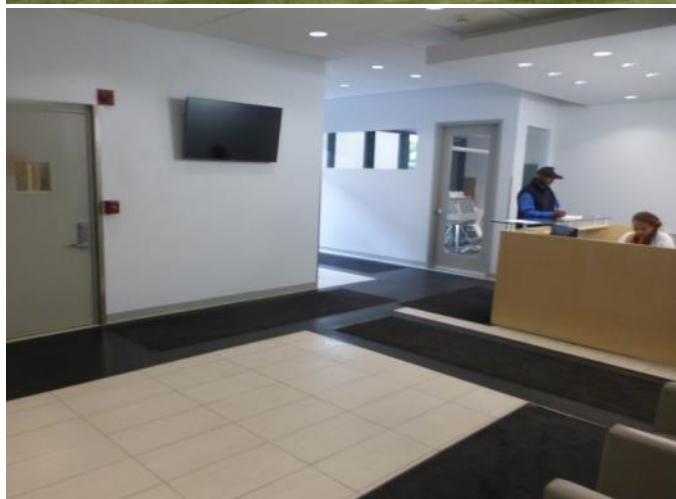


# Alexandria Arlington Resource Recovery Facility

Fiscal Year 2017  
Annual Operations Report

August 2017



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## **Definition of Abbreviations & Acronyms**

<b><u>Abbreviation/Acronym</u></b>	<b><u>Definition</u></b>
APC	Air Pollution Control
Apr	April
Aug	August
Avg	Average
Btu	British thermal unit
CAAI	Covanta Alexandria Arlington, Inc.
CEMS	Continuous Emissions Monitoring System
CO	Carbon Monoxide
Dec	December
ECOM	Emergency Communications
Feb	February
FMG	Facility Monitoring Group
FY	Fiscal Year
gal	Gallon
GAT	Guaranteed Annual Tonnage
HCl	Hydrochloric (Hydrogen Chlorides)
HDR	HDR Engineering Inc
HHV	Estimated Waste Heating Value (Btu/lb)
ID	Induced Draft
Jan	January
Jul	July
Jun	June
klbs	Kilo-pounds (1,000 lbs)
kWhr	Kilowatt hours (1,000 watt-hours)
lbs	Pounds
LOA	Letter of Agreement
Mar	March
Max	Maximum
May	May
Min	Minimum
MSW	Municipal Solid Waste
MW hr	Megawatt hours
No	Number
NOV	Notice of Violation
Nov	November
NO <sub>x</sub>	Nitrogen Oxide
Oct	October
OSHA	Occupational Safety and Health Administration
PDS	Potomac Disposal Services
ppm	Parts per million
ppmdv	Parts per million dry volume
PSD	Prevention of Significant Deterioration
Q1	First Quarter
Q2	Second Quarter
Q3	Third Quarter
Q4	Fourth Quarter
RE	Reportable Exempt
RNE	Reportable Non-Exempt
SDA	Spray Dryer Absorber
Sep	September
SO <sub>2</sub>	Sulfur Dioxide
TCLP	Toxicity Characteristic Leaching Procedure
VADEQ	Virginia Department of Environmental Quality
WL	Warning Letter
yr	Year
YTD	Year to date

# Alexandria/Arlington Waste-to-Energy Facility Annual Operations Report – Fiscal Year 2017

## 1.0 Purpose of Report

HDR Engineering, Inc. (HDR) was authorized by the Facility Monitoring Group (FMG) to conduct quarterly inspections and provide quarterly reports regarding the operation and maintenance of the Covanta Alexandria/Arlington Waste-to-Energy Facility (Facility) for the 2017 calendar year. This report is prepared for the fourth quarter of the 2017 fiscal year and summarizes Facility operations between April 1, 2017 and June 30, 2017, as well as the entire fiscal year. This report identifies the fiscal year beginning on July 1, 2016 as FY17 and the quarter beginning on April 1, 2017 as Q4FY17.

This report is based upon HDR's experience in the waste-to-energy industry, upon site observation visits and previous reports provided by HDR, and upon data provided by Covanta Alexandria / Arlington, Inc. (CAAI), the Facility owner and operator.

## 2.0 Executive Summary

CAAI operated the Facility in an acceptable manner and in accordance with established waste-to-energy industry practices during Q4FY17. The operation of the Facility, maintenance, safety, and overall cleanliness continue to be above average. Environmental performance was excellent with no reportable environmental excursions throughout the quarter. Note that as of June 30, 2017, the CAAI Facility has operated 1,296 days without an environmental excursion.

During Q4FY17, the boilers experienced four (4) instances of unscheduled downtime totaling 52.1 hours, and the turbine generators experienced no unscheduled downtime. Boiler No. 2 experienced one (1) instance of scheduled downtime totaling 17.8 hours for routine cleaning during Q4FY17. During the quarter, the boilers experienced no standby time, and Turbine Generator No. 2 experienced 7.3 hours of standby time while Boiler No. 2 was down. Note that

standby time is not factored into overall availability. A detailed listing of downtime is provided in Section 5.2 of this report.

Average waste processed during the quarter was 1,022.2 tons per day, or 104.8% of nominal facility capacity. Waste deliveries averaged 1,036.4 tons per day, which is 1.4% higher than the burn rate. The capacity utilization of 104.8% is comparable to that of mature, well run waste to energy facilities.

For FY17, average waste processed was 957.6 tons per day, or 98.2% of nominal facility capacity of 975 tons per day. Waste deliveries averaged 955.1 tons per day, which is 0.3% less than the annual burn rate. The annual capacity utilization of 98.2% compares very favorably to industry averages.

Performance trends for various measurements are presented in Section 4. In general, the Facility continues to demonstrate reasonable consistency in month to month performance throughout the most recent three-year period tracked for detailed comparisons.

During the quarter, MSW processed slightly increased (0.7%) from the corresponding quarter in FY16; steam production increased (1.1%), and electricity generated (gross) increased (0.9%) from the corresponding quarter in FY16. The increase in steam generation is attributable to the increase (1.4%) in waste heating value, offset by more boiler downtime (14.4 additional hours). The increase in electricity generated (gross) in Q4FY17, is attributable to higher steam production, offset by slightly more downtime (0.6 additional hours) experienced by the turbine generators.

During FY17, MSW processed slightly decreased 0.1% from FY16; steam production slightly increased 0.1%, and electricity generated (gross) increased 1.5% compared to FY16. The increase in steam generation was attributable to the increase (1.8%) in the calculated average waste heating value, offset by more (117.3 additional, hours) scheduled, unscheduled, and standby downtime experienced by the boilers. The increase in gross electrical generation in FY17

as compared to FY16 is attributable to the increase in steam production, offset by more (173.0 additional hours) scheduled, unscheduled, and standby downtime experienced by the turbine generators. Also note that 2016 was a Leap Year and FY16 had an additional day of operations, when compared to the FY17. This negatively biases processed tonnage, steam production, and electrical generation when comparing FY17 to FY16. CAAI continued to throttle back the boiler steam load as necessary in FY17 to stay below the steam production limit.

### **3.0 Facility Inspection and Records Review**

In May 2017, HDR met with the Facility management and other plant personnel to discuss Facility operations and maintenance, acquire data and reports, perform an independent visual inspection of the operating Facility, photograph areas of interest, and perform a review of recent Facility activity. This visit was coordinated with the scheduled FMG meeting. At the time of the inspection, HDR reviewed CAAI records, discussed performance issues with CAAI staff, and provided a verbal report and performance statistics at the May 2017 FMG meeting. HDR maintains a running tabulation of the status of corrective actions and plant performance trends. CAAI provides the following documents for each month:

- Facility Monthly Operating Reports
- Monthly Continuous Emissions Monitoring System (CEMS) Reports

Table 1 summarizes maintenance, repair, and plant condition issues reported during this and prior reporting periods. An “A” indicates an issue of the highest priority and worthy of immediate attention. Such items are usually safety or operability issues. A “B” indicates that the issue needs to be dealt with as quickly as possible, but is not urgent. These items will usually result in a process improvement or will help avoid future “urgent” issues. A “C” indicates that the issue should be dealt with at the earliest convenience, but is not a priority issue. This category might include issues related to aesthetics, non-urgent maintenance, or housekeeping improvements which are not safety related.

Note that HDR inspections are generally performed while equipment is operating, and are not intended to address the internal condition, performance or life expectancy of mechanical, electrical and electronic equipment and structures. HDR inspections are only performed quarterly, generally representing findings on the day of the inspection. CAAI is responsible, without limitation, for operations, maintenance, environmental performance and safety and should not rely on HDR observations or inspection reports which are overviews of Facility external conditions only.



**Table 1: Summary of Inspection Report Deficiencies**

\*A is highest priority & demands immediate attention: B needs attention, but is not urgent; C can be addressed at earliest opportunity & is not urgent.

Item No.	Inspection Report Deficiencies	Issue Reported	Priority*	HDR Recommendation	Status	Open / Closed
1	Corrosion on ceiling panels in Turbine Generator Enclosure	August 2014	C	Sand, Prime, Paint and Preserve, and replace deteriorated panels as necessary	<b>HDR observed the corroded/deteriorated sections had been primed, but no panels were replaced. CAAI reports that it plans to replace panels in 1 to 2 years.</b>	Open
2	Deteriorated purlin east wall in Tipping Floor Enclosure	November 2014	C	Replace deteriorated purlin	<b>CAAI reports that it will replace sections of the east wall of the Tipping Floor Enclosure as a 2016 Budget Item.</b>	Open
3	Induced Draft Fan No. 1 Lagging deteriorated, west side of CEMS Enclosure	May 2015	C	Replace deteriorated Induced Draft Fan Lagging	<b>Status Unchanged</b>	Open
4	Pot hole, southeast corner of Ash Trailer Canopy	August 2015	C	Repair road surface	<b>Status Unchanged</b>	Open
5	Chemical storage container deteriorated, north of Main Vibrating Pan, at ground elevation	February 2016	C	Replace storage container	<b>Complete</b>	Closed
6	Underside of grating deteriorated, upper elevations of all three economizers	August 2016	C	Replace economizer grating in upper elevations	<b>Status Unchanged</b>	Open
7	Pavement spider-cracking at Tipping Floor Entrance	November 2016	C	Resurface section of pavement at Tipping Floor Entrance	<b>Status Unchanged</b>	Open
8	Concrete slab damaged that Citizen's Drop-off Roll-off is on	November 2016	C	Repair concrete slab	<b>Status Unchanged</b>	Open
9	Pothole where Tipping Floor Exit Road enters Eisenhower Avenue	November 2016	C	Repair pothole	<b>Complete</b>	Closed
10	Corrosion on Scale House	November 2016	C	Conduct proper painting preservation measures on corroded spots of Scale House	<b>Status Unchanged</b>	Open
11	Housing Damaged of Self Contained Breathing Apparatus (SCBA) – North Charging Floor Entrance	February 2017	C	Replace SCBA Enclosure	<b>Complete</b>	Closed
12	Tipping Floor Center Bay concrete apron eroded and rebar exposed	February 2017	C	Resurface eroded section of Tipping Floor near refuse pit	<b>Status Unchanged</b>	Open

Item No.	Inspection Report Deficiencies	Issue Reported	Priority*	HDR Recommendation	Status	Open / Closed
13	Ceiling panels deteriorated above Boiler Nos. 2 and 3— See Figure 1 (Appendix B)	May 2017	C	Replace deteriorated ceiling tiles and conduct painting preservation measures	Status Unchanged	Open
14	Pebble Lime Warning Sign deteriorated on SDA No. 3 Entrance Door — See Figure 2 (Appendix B)	May 2017	A	Replace sign	Status Unchanged	Open
15	Fence falling over near Citizen's Drop Roll-Off — See Figure 3 (Appendix B)	May 2017	C	Re-align and secure fence	Status Unchanged	Open
16	Siding on north and east side of Facility dirty — See Figure 4 (Appendix B)	May 2017	C	Pressure Wash Siding	Status Unchanged	Open
17	Viewport glass cracked on Boiler No. 3 Barn Door — See Figure 5 (Appendix B)	May 2017	A	Replace viewport glass	Status Unchanged	Open

## 4.0 Facility Performance

Monthly operating data provided by CAAI indicates that 93,024 tons of MSW were processed during Q4FY17, and a total of 94,315 tons of MSW including 4,842 tons of Special Handling Waste were received. Total ash production during the quarter was 18,451 tons, which represents 19.8% of the waste processed by weight. The average uncorrected steam production rate for Q4FY17 was 3.04  $\text{ton}_{\text{steam}}/\text{ton}_{\text{waste}}$ , which is higher (1.8%) than the corresponding quarter in FY16. The increase in this metric is attributable to the 1.4% increase in the average waste heating value (HHV) calculated by CAAI.

On an annual basis, 349,516 tons of MSW were processed during FY17, and a total of 348,616 tons of MSW and 13,411 tons of Special Handling Waste were received. Total ash production during FY17 was 71,208 tons, which represents 20.4% of the waste processed. The average uncorrected steam production rate for FY17 was 3.0  $\text{ton}_{\text{steam}}/\text{ton}_{\text{waste}}$ , and slightly higher (0.2%) than the corresponding period last year. The slight increase in this metric is attributable to the increase (1.8%) in the calculated average waste heating value that was experienced in FY17, as compared to FY16.

**Chart 1: Tons of Waste Processed**

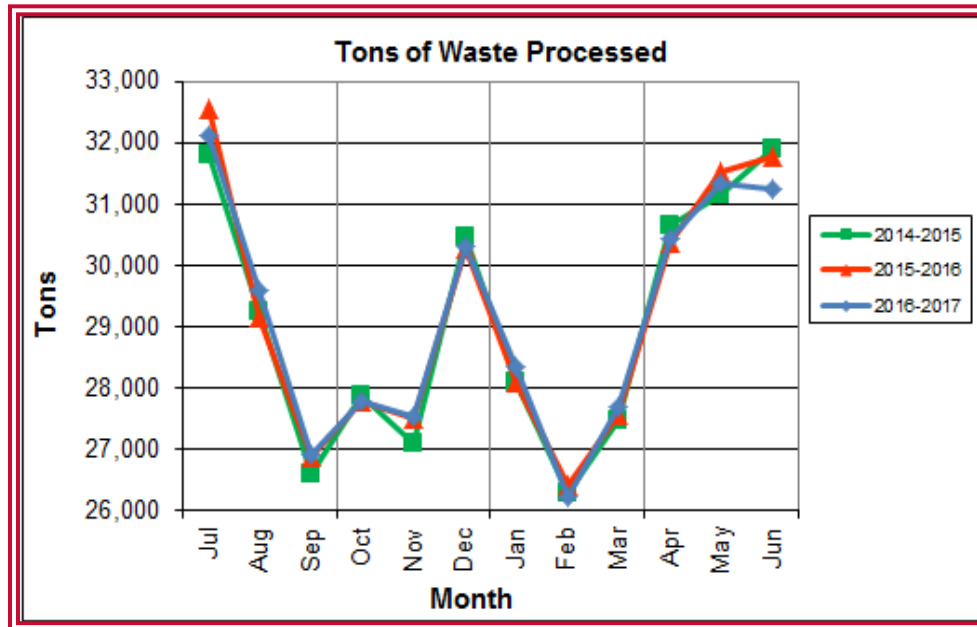


Chart 1 illustrates that Q4FY17 waste processed was slightly lower (0.7%) than the corresponding quarter, Q4FY16.

CAAI reported that 457 tipping floor/MSW internal inspections were conducted during the quarter and 10 notices of violation (NOVs) were issued to haulers for the following issues:

- April 2017 – Nine (9) NOVs were issued for:
  - Two (2) NOVs for trash on trucks
  - One (1) NOV for excessive metal in the load
  - One (1) NOV for jumping in line
  - Five (5) for blocking intersection to Tipping Floor
- May 2017 – No NOVs issued
- June 2017 – One (1) NOV issued for excessive metal in the load

**Chart 2: Tons of Ash Produced per Ton of Waste Processed**

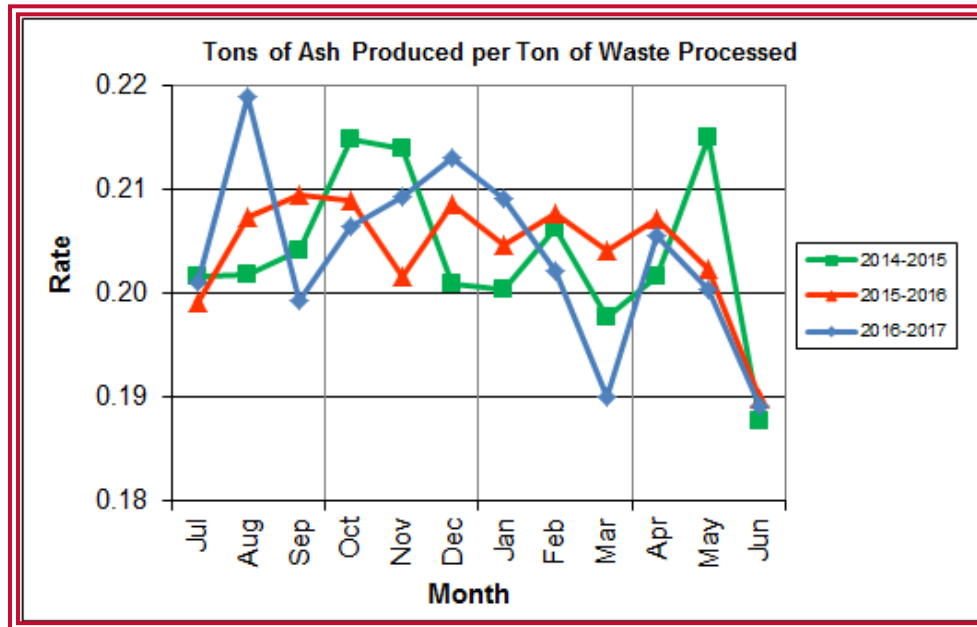


Chart 2 illustrates that the average ash production rate in Q4FY17 was slightly lower (0.2%) at 19.8% of processed waste, compared to the corresponding quarter in FY16 when the rate was 20.0%.

The annual ash production rate for FY17 was identical to FY16 at 20.4%. This result compares very favorably with industry averages which are generally in the range of 25-28%.

**Chart 3: Ferrous Recovery Rate**

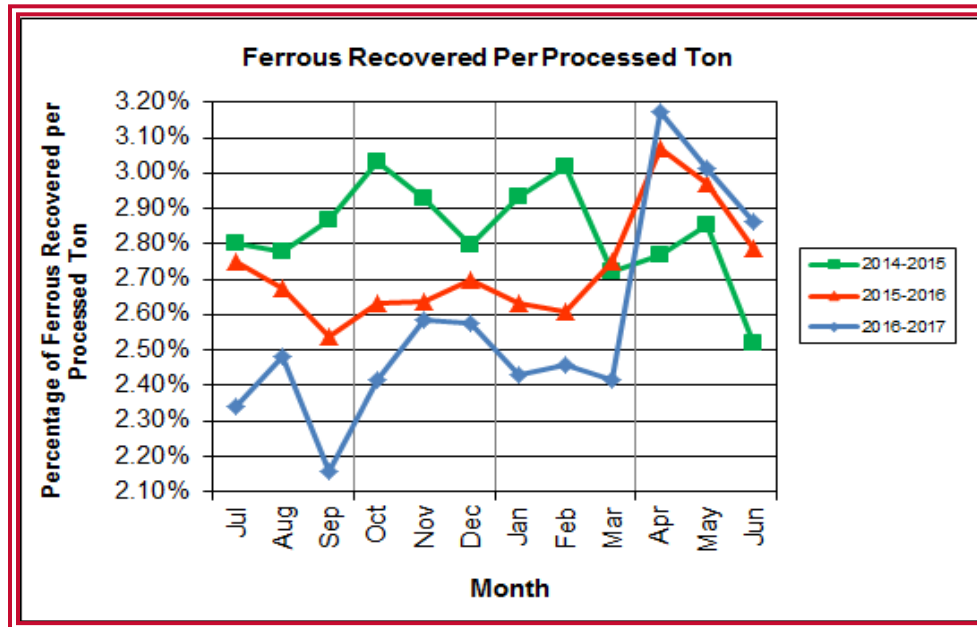
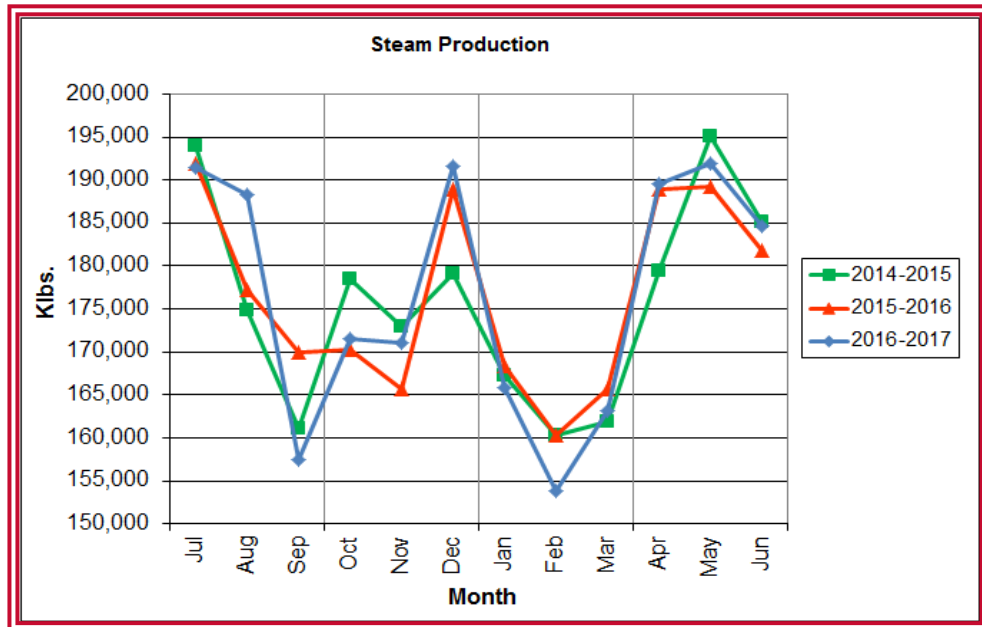


Chart 3 depicts the monthly ferrous metal recovery rate as a percentage of processed MSW tonnage. In Q4FY17, 2,805 tons of ferrous metals were recovered, which is 1.9% higher than the corresponding quarter in FY16 and equivalent to 3.0% of processed waste.

In FY17, 9,036 tons of ferrous metals were recovered, which is 5.6% lower than FY16 and equivalent to 2.6% of processed waste. CAAI attributes the significant decline to an increase in recycling rates resulting in less metal in the MSW. CAAI indicated that in late March 2017, it made adjustments to the length of the main pan to decrease the gap between the pan and the ferrous magnet. The adjustments to the pan resulted in an increased trend in ferrous recovery for the last quarter of FY17.

**Chart 4: Steam Production**



In Chart 4, the total steam production for Q4FY17 was 566,152 klbs., and higher (1.1%) than the corresponding quarter in FY16. The increase in steam generation is attributable to the increase (1.4%) in waste heating value, offset by more boiler downtime (14.4 additional hours).

Annual steam production for FY17 was 2,120,115 klbs., or 0.1% higher than FY16 which produced 2,118,125 klbs. The increase in steam generation was attributable to the increase (1.8%) in the calculated average waste heating value, offset by more (117.3 additional, hours) scheduled, unscheduled, and standby downtime experienced by the boilers.

**Chart 5: 12-Month Rolling Steam Production**

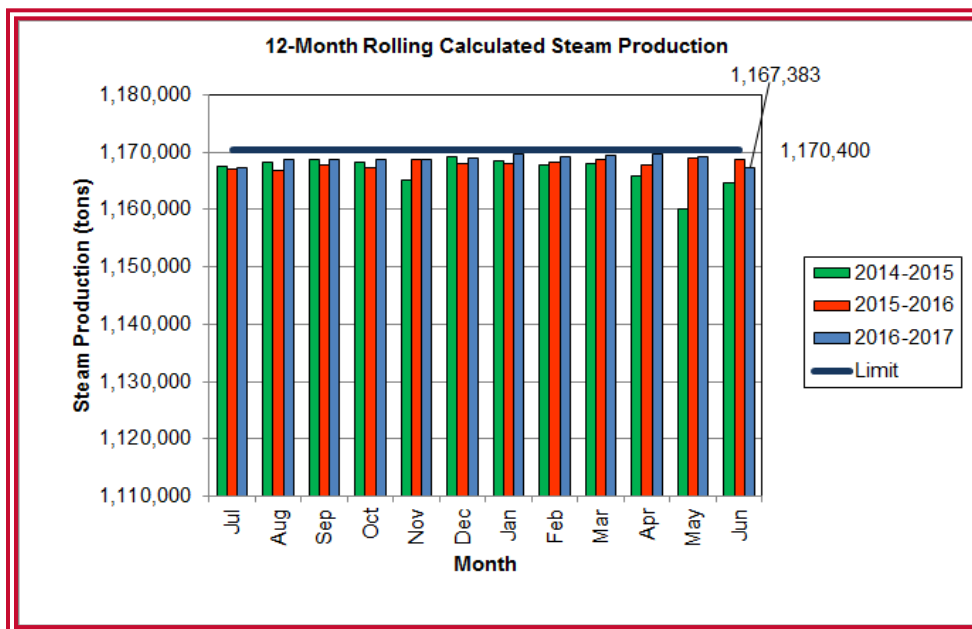
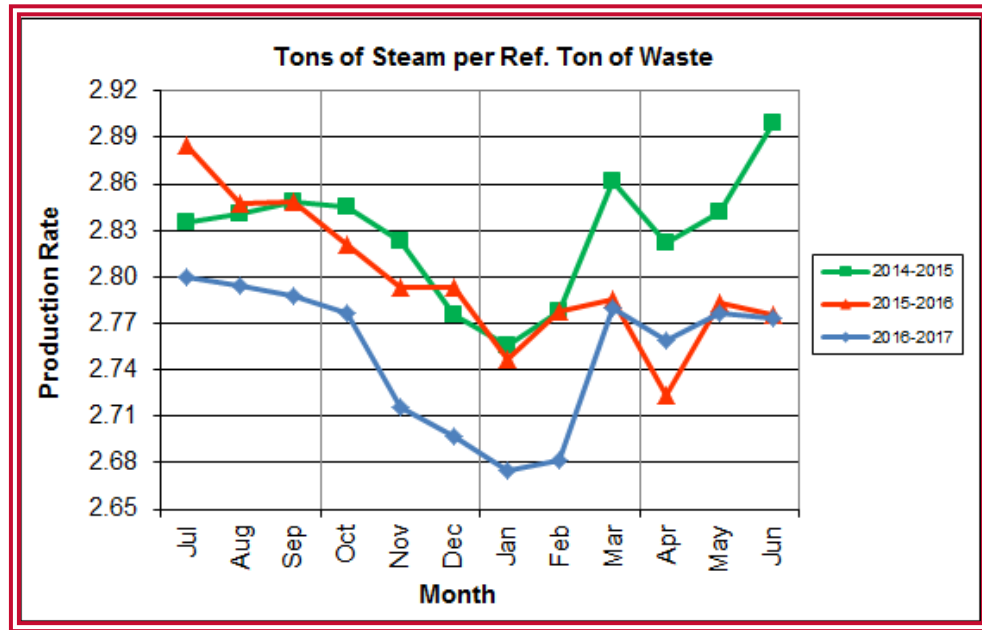


Chart 5 depicts the 12-month rolling steam production total for the period ending in June 2017. According to the Title V permit, the annual steam production for the Facility shall not exceed 1,170,400 tons on the basis of an average value of 3.34 lbs of steam per lb of MSW processed, calculated monthly as the sum of each consecutive 12 month period. The Facility was in compliance with the 12-month rolling steam production total every month in FY17. The 12-month rolling total for steam production ending in June 2017 was 1,167,383 tons which is 99.7% of the limit. Chart 5 clearly shows that Facility throughput, and in turn, steam and electricity production are being throttled to stay ever so slightly below the steam production limit nearly every month.



**Chart 6: Steam Production Rate**



In Chart 6, the conversion of raw waste tonnages into “reference tons” is another way of analyzing steam production, and helps to determine whether changes are related to boiler performance or to fuel issues. “Reference tons” are adjusted to account for the calculated average fuel heating value, so that lower Btu fuel raw tonnages are adjusted upwards and vice versa. In Q4FY17, this metric tracked slightly higher (0.3%) at 2.77 tons<sub>steam/ton<sub>ref.</sub></sub>, compared to the corresponding quarter in FY16. This trend shows a very slight improvement of boiler performance compared to the prior three (3) quarters in FY17, but still significantly lower than two (2) years ago.

The annual steam production rate for FY17 was 2.75 tons<sub>steam/ton<sub>ref.</sub></sub>, which is lower (1.6%) than FY16. This chart shows that for the last first eight (8) months of FY17, a downtrend was experienced in the normalized steam production rate compared to the same period during the prior two (2) years. Although an improvement was experienced during Q4FY17, this trend should continue to be monitored to determine if it is indicative of poorer boiler performance, an aberration during scheduled outage periods, or some other currently unexplained cause.

**Chart 7: Calculated Waste Heating Value**

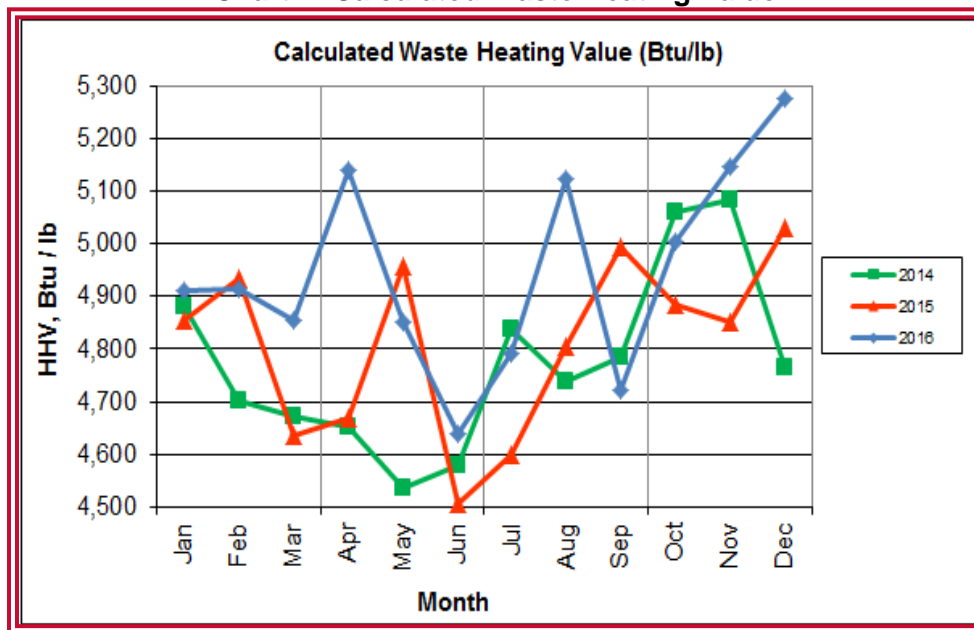


Chart 7 illustrates that Q4FY17 calculated average waste heating value was higher (1.4%) at 4,946 Btu/lb than the corresponding quarter Q4FY16, which averaged 4,877 Btu/lb.

In FY17, the annual average waste heating value was higher (1.8%) at 4,959 Btu/lb than FY16, which averaged 4,873 Btu/lb. Note that the FY17 annual average heating value of 4,959 Btu/lb is 10.2% higher than the facility design value of 4,500 Btu/lb. This disparity in average heating value of the fuel compared to the original design value established in the 1980's is one of the reasons that the annual capacity utilization is in excess of 100% and considerably higher than similar facilities that generally operate in the 90% range (see Section 2.0).

**Table 2: Quarterly Performance Summaries**

Month		Waste Processed (tons)	Waste Diverted (tons)	Ash Shipped (tons)	Special Handling (Supplemental) (tons)	Ferrous Recovered (tons)	Steam Produced (klbs)	Net Electrical Generation (MWhr)
Q4FY15	Quarterly Totals	93,695	0	18,870	1,842	2,541	559,721	36,175
	April -15	30,646	0	6,182	613	848	179,434	12,784
	May -15	31,160	0	6,701	531	889	195,150	11,786
	June - 15	31,889	0	5,987	698	804	185,137	11,605
Q4FY16	Quarterly Totals	93,652	0	18,703	2,262	2,753	559,883	40,207
	April -16	30,356	0	6,289	996	932	188,882	13,853
	May -16	31,530	0	6,380	605	936	189,239	13,541
	June – 16	31,766	0	6,034	661	885	181,762	12,813
Q4FY17	Quarterly Totals	93,024	0	18,451	4,842	2,805	566,152	40,625
	April -17	30,423	0	6,255	1,420	966	189,608	13,778
	May -17	31,350	0	6,285	1,705	945	191,859	13,849
	June - 17	31,251	0	5,911	1,717	894	184,685	12,998
FY17 Totals		349,516	0	71,208	13,411	9,036	2,120,115	150,935
FY16 Totals		349,881	0	71,401	8,567	9,571	2,118,125	148,529
FY15 Totals		348,686	0	71,019	5,413	9,864	2,109,442	145,085

Table 2 presents the production data provided to HDR by CAAI for Q4FY17 on both a monthly and quarterly basis. For purposes of comparison, data for Q4FY15 and Q4FY16 are also shown, as well as FY15, FY16 and FY17 totals.

In comparing quarterly totals, the data shows:

- Less waste was processed in Q4FY17 than Q4FY16 and Q4FY15
- More steam was generated in Q4FY17 than Q4FY16 and Q4FY15
- More electricity was generated in Q4FY17 than Q4FY16 and Q4FY15
- Significantly more supplemental waste was received in Q4FY17 than Q4FY16 and Q4FY15.

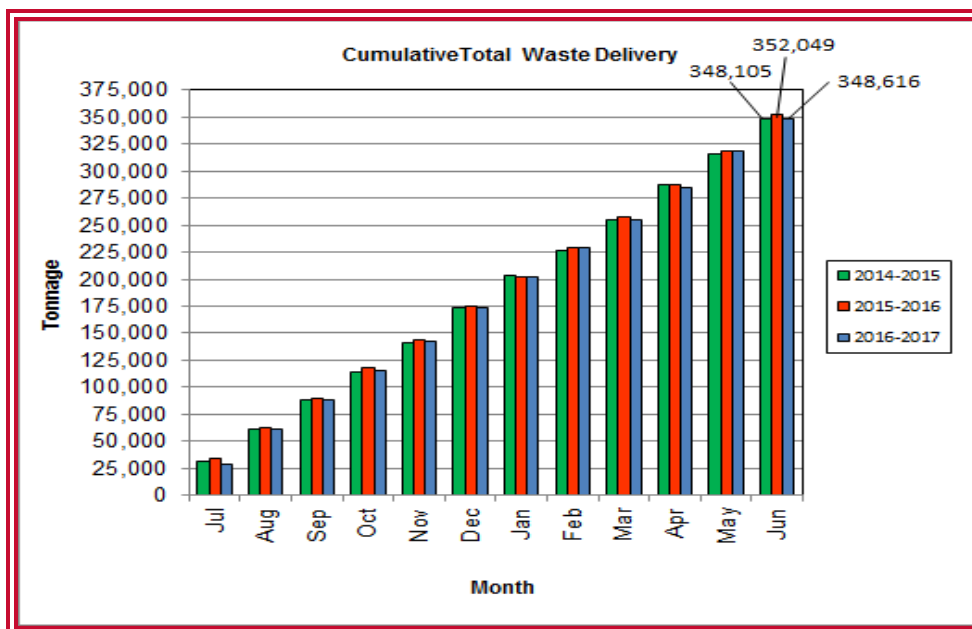
Please note that the total steam generation figures presented in Table 2 do not correlate with the annual steam production limit from the Facility Permit; such limits apply on a rolling average monthly basis, and not a fiscal year basis. It is also worth noting that the quantity of waste processed during Q4FY17 continues to be limited by the steam production permit restrictions (refer to Chart 5).

**Table 3: Waste Delivery Classification**

		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Totals</u>	<u>% of Total</u>
FY13	Jurisdiction Waste	19,413	18,357	16,632	17,625	18,838	16,195	-	-	-	-	-	-	107,058	30.76%
	Spot Waste tons	10,516	11,326	10,610	10,317	9,330	9,558	-	-	-	-	-	-	61,656	17.72%
	City Waste	-	-	-	-	-	-	1,683 <sup>(1)</sup>	1,287	1,444	2,382	2,286	1,919	11,000	3.16%
	County Waste	-	-	-	-	-	-	2,442 <sup>(1)</sup>	2,100	2,372	3,381	3,932	3,309	17,536	5.04%
	Municipal Solid Waste	-	-	-	-	-	-	25,019 <sup>(1)</sup>	23,637	21,661	27,066	25,794	24,930	148,107	42.56%
	Supplemental Waste	151	11	80	25	234	405	363	365	76	403	281	271	2,665	0.77%
	MSW Totals	29,928	29,683	27,241	27,942	28,167	25,753	29,507	27,388	25,552	33,231	32,293	30,429	348,022	100.00%
		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Totals</u>	<u>% of Total</u>
FY14	City Waste	2,065	1,693	1,702	1,924	1,566	1,780	1,529	1,231	1,556	2,256	2,203	1,883	21,389	6.11%
	County Waste	3,459	3,079	2,784	3,091	2,707	2,802	2,568	1,957	2,272	3,326	3,987	3,387	35,419	10.12%
	Municipal Solid Waste	26,167	23,604	22,034	23,354	21,879	25,531	23,869	22,523	23,198	25,414	27,206	24,812	289,590	82.75%
	Supplemental Waste	546	676	248	410	188	268	275	192	231	253	151	110	3,548	1.01%
	MSW Totals	32,237	29,053	26,768	28,779	26,340	30,380	28,241	25,903	27,256	31,249	33,546	30,193	349,946	100.00%
		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Totals</u>	<u>% of Total</u>
FY15	City Waste	1,814	1,497	1,699	1,737	1,518	1,770	1,411	1,209	1,648	2,155	2,059	2,045	20,562	5.91%
	County Waste	3,297	2,868	2,973	3,095	2,508	2,852	2,358	1,833	2,411	3,269	3,652	3,572	34,687	9.96%
	Municipal Solid Waste	26,661	24,466	21,887	21,241	21,678	27,906	24,611	20,915	24,094	25,189	23,126	25,667	287,442	82.57%
	Supplemental Waste	141	275	329	521	764	529	389	351	272	613	531	698	5,413	1.55%
	MSW Totals	31,913	29,106	26,888	26,595	26,468	33,057	28,769	24,308	28,424	31,225	29,369	31,982	348,105	100.00%
		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Totals</u>	<u>% of Total</u>
FY16	City Waste	1,960	1,563	1,723	1,645	1,685	1,872	1,147	1,619	1,811	2,024	1,950	2,220	21,219	6.03%
	County Waste	3,627	2,880	2,832	2,869	2,682	2,891	2,025	2,389	2,694	2,406	2,508	2,661	32,465	9.22%
	Municipal Solid Waste	27,933	22,999	22,552	22,850	20,679	26,138	22,632	22,781	22,935	24,388	26,561	27,355	289,801	82.32%
	Supplemental Waste	676	427	771	684	676	787	642	850	792	996	605	661	8,565	2.43%
	MSW Totals	34,196	27,869	27,878	28,047	25,722	31,687	26,446	27,639	28,232	29,814	31,623	32,896	352,049	100.00%
		<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Totals</u>	<u>% of Total</u>
FY17	City Waste	1,678	1,836	1,668	1,722	1,817	1,708	1,597	1,452	1,604	1,882	2,170	2,002	21,136	6.06%
	County Waste	2,386	2,469	2,370	2,184	2,321	2,289	2,287	2,016	2,517	2,371	2,877	2,889	28,976	8.31%
	Municipal Solid Waste	24,862	26,976	22,760	22,110	21,598	25,996	24,218	20,888	20,401	25,004	26,143	24,135	285,091	81.78%
	Supplemental Waste	504	642	734	926	941	1,036	1,083	1,413	1,291	1,420	1,705	1,717	13,412	3.85%
	MSW Totals	29,430	31,922	27,532	26,941	26,677	31,030	29,185	25,769	25,814	30,677	32,895	30,743	348,615	100.00%

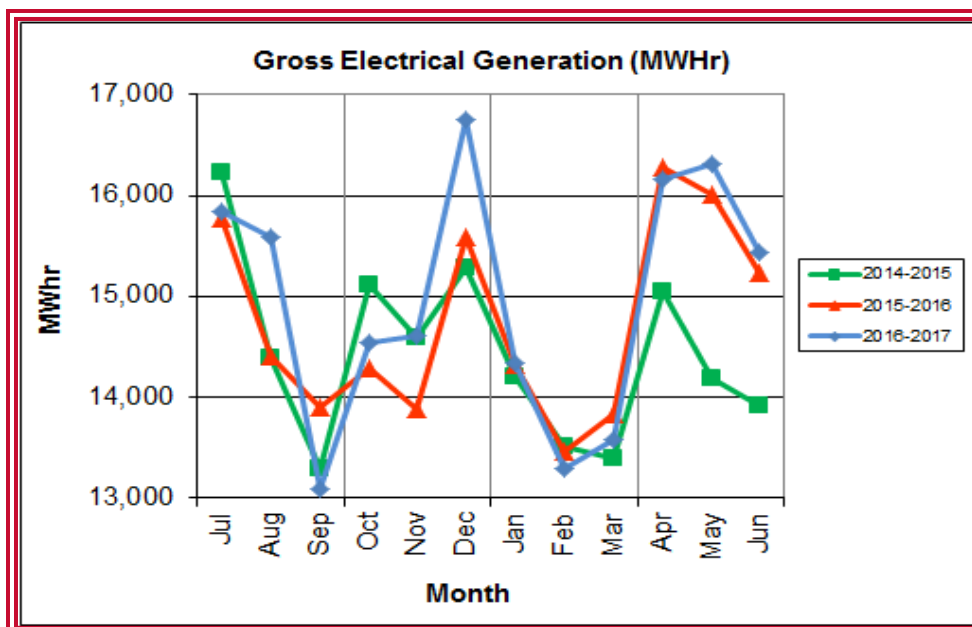
Note (1): Beginning January 2013, the method in which waste was classified was modified as compared to prior periods due to change in contractual obligations and plant ownership

**Chart 8: Cumulative Total Waste Delivery**



As depicted in Table 3 and Chart 8, for the quarter ending in March 2017; cumulative total waste delivery was 1.0% less compared to the same period in FY16.

**Chart 9: Gross Electrical Generation**

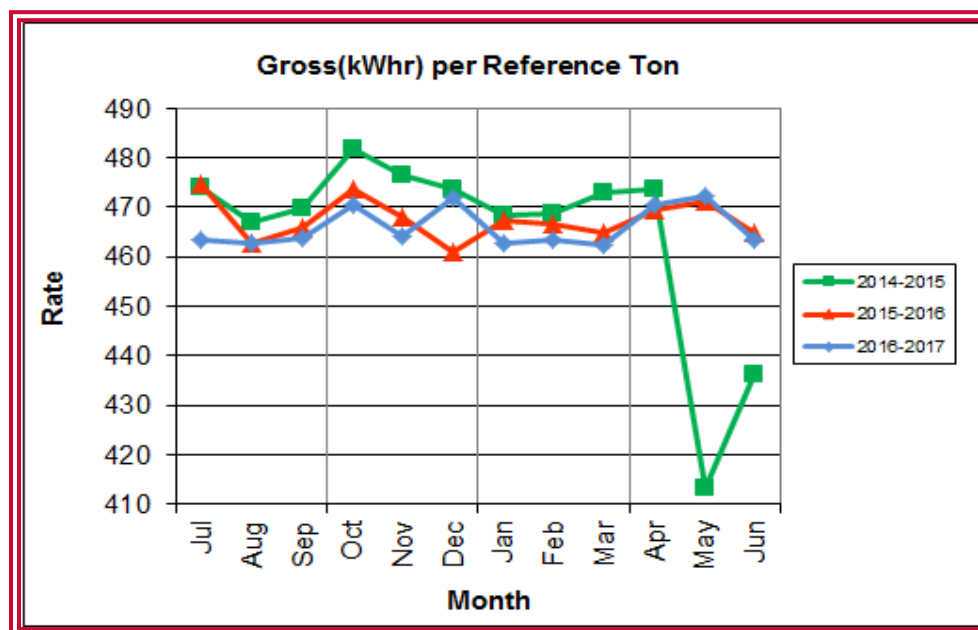


During Q4FY17, the Facility generated 47,923 MWhrs (gross) of electricity compared to Q4FY16 generation of 47,521 MWhrs (gross), a 0.9% increase.

The increase in electricity generated (gross) in Q4FY17, is attributable to higher steam production, offset by slightly more downtime (0.6 additional hours) experienced by the turbine generators. Note that the sharp spikes depicted in Chart Nos. 10 through 14 for the months of May and June 2015 are a result of significant downtime (424.7 hours) experienced by Turbine Generator No. 1 to repair an exciter failure.

During FY17, the Facility generated 179,556 MWhrs (gross) of electricity compared to the FY16 generation of 176,967, a 1.5% increase. The increase in gross electrical generation in FY17 as compared to FY16 is attributable to the increase in steam production, offset by more (173.0 additional hours) scheduled, unscheduled, and standby downtime experienced by the turbine generators. Also note that 2016 was a Leap Year and as such had an additional day of operations, when compared to the FY17. This slightly biases negatively processed tonnage, steam production, and electrical generation when comparing FY17 to FY16.

**Chart 10: Gross Conversion Rate**



As shown in Chart 10, the average gross electrical generation per reference ton of refuse processed during Q4FY17 was 469 kWhr, which is identical to the

corresponding quarter in FY16. Since this calculated value uses reference or normalized tonnages of waste, it should cancel the effect of MSW heating value (Btu content) variability.

During FY17, the average gross electrical generation per reference ton of refuse processed was 466 kWhr, which is slightly lower (0.3%) than FY16.

**Chart 11: Net Conversion Rate**

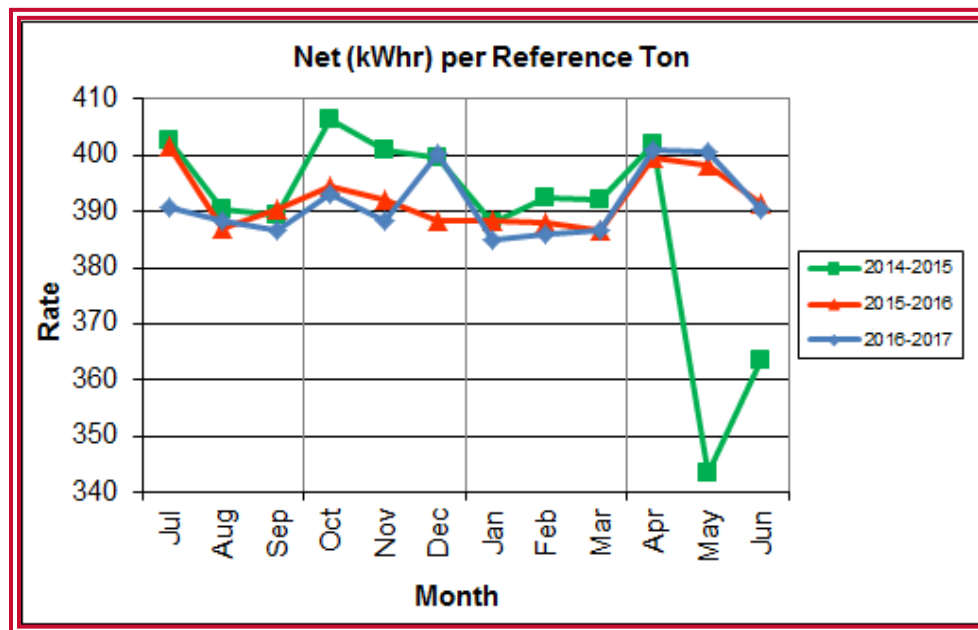


Chart 11 depicts the normalized net power (gross minus in-house usage) generation history. In Q4FY17, the average net electrical generation per reference ton was 397 kWhr, which is 0.3% higher than the corresponding quarter in FY16.

In FY17, the average net electrical generation per reference ton was 391 kWhr, which is 0.2% lower than FY16.

Chart 12: Net Conversion Rate

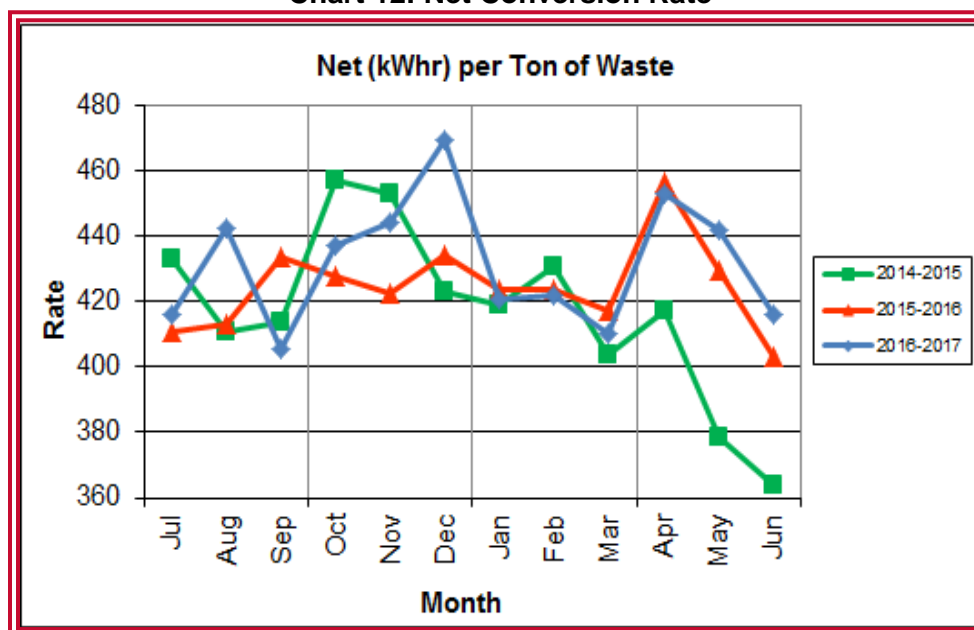
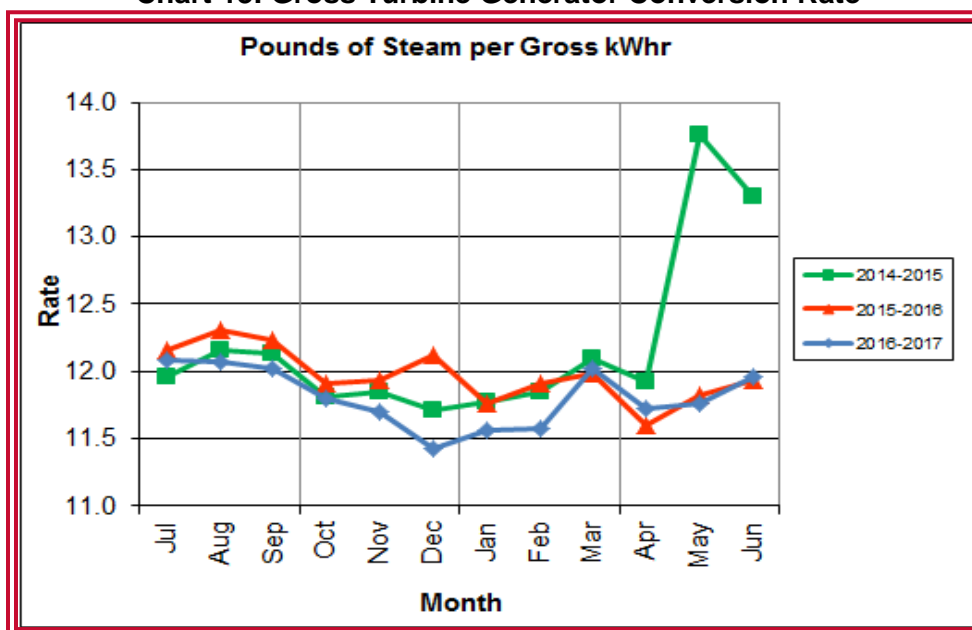


Chart 12 depicts the net power generation per processed ton. The net electrical generation per processed ton in Q4FY17 was 437 kWhr, which is 1.7% higher than the corresponding quarter in FY16, is attributable to higher steam production, offset by slightly more downtime (0.6 additional hours) experienced by the turbine generators.

In FY17, the net electrical generation per processed ton was 432 kWhr which is 1.6% higher than FY16. The increase is attributable to the increase in steam production, offset by more (173.0 additional hours) scheduled, unscheduled, and standby downtime experienced by the turbine generators.



**Chart 13: Gross Turbine Generator Conversion Rate**

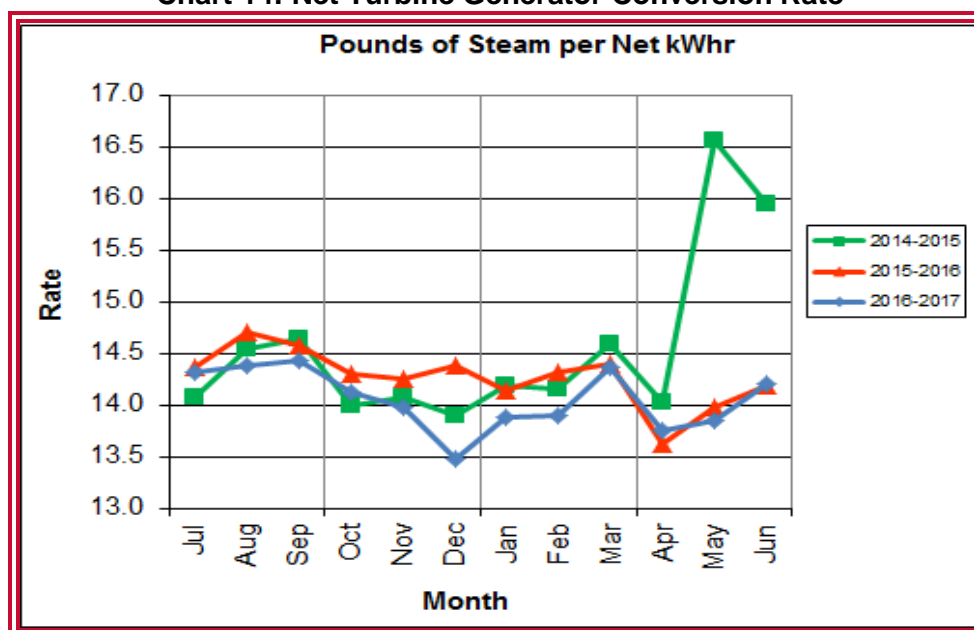


Charts 13 and 14 illustrate the quantities of steam required to generate one (1) kWhr of electricity, gross and net respectively. This measure is a turbine generator performance indicator, where lower steam rates indicate superior performance. For simplification, this calculated rate is based on the average for the two turbine generators. In Q4FY17 the average lbs of steam consumed per gross kWhr generated was 11.8, which is 0.3% higher (less efficient) than the corresponding quarter Q4FY16. A factor that negatively impacts this metric is Turbine Generator No. 2, which continues to operate with its Stage 9 blades removed from the rotor. CAAI reported that during the Turbine Generator No. 2 overhaul in November 2013, some cracking was observed on the Stage 9 blades of the rotor, and the blading in that row was removed as a precautionary measure. CAAI originally indicated that a new set of blades would be manufactured and installed during a Turbine Generator No. 2 Outage in 2016, but advised in May 2015, that the implementation of the replacement blades installation would be delayed, and did not provide a date for repair. The average lbs of steam consumed per net kWhr was 13.9, which is 0.1% higher (declined) than the corresponding quarter in FY16. The average steam temperature during the quarter was 691.3° F, which is 0.1% higher than the average steam

temperature of the corresponding quarter last fiscal year and 8.7° F lower than design temperature of 700° F.

In FY17, the average lbs of steam consumed per gross kWhr was 11.8, which is 1.4% lower than the rate in FY16, noting that for this metric, lower steam consumption represents improved performance. The average lbs of steam consumed per net kWhr in FY17 was 14.1, which is 1.5% lower than the rate in FY16. The average steam temperature for FY17 was 686.4° F, which is slightly higher (0.9%) than the steam temperature in FY16 and 13.6 F lower than the design temperature of 700° F.

**Chart 14: Net Turbine Generator Conversion Rate**



## 4.1 Utility and Reagent Consumptions

**Table 4: Facility Utility and Reagent Consumptions**

Utility	Units	Q4FY17 Total	Q4FY16 Total	Q4FY17"Per Processed Ton" Consumption	Q4FY16"Per Processed Ton" Consumption	FY17 Total	FY16 Total
Purchased Power	MWhr	6,191	5,651	0.07	0.06	22,906	22,242
Fuel Oil	Gal.	13,440	11,590	0.14	0.12	58,890	41,110
Boiler Make-up	Gal.	1,234,000	1,794,000	13.27	19.16	6,257,000	7,813,000
Cooling Tower Make-up	Gal.	42,298,090	42,074,659	454.70	449.27	152,993,251	146,912,669
Pebble Lime	Lbs.	1,324,000	1,344,000	14.23	14.35	5,042,000	5,378,000
Ammonia	Lbs.	191,000	183,000	2.05	1.95	710,000	663,000
Carbon	Lbs.	94,000	98,000	1.01	1.05	374,000	404,000
Dolomitic Lime	Lbs.	290,000	138,000	3.12	1.47	784,000	701,800

Fuel oil usage during the quarter represents approximately 0.22% of the total heat input to the boilers, which compares favorably with industry averages, and slightly higher than the percentage of heat input in Q4FY16 which was 0.19%. Fuel oil is used to stabilize combustion of wet fuel, as well as during start-up and shut-down of the boilers for maintenance. Boiler makeup water usage during the quarter represents 1.8% of steam flow, which is slightly lower than the boiler makeup in Q4FY16 which was 2.7%, and is acceptable. Pebble lime usage, at 1,324,000 lbs. is lower (1.5%) than the corresponding quarter last year, and the quarterly consumption rate of 14.2 lbs/ton is below historical levels (16-18 lbs/ton).

In comparing Q4FY17 to Q4FY16 on a per processed ton consumption basis:

- the purchased power consumption rate was 10.3% higher
- the total fuel oil consumption rate was 16.7% higher
- the boiler make-up water consumption rate was 30.8% lower
- the cooling tower make-up water consumption rate was 1.2% higher
- the total pebble lime consumption rate was 0.8% lower
- the ammonia consumption rate was 5.1% higher
- the carbon consumption rate was 3.4% lower
- the total dolomitic lime consumption rate was 111.6% higher

CAAI reports that the significant increase in dolomitic lime usage during the quarter, when compared to the corresponding quarter last year, is attributable to a dolomitic lime silo level detector malfunction experienced from June 25, 2015 through July 9, 2015. As a result of this malfunction, CAAI stated that delivery totals were utilized as usage totals during those months last fiscal year.

## **4.2 Safety & Environmental Training**

The Facility experienced no OSHA recordable accidents during the quarter and has operated 284 days without an OSHA recordable accident. During the quarter, Safety and Environmental training was conducted with themes as follows:

### **April 2017**

- Safety:
  - Blood Borne Pathogens
  - Hearing Conservation
  - Barricades and Flagging
- Environmental:
  - Reagent Optimization

### **May 2017**

- Safety:
  - Walking, Working Surfaces, and Fall Protection
  - Fall Protection Equipment and Inspection
  - Portable Ladder Safety
  - Fall Hazards
  - Inspections and Assessments
- Environmental:
  - Annual Review of the Environmental Compliance Operating Manual (ECOM)
  - Exercise on procedure if an unknown chemical is delivered in the waste stream
  - Environmental Awareness and the 3 R's (Recognize, Report, Respond)

### **June 2017**

- Safety:
  - Emergency Action Plan
  - Fire Safety Equipment and Fire Extinguisher Training
  - Heat Stress
  - How to Handle Facility Intruder
- Environmental:
  - Solid Waste Deliveries
  - Environmental Inspections

## 5.0 Facility Maintenance

Throughout the quarter, significant routine and preventative maintenance was performed. HDR considers that the Facility is implementing an effective maintenance regimen, and is performing routine and preventative maintenance, along with selected equipment replacements in a timely manner. CAAI monthly maintenance reports provide a detailed account of maintenance performed.

Beginning June 21, 2017 Boiler No. 2 experienced 17.8 hours of downtime, for a scheduled cleaning outage. In addition to the scheduled cleaning outage, CAAI reports that 852 preventative maintenance actions were completed during the quarter.

### 5.1 Availability

Facility availabilities for Q4FY17 are shown in Table 5. According to CAAI reports, the average unit availabilities for Boiler Nos. 1, 2, and 3 for Q4FY17 were 98.6%, 98.2%, and 100.0%, respectively. The three-boiler average availability during the quarter was 98.9%, which is excellent and comparable to that of mature, well run waste to energy facilities.

During Q4FY17, the average availability for Turbine Generator Nos. 1 and 2 was 100.0%, which is excellent.

Overall boiler availability for FY17 was 96.2%, and overall turbine generator availability was 99.5%. Overall availabilities for the boilers are highly acceptable and above industry averages, noting that these reported availability metrics exclude standby time experienced during the fiscal year which amounted to 315.9 hours for the boilers and 631.9 hours for the turbine generators.

**Table 5: Quarterly Facility Unit Availabilities**

<b>Availability</b>	<b>Q1FY17 Average</b>	<b>Q2FY17 Average</b>	<b>Q3FY17 Average</b>	<b>Q4FY17 Average</b>	<b>FY17 Average</b>
Boiler No. 1	97.7%	97.9%	91.4%	98.6%	96.4%
Boiler No. 2	94.6%	99.6%	90.9%	98.2%	95.9%
Boiler No. 3	98.7%	94.3%	92.8%	100.0%	96.5%
<b>Avg.</b>	<b>97.0%</b>	<b>97.3%</b>	<b>91.7%</b>	<b>98.9%</b>	<b>96.2%</b>
Turbine No. 1	100.0%	100.0%	97.3%	100.0%	99.3%
Turbine No. 2	100.0%	100.0%	98.9%	100.0%	99.7%
<b>Avg.</b>	<b>100.0%</b>	<b>100.0%</b>	<b>98.1%</b>	<b>100.0%</b>	<b>99.5%</b>

## 5.2 Downtime Summary

**Table 6: Boiler Downtime – Q4FY17**

Boiler Number	Outage Begin Date	Outage End Date	Hours Unavailable	Downtime Classification	Reason Unavailable
2	5/18/17	5/18/17	21.0	Unscheduled	Tube leak repairs
1	5/21/17	5/21/17	3.3	Unscheduled	Feeder repairs
1	5/28/17	5/29/17	16.0	Unscheduled	Grate bar repairs
1	6/6/17	6/6/17	11.8	Unscheduled	Under Fire Air Fan failure
2	6/21/17	6/21/17	17.8	Scheduled	Scheduled boiler cleaning
<b>Total Unscheduled Downtime</b>			<b>52.1 Hours</b>		
<b>Total Scheduled Downtime</b>			<b>17.8 Hours</b>		
<b>Total Standby Downtime</b>			<b>0.0 Hours</b>		
<b>Total Downtime</b>			<b>69.9 Hours</b>		

**Table 7: Turbine Generator Downtime – Q4FY17**

Turbine Generator Number	Outage Begin Date	Outage End Date	Hours Unavailable	Downtime Classification	Reason Unavailable
1	6/21/17	6/21/17	7.3	Standby	Scheduled Boiler No. 2 Cleaning
<b>Total Unscheduled Downtime</b>			<b>0.0 Hours</b>		
<b>Total Scheduled Downtime0</b>			<b>0.0 Hours</b>		
<b>Total Standby Downtime</b>			<b>7.3 Hours</b>		
<b>Total Downtime</b>			<b>7.3 Hours</b>		

### 5.3 Facility Housekeeping

CAAI is performing Facility housekeeping and maintaining plant cleanliness in accordance with acceptable industry practices. A site inspection was conducted in May 2017. At the time of the inspection, new deficiencies were recorded and prior deficiencies were given a status update. Photos of interest from the inspection are depicted in Appendix B. The Facility housekeeping ratings from the May 2017 inspection are presented in Table 8.

**Table 8: Facility Housekeeping Ratings – May 2017**

Facility Area	Acceptable	Needs Improvement	Unacceptable
Tipping Floor	√		
Citizen's Drop-off Area	√		
Tipping Floor Truck Exit	√		
Front Parking Lot	√		
Rear Parking Lot	√		
Boiler House Pump Room	√		
Lime Slurry Pump Room	√		
Switchgear Area	√		
Ash Load-out Area	√		
Vibrating Conveyor Area	√		
Ash Discharger Area	√		
Cooling Tower Area	√		
Truck Scale Area	√		
SDA/FF Conveyor Area	√		
SDA Penthouses	√		
Lime Preparation Area	√		
Boiler Drum Levels	√		
Turbine Room	√		
Electrical Room	√		



## 6.0 Environmental

The air pollution control equipment maintained emission concentrations well within the established regulations. Average Continuous Emission Monitoring System (CEMS) data collected for each monthly period during Q4FY17 are summarized in Appendix A. No permit deviations were reported by the Facility during Q4FY17. Note that as of June 30, 2017, the CAAI Facility has operated 1,296 days without an environmental excursion.

On August 8, 2014, CAAI sent a letter to the Virginia Department of Environmental Quality (VADEQ) requesting relief from the steam permit limit requirements in the Facility's Title V and PSD permits. These requested changes relate to the permit values established for the calculated steam-to-waste ratio, which has resulted in a reduction of MSW throughput. In recent discussions, CAAI indicated that it is re-evaluating options to the proposed permit changes, and will provide further updates on this issue.

### 6.1 Nitrogen Oxide Emissions

During Q4FY17, the monthly emission concentrations of nitrogen oxides (NO<sub>x</sub>) averaged 160.3 ppmdv, 159.0 ppmdv and 159.3 ppmdv for Boiler Nos. 1, 2, and 3, respectively. CAAI continues to operate the units at the lower (160 ppmdv) set-points, except immediately following a scheduled outage and associated boiler cleaning.

### 6.2 Sulfur Dioxide Emissions

During Q4FY17 the monthly emission concentration of stack sulfur dioxide (SO<sub>2</sub>) averaged 1.0 ppmdv, 0.3 ppmdv, and 0.3 ppmdv for Boiler Nos. 1, 2, and 3, respectively. All of these stack SO<sub>2</sub> concentrations are significantly below the permit limit of 29 ppmdv @ 7% O<sub>2</sub>.

### **6.3 Carbon Monoxide Emissions**

During Q4FY17, the average CO emission concentrations on Boiler Nos. 1, 2, and 3 were 35.3 ppm<sub>dv</sub>, 31.7 ppm<sub>dv</sub>, and 39.0 ppm<sub>dv</sub>, respectively, and all are well within permit limits (100 ppm<sub>dv</sub>, hourly average). However, as reported by HDR during the May 2016 FMG Meeting, and continuing through Q4FY17, CO averages have been trending higher over the past year of operations on all three boilers, and CAAI has been requested to investigate and mitigate this uptrend. While not a permit issue, it is indicative of poorer boiler performance and combustion efficiency.

### **6.4 Opacity**

During Q4FY17, the average opacity for Boiler Nos. 1, 2, and 3 was 0.3%, 1.3%, and 0.3% respectively. All of these averages are significantly below the 10% (6-minute) average permit limit.

### **6.5 Daily Emissions Data**

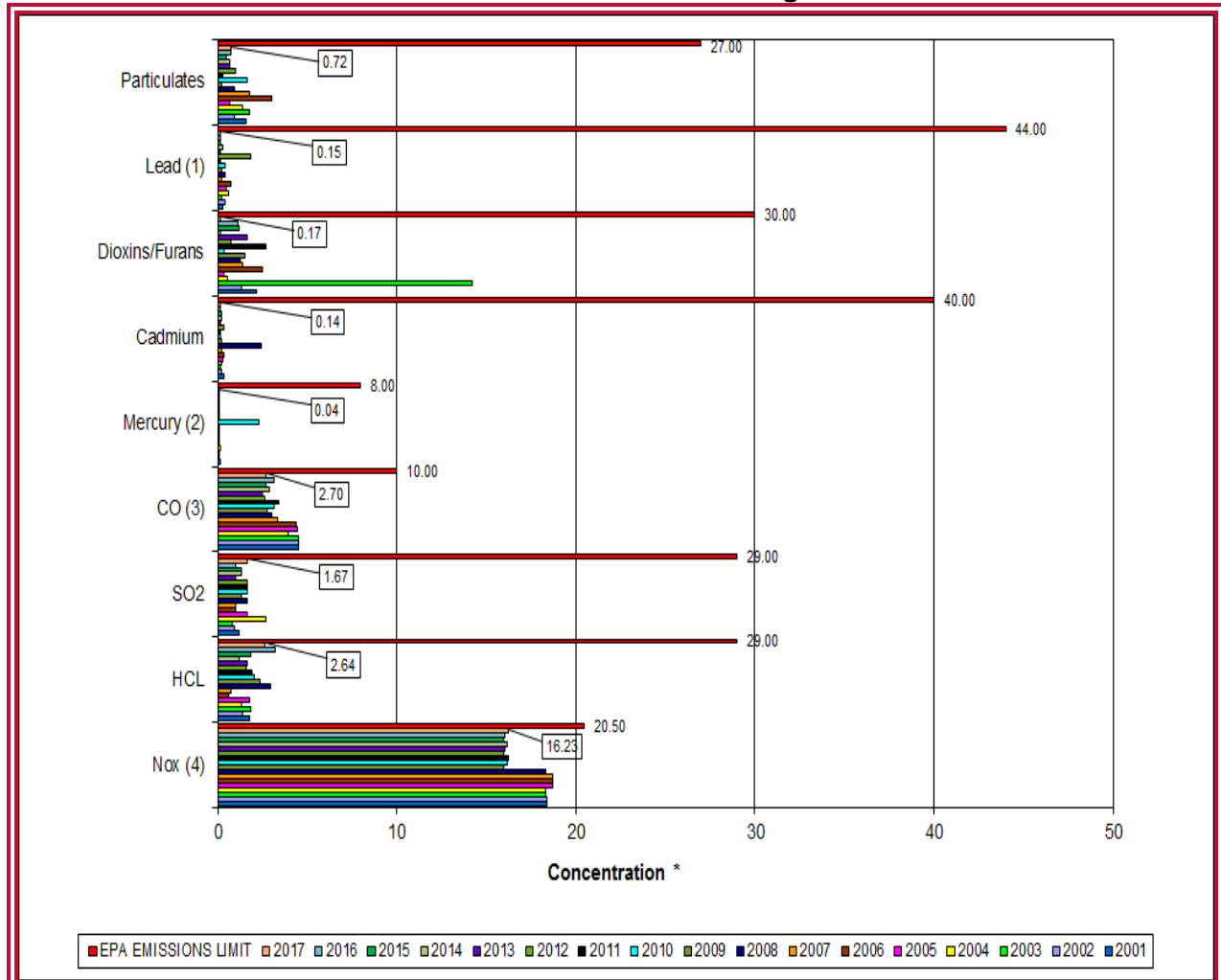
Appendix A, Tables 11, 12, and 13 tabulate the monthly average, maximum, and minimum emissions data for each unit during Q4FY17. Excursions, if any, would appear in bold print. It should be noted that these tabulations of monthly averages, reported here for informational purposes, are based on tabulations of daily averages. These averages do not correlate with official reports to the regulatory agencies because of differences in averaging times and other technical differences required by agency report formats.

### **6.6 2017 Annual Stack Testing**

Annual stack testing was conducted March 20th through March 22nd, 2017 by Testar Inc. Historical stack test data including 2017 results are summarized in Chart 15 and Table 9. The 2017 test results demonstrate compliance well within the permit limits for all parameters. In addition to the tests required by the Facility permit, additional tests for small particulate matter (PM < 2.5) were

conducted. While there are no current regulatory limits established for PM < 2.5, average results for 2017 were 0.003 Gr/DSCF (grains per dry standard cubic foot) corrected to 7% O<sub>2</sub>, compared to the 2016 Annual Stack Testing PM <2.5 Results which averaged 0.005 Gr/DSCF corrected to 7% O<sub>2</sub>.

**Chart 15: Stack Test Results through 2017**



Note (1): Lead emissions have been decreased by a factor of 10 for trending purposes

Note (2): Mercury emissions have been decreased by a factor of 10 for trending purposes

Note (3): CO emissions have been decreased by a factor of 10 for trending purposes

Note (4): NO<sub>x</sub> emissions have been decreased by a factor of 10 for trending purposes

Table 9: Stack Test Results through 2017

		NOx(4) (ppmdv)	HCL (ppmdv)	SO <sub>2</sub> (ppmdv)	CO(3) (ppmdv)	Mercury(2) (ug/dscm)	Cadmium (ug/dscm)	Dioxins/Furans (ng/dscm)	Lead(1) (ug/dscm)	Particulates (mg/dscm)	P.M. 2.5 (gr/dscf)
2007	Boiler 1	187	0.82	1	31	0.38	0.25		2.31	2.03	--
	Boiler 2	185	0.68	1	36	0.39	0.19	1.42	2.12	2.04	--
	Boiler 3	189	0.84	1	34	0.59	0.16		1.55	1.33	--
	AVERAGE	187.0	0.78	1.00	33.67	0.46	0.20	1.42	1.99	1.80	--
2008	Boiler 1	181	2.96	2	37	0.45	6.60	1.25	9.4	1.46	--
	Boiler 2	182	3.52	2	30	0.42	0.50		2.6	0.82	--
	Boiler 3	186	2.43	1	24	1.03	0.16		0.23	0.48	--
	AVERAGE	183.0	3.0	1.67	30.3	0.63	2.4	1.25	4.1	0.9	--
2009	Boiler 1	159	1.40	2	28	0.184	0.191		2.260	0.483	--
	Boiler 2	158	2.12	1	25	0.271	0.143		0.894	0.068	--
	Boiler 3	163	3.53	1	29	0.198	0.256	1.54	3.030	0.155	--
	AVERAGE	160	2.35	1.33	27.33	0.22	0.20	1.54	2.061	0.235	--
2010	Boiler 1	159	2.69	1	29	5.76	0.120		1.33	3.690	0.00410
	Boiler 2	158	0.67	1	28	29.50	0.032	0.35	3.00	0.914	0.00630
	Boiler 3	168	2.85	3	38	34.70	0.241		8.71	0.336	0.00990
	AVERAGE	161.7	2.07	1.67	31.67	23.32	0.13	0.35	4.347	1.647	0.007
2011	Boiler 1	167	2.15	2	28	0.36	0.140	2.67	1.72	0.130	0.00570
	Boiler 2	159	1.14	1	38	0.44	0.140		1.46	0.350	0.00690
	Boiler 3	161	2.40	2	37	0.36	0.110		1.47	0.350	0.00170
	AVERAGE	162.3	1.90	1.67	34.33	0.39	0.13	2.67	1.550	0.277	0.005
2012	Boiler 1	163	1.14	2	23	0.30	0.310		1.34	0.640	0.00932
	Boiler 2	156	2.02	2	29	0.34	0.250	0.75	6.52	1.280	0.00782
	Boiler 3	161	1.66	1	27	0.37	0.590		47.80	1.020	0.00679
	AVERAGE	160.0	1.61	1.67	26.33	0.34	0.38	0.75	18.553	0.980	0.008
2013	Boiler 1	164	1.48	1	28	0.36	0.134		1.45	0.637	0.00637
	Boiler 2	158	1.98	1	25	0.37	0.112	1.66	1.05	0.737	0.00475
	Boiler 3	159	1.52	1	22	0.42	0.137		3.03	0.733	0.00471
	AVERAGE	160.3	1.66	1.00	25.00	0.38	0.13	1.66	1.843	0.702	0.005
2014	Boiler 1	167	1.13	2	35	0.33	0.270	0.16	3.82	0.282	0.00337
	Boiler 2	157	1.02	1	35	0.35	0.183		2.52	1.240	0.00415
	Boiler 3	161	1.50	1	17	0.49	0.228		2.85	0.520	0.00425
	AVERAGE	161.7	1.22	1.33	29.00	0.39	0.23	0.16	3.063	0.681	0.004
2015	Boiler 1	164	1.80	2	25	0.32	0.102		1.00	0.513	0.00540
	Boiler 2	157	1.99	1	29	0.38	0.109		1.30	0.532	0.00410
	Boiler 3	159	1.71	1	27	0.39	0.409	1.21	3.04	0.499	0.00074
	AVERAGE	160.0	1.83	1.33	27.00	0.36	0.21	1.21	1.778	0.515	0.003
2016	Boiler 1	166	4.33	1.0	29	0.46	0.231		2.81	1.170	0.00680
	Boiler 2	156	3.46	1.0	37	0.43	0.154	1.16	1.13	0.657	0.00241
	Boiler 3	159	1.86	1.0	28	0.38	0.107		1.59	0.371	0.00456
	AVERAGE	160.3	3.22	1.00	31.33	0.42	0.16	1.16	1.843	0.733	0.005
2017	Boiler 1	171	1.41	2.0	33	0.49	0.169	0.17	1.99	0.860	0.00393
	Boiler 2	160	1.81	0.0	25	0.41	0.139		1.10	0.742	0.00160
	Boiler 3	156	4.71	3.0	23	0.37	0.115		1.28	0.561	0.00385
	AVERAGE	162.3	2.64	1.67	27.00	0.42	0.14	0.17	1.457	0.721	0.003
EPA EMISSIONS LIMIT		205	29	29	100	80	40	30	440	27	--
Percent of Limit for 2017		79.2%	9.1%	5.7%	27.0%	0.5%	0.4%	0.6%	0.3%	2.7%	--

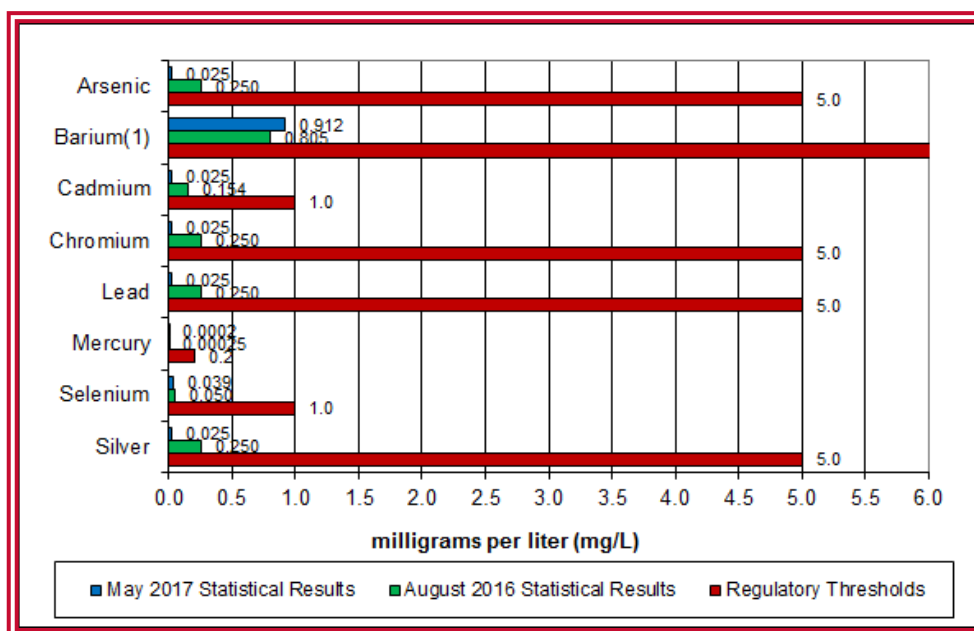
## 6.7 Ash System Compliance

The dolomitic lime feed rate is adjusted periodically in order to maintain a desired ash pH level in the range of 8.0 to 11.0. Since initial startup, the feed rate has varied from between 1 to 9 lbs per ton each month. Ash Toxicity (TCLP) tests were performed for field samples collected over a seven (7) day period in August 2016, and results indicated that the average pH during testing was 8.4. Results from the TCLP testing conducted in May 2017 and August 2016 are depicted in Table 10 and Chart 16 below.

**Table 10: Comparison of Statistical Results and Regulatory Thresholds for Metal Analytes**

Metals	90% Upper Confidence (May 2017)	90% Upper Confidence (August 2016)	Regulatory Threshold (mg/L)	% of Threshold (May 2017)	% of Threshold (August 2016)
Arsenic	0.025	0.250	5.0	0.50%	5.00%
Barium	0.912	0.805	100.0	0.91%	0.81%
Cadmium	0.025	0.154	1.0	2.50%	15.40%
Chromium	0.025	0.250	5.0	0.50%	5.00%
Lead	0.025	0.250	5.0	0.50%	5.00%
Mercury	0.0002	0.00025	0.2	0.10%	0.13%
Selenium	0.039	0.050	1.0	3.90%	5.00%
Silver	0.025	0.250	5.0	0.50%	5.00%

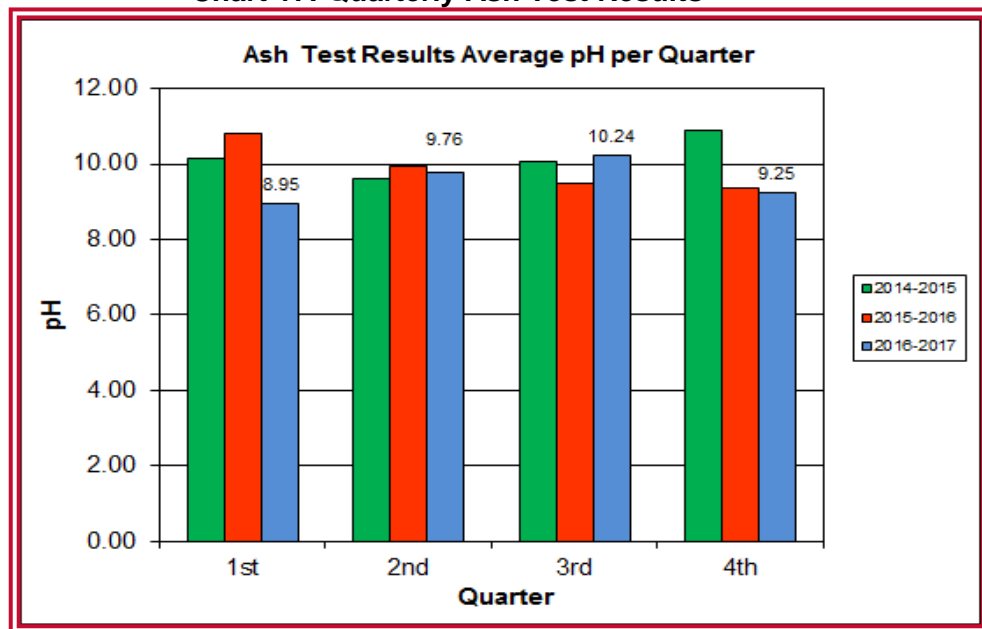
**Chart 16: Ash Toxicity Characteristic Leaching Procedure (TCLP) Results**



Note: The regulatory threshold for Barium is 100 mg/L

CAAI also samples ash monthly in-house, and documents pH reading to adjust dolomitic lime feed rate. The results for the ash pH tests are found below in Chart 17 where each quarter is represented by the average of the respective monthly readings. During Q4FY17, the average ash pH for in-house tests was 9.3.

**Chart 17: Quarterly Ash Test Results**



## **APPENDIX A FACILITY CEMS DATA**

**Table 11: Unit #1 Monthly Summary for Reportable Emissions Data**

Group#-Channel#		G8-C35	G8-C28	G8-C8	G8-C4	G8-C12	G8-C34	G8-C37	G8-C40	G8-C39
Long Descrip.		U-1 Steam	U-1 Econ	U-1 Stack	U-1 Stack	U-1 Stack	U-1 Opaci	U-1 FF In	U-1 Carbo	U-1 Lime
Short Descrip.		SteamFI	SO <sub>2</sub> ec	SO <sub>2</sub> sc	COsc	NO <sub>x</sub> sc	Opacity	FF InTemp	Carblnj	LimeFlow
Units		K#/Hr	ppmc	ppm	ppmc	ppmc	%	deg F	#/hr	gpm
Range		0-100	0-2000	0-500	0-4000	0-1000	0-100	100-500	0-50	0-20
Apr - 17	AVG	83.8	29.0	1.0	36.0	160.0	0.5	300.0	16.1	3.2
	Max	85.6	44.0	4.0	47.0	163.0	0.9	302.0	17.2	3.3
	Min	82.3	20.0	0.0	25.0	156.0	0.3	300.0	16.0	2.9
May - 17	AVG	83.0	23.0	1.0	35.0	160.0	0.3	300.0	15.2	3.2
	Max	85.0	36.0	4.0	50.0	163.0	0.9	301.0	16.5	3.3
	Min	79.2	12.0	0.0	24.0	156.0	0.0	299.0	14.9	3.1
Jun - 17	AVG	85.1	28.0	1.0	35.0	161.0	0.2	300.0	15.0	3.1
	Max	88.4	44.0	4.0	47.0	166.0	0.5	301.0	15.2	3.3
	Min	78.4	15.0	0.0	24.0	155.0	0.0	296.0	15.0	2.9
Quarter Average		84.0	26.7	1.0	35.3	160.3	0.3	300.0	15.4	3.2
Quarter Max Value		88.4	44.0	4.0	50.0	166.0	0.9	301.0	17.2	3.3
Quarter Min Value		78.4	12.0	0.0	24.0	155.0	0.0	296.0	14.9	2.9
Limits:		98	NA	29	100	205	10	331	14(a)	

(a) Carbon flow limit is a minimum value

\* Note: The data reported herein represent 24 hour average data for all parameters. Emissions excursions that are measured on shorter time intervals (i.e., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.



**Table 12: Unit #2 Monthly Summary for Reportable Emissions Data**

Group#-Channel#		G8-C35	G8-C28	G8-C8	G8-C4	G8-C12	G8-C34	G8-C37	G8-C40	G8-C39
Long Descrip.		U-2 Steam	U-2 Econ	U-2 Stack	U-2 Stack	U-2 Stack	U-2 Opaci	U-2 FF In	U-2 Carbo	U-2 Lime
Short Descrip.		SteamFI	SO <sub>2</sub> ec	SO <sub>2</sub> sc	COsc	NO <sub>x</sub> sc	Opacity	FF InTemp	Carblnj	LimeFlow
Units		K#/Hr	ppmc	ppm	ppmc	ppmc	%	deg F	#/hr	gpm
Range		0-100	0-2000	0-500	0-4000	0-1000	0-100	100-500	0-50	0-20
Apr - 17	AVG	89.3	42.0	0.0	35.0	159.0	1.3	298.0	16.0	3.2
	Max	90.7	71.0	3.0	47.0	167.0	1.7	299.0	16.3	3.4
	Min	87.3	31.0	0.0	27.0	156.0	0.9	298.0	16.0	2.9
May - 17	AVG	89.3	36.0	0.0	29.0	159.0	1.3	298.0	15.1	3.2
	Max	91.3	59.0	4.0	41.0	164.0	1.7	299.0	16.5	3.4
	Min	85.3	23.0	0.0	17.0	155.0	0.8	297.0	14.9	3.0
Jun - 17	AVG	85.4	52.0	1.0	31.0	159.0	1.3	298.0	15.0	3.2
	Max	91.9	219.0	34.0	45.0	172.0	1.5	300.0	15.1	5.5
	Min	65.6	22.0	0.0	21.0	153.0	0.9	297.0	14.9	2.8
Quarter Average		88.0	43.3	0.3	31.7	159.0	1.3	298.0	15.4	3.2
Quarter Max Value		91.9	219.0	34.0	47.0	172.0	1.7	300.0	16.5	5.5
Quarter Min Value		65.6	22.0	0.0	17.0	153.0	0.8	297.0	14.9	2.8
Limits:		97	NA	29	100	205	10	331	14(a)	

(a) Carbon flow limit is a minimum value

\* Note: The data reported herein represent 24 hour average data for all parameters. Emissions excursions that are measured on shorter time intervals (i.e., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

**Table 13: Unit #3 Monthly Summary for Reportable Emissions Data**

Group#-Channel#		G8-C35	G8-C28	G8-C8	G8-C4	G8-C12	G8-C34	G8-C37	G8-C40	G8-C39
Long Descrip.		U-3 Steam	U-3 Econ	U-3 Stack	U-3 Stack	U-3 Stack	U-3 Opaci	U-3 FF In	U-3 Carbo	U-3 Lime
Short Descrip.		SteamFI	SO <sub>2</sub> ec	SO <sub>2</sub> sc	COsc	NO <sub>x</sub> sc	Opacity	FF InTemp	CarbInj	LimeFlow
Units		K#/Hr	ppmc	ppm	ppmc	ppmc	%	deg F	#/hr	gpm
Range		0-100	0-2000	0-500	0-4000	0-1000	0-100	100-500	0-50	0-20
Apr - 17	AVG	89.4	39.0	1.0	40.0	160.0	0.4	298.0	16.1	3.1
	Max	91.5	57.0	4.0	54.0	161.0	0.7	299.0	16.1	3.4
	Min	86.9	21.0	0.0	31.0	159.0	0.1	298.0	16.0	2.9
May - 17	AVG	89.1	29.0	0.0	39.0	159.0	0.3	298.0	15.2	3.2
	Max	90.7	42.0	3.0	54.0	161.0	0.8	299.0	16.1	3.4
	Min	87.1	19.0	0.0	28.0	158.0	0.0	295.0	15.0	3.1
Jun - 17	AVG	88.7	26.0	0.0	38.0	159.0	0.2	298.0	15.0	3.1
	Max	91.5	44.0	3.0	53.0	161.0	0.4	300.0	15.2	3.3
	Min	84.4	14.0	0.0	27.0	156.0	0.0	294.0	14.9	2.7
Quarter Average		89.1	31.3	0.3	39.0	159.3	0.3	298.0	15.4	3.1
Quarter Max Value		91.5	57.0	4.0	54.0	161.0	0.8	300.0	16.1	3.4
Quarter Min Value		84.4	14.0	0.0	27.0	156.0	0.0	294.0	14.9	2.7
Limits:		99	NA	29	100	205	10	339	14(a)	

(a) Carbon flow limit is a minimum value

\* Note: The data reported herein represent 24 hour average data for all parameters. Emissions excursions that are measured on shorter time intervals (i.e., 4-hour block averages for CO) do not correlate with the 24 hour average data reported above.

## APPENDIX B

### SITE PHOTOS – MAY 2017



**Figure 1: Ceiling panels deteriorated above Boiler Nos. 2 and 3 – New Deficiency**



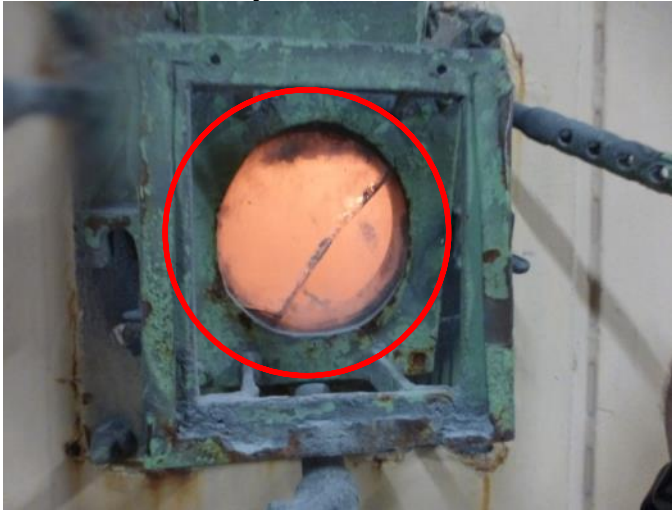
**Figure 2: Pebble Lime Warning Sign deteriorated on SDA No. 3 Entrance Door – New Deficiency**



**Figure 3: Fence falling over near Citizen's Drop Roll-Off – New Deficiency**



**Figure 4: Siding on north and east side of Facility dirty – New Deficiency**



**Figure 5: Viewport glass cracked on Boiler No. 3 Barn Door – New Deficiency**



**Figure 6: Cooling Towers & Ash Trailer Canopy from SDA Deck No. 3**





**Figure 7: SDA No. 3 and Dolomitic Lime Silo**



**Figure 8: Scales and Facility Roadway from Turbine Generator Enclosure Roof**



**Figure 9: SDA Hopper Nos. 2 and 3 from Economizer Deck**



**Figure 10: Turbine Generator No. 2**



**Figure 11: Ferrous Magnet**



**Figure 12: Ammonia Storage Silo**





**Figure 13: Cooling Tower and Stack**



**Figure 14: White Goods Roll-off**



**Figure 15: Tipping Floor Entrance Road**



**Figure 16: Scales and Scale House**



**Figure 17: Citizen's Drop off Roll-off**



**Figure 18: South side of Facility from Eisenhower Sidewalk**

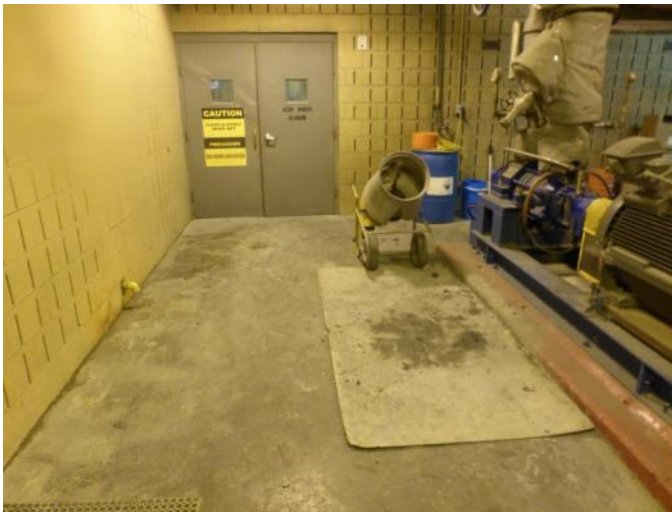




**Figure 19: West side Roadway from Facility Entrance**



**Figure 20: General Facility Photo from southeast up Eisenhower**



**Figure 21: TCLP Sampling in Progress**



**Figure 22: Baghouse Aisle – No issues observed**



**Figure 23: SDA Hopper Double Dump Valve**



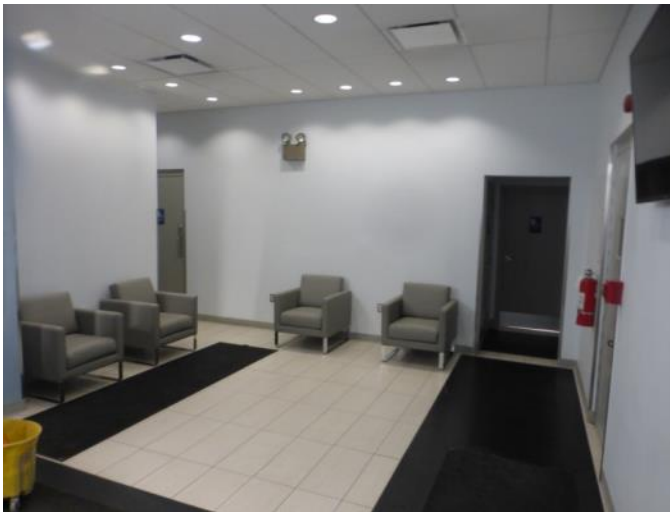
**Figure 24: Facility Upgrades – New Lighting, Floor Tiles, and Paint**



**Figure 25: Facility Upgrades – Covanta Break Room with New Floor Tiles and Paint**



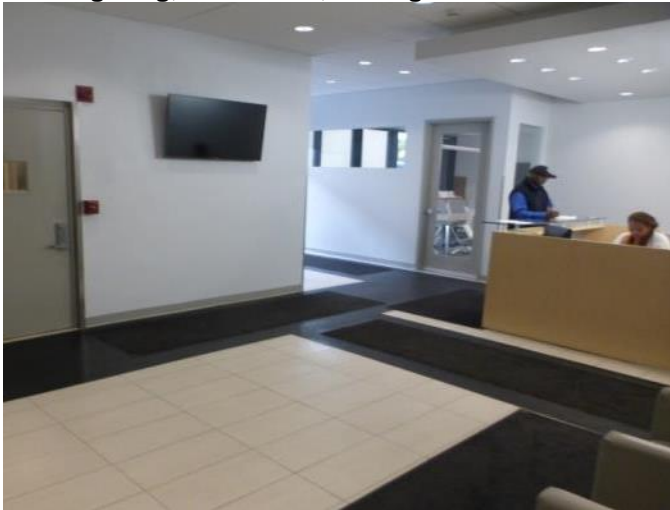
**Figure 26: Facility Upgrades - New Concrete Slab at Facility Entrance**



**Figure 27: Facility Upgrades – Receptionist Area - New Lighting, Floor Tiles, Ceiling Tiles and Paint**



**Figure 28: Facility Upgrades – New Conference Room just off Main Entrance**



**Figure 29: Facility Upgrades – Receptionist Area – Alternate View**



**Figure 30: New LED Light Fixtures throughout Turbine Generator Enclosure**