"…meeting community needs…enhancing quality of life."

Department of Utilities
Wastewater Treatment Division
2006 East Newberry Street
Appleton, WI 54915-2758

CITY OF APPLETON
WASTEWATER TREATMENT PLANT

AWWTP
Annual Biosolids Management Program Report
2009

- **Biosolids Production**
- **Biosolids Compliance Monitoring**
- **Biosolids Land Application**
- **Complaint Investigation**
- **Site Approvals and Compliance Monitoring**
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January 29, 2010

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2009 ANNUAL BIOSOLIDS MANAGEMENT PROGRAM PERFORMANCE REPORT

Executive Summary

The City of Appleton, Department of Utilities, Wastewater Treatment Division, is committed to a program of beneficial use through land application for the biosolids. The Appleton Wastewater Treatment Plant (AWWTP) Biosolids Management Program adheres to the guidelines and regulations as described in the United States Environmental Protection Agency's Code of Federal Regulations (CFR) 40 part 503 and the State of Wisconsin Department of Natural Resources (WDNR) Administrative Code NR 204.

Biosolids Production

The AWWTP produced 18,883 wet tons of biosolids from January 1, 2009 to December 31, 2009. This period represents 255 days of biosolids production (**See Exhibit 1). Table 1** summarizes five (5) year historical average biosolids production from 2005 to present.

Table 1: Historical Biosolids Production – 2005 to Present

Year	Total Production (wet tons)	Total Operating Days	Average Production (wet tons/day)
2005	27,775	251	110.5
2006	21,547	257	84.0
2007	21,677	255	84.8
2008	19,414	251	76.8
2009	18,883	255	74.0
5 Year Average	**21,859**	**254**	**86.0**

Biosolids Compliance Monitoring

AWWTP staff collected biosolid samples for analysis of fecal coliform, nitrogen, phosphorous, calcium, select metals, solids content, and pH. Select parameters including boron, iron, magnesium, manganese, sodium, and sulfur were analyzed during the year to establish a baseline for other macro and micronutrients in biosolids. The additional information provides important insight into the larger value of nutrients contained in AWWTP biosolids and their ability to deliver these commonly overlooked nutrients to soils that are sometimes deficient. All samples collected were within limits established by Part 503 Federal regulations and/or WDNR NR 204 (**See Exhibit 2)**. The 5-year historical average for primary macronutrients (nitrogen [organic N

and ammonium N], phosphorus, and potassium) in biosolids is summarized in **Table 2** on the following page.

Table 2: Historical Biosolids Macronutrients Composition – 2005 to Present

Year	%TS	TKN (%)	NH-3 (%)	P (%)	K (%)
2005 Average	33.8	1.92	0.21	1.26	0.20
2006 Average	36.3	1.52	0.24	0.94	0.15
2007 Average	36.8	1.47	0.18	1.01	0.10
2008 Average	36.9	1.50	0.27	1.04	0.07
2009 Average	39.0	1.49	0.25	1.05	0.10
5 Year Average	**36.6**	**1.58**	**0.23**	**1.06**	**0.12**

Note: %TS total solids from daily composite test samples.

Vector Attraction Reduction (VAR) – Volatile Solids Reduction (VSR)

Sludge may not be land applied unless one of the eleven (11) vector attraction reduction (VAR) options specified in NR 204.07(7) (a) to (k). The AWWTP utilizes two (2) mesophilic anaerobic digesters (AD) to satisfy the 38% minimum volatile solids requirement specified within NR 204.07(7) (a). The AWWTP also incorporates biosolids following land application as a best management practice which satisfies NR 204.07(7)(k).

Historically, AWWTP mesophilic AD has satisfied the 38% VSR requirement. However, in 2009 VSR was observed to be less than 38% during the months of May, June, October, November, and December. The decreases in VSR are believed to be associated with one or a combination of factors that include declines in total volatile solids contributions and changes made to the receiving station hauled waste program.

Biosolids Land Application

A total of 20,509 wet tons of biosolids were land applied to 806 acres of "new" self-approved and existing permitted agricultural properties during 2009. The average land application rate on these agricultural sites was 25 wet tons per acre (**See Exhibit 3 and Exhibit 4)**. **Table 3** below summarizes biosolids applications by county from 2005 to 2009.

Table 3: Historical Biosolids Application by County – 2005 to Present

	2005		2006		2007		2008		2009	
County	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**
Calumet	222.9	21.1	222.0	19.8	362.3	32.6	279.9	31.9	388.8	47.5
Portage	271.5	25.8	581.8	51.8	214.6	19.3	408.1	59.1	235.2	28.2
Outagamie	90.0	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shawano	0.0	0	77.3	6.9	0.0	0.0	0.0	0.0	0.0	0.0
Waupaca	0.0	0	0.0	0.0	96.0	8.6	0.0	0.0	182.3	24.3
Waushara	470.5	44.5	241.6	21.5	439.8	39.6	56.6	9.0	0.0	9.0
Total	**1,054.3**	**100**	**1,122.7**	**100**	**1,111.3**	**100**	**744.6**	**100**	**806.3**	**100**

Site Approvals and Compliance Monitoring

Eleven (11) "new" sites owned or leased by four (4) farmers were tested and self-approved for participation in the AWWTP Biosolids Management Program. The new sites total 208.1 acres of land in the "active inventory" of the AWWTP Biosolids Management Program. These sites are distributed by county in the **Table 4** below.

Table 4: 2009 Site Approvals

County	Acreage	%
Calumet	111.0	53.3
Waupaca	97.1	46.7
Total	**208.1**	**100**

Compliance testing was also performed on an additional 440 acres of existing permitted application sites in Calumet (200 acres) and Portage (240 acres) Counties as required by NR 204.

Complaint Investigation

No complaints were received from the general public, local officials or regulators in 2009.

Regulatory Compliance

No "notices of violation" were received from regulatory authorities during 2009. The AWWTP Biosolids Management Program strives to maintain and exceed all the requirements under which the Program is guided.

Research Projects

Long-Term Biosolids Study

The UW-Madison Cooperative has conducted a 4-year study for the AWWTP Biosolids Management Program that evaluated crop response from corn and soybeans at various biosolids application rates. The study was initiated by the AWWTP in 2006 to determine the impact(s) of lime residuals from the Appleton Water Treatment Facility on agricultural crops. The study has proven equally informative researching other nutrient benefits of biosolids on crop yields. Results of the study indicate that the lime-amended biosolids increases pH similar to that of 60-69 aglime and that nutrient uptake by corn and soybean plants were positively influenced by biosolids treatments when compared to chemical fertilizer applications alone. The results of the study give credence to biosolids nutrient management practices currently being employed by the AWWTP.

City of Appleton and Outagamie County Compost Pilot

In September 2009 the engineering phase of the Outagamie County-City of Appleton Compost Pilot study was initiated. The Outagamie County Department of Solid Waste, AWWTP, and Appleton Department of Public Works (DPW) are participating in a study that will demonstrate feasibility and assess costs for a cooperative windrow composting operation at the Outagamie County Landfill. This study is building upon the earlier success of the 2007 Black Creek Compost Study. It is the intent to focus on outdoor composting during all seasons and complete the feasibility study by 2011.

Brown County Waste Transformation Project (BCWTP)

The AWWTP began participation in the BCWTP in 2009. The BCWTP is an initiative to find economic and environmental solutions for farmers, industries, and municipal wastewater treatment plants that land apply waste. The BCWTP is comprised of a group of public and private shareholders that share the common goal of establishing a waste transformation facility in northeast Wisconsin. The BCWTP is working to take organic waste streams that are generated by municipal, industrial, or agricultural sectors to make a value added product that can be sold to an end-user as a pelletized pathogenic free fertilizer similar to the Milorganite® product.

2009
ANNUAL BIOSOLIDS MANAGEMENT PROGRAM REPORT

Biosolids Production

The Appleton Wastewater Treatment Plant (AWWTP) produced 18,801 wet tons of biosolids from January 1, 2009 to December 31, 2009. This period represents 255 days of biosolids production. The average percent solids composition for the year was 39.0% (from daily production test samples) and represents the highest yearly average to date. High solids contents translate into a maximization of biosolids storage and saves on land application costs (hauling more solids and less water). The increase in solids content is attributed to the attention given to overall processes by AWWTP staff. Biosolids production data for 2009 is summarized in Exhibit 1.

The biosolids storage building design capacity is 8,944 wet tons. The Wisconsin Department of Natural Resources (WDNR) requires all publicly operated treatment plants (POTWs) to have 180-days of sludge storage (production based determination). In 2009 the AWWTP plant average 180-day storage capacity was 9,311 wet tons. The storage requirement based on average solids production rates has historically been greater than available storage. **Figure 1** below depicts year to date storage requirements, solids production totals, solids disposal totals (land application and landfill disposal), and year-end solids remaining in storage.

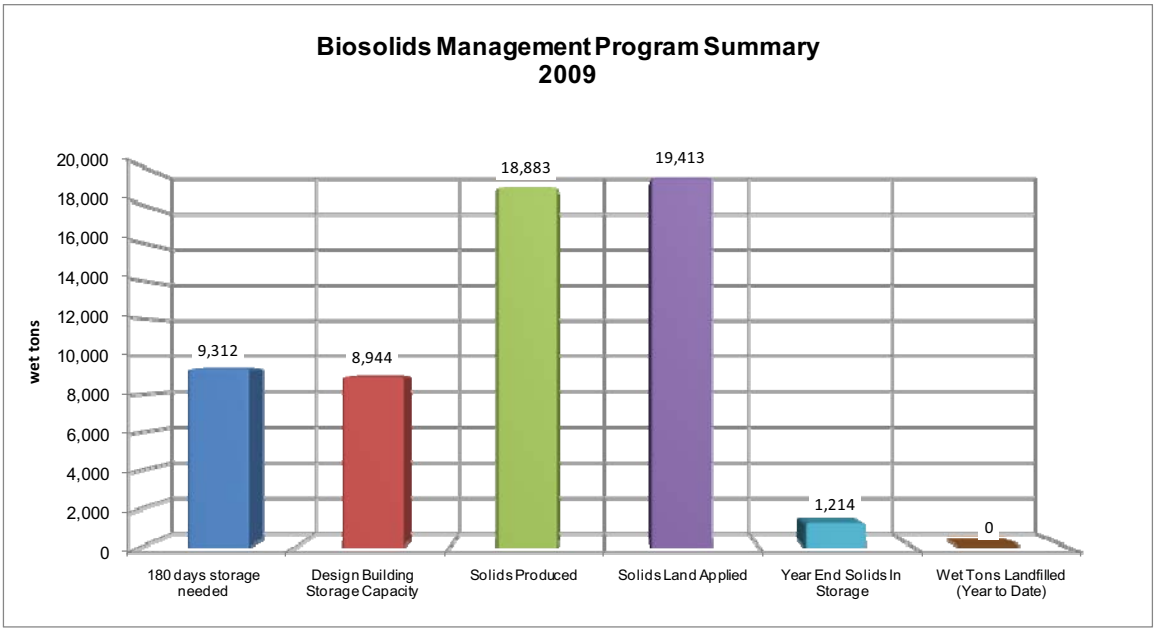

Figure 1

A capital improvement project (CIP) to expand the storage building capacity remains in long-term strategic planning initiatives. Decreases in biosolids production rates, alternative solids treatment, and various options for beneficial use are being evaluated to assist with planning initiatives. The decrease in biosolids production since 2005 is associated with loss of loading contributions to the wastewater treatment plant from Kerwin Paper Company (closed in July 2005). The loss of Kerwin significantly decreased solids loading to the AWWTP and has currently eased some of the design storage limitations.

The loss in loading contributions associated with the Kerwin closing and the most recent economic downturn experienced since 2008 has translated into a loss of revenue that has not been replaced to date. Therefore, budgetary constraints resulting from annual fixed operational costs have been curtailed through nominal rate increases, staff streamlining, and intensive resource allocation. Similar conditions have been observed in local, regional, and national industrial sectors. **Figure 2** below depicts the decrease in belt filter press (BFP) production from 2000 to 2009.

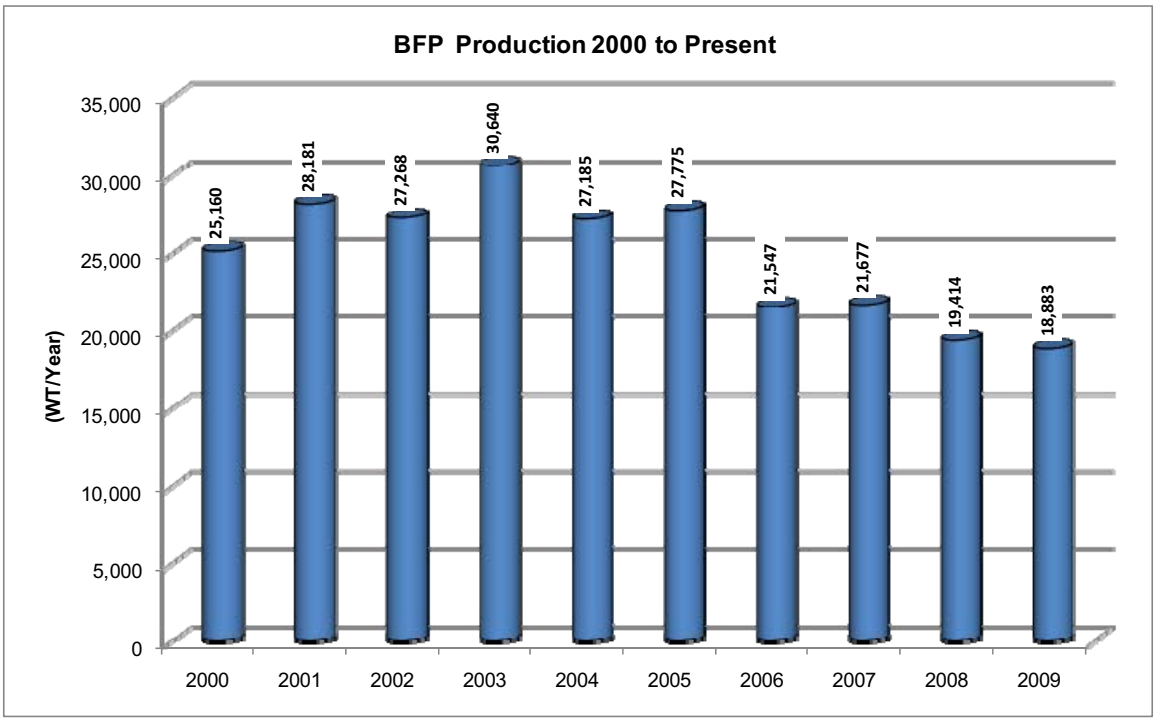

Figure 2

Biosolids Compliance Monitoring

A total of six (6) bimonthly biosolids samples were collected to satisfy compliance monitoring requirements. All samples collected in 2009 were within limits established by Part 503 Federal regulations and/or WDNR NR 204. AWWTP solids operators collected biosolids samples for analysis of fecal coliform, nitrogen, phosphorous, calcium, arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, solids content, and pH. In addition, micro-nutrients (boron, manganesem mangnesium, boron, iron, sodium, and sulfur) were included with bi-monthly testing to provide a more complete baseline of biosolids nutrient availablity. Additional data also provides added value in promoting beneficial use by validating biosolids positive benefits as a soil conditioner.

Solids samples are collected on a bimonthly basis and submitted to a contracted laboratory for analysis of fecal coliform, select nutrients, and select metals. AWWTP laboratory staff analyze bimonthly samples for solids content. AWWTP solids operators collect bimonthly biosolids samples directly from the BFPs at specified hourly intervals over the 24-hr production period. The samples are combined to form a composite sample for metals and nutrient analysis. Fecal and solids samples are contained individually for testing and the results are averaged.

The average nutrient and metals concentrations observed in 2009 are consistent with historical trends. The average fecal coliform samples were two (2) orders of magnitude or one hundred (100) times less than the NR 204 Class B ceiling limit of 2 million colony forming units (CFU) per gram of total solids. The Class A ceiling limit is 1,000 CFUs per gram of total solids. A detailed summary of 2009 biosolids compliance monitoring results and historical compliance monitoring results are located in Exhibit 2.

Vector Attraction Reduction (VAR) – Volatile Solids Reduction (VSR)

Sludge may not be land applied unless one of the eleven (11) vector attraction reduction (VAR) options specified in NR 204.07(7) (a) to (k). The AWWTP utilizes two (2) mesophilic anaerobic digesters (AD) to satisfy NR 204.07(7) (a) which states that "the mass of volatile solids in the sludge shall be reduced by a minimum of 38% between the time the sludge enters the digestion process and the time it either exits the digester or a storage facility". In addition to VSR, the AWWTP has also incorporated biosolids following land application as a best management practice that satisfies NR 204.07(7)(k).

The AWWTP utilizes the Van Kleek equation to calculate VSR. The Van Kleek equation is:

$$VSR\% = \frac{VS_{in} - VS_{out}}{VS_{in} - (VS_{out} \times VS_{in})}$$

The AWWTP collects total solids and volatile solids samples across the AD process to determine mass balance and VSR. AWWTP staff collect digester feed samples (VS_{in}) every seven (7) days while belt filter press samples (VS_{out}) are collected daily to measure performance. The Van Kleeck equation is used to calculate VSR assuming a 48-day hydraulic retention time (HRT) with the AWWTP digesters. In other words, seven (7) sampling events separate the digester feed VSR sample results used as VS_{in} from the belt filter press VSR sample results used as VS_{out}. An average of the monthly VSR readings is then reported.

Historically, the AWWTP mesophilic AD has satisfied the 38% VSR requirement. However, in 2009 VSR was observed to be less than 38% during the months of May, June, October, November, and December. The decreases in VSR are believed to associated with one or a combination of the following:

1. Declines in volatile solids contributions (CBOD and TSS) from the commercial and industrial sector which have occurred in the "down" economy.

2. In April 2009 changes were made to the AWWTP hauled waste program following updated characteristic testing and computer modeling. Waste characteristics of some wastes changed since their initial authorization. Each wastes characteristics were modeled to determine optimum treatment at least costs (i.e headworks vs. digestion). Certain wastes (very high TSS and CBOD) were restricted from discharge or limited by volume because it was determined that the $5.20 flat tipping fee did not provide sufficient cost recovery to the Utility.

3. In October 2009 restrictions were placed on a receiving station hauler in an effort to reduce digester sodium levels. Digester sodium levels reached the moderately inhibitory level for anaerobic bacteria based upon text book values (McCarty, P.L. and McKinney, R.E., Salt Toxicity in Anaerobic Treatment). It was determined that the single hauler was contributing 85% of all sodium associated with authorized hauled wastes.

The aforementioned factors have the potential of diminishing VSR either by reducing the total volatile solids entering the process (volatile contributions) or those biological processes which reduce volatile solids (biological inhibition). Further testing will be conducted to evaluate VSR and process efficiencies. Additionally, volatile contributions and assumptions made by the Van Kleek equation will be studied to determine if biases exist within existing sampling protocols.

Biosolids Land Application

A total of 20,509 wet tons of biosolids were land applied to 806 acres of self-approved and existing permitted agricultural properties during 2009. These sites were located in Calumet (388.8 acres), Portage (235.2 acres), and Waupaca (182.3 acres) Counties. The average land application rate on these agricultural sites was 25 wet tons per acre.

Land application activities took place over three (3) individual hauling periods. These hauling periods are described in the **Table 5** below and are further detailed in Exhibit 3.

Table 5: 2009 Biosolids Land Application Activity Summary

Hauling Period	Dates	Duration (Days)	Wet Tons Applied
1	Apr. 9, 10, 23 May 1, 4-8, 11	10	10,777
2	Aug. 31 Sept. 1-3	4	4,563
3	Nov. 4-6, 9 Dec. 3	5	5,172
Total	**--**	**24**	**20,509**

Land application activities began in early April 2009 but had to be postponed until town road limits were lifted in May due to cool temperatures and sustained frost conditions. No winter hauling took place due to consistent snow covered and/or frozen conditions. Regulations prohibit spreading on frozen or snow-covered soils under NR 503 and NR 204. Since 2005, no biosolids have been landfilled due to decreases in BFP production and utilization of favorable weather conditions for scheduled land application activities.

Complaint Investigation

No complaints were received from the general public, local officials, or regulators in 2009. Complaints can be associated with alleged road damage, contamination of surface water, and/or contracting an illness. The AWWTP not only prides itself on maintaining a good standing with regulators but also strives to establish and maintain good working relationships with the general public and program participants by maintaining maximum standards of human and environmental health.

Site Approvals and Compliance Monitoring

Eleven (11) “new” sites owned or leased by four (4) farmers were tested and self-approved for participation in the AWWTP Biosolids Management Program. The new sites total 208.1 acres of land located in Calument (111.0 acres) and Waupaca (97.1 acres) Counties. Compliance testing was also performed on an additional 440 acres of existing permitted land application sites in Calumet (200 acres) and Portage (240 acres) Counties as required by NR 204.

The current inventory of Biosolids Program participants is continually evaluated to balance area

or acreage needed to land apply biosolids with costs associated with beneficial use on permitted sites. New sites are continually sought after to meet the requirements of the AWWTP. However, the "active" inventory of available acreage has and will continue to be reduced based upon a variety of factors that include historical site use, adjustment for actual tillable acreage, proximity to the AWWTP, site restrictions (i.e. soil types, topography, proximity to surface waters, wetlands, homes, businesses, and water supply wells), and soil test results. To date the active inventory of land application sites has been reduced from over 14,000 acres in 2007 to less than 7,000 acres at year-end 2009. The thorough evaluation of new sites and existing permitted sites based upon the aforementioned factors will assist with deriving a more consistent and reliable application schedule based upon crop rotation and nutrient demand that will benefit the AWWTP and participants while decreasing overall costs.

Regulatory Compliance

No "notices of violation" were received from regulatory authorities during 2009. The AWWTP Biosolids Management Program strives to maintain and exceed all the requirements under which the Program is guided.

Research Projects

- **Agricultural Studies**
  To enhance the AWWTP's land application management strategy to maximize the positive benefits biosolids have as agricultural fertilizer and/or soils amendment.

1. Long-Term Biosolids Study

In 2006, the University of Wisconsin-Madison began the first of a four (4) year study to measure the effect of biosolids co-mingled with water treatment lime solids on the growth, soil test, nutrient uptake, and yield of corn and soybean. Biosolid application rates of 5 tons per acre (t/a), 10 t/a, 20 t/a, and 40 t/a were used including control treatments that were un-limed or received conventional aglime (calcium carbonate). The research data from indicates that the lime-amended biosolids increases pH similar to that of aglime at the rates of 20 t/a and 40 t/a. Nutrient uptake (N, P, K, Ca, Mg, S, B, Zn, Mn, Cu, Fe, Al) by corn and soybean plants was positively influenced by biosolids treatments. Yields were also observed to be higher where biosolids were applied.

Soil test P results generally correlated with the various biosolids treatment or application rates on two rotational test plots (corn and soybean) referred to as the "north-half" and "south-half". Soil test P also generally showed a downward trend from 2006 to 2009 with the exception of the north-half treatments in 2009. The 2009 north-half soil P results have yet to be adequately explained in the final UW report. The increases could be the result of one or a combination of variables from one year to the next that include nutrient stratification, tillage depth, crop rotation (corn vs. soybean), yield (is stand stressed or productive), and/or soil test variability (sample depth, sample location, and/or laboratory method(s)). The overall decrease observed in soil test P results can be attributed to a combination of mixing biosolids within the tillage layer, fixation, and crop uptake. This information confirms assumptions made that biosolids rich in phosphorous or manure containing phosphorous is becoming fixed or is being removed by the crop and from the field as forage. Phosphorous management is an important aspect to farmers who must manage manure phosphorous under the Wis. Adm. Code N.R. 151 Agricultural Performance Standards and associated Natural Resource Conservation Service (NRCS) 590 Management Plans.

The average AWWTP biosolids application rate in 2009 was approximately 25 wet tons per acre. The application rate was commonly less than the equivalent rate allowed by NR 204 for most crops, which is based upon recommended plant nitrogen needs. The recommended or NR 204 allowable application rates are derived to meet plant nitrogen needs while minimizing the potential leaching of nitrate and nitrites into groundwater as biosolids are broken down by microorganisms. The application rates employed by the AWWTP Biosolids Management Program factors not only plant nitrogen needs for any given crop or crop rotation, but considers soil phosphorus test levels, soil test pH, recommended lime application, and the soils buffering characteristics. AWWTP management of biosolids through controlled application rates and timely incorporation along with farmers own Best Management Practices (BMPs) not only protects groundwater quality but minimizes surface water impacts via run-off or erosion.

Based upon the results of the study the biosolids application rates employed by the AWWTP Biosolids Management Program appear to be supplying sufficient nutrients to plants. Program participants continue to state that they observe positive crop response for variety of crops following biosolids application when compared to commercial fertilizer application alone. Increased yields and decreased use of commercial fertilizer translates into additional revenue and cost savings to the farmer. A future crop response study that would evaluate the impact of biosolids application on high pH demanding crops like alfalfa may be considered.

- **Waste Treatment and Beneficial Use Alternatives**
  To seek environmentally friendly and cost effective alternatives to traditional land application of biosolids that would diversify potential outlets for biosolids. The ultimate goal of diversification is to accomplish the following:

  1) Eliminate the need to construct additional biosolids storage facilities for meeting the DNR 180 day storage requirement
  2) Reduce operational costs of biosolids landspreading program
  3) Provide a long term replacement of the current Class B Biosolids land application program that may be subject to future regulatory constraints

1. City of Appleton and Outagamie County Compost Pilot

The City of Appleton and Outagmie County Compost pilot is a collaborative effort that will demonstrate the logistical and economic feasibility of a cooperative windrow composting operation. Outdoor windrow co-composting of biosolids was successfully demonstrated in the fall of 2007 near Black Creek. However, seasonal limitations to small windrows were observed and process logistics and costs of a larger-scale operation were left unanswered. Participating staff from the Outagamie County Department of Solid Waste, City of Appleton Wastewater Treatment Plant (AWWTP) and Appleton Department of Public Works (DPW) referred to as the "Compost Advisory Group", each have expressed goals for the long-term, cost-effective, and environmentally sound alternatives for management of organic waste streams. This collaborative compost pilot study will determine feasibility by focusing on outdoor composting during all seasons with significantly larger volumes of materials.

AECOM was selected by the Compost Advisory Group as the project engineer in September 2009. AECOM has provided conceptual design plans and preliminary treatment blends based upon information provided by the Advisory Group. Pad construction details continue to be worked out with a focus on function, environmental protection, schedule, and cost. City of Appleton inter-departmental communication has resulted in off-site clay sources that could be

used for pad construction at no cost to the project. The preliminary schedule for completion of the compost pad is late April or early May 2010. The selection of the contracted "organics recycler" is anticipated to take place by March with active composting occurring by June 2010. Pilot demonstrations will occur through May 2011. If the pilot is successful, the information provided by the feasibility study will be used for engineering determination of a larger-scale permitted operation.

2. Brown County Waste Transformation Project (BCWTP)

The BCWTP is an initiative to find economic and environmental solutions for farmers, industries, and municipal wastewater treatment facilities that land apply waste. The BCWTP is comprised of a group of public and private shareholders that share the common goal of establishing a waste transformation facility in northeast Wisconsin. The BCWTP is working to take organic waste streams that are generated by municipal, industrial, or agriculturally sectors to make a product that can be sold to an end-user as a pelletized pathogenic free fertilizer similar to a Milorganite® product.

In November 2009 Appleton Utilities Committee and Common Council approved the AWWTP's participation in the BCWTP. Participation will yield a detailed material characterization report along with product validation analysis that includes a UW-Madison greenhouse study. The greenhouse study is designed to evaluate the nitrogen availability of the pelletized biosolids to corn and the effect on soil test properties on two different soil types. Results from product testing and greenhouse study are expected by mid-2010.

The BCWTP is similar to the compost pilot study in that each process has the potential of providing the AWWTP with a reliable, cost-effective, and environmentally safe method of biosolids treatment. However, each treatment process generates vastly different end-products capable of appealing to a number of markets including agriculture, commercial landscapers, municipal parks and/or engineering, sports turf, site restoration or reclamation, soil blenders, and commercial retail (lawn and garden). Similar to composting, the BCWTP could provide a diversion of a percentage of biosolids annually produced at the AWWTP. Economics of treatment and potential markets for end use(s) determined by the feasibility study would assist with determining quantities of AWWTP biosolids that could be diverted to a future full-scale facility.

Exhibits:
Exhibit 1- Belt Filter Press Production
Exhibit 2- Biosolids Laboratory Analysis
Exhibit 3- Biosolids Land Application Data
Exhibit 4- Biosolids Land Application Data, Nutrients & Metals Tracking
Exhibit 5- Calculated Site Life for Application of AWWTP Biosolids

Attachments:
1 – Characteristic Report Form 3400-49
2 – Other Methods of Disposal or Distribution Report Form 3400-52
3 – Annual Land Application Report Form 3400-055
4 – Annual Sludge Report Form 3400-165
5 – Biosolids Management Program Nutrient Management Data
6 – CD Rom: Copies of Biosolids Laboratory Test Reports

NOT INCLUDED

EXHIBIT 1
AWWTP 2009 ANNUAL BIOSOLIDS MANAGEMENT PROGRAM REPORT

AWWTP BIOSOLIDS MANAGEMENT PROGRAM

BELT FILTER PRESS PRODUCTION - 2009

To Date: Total Press Production Wet Tons YTD 2009 **18,883.37**

To Date: Total Dry Tons Produced YTD 2009 **7,315.08**

DATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1				101.87	46.83	48.41	98.38		80.46	58.41		125.97
2	78.14	104.27	104.62	105.20		69.52	39.24		33.48	38.55	60.60	82.39
3		111.12	104.26	70.82		95.76		64.97	87.53		58.65	74.05
4		111.43	93.61		72.63	111.16		105.80	57.04		20.23	32.55
5	69.03	118.46	111.32		76.29	26.91	83.36	108.40		55.31	52.95	
6	106.26	75.59	71.72	92.16	78.30		142.21	95.33		89.53	53.86	
7	105.56			89.07	94.76		121.17	2.57		88.93	37.75	44.03
8	99.44			106.53	21.00	94.92	97.88		48.92	78.23		70.88
9	68.11	95.31	60.54	54.61		96.33	65.46		85.85	30.36	72.29	69.86
10		97.79	101.60	28.02		92.16		68.65	72.68		57.04	69.70
11		80.23	112.76		49.25	97.60		105.27	63.35		73.93	26.79
12	96.46	101.77	138.43		78.59	68.90	55.58	104.48		82.41	74.89	
13	81.86	21.49	86.71	34.46	77.54		67.20	94.19		93.74	55.35	
14	109.39			81.88	79.05		99.84	8.64	54.71	92.92	16.38	39.04
15	124.42			89.74	62.94	48.60	95.07		93.14	66.17		66.03
16	78.33	61.66	106.10	90.03		74.90	5.52		93.93	20.96	62.74	65.49
17		103.29	104.88	59.31		70.84		62.47	27.27		102.69	75.19
18		117.53	113.50		69.97	87.15		101.47	31.35		95.07	52.66
19	49.46	114.73	105.94		69.75	31.02	64.95	107.05		76.50	77.56	
20	33.88	73.51	83.82	55.83	56.49		105.41	44.85		82.43	27.41	
21	76.75			83.58	62.70		107.56	11.67	135.03	79.62		58.13
22	105.74			89.90	44.92	52.20	47.13		132.83	104.46		42.92
23	57.29	106.17	73.35	95.53		87.44	7.30		71.01	29.12	79.60	27.04
24		76.83	76.73	26.81		93.14		45.50	72.82		78.92	
25		116.13	74.02			98.93		86.47	52.93		57.76	
26	74.03	65.86	54.44		37.62	30.91	55.44	86.29		53.54		
27	115.42	25.08	17.84	74.23	74.89		104.82	73.07		82.65		
28	114.85			68.65	78.17		106.50	27.46	86.81	82.75		49.21
29	106.96			76.76	22.84	96.71	93.08		63.47	62.04		85.33
30	66.75		58.21	73.44		92.52	5.66		87.47	25.21	114.48	83.19
31			97.64					88.15				27.93
Monthly Production (WT)	1,818.13	1,778.25	1,952.04	1,648.43	1,254.53	1,666.03	1,668.76	1,492.75	1,532.08	1,473.84	1,330.15	1,268.38
Percent Total Solids: Monthly Avg.	33.99	36.03	35.27	38.37	38.67	39.11	40.70	42.70	41.38	39.27	41.98	40.31
Monthly Production (DT)	617.90	640.61	688.45	632.45	485.06	651.64	679.11	637.48	633.97	578.75	558.41	511.24
Average Daily Production for Month (WT)	86.58	88.91	88.73	74.93	62.73	75.73	75.85	71.08	72.96	66.99	63.34	60.40
Calendar Days Monthly Average Production (WT	58.65	63.51	62.97	54.95	40.47	55.53	53.83	48.15	51.07	47.54	44.34	40.92
YTD Total Press Production (WT)	1,818	3,596	5,548	7,197	8,451	10,117	11,786	13,279	14,811	16,285	17,615	18,883
YTD Average Daily Production (WT)	86.58	87.72	88.07	84.67	80.49	79.66	79.10	78.11	77.54	76.45	75.28	74.05
YTD Average Calender Day Production (WT)	58.65	60.96	61.65	59.97	55.97	55.90	55.60	54.65	54.25	53.57	52.74	51.74
Actual Monthly Production Days	21	20	22	22	20	22	22	21	21	22	21	21
YTD Production Days	21	41	63	85	105	127	149	170	191	213	234	255
YTD Production (DT)	617.90	1,258.52	1,946.97	2,579.42	3,064.48	3,716.12	4,395.23	5,032.71	5,666.68	6,245.43	6,803.84	7,315.08
YTD Production (WT)	1,818.13	3,596.38	5,548.42	7,196.85	8,451.38	10,117.41	11,786.17	13,278.92	14,811.00	16,284.84	17,614.99	18,883.37
Calculated 180-Day Storage (WT)	**10,556.88**	**10,972.01**	**11,096.84**	**10,795.28**	**10,074.49**	**10,061.51**	**10,007.13**	**9,836.24**	**9,765.49**	**9,642.34**	**9,493.11**	**9,312.35**

EXHIBIT 2
AWWTP 2009 ANNUAL BIOSOLIDS MANAGEMENT PROGRAM REPORT

AWWTP BIOSOLIDS MANAGEMENT PROGRAM

BIOSOLIDS LABORATORY ANALYSIS - 2009

	Units	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	AVG	MIN	MAX
Sample Date		1/13/2009		3/10/2009		5/5/2009		7/15/2009		9/15/2009		11/10/2009				
Nutrients																
Total Solids	%	32.2		34.1		33.4		40.6		38.5		38.3		36.2	32.2	40.6
Total Nitrogen	%	1.46		1.70		2.10		0.97		1.20		1.50		1.49	0.97	2.10
Ammonium Nitrogen	%	0.36		0.35		0.16		0.16		0.27		0.21		0.25	0.16	0.36
Total Phosphorus	%	0.89		1.30		1.50		1.00		0.81		0.78		1.05	0.78	1.50
Total Potassium	%	0.08		0.08		0.17		0.08		0.07		0.09		0.10	0.07	0.17
Water Extractable P	%	2.80		3.90		2.00		2.10		1.90		1.10		2.30	1.10	3.90
Calcium	mg/kg	256,435		257,460		252,020		277,833		254,688		276,506		262,490	252,020	277,833
CFR 503/NR 204 Metals																
Arsenic	mg/kg	1.4		1.2		5.1		2.2		5.3		2.4		2.9	1.2	5.3
Cadmium	mg/kg	<1.43		<0.07		<0.87		0.81		<0.60		<1.0		0.14	0.0	0.8
Copper	mg/kg	155		114		120		89		104		120		117	89	155
Lead	mg/kg	12.0		6.7		9.9		18.0		3.1		<4.2		8.3	0.0	18.0
Mercury	mg/kg	0.19		0.47		0.45		0.12		0.10		0.42		0.29	0.10	0.47
Molybdenum	mg/kg	9.7		4.7		4.50		5.9		5.8		5.7		6.05	4.5	9.70
Nickel	mg/kg	7.8		6.5		6.3		4.2		6.5		14.0		7.6	4.2	14.0
Selenium	mg/kg	<1.08		<1.7		2.20		<0.72		2.3		1.6		1.02	0.0	2.3
Zinc	mg/kg	230		190		222		170		218		211		207	170	230
Nutrients (Additonal)																
Boron	mg/kg	14.6		14.0		8.4		4.4		7.0		8.1		9.4	4.4	14.6
Iron	mg/kg	26,028		19,114		19,790		21,302		23,449		24,982		22,444	19,114	26,028
Magnesium	mg/kg	10,351		10,422		9,278		9,998		10,361		10,535		10,158	9,278	10,535
Manganese	mg/kg	1,764		780		784		1,576		2,493		1,925		1,554	780	2,493
Sodium	mg/kg	5,177		4,356		10,458		8,847		10,584		9,389		8,135	4,356	10,584
Sulfur	%	0.12		0.15		0.18		0.15		0.12		0.16		0.15	0.12	0.18
Other																
Fecal Coliform (Geometric Mean of 7 Samples)	[CFU/g/TS]	21,737		8,671		14,161		3,765		7,809		8,472		10,769	3,765	21,737
pH	(S.U.)	7.7		7.7		7.6		7.7		7.8		7.5		7.7	7.5	7.8

EXHIBIT 3
AWWTP 2009 ANNUAL BIOSOLIDS MANAGEMENT PROGRAM REPORT

AWWTP BIOSOLIDS MANAGEMENT PROGRAM

BIOSOLIDS LAND APPLICATION DATA - 2009

		Day(s)																																		
Site	Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total Wet Tons	Total Dry Tons	Site Acres	WT / Acre	Wet Tons in Storage
																																					9,252.3
JM-2F2	April									298.6																							298.6	106.3	12.4	24.1	9,008.4
JM-2F1	April									323.7																							323.7	115.2	14.3	22.6	8,684.7
JM-1F2	April									544.0	234.4																						778.4	277.1	25.0	31.1	7,934.3
JM-1F1	April										545.9																						545.9	194.4	18.5	29.5	7,388.4
JLF-7	April																							170.2									170.2	60.6	5.7	29.9	7,802.8
JLF-1F1	April /May	382.1																						495.8									877.8	312.5	33.0	26.6	6,925.0
JLF-3F1	May	402.1																															402.1	143.2	15.0	26.8	6,938.3
JLF-5	May	403.8																															403.8	143.7	15.0	26.9	6,534.5
JLF-2	May	142.3			517.1																												659.4	234.8	24.0	27.5	5,994.6
JLF-4F2	May				394.7																												394.7	140.5	13.8	28.6	5,599.8
JLF-3F2	May				125.9																												125.9	44.8	5.6	22.5	5,474.0
RTz-2	May					654.4																											654.4	233.0	23.5	27.8	4,895.9
RTz-3	May					424.9																											424.9	151.3	15.3	27.8	4,471.0
RB-2F2	May					167.7	151.3																										319.0	113.5	10.5	30.4	4,230.4
RB-2	May						634.7																										634.7	225.9	20.3	31.3	3,595.7
RB-1	May						368.5	887.5																									1,256.0	447.1	41.5	30.3	2,339.7
MK-4	May							294.4	444.5																								738.9	263.0	27.0	27.4	1,695.6
MK-5	May								558.6																								558.6	198.9	29.6	18.9	1,137.0
MK-11	May								169.5			479.9																					649.4	231.2	35.5	18.3	487.6
MK-7	May											557.9																					557.9	198.6	32.0	17.4	*35.5*
MCL-2F1	August/Sept																															440.0	440.0	162.8	14.9	29.5	5,277.1
MCL-1F1	September	418.5																														589.8	1,008.4	373.1	33.6	30.0	4,268.7
DL-5	September	339.5																															339.5	125.6	26.0	13.1	4,009.7
DL-2W	September	534.5	1060.7																														1,595.2	590.2	54.0	29.5	2,414.5
ML-3	September		250.4	220.1																													470.4	174.1	15.4	30.5	1,977.5
ML-11	September			96.9																													96.9	35.8	7.1	13.6	1,880.7
ML-15	September			612.8																													612.8	226.8	31.3	19.6	1,355.4
KO-16	November				819.3																												819.3	331.8	32.5	25.2	3,107.4
KO-17	November				219.9	427.2																											647.1	262.1	25.5	25.4	2,460.3
KO-19F1	November					488.3																											488.3	197.7	21.0	23.3	2,025.0
KO-19F2	November					200.7																											200.7	81.3	7.5	26.8	1,824.4
DL-8A	November						883.6			360.5																							1,244.1	503.9	42.0	29.6	634.1
DL-8B	November									279.1																							279.1	113.0	9.5	29.4	465.1
BPG-1F1	November									396.7																							396.7	160.7	15.0	26.4	68.3
BPG-1F1	December			193.6																													193.6	76.5	9.0	21.5	1,060.9
BPG-1F2	December			274.2																													274.2	108.3	13.5	20.3	786.7
BPG-2	December			168.8																													168.8	66.7	8.5	19.9	617.9
EPW-1F1	December			460.2																													460.2	181.8	20.0	23.0	231.8
																																TOTAL	20,509.3	7,607.7	803.80	25.3	
																																				End of Year Storage	1,213.8

1) Represents the average application rate for all sites in wet tons per acre.
2) Biosolids remaining in storage is calculated using a combination of SCADA production values, weights from certified scale tickets during each hauling period, and a visual estimate of what remained in storage at the end of each hauling period.

EXHIBIT 4
AWWTP 2009 ANNUAL BIOSOLIDS MANAGEMENT PROGRAM REPORT

AWWTP BIOSOLIDS MANAGEMENT PROGRAM

BIOSOLIDS LAND APPLICATION DATA, NUTRIENTS & METALS TRACKING - 2009

Site	DNR Site ID #	Application Date	Site Acres	Wet Tons Per Site	Wet Tons Per Acre	Dry Tons Per Site	Dry Tons Per Acre	Crop Code	Lbs/acre Nitrogen	Lbs/acre* Phosphorus	Lbs/acre* P_2O_5	Lbs/acre * Potassium	Lbs/acre * K_2O_5	Lbs / acre Arsenic	Lbs / acre Boron	Lbs / acre Cadmium	Lbs / acre Copper	Lbs / acre Iron	Lbs / acre Lead	Lbs / acre Magnesium	Lbs / acre Manganese	Lbs / acre Mercury	Lbs / acre Molybdenum	Lbs / acre Nickel	Lbs / acre Selenium	Lbs / acre Sulfur	Lbs / acre Zinc	Tons / acre Calcium
JM-2F2	93421	4/9/2009	12.4	298.6	24.1	106.3	8.6	17	103.2	161.7	8.7	13.7	12.4	0.046	0.238	0.000	2.360	391.120	0.175	181.873	33.478	0.005	0.111	0.118	0.000	25.717	3.629	1.981
JM-2F1	93420	4/9/2009	14.3	323.7	22.6	115.2	8.1	17	97.0	152.0	8.2	12.9	11.7	0.043	0.223	0.000	2.219	367.640	0.165	170.954	31.468	0.005	0.104	0.111	0.000	24.173	3.411	1.862
JM-1F2	93419	4/9/2009	25.0	778.4	31.1	277.1	11.1	17	129.4	202.8	10.9	17.2	15.6	0.058	0.298	0.000	2.960	490.456	0.220	228.064	41.981	0.006	0.139	0.148	0.000	32.249	4.551	2.484
JM-1F1	93418	4/10/2009	18.5	545.9	29.5	194.4	10.5	17	131.9	206.7	11.1	17.5	15.9	0.059	0.304	0.000	3.017	499.983	0.224	232.494	42.796	0.006	0.142	0.151	0.000	32.875	4.639	2.532
JLF-7	93385	4/23/2009	5.7	170.2	29.9	60.6	10.6	17	127.9	200.6	10.8	17.0	15.4	0.057	0.295	0.000	2.927	485.113	0.218	225.580	41.524	0.006	0.138	0.147	0.000	31.898	4.501	2.457
JLF-1F1	88952	4/23, 5/1/09	33.0	877.8	26.6	312.5	9.5	17	114.0	178.7	9.6	15.2	13.8	0.051	0.263	0.000	2.607	432.068	0.194	200.914	36.983	0.005	0.122	0.131	0.000	28.410	4.009	2.188
JLF-3F1	88954	5/1/2009	15.0	402.1	26.8	143.2	9.5	17	114.8	180.1	9.7	15.3	13.9	0.051	0.265	0.000	2.628	435.432	0.195	202.478	37.271	0.005	0.123	0.132	0.000	28.631	4.040	2.205
JLF-5	93384	5/1/2009	15.0	403.8	26.9	143.7	9.6	17	115.3	180.8	9.7	15.3	13.9	0.051	0.266	0.000	2.639	437.230	0.196	203.314	37.425	0.005	0.124	0.132	0.000	28.749	4.057	2.215
JLF-2	88953	5/4/2009	24.0	659.4	27.5	234.8	9.8	17	115.3	180.8	9.7	15.3	13.9	0.051	0.266	0.000	2.638	437.178	0.196	203.290	37.421	0.005	0.124	0.132	0.000	28.746	4.056	2.214
JLF-4F2	93383	5/4/2009	13.8	394.7	28.6	140.5	10.2	17	122.5	192.1	10.3	16.3	14.8	0.055	0.282	0.000	2.804	464.598	0.208	216.040	39.768	0.006	0.132	0.141	0.000	30.549	4.311	2.353
JLF-3F2	88954	5/4/2009	5.6	125.9	22.5	44.8	8.0	17	96.3	151.0	8.1	12.8	11.6	0.043	0.222	0.000	2.203	365.082	0.164	169.765	31.249	0.005	0.103	0.110	0.000	24.005	3.387	1.849
RTz-2	81867	5/5/2009	23.5	654.4	27.8	233.0	9.9	17	119.3	187.0	10.1	15.9	14.4	0.053	0.275	0.000	2.729	452.284	0.203	210.314	38.714	0.006	0.128	0.137	0.000	29.739	4.197	2.291
RTz-3	81868	5/5/2009	15.3	424.9	27.8	151.3	9.9	17	119.0	186.5	10.0	15.8	14.4	0.053	0.274	0.000	2.722	451.035	0.202	209.734	38.607	0.006	0.128	0.136	0.000	29.657	4.185	2.284
RB-2F2	81867	5/5/2009	10.5	319.0	30.4	113.5	10.8	17	130.1	204.0	11.0	17.3	15.7	0.058	0.300	0.000	2.978	493.404	0.221	229.435	42.233	0.006	0.140	0.149	0.000	32.443	4.578	2.499
RB-2	81842	5/6/2009	20.3	634.7	31.3	225.9	11.1	17	128.5	201.5	10.8	17.1	15.5	0.057	0.296	0.000	2.941	487.279	0.219	226.587	41.709	0.006	0.138	0.147	0.000	32.040	4.521	2.468
RB-1	81841	5/6/2009	41.5	1256.0	30.3	447.1	10.8	17	129.7	203.3	10.9	17.2	15.6	0.058	0.299	0.000	2.967	491.580	0.221	228.587	42.077	0.006	0.139	0.149	0.000	32.323	4.561	2.490
MK-4	77457	5/8/2009	27.0	738.9	27.4	263.0	9.7	17	117.2	183.8	9.9	15.6	14.1	0.052	0.270	0.000	2.682	444.476	0.199	206.684	38.045	0.006	0.126	0.134	0.000	29.226	4.124	2.251
MK-5	53266	5/8/2009	29.6	558.6	18.9	198.9	6.7	17	80.8	126.8	6.8	10.8	9.8	0.036	0.186	0.000	1.850	306.547	0.138	142.546	26.239	0.004	0.087	0.093	0.000	20.156	2.844	1.553
MK-11	81859	5/11/2009	35.5	649.4	18.3	231.2	6.5	17	78.4	122.9	6.6	10.4	9.5	0.035	0.181	0.000	1.793	297.103	0.133	138.154	25.431	0.004	0.084	0.090	0.000	19.535	2.757	1.505
MK-7	77599	5/11/2009	32.0	557.9	17.4	198.6	6.2	17	74.7	117.1	6.3	9.9	9.0	0.033	0.172	0.000	1.709	283.155	0.127	131.668	24.237	0.004	0.080	0.086	0.000	18.618	2.627	1.434
MCL-2F1	92307	8/31/2009	14.9	440.0	29.5	162.8	10.9	17	110.1	273.1	14.7	27.3	24.8	0.080	0.140	0.009	2.283	448.927	0.305	210.589	25.783	0.006	0.114	0.115	0.024	36.052	4.283	2.894
MCL-1F1	92306	8/31, 9/1/09	33.6	1008.4	30.0	373.1	11.1	1	111.9	277.6	14.9	27.8	25.2	0.081	0.142	0.009	2.321	456.280	0.310	214.038	26.205	0.006	0.115	0.117	0.024	36.643	4.353	2.942
DL-5	64902	9/1/2009	26.0	339.5	13.1	125.6	4.8	58	48.7	120.8	6.5	12.1	11.0	0.035	0.062	0.004	1.010	198.518	0.135	93.124	11.401	0.003	0.050	0.051	0.011	15.943	1.894	1.280
DL-2W	64899	9/1/2009	54.0	1595.2	29.5	590.2	10.9	1	110.1	273.3	14.7	27.3	24.8	0.080	0.140	0.009	2.284	449.137	0.305	210.687	25.795	0.006	0.114	0.115	0.024	36.069	4.285	2.896
ML-3	76312	9/2/2009	15.4	470.4	30.5	174.1	11.3	1	113.9	282.6	15.2	28.3	25.6	0.083	0.145	0.009	2.362	464.454	0.315	217.872	26.675	0.006	0.118	0.119	0.025	37.299	4.431	2.994
ML-11	81859	9/3/2009	7.1	96.9	13.6	35.8	5.0	58	50.8	126.0	6.8	12.6	11.4	0.037	0.064	0.004	1.053	207.032	0.141	97.117	11.890	0.003	0.052	0.053	0.011	16.626	1.975	1.335
ML-15	81863	9/3/2009	31.3	612.8	19.6	226.8	7.2	17	73.1	181.4	9.8	18.1	16.5	0.053	0.093	0.006	1.517	298.165	0.202	139.867	17.124	0.004	0.075	0.076	0.016	23.945	2.844	1.922
KO-16	89035	11/4/2009	32.5	819.3	25.2	331.8	10.2	17	101.0	221.3	11.9	21.4	19.4	0.084	0.132	0.005	2.093	431.503	0.207	198.145	32.446	0.004	0.108	0.114	0.030	30.086	4.078	2.623
KO-17	89036	11/4/2009	25.5	647.1	25.4	262.1	10.3	17	103.9	227.8	12.3	22.0	20.0	0.087	0.136	0.006	2.154	444.157	0.213	203.955	33.397	0.005	0.111	0.117	0.031	30.968	4.198	2.700
KO-19F1	NEW SITE	11/5/2009	21.0	488.3	23.3	197.7	9.4	17	94.8	207.9	11.2	20.1	18.2	0.079	0.124	0.005	1.966	405.304	0.195	186.114	30.476	0.004	0.102	0.107	0.028	28.259	3.831	2.463
KO-19F2	NEW SITE	11/5/2009	7.5	200.7	26.8	81.3	10.8	17	109.1	239.2	12.9	23.1	21.0	0.091	0.143	0.006	2.262	466.423	0.224	214.180	35.071	0.005	0.117	0.123	0.033	32.520	4.408	2.835
DL-8A	64905	11/6/2009	42.0	1244.1	29.6	503.9	12.0	1	120.8	264.8	14.3	25.6	23.2	0.101	0.158	0.006	2.504	516.378	0.248	237.119	38.828	0.005	0.130	0.136	0.036	36.003	4.880	3.138
DL-8B	87914	11/9/2009	9.5	279.1	29.4	113.0	11.9	1	119.8	262.6	14.1	25.4	23.0	0.100	0.157	0.006	2.484	512.110	0.246	235.159	38.507	0.005	0.129	0.135	0.036	35.706	4.840	3.113
BPG-1F1	NEW SITE	11/9/2009 12/3/2009	24.0	590.4	24.6	236.1	9.8	17	108.7	197.7	13.6	20.6	20.0	0.069	0.154	0.006	2.355	488.076	0.217	214.291	37.188	0.007	0.117	0.206	0.033	32.541	4.349	2.820
BPG-1F2	NEW SITE	12/3/2009	13.5	274.2	20.3	108.3	8.0	17	85.4	125.2	8.6	14.4	14.0	0.039	0.130	0.001	1.925	400.841	0.001	169.036	30.887	0.007	0.091	0.225	0.026	25.672	3.386	2.218
BPG-2	NEW SITE	12/3/2009	8.5	168.8	19.9	66.7	7.8	17	83.5	122.3	9.5	14.1	13.7	0.038	0.127	0.001	1.882	391.836	0.001	165.239	30.193	0.007	0.089	0.220	0.025	25.096	3.309	2.168
EPW-1F1	NEW SITE	12/3/2009	20.0	460.2	23.0	181.8	9.1	1	96.8	141.8	9.7	16.4	15.8	0.044	0.147	0.001	2.181	454.120	0.001	191.504	34.992	0.008	0.104	0.254	0.029	29.085	3.836	2.513
Average >>			21.72	554.31	25.37	205.58	9.40		105.1	191.0	10.5	17.7	16.177	0.059	0.199	0.003	2.325	420.163	0.191	193.419	32.852	0.005	0.112	0.131	0.012	28.872	3.896	2.324

EXHIBIT 5
AWWTP 2009 ANNUAL BIOSOLIDS MANAGEMENT PROGRAM REPORT

BIOSOLIDS MANAGEMENT PROGRAM

CALCULATED SITE LIFE FOR APPLICATION OF AWWTP BIOSOLIDS

BASED ON AVERAGE METALS CONCENTRATIONS AND NUTRIENT LOADING RATES FOR 2009

REFERENCE: NR204.07 (s) metal concentrations

Metal	NR-204 Table 1 Ceiling Concentrations (ppm)	NR-204 Table 2 Lifetime Metal Loadings (lbs/acre)	NR-204 Table 3 Monthly Average Concentrations (ppm)	Biosolids Program City of Appleton Biosolids Analysis Avg. Concentrations 2009 (ppm)	Biosolids Program City of Appleton Avg. Concentrations in 2009 (lbs/acre)	Biosolids Program Years of Site Life Concentrations Applied in 2009 (Years)
Arsenic	75	36	41	2.94	0.059	611
Cadmium	85	34	39	0.14	0.003	13,494
Copper	4,300	1,339	1,500	117.00	2.325	576
Lead	840	268	300	8.28	0.191	1,400
Mercury	57	15	17	0.29	0.005	2,814
Molybdenum	75	Deleted until EPA revises		6.05	0.112	N/A
Nickel	420	375	420	7.55	0.131	2,857
Selenium	100	89	100	1.02	0.012	7,467
Zinc	7,500	2,500	2,800	206.83	3.896	642