects" May 19, 2016
- Biosolids – A Sustainable Soil Amendment and Fertilizer Pamphlet
- Multiple YouTube Community Garden uses for biosolids (2011 – 2015)
- Sustainability Summit – 2016 (April 13 – 14, 2016)
- Free Tree program – distribution of 100,000 oak trees potted in composted biosolids
- Rain barrel project – distribution of free rain barrels throughout the community

Element 7. Roles and Responsibilities

- EMS Manual Element 07 – Roles and Responsibilities, Version 8, 3/16/15

- Document 7.1 – EMS Coordinator Responsibilities, Version 4, 10/13/11
- Document 7.2 – Field Division EMS Responsibilities, Version 3, 10/13/11
- Interviews with:
  - David St. Pierre, Executive Director – Metropolitan Water Reclamation District of Greater Chicago
  - John Murray, Director Maintenance and Operations (M&O) Division
  - Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator – LASMA
  - Ahmad Laban, Principal Engineer – LASMA
  - Sharon Sopcak-Phelan, Field Operations Officer – M & R Department, Industrial Waste Div. Field Services – Stickney WRP (Industrial Waste Division)
  - Brett Garelli, Deputy Director of Maintenance and Operations (M&O) – Plant Manager – Stickney WRP
  - Reed Dring, Engineer of Treatment Plant Operations 1 – Operations Manager – Stickney WRP
  - Tom Conway, Assistant Director Maintenance and Operations (M&O) Division – Calumet WRP
  - Brian Perkovich, Managing Engineer – Calumet WRP
  - Neil Dorigan, Managing Engineer – Calumet WRP\
  - Jim Cloonan, Assistant Chief Operating Engineer – Kirie WRP
  - Lakhwinder Hundal, Ph.D, Supervising Environmental Soil Scientist, M&R Department, Stickney WRP
  - Hitesh Shah, Plant Manager – Egan WRP
  - John Lazicki, Plant Manager – Hanover Park WRP
  - Greg Firrantello, Agronomy Manager – Steward Spreading
  - Ruth Joplin, Risk Manager, Risk Management Section, General Administration Division
  - Allison Fore, Officer Public and Intergovernmental Affairs – Public Affairs Office

Element 8. Training

- Element 08 – Training, Version 8, 3/16/15
- Document 08.1 – Types of Training, Version 3, 10/13/11
- Document 08.2 – Employees Required to Attend EMS Awareness Training, Version 7, 3/23/15
- Interviews with various personnel with biosolids value chain responsibilities (see list presented in the Audit Scope section of this report)
- Reviewed Sign-In Sheets for "EMS for Biosolids Awareness Training" at all WRPs and M&R for 2016.
- EMS Awareness on-line slide deck for training

Element 9. Communications

- EMS Manual Element 09 – EMS Communications, Version 10, 3/23/15

- Interview with Allison Fore, Officer Public and Intergovernmental Affairs – Public Affairs Office
- Interview with Dan Wendt, Assistant Public and Intergovernmental Affairs Specialist – Public Affairs Office
- Interview with Pat Thomas, Public Affairs Specialist – Graphic Artist – Public Affairs Office
- Interview with Dr. Lakhwinder Hundal – Supervising Environmental Soil Scientist – Monitoring and Research Department – Stickney WRP
- Interview with Gregg Bratton, Executive Director, ChicaGRO Intergenerational Growing Project (Community gardens South Side Chicago)
- Visited three composted biosolids community gardens in South Side Chicago
- MWRD website - https://www.mwrd.org/irj/portal/anonymous/Home
- Biosolids Program and EMS Performance Report – May 2, 2016
- MWRD Recovering Resources, Transforming Water Brochure – May 2016
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- Notification Mailing List – City Managers and Mayors
- Press Release – "MWRD is working with communities to replenish our green canopy." April 15, 2016.
- Press Release – "MWRD soil enriches South Side community garden projects" May 19, 2016
- Biosolids – A Sustainable Soil Amendment and Fertilizer Pamphlet
- Multiple YouTube Community Garden uses for biosolids (2011 – 2015)
- Sustainability Summit – 2016 (April 13 – 14, 2016)
- Free Tree program – distribution of 100,000 oak trees potted in composted biosolids
- Rain barrel project – distribution of free rain barrels throughout the community

Element 10. Operational Control of Critical Control Points

- EMS Manual Element 10 – Operational Control of Critical Control Points, Version 6, 10/27/11
- Document 10.1 – Operational Control Guidance, Version 1, 10/13/11
- Spot checked various Standard Operating Procedures at different Wastewater Reclamation Plants
- Interviews with:
  - Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator – LASMA
  - Ahmad Laban, Principal Engineer – LASMA
  - Steve Hall, Senior Civil Engineer - CALSMA
  - Brett Garelli, Deputy Director of Maintenance and Operations (M&O) – Plant Manager – Stickney WRP
  - Reed Dring, Engineer of Treatment Plant Operations 1 – Operations Manager – Stickney WRP
  - Henry Marks, Chief Operating Engineer – Stickney WRP

- Steve Carmody, Maintenance Manager – Stickney WRP
- Mark Kwan, Operating Engineer II – Stickney WRP
- Mike Doyle, Operating Engineer I – Stickney WRP
- Tom Conway, Assistant Director Maintenance and Operations (M&O) Division – Calumet WRP
- Brian Perkovich, Managing Engineer – Calumet WRP
- Neil Dorigan, Managing Engineer – Calumet WRP\
- Patrick Connolly, Principal Engineer – Calumet WRP
- Jim Cloonan, Assistant Chief Operating Engineer – Kirie WRP
- Jim Kaminski, Treatment Plant Operator III – Kirie WRP
- Katarzyna (Kathy) A. Lai, Principal Engineer, Operations Manager – Egan WRP
- Hitesh Shah, Plant Manager – Egan WRP
- Sanjay Patel, Egan WRP
- John Lazicki, Plant Manager – Hanover Park WRP
- Rob Pogorney, Engineering Technician V. Hanover Park WRP
- Dan Mikso, Chief Operator, Hanover Park WRP
- Al Eswani, Senior Civil Engineer, Hanover Park WRP

Element 12. BMP Documentation and Document Control

- EMS Manual Element 12 - Documentation, Document Control and Recordkeeping, Version 8, 3/16/15
- Document 12.1 - Types of Documents – Version 2, 10/13/11
- Interview with Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator – LASMA
- Interview with Ahmad Laban, Principal Engineer – LASMA

Element 13. Monitoring and Measurement

- EMS Manual Element 13 – Monitoring and Measurement, Version 6, 3/16/15
- Reviewed quarterly reports on Goals and Objectives progress 2015 through first quarter 2016
- Reviewed Biosolids Program and EMS Performance Report for 2015 – May 2, 2016
- Monitoring and Research Department "Composted Demonstration Project Report - 2 October 2015
- Biological stability, nutrient concentration, odor evaluation and pathogen test of composted biosolids produced by co-composting with woodchips in 2015 – Dec 2015
- Interviews with the following:
    - See Element 10 for all staff interviewed

Element 14. Nonconformances: Preventive and Corrective Action

- EMS Manual Element 14 – Non-conformances: Preventive and Corrective Action, Version 9, 3/16/15
- Document 14.1 – Corrective Action Plan Guidance, Version 2, 10/13/11
- Reviewed Biosolids Program and EMS Performance Report for 2015 – May 2, 2016 (summary of nonconformances and corrective actions)
- Corrective Action Plans (CAPs) from interim audit and internal audit conducted 2015.
- Corrective Action tracking spreadsheet for 2015 Interim Audit Nonconformances

Element 15. Biosolids Management Program Report

- EMS Manual Element 15 – Biosolids Program Report, Version 7, 3/16/15
- Document 15.1 – Biosolids EMS Annual Report Guidance, Version 4, 10/13/11
- Reviewed Biosolids Program and EMS Performance Report for 2015 – May 2, 2016

Element 16. Internal BMP Audit

- EMS Manual Element 16 – Biosolids EMS Internal Audit, Version 6, 3/16/15
- Document 16.1 – Biosolids EMS Internal Audit Guidance, Version 5, 10/13/11
- Document 16.2 – Biosolids EMS Audit Schedule, Version 3, 4/19/12
- Internal audit first quarter 2016 (January 4, 2016 – March 4, 2016)
- Internal Audit Draft Report – March 10, 2016

Element 17. Management Review

- EMS Manual Element 17 – Management Review, Version 6, 3/16/15
- Document 17.1 – Management Review Guidance, Version 1, 10/13/11
- 2014 Biosolids
- Reviewed Biosolids Program and EMS Performance Report for 2015 – May 2, 2016
- Interview with David St. Pierre, Executive Director – Metropolitan Water Reclamation District of Greater Chicago
- Interview with John Murray, Director Maintenance and Operations (M&O) Division
- Interview with Dan Collins, Managing Civil Engineer - Biosolids Manager & Biosolids EMS Coordinator – LASMA
- Interview with Ahmad Laban, Principal Engineer – LASMA

Appendix E

Annual Biosolids Program Report by M&R

Viewable by accessing the District's Biosolids website, www.mwrd.org, and by navigating through Departments >Maintenance & Operations >EMS for Biosolids

MONITORING AND RESEARCH DEPARTMENT

REPORT NO. 17-20

ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR 2016

April 2017

Metropolitan Water Reclamation District of Greater Chicago
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ANNUAL BIOSOLIDS MANAGEMENT REPORT FOR 2016

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LIST OF ACRONYMS

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

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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 2016 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 Metropolitan Water Reclamation District of Greater Chicago (District) submitted the 2016 Part 503 biosolids management report electronically to the United States Environmental Protection Agency (USEPA) on February 21, 2017, as required under the USEPA Code of Federal Regulations Title 40 Part 503 at Section 503.18. This report serves as the District record in compliance with the frequency of monitoring, record keeping, and reporting (Sections 503.16, 503.17, and 503.18, respectively) of the District's 2016 biosolids management operations. The information in this report demonstrates 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 503.32(a)(5), 503.32(a)(6), 503.32(a)(7), 503.32(a)(8), 503.32(b)(2), 503.32(b)(3), 503.32(b)(5), 503.33(b)(1), 503.33(b)(5), 503.33(b)(9), 503.33(b)(10), 503.13, 503.14, and 503.16 for the District's 2016 biosolids management program.

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

1. Fulton County Dedicated Biosolids Application to Land (IEPA Permit No. 2013-SC-58146).

2. Hanover Park Fischer Farm Biosolids Application to Land (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 and 2015-SC-59620).

4. Farmland Application Program (Biosolids Application to Farmland from the Calumet, Stickney, and Egan WRPs under IEPA Permit No. 2014-SC-58425).

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 (Kirie), and Terrence J. O'Brien (O'Brien) WRPs do not produce a final biosolids product, while the Calumet, Stickney, and Hanover Park WRPs produced final biosolids products that were beneficially used in 2016. The Egan WRP did not produce final biosolids products in 2016 due to scheduled digester maintenance. In addition, we discuss the utilization of the biosolids, outline the data-reporting requirements under Part 503, and present the required monitoring data in summary tables. The production and utilization of sludges and biosolids by the District in 2016 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 utilized, since biosolids may be utilized from production inventory for a previous year or biosolids produced in a given year may be stored or aged for utilization at a later time.

TABLE 1: PRODUCTION AND UTILIZATION OF SLUDGE AND BIOSOLIDS DURING 2016

Production and Utilization	Water Reclamation Plants						
	Stickney[1]	Calumet[1]	O'Brien	Egan[1]	Hanover Park[1]	Kirie	Lemont
	Dry Tons (Metric Tons)						
Production[2]	120,279 (109,115)	21,323 (19,344)	35,604 (32,299)	8,156 (7,399)	796 (722)	6,554 (5,946)	309 (280)
Utilization	45,546 (41,319)	12,835(11,644)	-	-	650 (590)	-	-
Agricultural land	37,784[3] (34,277)	7,514 (6,817)	-	-	650 (590)	-	-
Urban land (total)	7,762 (7,042)	5,321 (4,827)	-	-	-	-	-
air-dried	4,709 (4,272)	5,321 (4,827)	-	-	-	-	-
composted	1,766 (1,602)	-					
District property	1,287 (1,168)						
Landfill (total)	611[4] (554)	2,512 (2,279)	-	-	-	-	-
Co-disposal	581 (527)	274 (249)	-	-	-	-	-
Daily cover	-	-	-	-	-	-	-
Final cover	30 (27)	2,238 (2,030)	-	-	-	-	-
To Other WRPs[5]	-	-	35,604 (32,299)	8,156[6] (7,399)	-	6,554 (5,946)	309 (280)
Temporary Storage	-	-	-	-	-	-	-
Pelletizing facility[7]	37,143 (33,696)	-	-	-	-	-	-

[1]Differences between biosolids production and total use or disposal in 2016 were due to a net withdrawal or storage in lagoons or drying areas, and processing of biosolids imported from other WRPs.

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

[3]Includes 5.23 DT used on Fulton County research plots.

[4]Includes shipment to Laraway Waste Management Landfill.

[5]For further processing.

[6]Includes 930 DT of centrate and 5,655 DT of solids pumped to the O'Brien WRP for further processing, and 1,543 DT of partially digested centrifuge cake solids and unsuitable material trucked to CALSMA for additional processing and to LASMA for landfill co-disposal, respectively; 28 DT are recycled at the Egan WRP for Anita Mox project.

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

LEMONT WATER RECLAMATION PLANT

The Lemont WRP, located in Lemont, Illinois, has a design average flow of 2.3 million gallons per day (MGD). The annual average treated flow in 2016 was 2.74 MGD. Wastewater reclamation processes include both primary (primary settling) and secondary (activated sludge process) treatments. In 2016, the Lemont WRP produced 309 dry tons (DT) of solids (Table 1), which were gravity concentrated and transported to the Stickney WRP for further processing.

No final biosolids product is generated at this WRP.

JAMES C. KIRIE WATER RECLAMATION PLANT

The Kirie WRP, located in Des Plaines, Illinois, has a design average flow of 52 MGD. The annual average treated flow in 2016 was 37.8 MGD. Wastewater reclamation processes include grit tanks, secondary (activated sludge process), and tertiary (sand filtration) treatments. In 2016, the Kirie WRP produced 6,554 DT of solids (Table 1), which were sent via force main to the Egan WRP, then to the O'Brien WRP, and finally to the Stickney WRP for further processing.

No final biosolids product is generated at this WRP.

TERRENCE J. O'BRIEN WATER RECLAMATION PLANT

The O'Brien WRP, located in Skokie, Illinois, has a design average flow of 333 MGD. The annual average treated flow in 2016 was 225 MGD. Wastewater reclamation processes at the O'Brien WRP include primary (primary settling) and secondary (activated sludge process) treatments. In 2016, the O'Brien WRP produced 35,604 DT of solids (Table 1), which were sent via pipeline to the Stickney WRP for further treatment. This total includes solids generated from water reclamation at the O'Brien WRP and solids conveyed from the Egan WRP to the O'Brien WRP via sewer, which is described in the next section.

No final biosolids product is generated at this WRP.

JOHN E. EGAN WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Egan WRP, located in Schaumburg, Illinois, has a design average flow of 30 MGD. The annual average treated flow in 2016 was 23.7 MGD. Wastewater reclamation processes include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatments. All solids generated at the Egan WRP, including solids conveyed from the Kirie WRP, are anaerobically digested. During some winters or when the centrifuges are not operating, liquid digested solids are sent via sewers to the O'Brien WRP. Centrifuge centrate is also sent via sewers to the O'Brien WRP.

In 2016, the total solids production at the Egan WRP was 8,156 DT (Table 1). Of that total, 6,585 DT (5,695 DT of biosolids and 930 DT of centrate) were pumped to the O'Brien WRP and then to the Stickney WRP for digestion and further processing. Solids were only partially digested at the Egan WRP for most of the year because at least one digester was temporarily out of service. A total of 1,543 DT of partially digested centrifuge cake biosolids was shipped to the LASMA and CALSMA sites for temporary storage and further processing. while the remaining 28 DT were recycled at the Egan WRP for use in their ANITA Mox N-recovery project. No further reporting is required because no Egan WRP biosolids were directly utilized.

Summary of Biosolids Use and Disposal at Landfills

In 2016, no Egan biosolids were co-disposed in any landfill.

Biosolids Conveyed to Other Water Reclamation Plants for Further Processing

In 2016, a total of 5,655 DT of solids and 930 DT of centrifuge centrate were pumped to the O'Brien WRP for further processing. In addition, a total of 1,543 DT of partially digested biosolids were trucked from the Egan WRP to the LASMA and CALSMA sites for additional processing and storage.

HANOVER PARK WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Hanover Park WRP, located in Hanover Park, Illinois, has a design average flow of 12 MGD. The annual average treated flow in 2016 was 8.71 MGD. Wastewater reclamation processes at this WRP include primary (primary settling), secondary (activated sludge process), and tertiary (sand filtration) treatments. All solids produced at the Hanover Park WRP are anaerobically digested and stored in lagoons and later land-applied by injection at the on-site Fischer Farm.

In 2016, the total biosolids production at this WRP was 796 DT (Table 1).

Land Application of Class B Liquid Biosolids

In 2016, the Hanover Park WRP land-applied a total of 650 DT of biosolids at the on-site Fischer Farm under IEPA Permit No. 2012-SC-2255. The quantity of land-applied biosolids (650 DT) was lower than the quantity produced (796 DT) in 2016; hence 146 DT were placed in storage lagoons for later use. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is four times per year.

All Hanover Park WRP lagoon biosolids land-applied in 2016 met the pollutant concentration limits in Table 3 of Section 503.13 for all metals (Table 2). All biosolids also met the anaerobic digestion time and temperature requirements of the Class B pathogen standards of Section 503.32(b)(3) (Table 3), and the vector attraction reduction requirements of Section 503.33(b)(1) (Table 4). Management practices at this land-application site complied with Section 503.14 as previously described in a letter to the USEPA dated January 28, 1994 (Appendix I).

TABLE 2: CONCENTRATIONS OF NITROGEN AND METALS IN BIOSOLIDS[1] GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
					Supernatant						
					mg/L						
05/28/16	546	521	<0.050	<0.0010	0.047	<0.20	<0.0100	0.020	<0.020	<0.005	0.086
06/04/16	607	486	<0.050	<0.0010	0.078	<0.20	<0.0100	0.023	<0.020	<0.005	0.095
06/18/16	632	553	<0.050	<0.0010	0.052	<0.20	<0.0100	0.024	<0.020	0.006	0.097
07/09/16	665	574	<0.020	<0.0010	0.060	<0.20	<0.0050	0.025	<0.010	0.023	0.101
07/16/16	639	548	<0.020	<0.0010	0.048	<0.20	<0.0050	0.026	<0.010	0.013	0.083
07/30/16	546	436	<0.020	<0.0010	0.048	<0.20	0.0086	0.028	<0.010	<0.005	0.086
08/06/16	495	404	<0.020	<0.0010	0.047	<0.20	0.0059	0.024	<0.010	0.010	0.071
08/13/16	495	387	<0.020	0.0012	0.042	0.32	0.0055	0.026	<0.010	<0.005	0.068
08/27/16	479	377	0.020	<0.0010	0.063	<0.05	0.0077	0.031	<0.010	0.011	0.083
09/03/16	494	388	<0.020	<0.0010	0.062	<0.05	<0.0050	0.029	<0.010	0.030	0.090
09/17/16	478	395	<0.020	<0.0010	0.042	0.06	0.0053	0.029	<0.010	0.029	0.073
10/01/16	516	403	<0.020	<0.0010	0.054	0.07	0.0062	0.029	<0.010	0.017	0.082
10/29/16	558	487	<0.020	<0.0010	0.049	<0.05	<0.0050	0.029	<0.010	0.030	0.084
11/05/16	571	48	<0.020	<0.0010	0.052	<0.05	<0.0050	0.029	<0.010	0.036	0.074
					Liquid Biosolids[2]						
					mg/kg						
01/09/16	79,674	921	<5	2	813	1.7	13	36	29	<5	870
12/24/16	94,752	767	<5	2	791	1.2	13	26	21	<5	865
12/31/16	76,935	873	<5	2	861	1.3	14	33	24	<5	922
Minimum	76,935	767	<5	2	791	1.2	13	26	21	<5	865
Mean[3]	83,787	854	<5	2	822	1.4	13	32	25	<5	886
Maximum	94,752	921	<5	2	861	1.7	14	36	29	<5	922
503 Limit	NL[4]	NL	41	39	1,500	1.7	75	420	300	100	2,800

[1]Concentrations of constituents in applied supernatant and biosolids reported in mg/L (volume basis) and mg/kg (dry weight basis), respectively.
[2]Descriptive statistics reported for liquid biosolids only.
[3]In computing each mean, any value less than the reporting limit was considered the reporting limit.
[4]No limit.

TABLE 3: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2016

Month	Average Temperature	Average Detention Time	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32(b)(3)[1]
	----- ^{o}F -----	----- days -----		----- days -----
January	95.0	24.0	yes	15.0
February	95.0	22.6	yes	15.0
March	95.0	20.7	yes	15.0
April	95.0	21.1	yes	15.0
May	95.0	20.6	yes	15.0
June	95.0	18.5	yes	15.0
July	95.0	18.9	yes	15.0
August	95.0	18.0	yes	15.0
September	95.0	18.9	yes	15.0
October	95.0	21.6	yes	15.0
November	95.0	24.9	yes	15.0
December	95.0	24.3	yes	15.0

[1]For anaerobic digestion at average temperature achieved.

TABLE 4: VOLATILE SOLIDS REDUCTION IN BIOSOLIDS GENERATED AT THE HANOVER PARK WATER RECLAMATION PLANT AND APPLIED AT THE FISCHER FARM SITE IN 2016

Month	Digester Feed	Digester Draw	Lagoon Biosolids[1]	Volatile Solids Reduction[2]
	---------- % Total Volatile Solids ----------			----- % -----
January	86.1	73.1	68.0	65.8
March	87.0	74.5	57.1	80.1
June	85.0	73.6	58.1	75.6
July	85.7	74.5	57.8	77.1
August	85.6	75.7	67.4	65.2
September	85.2	74.9	63.5	69.7
October	86.3	76.2	58.5	77.6
November	85.8	76.2	58.2	77.0
December	86.8	75.9	70.6	63.4

[1]Biosolids applied as supernatant from 5/28 through 11/5/2016; liquid biosolids applied on 1/9, 12/24, and 12/31/2016.
[2]Volatile solids reduction computed using total volatile solids for digester feed and lagoon biosolids.

CALUMET WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Calumet WRP, located in Chicago, Illinois, has a design average flow of 354 MGD. The annual average treated flow in 2016 was 253 MGD. Wastewater reclamation processes at this WRP include primary settling and secondary activated sludge processes. All solids produced at the Calumet WRP are anaerobically digested. Calumet WRP biosolids are then:

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

    a) Application of air-dried Exceptional Quality (EQ) biosolids to urban land under the District's Controlled Solids Distribution Program.

    b) Use as air-dried biosoilds at local municipal solid waste landfills as final cover.

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

3. Placed in lagoons for dewatering; transported to paved cells for composting with wood chips and landscape waste to produce EQ biosolids compost prior to application as a soil amendment to urban land.

Biosolids that are unsuitable for beneficial reuse are co-disposed in local municipal solid waste landfills.

In 2016, a total of 21,323 DT of biosolids was produced at the Calumet WRP (Table 1). The total quantity of 15,347 DT of biosolids utilized (12,835 DT land-applied and 2,512 DT disposed of at landfills) was less than the total 2016 production for the Calumet WRP. Hence, a total of 5,976 DT was stored in lagoons or on drying cells for further processing and/or later use.

Summary of Biosolids Use and Disposal at Landfills

In 2016, a total of 2,238 DT of biosolids generated at the Calumet WRP was applied as final cover at the Land and Lakes Landfill, Dolton, Illinois. A total of 274 DT of unsuitable solids was co-disposed with municipal solid wastes at the Waste Management's Laraway Landfill site, Joliet, Illinois. No biosolids were used as daily cover.

Land Application of Class B Biosolids

In 2016, the Calumet WRP land-applied 7,514 DT of semi-dried Class B biosolids to farmland under IEPA Permit No. 2014-SC-58425 through contracts with Synagro Midwest, Inc. (Contract No. 14-692-12) and Stewart Environmental, Inc. (Contract No. 14-690-11). During 2016, approximately 1,500 DT centrifuge cake biosolids were transported from the Egan WRP to the CALSMA sites for storage and later land application. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

All Calumet WRP semi-dried Class B biosolids land-applied in 2016 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 5), the vector attraction reduction requirements of Section 503.33(b)(10) (by incorporation in soil within six hours after application), and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 6). The biosolids nitrogen concentrations (Table 5) were used to compute the agronomic rates for farmland application.

Application of Biosolids to Urban Land

In 2016, a total of 5,321 DT of air-dried Class A EQ biosolids generated at the Calumet WRP was applied to urban land and District property through the District's Controlled Solids Distribution Program under IEPA Permit Nos. 2010-SC-0200 and 2015-SC-59620 for maintenance of golf courses and recreation fields, landscaping, and for the construction of new recreation fields. The sites and method of utilization of these biosolids under the Controlled Solids Distribution Program are listed in Table 7.

Air-Dried Exceptional Quality Biosolids. In 2016, a total of 5,321 DT of air-dried Class A EQ biosolids generated at the Calumet WRP was applied to urban land. All Calumet WRP air-dried, EQ biosolids land-applied in 2016 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 8), the vector attraction reduction requirements of Section 503.33(b)(1) (Table 8), and the Class A pathogen limits of Section 503.32(a)(5) (Tables 9 and 10). Enteric viruses and helminth ova were analyzed before biosolids were dried (Table 9). The fecal coliform analysis was performed after the biosolids were dried and prior to utilization on urban land (Table 10). Management practices complied with Section 503.14 as previously described in a letter to the USEPA dated January 28, 1994 (Appendix I). In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

Composted Exceptional Quality Biosolids. During 2016, semi-dried biosolids generated at the Calumet and Stickney WRPs were composted with woodchips and cured at the Calumet East Solids Management Area (CALSMA). Since this material was still in the curing stage at the end of 2016, no Calumet composted biosolids were applied to urban land in 2016. However, the material will be distributed during 2017. The fecal coliform analysis was performed after the composted EQ biosolids were cured and prepared for later utilization on urban land (Table 11). Class A pathogen reduction was achieved using the open windrow composting process through which all the requirements of Section 503.32(a)(7) were met. The temperature of the compost piles was maintained at $\geq 55^{o}$C for at least 15 days and the piles were

turned five times during this period (Table 12). Vector attraction reduction was achieved through the same open windrow composting process and met the requirements of Section 503.33(b)(5) by fulfilling the temperature and time requirements ($\geq 45^{0}$C for at least 14 days) in the open windrows (Table 12).

The composted EQ biosolids generated at the Calumet WRP in 2016 will be applied to urban land through the District's Controlled Solids Distribution Program in 2017. Provided all composting requirements of Sections 503.32(a)(7) and 503.33(b)(5) are met, no additional monitoring is required.

TABLE 5: CONCENTRATIONS OF NITROGEN AND METALS IN SEMI-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
03/30/16	24,585	2,655	7	2	343	0.80	4	23	81	<5	977
03/30/16	24,583	1,857	7	2	328	0.55	3	22	75	<5	936
05/03/16	29,641	1,897	8	2	411	1.05	11	29	85	<5	1,256
05/03/16	27,268	3,632	9	2	371	0.75	6	27	89	<5	1,098
05/12/16	25,747	2,003	8	2	389	0.60	6	27	93	<5	1,152
06/15/16	25,588	2,559	7	2	371	0.75	7	27	89	<5	1,075
06/15/16	26,330	2,974	6	2	380	0.83	10	28	83	<5	1,070
06/22/16	23,872	1,836	7	2	404	0.67	6	28	93	<5	1,202
06/28/16	25,257	2,358	10	2	382	1.2	9	30	90	<5	1,180
06/29/16	21,158	5,621	7	2	386	0.83	11	28	74	<5	1,129
07/06/16	24,531	2,639	9	2	377	0.90	9	29	82	<5	1,155
07/19/16	26,147	3,596	13	3	338	0.79	11	24	78	<5	970
07/29/16	23,099	2,734	9	2	438	0.67	9	30	85	<5	1,308
08/03/16	20,966	4,633	9	2	370	0.77	8	28	87	<5	1,142
08/11/16	24,120	588[2]	10	3	441	0.92	9	29	86	<5	1,251
08/18/16	20,588	187[2]	9	2	433	0.85	10	30	89	<5	1,256
08/24/16	14,522	176[2]	8	2	408	0.83	9	29	83	<5	1,198
09/26/16	34,538	2,198	9	3	396	0.98	8	31	77	<5	1,097
10/06/16	10,248	1,862	11	3	368	0.73	9	30	87	<5	977
11/02/16	18,943	4,234	10	3	378	0.71	8	30	87	<5	1,218
11/30/16	25,670	5,007	8	3	407	0.57	11	31	78	<5	1,232

TABLE 5 (Continued): CONCENTRATIONS OF NITROGEN AND METALS IN SEMI-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
Minimum	10,248	176	6	2	328	0.55	3	22	74	<5	936
Mean[1]	23,686	2,631	9	2	387	0.80	8	28	84	<5	1,137
Maximum	34,538	5,621	13	3	441	1.2	11	31	93	<5	1,308
503 Limit	NL[3]	NL	41	39	1,500	17	75	420	300	100	2,800

[1]In calculating each mean, any value less than the reporting limit was considered the reporting limit.
[2]Low NH_3-N concentrations due to use of failed composted biosolids on farmland.
[3]No Limit.

TABLE 6: DIGESTER[1] TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2016

Month	Average Temperature	Average Detention Time	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32(b)(3)[2]
	---- °F ----	----- days -----		----- days -----
January	97.9	78.8	yes	15.0
February	97.8	61.0	yes	15.0
March	97.3	36.3	yes	15.0
April	97.5	32.3	yes	15.0
May	97.8	51.7	yes	15.0
June	97.4	48.7	yes	15.0
July	97.7	65.7	yes	15.0
August	97.7	54.8	yes	15.0
September	97.7	68.6	yes	15.0
October	97.6	69.9	yes	15.0
November	97.6	78.3	yes	15.0
December	97.5	53.5	yes	15.0

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

TABLE 7: SITES THAT UTILIZED CALUMET WATER RECLAMATION PLANT AIR-DRIED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2016

User	Use/Location
A. B. Sanchez Landscaping, Arlington Heights	Landscaping
Bolingbrook Park District, Bolingbrook	Athletic fields - 4 parks[1]
Chicago Park District, Chicago	Athletic fields - 14 parks[2]
Cinder Ridge Golf Course, Wilmington	Golf Course
Crete Monee High School, Crete	Athletic fields
De La Salle High School, Chicago	Athletic fields
Dolton Park District, Dolton	Athletic fields - Dolton Park
Evanston High School, Evanston	Athletic fields
Evergreen Park High School, Evergreen Park	Athletic fields
Frankfort Park District, Frankfort	Athletic fields - 3 parks[3]
Harvey Park District, Harvey	Athletic fields - 4 parks[4]
Highway Department, Orland Park	Landscaping
Land and Lakes Inc., Romeoville	Landscaping
MWRD, Calumet	Landscaping
MWRD, Skokie	Landscaping
Midlothian Park District, Midlothian	Athletic fields - Memorial Park
Moody Bible Institute, Chicago	Athletic fields - Soccer Field
Oak Lawn Spartan Athletic Complex, Oak Lawn	Athletic fields - Baseball fields
Olympia Fields Park District, Olympia Fields	Athletic fields - Sergeant Means Park
Village of Lincolnwood, Lincolnwood	Athletic fields - Proesel Park
Reavis High School, Burbank	Athletic fields
Reavis High school, Burbank	Athletic fields
St Ignatius High School, Chicago	Athletic fields
Stanley Palarz, Lockport	Landscaping
Thornton Reservoir, Thornton	Landscaping
Tinley Park Park District, Tinley Park	Athletic fields - 3 parks[5]
Troy Middle School, Plainfield	Athletic fields
Village of Orland Park, Orland Park	Athletic fields - Freedom Park
Wilmette Golf Course, Lemont	Golf Course

[1]Central Park, Lily Cache Park, Indian Chase Meadow, and Indian Boundary Park.
[2]Oriole, Athletic Field, Douglass, Horner, Kelvyn, Northerly Island, Norwood, Riis, Rogers, Touchy, Warren, Washington, Welles, and Winnemac Parks.
[3]Commissioners, Jackson Creek, and Michele Bingham Parks.
[4]Lexington, Martin L. King Jr., Medgar Evers, and Taft Parks.
[5]Community, Dog, and Centennial Parks.

TABLE 8: CONCENTRATIONS OF NITROGEN AND METALS AND VOLATILE SOLIDS REDUCTION IN AIR-DRIED BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2016

Sample Date	TKN	NH_3-N	TVS[1]	TVS[2] Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg		%		mg/dry kg								
06/01/16	23,475	2,139	32.4	84.6	7	2	362	0.79	7	27	89	<5	1,116
06/08/16	24,993	2,620	39.3	79.3	5	2	355	0.59	7	26	85	<5	1,090
07/06/16	23,025	2,458	38.7	79.7	8	2	393	1.1	8	29	91	<5	1,188
07/13/16	22,948	3,050	33.2	84.0	8	2	384	0.86	7	27	87	<5	1,121
07/13/16	23,708	3,052	41.8	76.9	8	2	399	1.0	9	29	88	<5	1,174
07/20/16	18,299	1,433	31.1	85.5	7	3	269	0.68	8	29	76	<5	817
07/20/16	22,979	1,449	41.8	77.0	8	2	402	0.92	8	29	84	<5	1,216
07/29/16	14,800	969	25.8	88.8	8	4	273	0.65	6	30	79	<5	847
09/22/16	10,923	100	41.9	49.8	7	2	303	1.2	4	21	65	<5	921
09/22/16	14,393	78	44.3	60.6	7	3	449	1.1	9	32	92	<5	1,390
09/22/16	16,141	34	38.4	58.7	9	3	389	0.89	5	32	93	<5	1,137
09/29/16	14,390	44	39.6	31.1	8	3	382	0.67	10	28	87	<5	1,062
11/09/16	21,627	1,010	36.6	63.5	7	3	356	0.85	7	30	84	<5	1,174
11/16/16	14,306	1,050	37.6	62.0	9	3	384	0.35	9	30	89	<5	1,300
11/30/16	26,290	3,203	44.6	49.2	8	3	411	0.69	11	31	90	<5	1,237
Minimum	10,923	34	25.8	49.2	5	2	269	0.35	4	21	65	<5	817
Mean[3]	19,482	1,513	37.8	70.3	8	3	367	0.81	8	29	85	<5	1,119
Maximum	26,290	3,203	44.6	88.8	9	4	449	1.2	11	32	93	<5	1,390
503 Limit	NL[4]	NL	NL	38.0	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids.
[2]Total volatile solids for digester feed during 2014 were used to calculate TVS reductions because the biosolids used to produce air-dried biosolids were stored in lagoons during that year.
[3]In calculating each mean, any value less than the reporting limit was considered the reporting limit.
[4]No limit.

TABLE 9: MICROBIOLOGICAL ANALYSIS OF BIOSOLIDS[1] GENERATED BY NON-COMPLIANT PROCESS TO FURTHER REDUCE PATHOGENS-EQUIVALENT CODIFIED PROCESSING TRAINS AT THE CALUMET WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2016

Sample Date[2]	Total Solids	Fecal Coliform	Sample Date[3]	Helminth Ova	Enteric Virus
	---- % ----	----- MPN[4]/g -----		--- No./4g ---	--- PFU[5]/4g ---
10/01/15	66.6	150	08/25/15	<0.0800	<0.8000
10/01/15	62.5	180	10/01/15	0.0800	<0.8000
05/17/16	78.0	170	12/01/15	<0.0800	<0.8000
07/21/16	68.5	6	03/15/16	<0.0800	<0.8000
5/24/16	79.9	36	04/12/16	<0.0800	<0.8000
07/26/16	78.8	44	06/08/16	<0.0800	<0.8000

[1]All biosolids satisfied Part 503 Class A requirements.
[2]Sample dates apply to FC samples only.
[3]Non-PFRP biosolids sampled before the material was dried and subsequently used in 2016.
[4]Most probable number.
[5]Plaque-forming unit.
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TABLE 10: MICROBIOLOGICAL ANALYSIS OF CLASS A BIOSOLIDS GENERATED AT THE CALUMET WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2016

Sample Date	Lagoon	Total Solids	Fecal Coliform
		---- % ----	----- MPN[1]/g -----
04/27/16	18	65.4	44
04/27/16	18	65.6	58
05/03/16	19	76.1	380
05/03/16	19	64.9	100
05/17/16	18	67.2	870
05/17/16	19	78.0	170
05/24/16	18	79.9	36
05/25/16	18	84.0	60
06/01/16	18	58.1	200
06/01/16	18	51.4	87
06/08/16	18	71.4	230
06/16/16	18	78.9	360
06/16/16	18	78.0	37
07/07/16	18	82.6	9
07/07/16	6	81.7	610
07/21/16	18	68.5	6
07/21/16	18	68.5	100
07/26/16	18	69.1	110
07/26/16	18	70.3	54
07/26/16	18	60.0	19
07/26/16	6	78.8	44
07/27/16	6	66.6	57
09/13/16	19	69.2	73
09/13/16	18	71.7	95
09/20/16	19	80.2	360
09/22/16	19	64.9	15
10/20/16	18	70.8	140
10/25/16	19	64.4	150
10/25/16	14	83.3	60

[1]Most probable number.

TABLE 11: MICROBIOLOGICAL ANALYSIS OF CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS[1] PROCESSED AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2016 AND STORED FOR UTILIZATION ON URBAN LAND IN 2017

Sample Date	Total Solids	Fecal Coliform
	---------- %----------	---------- MPN[2]/g ----------
11/17/16	44.6	7

[1]Stickney WRP centrifuge cake utilized in the composting process.
[2]Most probable number.

TABLE 12: SUMMARY OF DAILY TEMPERATURE READINGS AND TURNING OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED BIOSOLIDS AT THE CALUMET EAST SOLIDS MANAGEMENT AREA IN 2016

Pile ID[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature ^{0}C (range)
		1st	2nd	3rd	4th	5th	
16-03	06/11 - 07/22	6/27	7/01	7/05	7/11	7/18	55 – 74
16-04	06/12 - 07/06	6/16	6/22	6/27	7/01	7/06	58 – 72
16-05	06/13 - 07/11	6/17	6/23	6/28	7/05	7/11	58 – 73
16-07	08/05 - 09/02	8/09	8/13	8/18	8/23	8/29	57 – 69
16-08	08/08 - 09/04	8/12	8/16	8/20	8/25	9/01	58 – 73
16-09	08/06 - 09/04	8/11	8/16	8/20	8/25	9/01	61 – 73
16-10	08/08 - 09/04	8/12	8/16	8/20	8/25	9/01	55 – 71
16-11	09/06 - 10/19	9/12	9/19	9/23	9/29	10/15	56 – 67
16-12	08/09 - 09/09	8/13	8/18	8/23	8/29	9/03	55 – 71
16-14	09/06 - 10/09	9/14	9/19	9/23	9/29	10/05	55 – 72
16-15	09/06 - 10/03	9/06	9/12	9/19	9/23	9/29	56 – 73
16-16	08/20 - 09/23	8/25	9/01	9/08	9/14	9/19	55 – 70

[1]All piles reported are certified to fulfill the temperature and turning requirements (minimum of 55°C for 15 consecutive days and turned a minimum of five times during the composting period).
[2]Windrow turning date expressed as month/day in 2016.

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 PFRP according to Section 503.32(a)(8). The PFRP equivalency commenced on August 1, 2002 (Appendix II). The current renewable certification of the PFRP designation is valid from August 1, 2012, through July 31, 2017, and requires analysis of six samples for helminth ova and enteric viruses annually during this period**.**

All of the Calumet WRP EQ biosolids generated or utilized in 2016 were not PFRP-compliant with respect to the minimum required duration of lagoon aging (18 months) due to operational constraints. Therefore, no PFRP-compliant biosolids were available for sampling and analysis. All biosolids utilized as EQ material in 2016 were tested for pathogen compliance according to Section 503.32(a)(5).

STICKNEY WATER RECLAMATION PLANT

Treatment Plant and Biosolids Process Train Description

The Stickney WRP, located in Stickney, Illinois, has a design average flow of 1,200 MGD. The annual average treated flow in 2016 was 680 MGD. Wastewater reclamation processes include primary (Imhoff and primary settling) and secondary (activated sludge process) treatments. All solids produced at this WRP and coming from the O'Brien, Egan, Kirie, and Lemont WRPs are anaerobically digested. Stickney WRP biosolids are then:

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

    a. Application of air-dried Exceptional Quality (EQ) biosolids to urban land under the District's Controlled Solids Distribution Program.

    b. Use as air-dried biosolids at local municipal solid waste landfills as final landfill cover.

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

3. Dewatered by centrifuging to approximately 25 percent solids content, transported to paved cells, and air-dried prior to use as daily landfill cover.

4. Dewatered by centrifuging to approximately 25 percent solids content and conveyed to Metropolitan Biosolids Management, LLC, for further processing under Contract 98-RFP-10.

5. Dewatered by centrifuging to approximately 25 percent solids content and transported to Harlem Avenue Solids Management Area (HASMA) for co-composting with woodchips and yardwaste prior to application as a soil amendment to urban land to produce EQ biosolids compost under the District's Controlled Solids Distribution Program.

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

    a. Application to urban land under the District's Controlled Solids Distribution Program.

    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.

Biosolids that are unsuitable for beneficial reuse are co-disposed in local municipal solid waste landfills.

In 2016, the Stickney WRP produced a total of 120,279 DT of biosolids (Table 1). This total includes biosolids generated by processing sludge originating at the Stickney WRP as well as the sludge imported from the O'Brien, Egan, Kirie, and Lemont WRPs for further processing. The quantity of biosolids used and disposed of (75,538 DT) was lower than the total 2016 production (120,279 DT) for the Stickney WRP. Hence, 44,741 DT were stored in lagoons and/or on drying cells for further processing or later use.

Summary of Biosolids Use and Disposal at Landfills

In 2016, a total of 581 DT of biosolids, generated at the Stickney WRP and including 70 DT unsuitable solids generated by digester cleaning and trucked from the Egan WRP to LASMA, were co-disposed with municipal solid wastes at the Laraway Landfill, Joliet, Illinois. A total of 30 DT of biosolids was also used as final cover.

Application of Class B Biosolids to Farmland

In 2016, a total of 37,784 DT of centrifuge cake and semi-dried biosolids generated at the Stickney WRP was applied to agricultural land under IEPA Permit No. 2014-SC-58425. This total includes 5.2 DT applied to research plots at the Fulton County site. Application to agricultural land was done through contracts with Synagro Midwest, Inc. (Contract No. 14-692-12) and Stewart Environmental, Inc. (Contract No. 14-690-11). During 2016, a minimal amount of centrifuge cake biosolids was shipped from the Egan WRP to the Lawndale Avenue Solids Management Area for further processing and drying. In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is 12 times per year.

All Stickney WRP centrifuge cake and semi-dried biosolids land applied in 2016 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 13), the vector attraction reduction requirements of Section 503.33(b)(10) (by incorporation in soil within six hours after application), and the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 14). The biosolids nitrogen concentrations (Table 13) were used to compute the agronomic rates for farmland application.

Application of Biosolids to Urban Land

In 2016, through the District's Controlled Solids Distribution Program, a total of 6,475 DT of Stickney WRP air-dried (4,709 DT) and composted EQ (1,766 DT) biosolids was applied under IEPA Permit Nos. 2010-SC-0200 and 2015-SC-59620 to urban land for the construction and maintenance of golf courses, recreation fields, and parks. An amount of 1,287 DT of partially composted biosolids was applied to District property as Class B biosolids for construction and landscaping. This site met the low public access requirement. The sites and method of utilization of these biosolids under the program are listed in Table 15.

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 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
03/29/16	28,188	6,329	7	5	412	0.32	12	41	107	<5	874
03/29/16	46,350	9,200	5	5	452	0.40	20	42	85	<5	790
03/29/16	37,926	9,196	9	4	399	0.66	12	41	107	<5	861
04/25/16	29,011	6,247	6	4	450	0.74	12	43	116	<5	948
04/25/16	30,650	5,491	6	4	425	1.1	12	42	107	<5	906
04/26/16	28,126	6,660	7	4	427	0.76	12	42	113	<5	900
04/26/16	49,818	12,286	<5	4	456	0.63	21	42	86	<5	795
05/19/16	57,499	6,150	8	5	427	0.77	12	43	114	<5	955
05/19/16	46,997	14,350	5	4	424	0.74	22	42	84	<5	782
05/20/16	29,729	5,918	7	7	451	0.72	12	46	93	<5	905
05/20/16	27,591	5,422	5	7	450	0.77	11	44	91	<5	839
06/06/16	43,812	13,012	<5	4	394	0.67	16	41	96	<5	739
06/08/16	33,133	6,910	7	4	419	0.83	13	42	109	<5	890
06/08/16	37,054	5,338	<5	7	467	0.71	12	46	92	<5	881
06/16/16	42,333	15,037	<5	4	414	0.78	16	44	87	<5	793
07/11/16	27,248	5,949	8	5	437	0.87	13	46	121	<5	969
07/29/16	57,016	20,226	6	4	408	0.92	9	38	76	<5	715
07/29/16	30,398	9,159	8	5	448	0.88	10	44	119	<5	920
07/29/16	30,522	6,177	9	5	433	0.94	11	44	116	<5	911
07/29/16	26,572	5,765	8	5	437	1.2	11	44	118	<5	918

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 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
08/01/16	49,591	17,241	5	4	420	0.81	11	38	78	<5	729
08/08/16	49,738	16,072	5	4	396	0.79	10	37	74	<5	684
08/17/16	39,243	13,060	6	4	421	0.99	9	39	99	<5	789
08/22/16	38,431	11,429	5	3	425	0.44	11	42	105	<5	848
08/30/16	30,140	5,221	6	5	414	0.99	12	44	102	<5	881
09/20/16	26,316	4,582	6	6	448	0.85	12	46	109	<5	949
09/20/16	38,228	10,271	<5	4	430	0.73	12	43	88	<5	816
09/22/16	24,323	4,816	8	6	438	0.54	12	45	102	<5	918
09/23/16	46,607	12,662	5	4	442	0.73	14	43	87	<5	807
10/12/16	31,548	6,918	7	5	427	0.76	12	43	93	<5	815
10/20/16	28,875	4,352	8	6	426	1.0	9	43	106	<5	920
10/25/16	39,265	11,965	6	4	416	0.72	10	46	116	<5	883
11/01/16	38,791	11,722	6	4	418	0.78	10	46	121	<5	809
11/09/16	39,080	11,056	6	4	390	0.88	10	44	109	<5	834
11/11/16	46,986	9,245	5	3	410	0.85	12	42	94	<5	834
11/14/16	45,013	8,944	5	3	414	0.77	12	43	91	<5	850
11/14/16	16,740	1,005	8	6	463	0.80	11	47	127	<5	1,013
11/15/16	42,337	12,485	6	4	424	0.72	10	47	123	<5	905
11/15/16	41,274	10,220	5	4	417	1.1	12	42	95	<5	857
11/16/16	40,070	11,814	6	4	424	0.71	10	42	111	<5	854
11/23/16	40,843	12,917	6	3	373	0.80	10	40	105	<5	774

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 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
Minimum	16,740	1,005	<5	3	373	0.32	9	37	74	<5	684
Mean[1]	37,400	9,337	6	5	426	0.78	12	43	102	<5	855
Maximum	57,499	20,226	9	7	467	1.2	22	47	127	<5	1,013
503 Limit	NL[2]	NL	41	39	1,500	17	75	420	300	100	2,800

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

TABLE 14: DIGESTER TEMPERATURES AND DETENTION TIMES DURING PROCESSING OF BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO FARMLAND IN 2016

Month	Average Temperature	Average Retention Time	Meets Part 503 Class B Requirements	Minimum Detention Time Required by 503.32(b)(3)[1]
	---- °F ----	--- days ---		--- days ---
January	97.5	19.9	yes	15.0
February	97.2	20.0	yes	15.0
March	98.7	20.6	yes	15.0
April	97.4	23.3	yes	15.0
May	97.8	23.6	yes	15.0
June	98.0	21.2	yes	15.0
July	97.8	22.6	yes	15.0
August	97.7	24.1	yes	15.0
September	98.1	27.1	yes	15.0
October	97.6	25.4	yes	15.0
November	98.1	23.0	yes	15.0
December	97.4	22.9	yes	15.0

[1]For anaerobic digestion at average temperature achieved.

TABLE 15: SITES THAT UTILIZED STICKNEY WATER RECLAMATION AIR-DRIED AND COMPOSTED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2016

User	Use/Location
Composted Biosolids	
A Block Ltd, Lemont	Landscaping
Beary Landscaping, Lockport	Landscaping
Bienia Janus, Lemont	Landscaping
Chicago Urban Farm, Chicago	Gardens
Clemens Gizynski, Chicago	Gardens
Cog Hill Golf Course and Country Club, Lemont	Trees and landscaping
Coyote Run Golf Course, Flossmoor	Trees and landscaping
Devotional Associates of Yogeshwar Church, Streamwood	Gardens
Frank Ratulowski, Homer Glen	Trees and landscaping
Glen Eagle Country Club, Lemont	Trees and landscaping
Harvey Park Districts, Harvey	Trees and landscaping
Helen Lekavich, Midlothian	Gardens
Hinsdale Fil-Am Church, Hinsdale	Gardens
Jerry Gould, Riverside	Landscaping
Joe Miller, Justice	Landscaping
JTP Lawn Service, Crete	Landscaping
Julian Plumber, Blue Island	Landscaping
Lake Street Supply, Chicago	Landscaping
Land Works Ltd, Bolingbrook	Landscaping
Luke Loboz, Homer Glen	Trees and landscaping
Mark Kobilca, Lemont	Trees and landscaping
Matt Larson, La Grange	Gardens
MWRD, Hanover Park	Trees and landscaping
MWRD, Willow Springs	Trees and landscaping
MWRD, Cicero	Trees and landscaping
Nava R Rijal, La Grange Highlands	Gardens
Nick Gabb, Frankfort	Gardens
Noel Paradela, Broadview	Gardens
Northeastern University, Chicago	Trees and landscaping
Oak Forest Park District, Oak Forest	Trees and landscaping
Richton Park District, Richton Park	Trees and landscaping

TABLE 15 (Continued): SITES THAT UTILIZED STICKNEY WATER RECLAMATION PLANT AIR-DRIED AND COMPOSTED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2016

User	Use Location
Composted Biosolids (cont'd.)	
Shodhan Patel, Streamwood	Gardens
Stanley Janik, Lockport	Trees and landscaping
State Tree Nursery, Topeka	Trees and Garden
The Pullman State Historic Site, Chicago	Trees and landscaping
Thornton Reservoir, Thornton	Trees and landscaping
Tinley Park Park District, Tinley Park	Trees and landscaping
Twin Oaks Landscaping Co, Oswego	Trees and landscaping
UPS, Hodgkins	Trees and landscaping
Village of Hanover Park , Hanover Park	Trees and landscaping
Village of Midlothian, Midlothian	Trees and landscaping
Village of Oak Lawn, Oak Lawn	Trees and landscaping
Village of Park Forest, Park Forest	Trees and landscaping
Air-dried Biosolids	
Bolingbrook Park District, Bolingbrook	Athletic fields - Indian Boundary Park
Brooks Elementary School, Harvey	Athletic fields
Chicago Park District, Chicago	Athletic fields - 8 parks[1]
Chicago Urban Farm, 2619 E. 76th Street, Chicago, IL 60649	Garden
Dolton Park District, Dolton	Athletic fields - Dolton Park
East Leyden High School, Franklin Park	Athletic fields
Evanston High School, Evanston	Athletic fields
Fairgrounds Golf Courses, Vernon Hills	Golf Course
Jim and Becky Mansell, Peotone	Garden and hay
Julian Plumber, Blue Island	Landscaping
Kinga Stanek, Orland Park	Landscaping
Luke Loboz, Homer Glen	Landscaping
MWRD, Cicero	Landscaping
MWRD, Skokie	Landscaping
Mid-Iron Golf Club, Lemont	Golf Course
Oak Lawn Park District, Oak Lawn	Athletic fields - 3 parks[2]
Otis P. Graves Elementary School, Summit	Athletic fields

TABLE 15 (continued): SITES THAT UTILIZED STICKNEY WATER RECLAMATION PLANT AIR-DRIED AND COMPOSTED BIOSOLIDS UNDER THE CONTROLLED SOLIDS DISTRIBUTION PROGRAM IN 2016

User	Use Location
Air-dried Biosolids (cont'd.)	
Republic Service, Chicago	Landscaping - 3 sites[3]
Richard G. Vega, Yorkville	Landscaping
St. Ignatius High School, Chicago,	Athletic fields
Stanley Janik, Lockport	Landscaping
Stanley Palarz, Lemont	Landscaping
Troy Middle School, Plainfield	Athletic fields
Village Greens Golf Course, Oak Lawn	Athletic fields
Village of Franklin Park, Franklin Park	Athletic fields - Franklin Park
Village of Lyons, Lyons	Athletic fields

[1]Addams/Medill, Garfield, Harrison, Humboldt, Marquette, McKinley, Smith, Union.
[2]Central, Keeler, Worthbrook.
[3]Dixon, Pontiac, Streator.

Air-dried Exceptional Quality Biosolids. In 2016, a total of 4,709 DT of Stickney WRP air-dried EQ biosolids was applied to urban land. All Stickney air-dried biosolids applied to urban land in 2016 met the pollutant concentration limits in Table 3 of Section 503.13 (Table 16) and the vector attraction reduction requirements of Section 503.33(b)(1) (Table 16). All of the air-dried, EQ biosolids met the Class A pathogen limits of Section 503.32(a)(5) (Tables 17 and 18). The remaining air-dried Class B biosolids (1,287 DT) met the anaerobic digestion time and temperature requirements of the Class B pathogen standard of Section 503.32(b)(3) (Table 14). These Class B biosolids were applied for landscaping purposes to the District's property with limited public access. The vector attraction reduction requirement was met by incorporation of the applied biosolids into the soil, as per Section 503.32(b)(10). These limited public-access sites are fenced and therefore met the public access requirements of Section 503.32(b). Management practices complied with Section 503.14, as previously described in a letter to the USEPA dated January 28, 1994 (Appendix I). In accordance with Table 1 of Section 503.16, the frequency of monitoring for these biosolids is six times per year.

Composted Exceptional Quality Biosolids. During the year, centrifuge cake biosolids generated at the Stickney WRP were composted with woodchips and cured at the Harlem Avenue Solids Management Area. The cured composted EQ biosolids were tested for chemical constituents and fecal coliform prior to utilization on urban land in 2016, and to validate the composting process. This material met the pollutant concentration limits in Table 3 of Section 503.13 (Table 19) and fecal coliform requirements for EQ biosolids (Table 20). Class A pathogen reduction was achieved using the open windrow composting process through which all the requirements of were met. The temperature of the compost piles was maintained at $\geq 55^{o}$C for at least 15 days and the piles were turned five times during this period (Table 21). Vector attraction reduction was achieved through the same open windrow composting process and met the requirements of Section 503.33(b)(5), by fulfilling the temperature and time requirements ($\geq 45^{0}$C for at least 14 days) in the open windrows (Table 21).

In 2016, a total of 1,766 DT of composted EQ biosolids generated at the Stickney WRP was applied to urban land through the District's Controlled Solids Distribution Program. Provided all composting requirements of Sections 503.32(a)(7) and 503.33(b)(5) are met, no additional monitoring is required.

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 URBAN LAND IN 2016

Sample Date	TKN	NH_3-N	TVS[1]	TVS[2] Reduction	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	------ mg/dry kg ------		---------- % ---------		----------mg/dry kg ----------								
05/24/16	23,061	2,825	38.1	59.3	6	5	425	0.74	12	41	114	<5	899
05/24/16	27,616	4,082	42.9	54.2	5	8	478	0.65	12	49	99	<5	940
06/08/16	24,626	6,209	41.4	57.0	<5	8	508	0.72	13	51	104	<5	992
06/13/16	21,834	2,630	41.9	56.1	7	8	502	0.66	12	54	104	<5	1,029
06/20/16	55,447	3,161	41.6	56.6	6	8	496	0.76	13	51	99	<5	996
06/27/16	27,642	3,913	42.7	54.7	6	8	482	0.80	13	51	101	<5	973
08/10/16	20,573	1,293	39.2	57.5	8	5	443	0.93	11	45	116	<5	950
09/07/16	18,669	820	36.1	62.7	8	5	450	1.1	11	45	118	<5	932
09/12/16	17,345	130	37.0	61.3	8	5	441	0.94	12	46	120	<5	972
09/20/16	17,773	63	36.3	62.4	9	6	461	0.82	12	48	122	<5	992
09/27/16	17,481	87	37.0	61.3	7	5	465	0.94	14	46	121	<5	993
10/05/16	22,842	1,849	36.6	61.9	9	5	456	0.85	13	47	121	<5	1,000
10/11/16	20,167	1,494	37.8	60.0	8	5	454	0.87	14	47	120	<5	1,003
10/25/16	20,942	1,356	36.7	61.7	8	5	445	1.0	12	46	121	<5	984
11/22/16	18,964	872	37.0	61.3	7	5	469	0.88	13	51	128	<5	1,037
Minimum	17,345	63	36.1	54.2	5	5	425	0.65	11	41	99	<5	899
Mean[3]	23,665	2,052	38.8	59.2	7	6	465	0.84	12	48	114	<5	979
Maximum	55,447	6,209	42.9	62.7	9	8	508	1.1	14	54	128	<5	1,037
503 Limit	NL[4]	NL	NL	38.0	41	39	1,500	17	75	420	300	100	2,800

[1]Total volatile solids.
[2]Total volatile solids for digester feed during 2013 - 2014 were used to calculate TVS reductions because the biosolids used to produce air-dried biosolids were stored in lagoons during those years.
[3]In calculating each mean, any value less than the reporting limit was considered the reporting limit.[4]No limit.

TABLE 17: MICROBIOLOGICAL ANALYSIS OF BIOSOLIDS[1] GENERATED BY NON-COMPLIANT PROCESS TO FURTHER REDUCE PATHOGENS-EQUIVALENT CODIFIED PROCESSING TRAINS AT THE STICKNEY WATER RECLAMATION PLANT AND APPLIED TO URBAN LAND IN 2016

Sample Date[2]	Total Solids	Fecal Coliform	Sample Date[3]	Helminth Ova	Enteric Virus
	--- % ---	---- MPN[4]/g -----		--- No./4g ---	--- PFU[5]/4g ---
09/28/15	64.0	78	08/17/15	<0.0800	<0.8000
09/28/15	64.0	78	10/20/15	<0.0800	<0.8000
05/03/16	46.1	62	12/01/15	<0.0133[6]	<0.8000
05/18/16	77.0	370	03/15/16	<0.0800	<0.8000
08/10/16	80.6	8	04/12/16	<0.0800	<0.8000
10/20/16	63.6	120	08/30/16	<0.0800	<0.8000

[1]All biosolids satisfied Part 503 Class A requirements.
[2]Sample dates apply to FC samples only.
[3]Non-PFRP biosolids sampled before the material was dried and subsequently used in 2016.
[4]Most probable number.
[5]Plaque-forming unit.
[6]Sample weight = 300 g; for all others, sample weight = 50 g.

TABLE 18 MICROBIOLOGICAL ANALYSIS OF CLASS A BIOSOLIDS GENERATED AT THE STICKNEY WATER RECLAMATION PLANT AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2016

Sample Date	Lagoon	Total Solids	Fecal Coliform
		-------- % -------	--------- MPN[1]/g -----
05/03/16	24	46.1	62
05/18/16	30	77.0	370
06/07/16	30	84.0	34
07/13/16	24	60.5	160
08/10/16	24	80.6	8
09/08/16	24	70.8	30
09/28/16	24	71.0	4
10/20/16	24	63.6	120
11/17/16	24	66.7	15

[1]Most probable number.

TABLE 19: CONCENTRATIONS OF NITROGEN AND METALS IN CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS[1] PROCESSED AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA AND APPLIED TO URBAN LAND IN 2016

Sample Date	TKN	NH_3-N	As	Cd	Cu	Hg	Mo	Ni	Pb	Se	Zn
	mg/dry kg										
05/05/16	17,546	225	<5	2	477	0.67	5	44	50	<5	678
05/18/16	19,536	219	<5	1	466	0.59	5	41	47	<5	612
06/08/16	14,636	<0.1	5	2	246	<0.25	4	23	40	<5	326
08/23/16	20,232	467	<5	2	459	0.32	5	21	44	<5	341
09/07/16	17,128	72	<5	2	246	0.36	5	21	43	<5	333
09/13/16	13,333	28	<5	2	518	0.38	5	22	47	<5	368
09/20/16	19,282	96	<5	2	506	0.26	3	21	53	<5	404
09/27/16	19,519	51	<5	2	475	<0.25	4	20	51	<5	359
10/05/16	17,133	25	<5	2	494	0.25	4	19	51	<5	342
10/11/16	17,853	96	<5	2	357	0.39	3	25	59	<5	429
10/20/16	16,384	40	<5	2	469	0.35	4	22	55	<5	377
10/24/16	15,389	<0.1	<5	2	476	<0.25	2	23	55	<5	399
11/10/16	15,509	12	<5	2	505	0.38	2	22	57	<5	356
11/16/16	13,613	24	<5	2	501	<0.25	5	17	40	<5	281
11/22/16	14,985	57	<5	2	576	<0.25	3	21	54	<5	329
Minimum	13,333	12	<5	1	165	<0.25	2	17	40	<5	281
Mean[1]	16,805	109	<5	2	221	0.35	4	24	50	<5	396
Maximum	20,232	465	<5	2	413	0.67	5	44	59	<5	678
503 Limit	NL[2]	NL	41	39	1,500	17	75	420	300	100	2,800

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

TABLE 20: MICROBIOLOGICAL ANALYSIS OF CURED COMPOSTED EXCEPTIONAL QUALITY BIOSOLIDS[1] PROCESSED AT THE HARLEM AVENUE SOLIDS MANGEMENT AREA AND TESTED PRIOR TO UTILIZATION ON URBAN LAND IN 2016

Sample Date	Total Solids	Fecal Coliform
	-------- % -------	--------- MPN[2]/g -----
11/16/16	51.7	6
11/16/16	47.3	6
12/14/16	50.4	580
12/14/16	46.9	11

[1]Stickney WRP centrifuge cake utilized in the composting process.
[2]Most probable number.

TABLE 21: SUMMARY OF DAILY TEMPERATURE READINGS AND TURNING OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED BIOSOLIDS AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2016

Pile ID[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature ^{0}C (range)
		1st	2nd	3rd	4th	5th	
16-01	02/23 - 03/14	2/26	2/29	3/3	3/7	3/10	55 - 67
16-03	04/11 - 05/09	4/16	4/21	4/25	4/29	5/3	55 -71
16-04	03/31 - 04/26	4/8	4/11	4/14	4/18	4/22	59 -71
16-05	04/08 - 05/06	4/12	4/16	4/21	4/26	4/30	57 -78
16-06	04/07 - 04/30	4/11	4/14	4/18	4/22	4/26	55 -74
16-07	04/26 - 05/23	4/30	5/5	5/9	5/13	5/19	58 -73
16-08	04/27 - 05/23	4/30	5/5	5/9	5/13	5/19	61 -70
16-09	04/26 - 05/23	4/30	5/5	5/9	5/13	5/19	56 -73
16-10	04/27 - 05/24	5/2	5/6	5/10	5/16	5/20	57 -68
16-11	05/05 - 06/03	5/9	5/13	5/19	5/23	5/27	60 -75
16-12	05/20 - 06/30	5/31	6/6	6/10	6/15	6/20	55 -73
16-13	05/24 - 06/30	5/31	6/6	6/10	6/15	6/20	56 -72
16-14	05/31 - 06/30	6/6	6/10	6/15	6/20	6/27	55 -75
16-15	05/24 - 06/30	6/6	6/10	6/15	6/20	6/27	57 -75
16-16	06/11 - 07/07	6/6	6/10	6/15	6/20	6/29	56 -73
16-17	06/10 - 07/11	6/15	6/20	6/27	7/1	7/7	56 -77
16-18	06/06 - 07/04	6/14	6/18	6/23	6/27	7/1	56 -74
16-19	06/07 - 07/25	7/5	7/9	7/13	7/18	7/22	56 -77
16-20	06/08 - 07/08	6/14	6/18	6/23	6/28	7/5	57 -77
16-21	06/12 - 07/16	6/22	6/28	7/5	7/9	7/13	57 -74
16-22	06/12 - 07/12	6/17	6/22	6/28	7/5	7/9	56 -75
16-23	06/12 - 07/21	6/17	6/28	7/6	7/11	7/18	56 -73
16-24	06/12 - 07/14	6/17	6/22	6/28	7/6	7/11	60 -78
16-25	06/17 - 07/31	7/7	7/11	7/19	7/25	7/28	56 -76
16-26	06/19 - 07/31	7/6	7/14	7/19	7/25	7/28	56 -75
16-27	06/29 - 07/31	7/6	7/14	7/18	7/25	7/28	61 -78
16-28	06/30 - 07/30	7/6	7/14	7/18	7/22	7/27	61 -78
16-29	06/30 - 07/30	7/6	7/14	7/18	7/25	7/27	59 -77
16-30	06/29 - 08/01	7/7	7/12	7/19	7/25	7/29	58 -75
16-31	06/30 - 07/30	7/6	7/12	7/18	7/22	7/27	63 -77
16-32	06/30 - 07/30	7/6	7/12	7/18	7/22	7/27	57 -78
16-33	06/30 - 08/02	7/7	7/11	7/19	7/25	7/29	57 -77
16-34	06/30 - 08/02	7/7	7/11	7/19	7/25	7/29	58 -75
16-35	06/30 - 08/02	7/7	7/11	7/19	7/25	7/29	55 -76
16-36	06/30 - 08/02	7/8	7/13	7/19	7/26	7/29	57 -77
16-37	06/30 - 08/03	7/8	7/13	7/19	7/26	7/30	56 -76
16-38	06/30 - 08/03	7/8	7/13	7/19	7/26	7/30	56 -76
16-39	06/30 - 08/03	7/8	7/13	7/19	7/26	7/30	55 -77
16-40	06/30 - 08/03	7/8	7/13	7/19	7/26	7/30	55 -77
16-41	06/30 - 08/03	7/6	7/12	7/18	7/22	7/30	61 -76
16-42	07/13 - 08/12	7/20	7/26	7/30	8/3	8/8	57 -76
16-43	07/15 - 08/12	7/20	7/26	7/30	8/3	8/8	57 -77
16-44	07/12 - 08/12	7/20	7/26	7/30	8/3	8/8	55 -78

TABLE 21 (Continued): SUMMARY OF DAILY TEMPERATURE READINGS AND TURNING OF OPEN WINDROWS DURING PRODUCTION OF COMPOSTED BIOSOLIDS AT THE HARLEM AVENUE SOLIDS MANAGEMENT AREA IN 2016

Pile ID[1]	Composting Date (Range)[2]	Turning Date[2]					Composting Temperature ^{0}C (range)
		1st	2nd	3rd	4th	5th	
16-45	07/16 - 08/14	7/20	7/27	8/2	8/6	8/10	59 -75
16-46	07/24 - 08/18	7/27	8/1	8/5	8/10	8/15	55 -77
16-47	07/21 - 08/18	7/27	8/1	8/5	8/10	8/15	60 -76
16-48	07/21 - 08/18	7/27	8/1	8/5	8/10	8/15	57 -76
16-49	07/22 - 08/18	7/27	8/1	8/5	8/10	8/15	58 -76
16-50	08/01 - 08/24	8/3	8/8	8/12	8/16	8/20	58 -75
16-51	08/01 - 08/24	8/3	8/8	8/12	8/16	8/20	56 -75
16-52	08/01 - 08/24	8/3	8/8	8/12	8/16	8/20	56 -74
16-53	08/01 - 08/24	8/3	8/8	8/12	8/16	8/20	57 -75
16-54	08/15 - 09/12	8/19	8/23	8/29	9/2	9/9	55 -74
16-55	08/15 - 09/12	8/19	8/23	8/29	9/2	9/6	56 -73
16-56	08/15 - 09/12	8/19	8/23	8/29	9/2	9/6	57 -71
16-57	08/16 - 09/12	8/20	8/25	8/29	9/2	9/6	56 -74
16-58	09/17 -10/14	9/21	9/26	9/30	10/4	10/10	56 -73
16-59	09/17 -10/14	9/21	9/26	9/30	10/4	10/10	56 -74
16-60	09/17 -10/14	9/21	9/26	9/30	10/4	10/10	56 -74
16-61	09/22 -10/18	9/26	9/30	10/4	10/10	10/14	56 -70
16-62	09/22 -10/18	9/26	9/30	10/4	10/10	10/14	55 -73
16-63	09/22 -10/18	9/26	9/30	10/4	10/10	10/14	58 -73
16-64	10/11 - 11/12	10/18	10/24	10/28	11/1	11/8	56 -71
16-65	10/10 - 11/12	10/18	10/24	10/28	11/1	11/8	55 -74
16-66	11/08 - 12/13	11/18	11/23	11/28	12/2	12/6	56 -69
16-67	11/01 - 12/06	11/18	11/23	11/28	12/2	12/6	56 -69
16-68	11/08 - 12/13	11/18	11/23	11/28	12/2	12/6	55 -68

[1]All piles reported are certified to fulfill the temperature and turning requirements (minimum of 55°C for 15 consecutive days and turned a minimum of five times during the composting period).
[2]Windrow turning date expressed as month/day in 2016.

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

Biosolids from the District's Stickney and Calumet WRPs were sent to landfills in 2016 for disposal. All biosolids sent to these landfills are usually analyzed as specified in 40 CFR Part 261 to establish the nonhazardous nature of these biosolids for co-disposal. Analytical results, including toxic characteristic leaching procedure constituents, polychlorinated biphenyls, cyanide, sulfide, and paint filter test, were submitted in 2015 to the landfill company to satisfy the requirements of their IEPA permit. No analyses were performed in 2016 since the analytical data are usually valid for two to three years. The analytical data generated in 2015 are still valid, and they should be updated next year. District sludge has always met the requirements of 40 CFR Parts 258 and 261 and the Illinois nonhazardous waste landfill regulations (Title 35, Subtitle G, Chapter I, Subchapter H, Part 810). In 2016, a total of 855 DT of District biosolids (581 DT from the Stickney WRP and 274 DT from the Calumet WRP) was co-disposed with municipal solid wastes at two non-hazardous waste landfills (Land and Lakes in Dolton and Laraway in Joliet, Illinois).

APPPENDIX I

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

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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

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 Metropolitan 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.

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 substation 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 subsurface 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.

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

APPPENDIX 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.

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

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

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

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

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

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

Sincerely yours,

[signature] for

Jo Lynn Traub
Director, Water Division

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

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

JUL 30 2012

REPLY TO THE ATTENTION OF

WN-16J

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

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

Dear Dr. Granato:

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

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

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

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

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

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

Sincerely,

Tinka G. Hyde
Director, Water Division

cc: Albert Cox, MWRDGC
Al Keller, IEPA

Protecting Our Water Environment

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

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

September 14, 2012

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

Dear Ms. Hyde:

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

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

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

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

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

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

Very truly yours,

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

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

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

JUL 20 2010

REPLY TO THE ATTENTION OF: WN-16J

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

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

Dear Mr. Kollias:

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

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

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

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

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

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

Sincerely,

Tinka G. Hyde
Director, Water Division