

Alexandria/Arlington Waste-to-Energy Facility

Fiscal Year 2023 Annual Report



Background

In 1984, an agreement was entered into between the Alexandria Sanitation Authority and the Arlington Solid Waste Authority to develop and construct a solid waste disposal facility having the capacity to handle 975 tons per day of waste from the City of Alexandria and Arlington County (the Jurisdictions). Waste-to-Energy was determined to be the most environmentally sustainable means of disposing of waste, after reduction, reuse and recycling. The waste-to-energy (WTE) facility (the Facility), located at 5301 Eisenhower Avenue, Alexandria, is operated by Covanta Alexandria/Arlington Inc. (Covanta), and has been in operation since 1988. Over the years, a number of enhancements and improvements have been made to the Facility primarily to meet the increasingly stringent air pollution requirements of the Clean Air Act, and the Facility has continued to reliably handle the waste from the Jurisdictions since it opened.

In 2012, both Jurisdictions entered into a new Waste Disposal Service Agreement, which became effective January 1, 2013, and in

December 2013 agreed to extend the site lease for the continued operation of the Facility by Covanta to the year 2038. In return the Jurisdictions received a favorable rate for disposing of the Jurisdictional waste at the Facility. This Annual Report summarizes the operation of the Facility during Fiscal Year 2023 (FY23). For more information on the history of the Facility and details of its operation, go to: <https://www.alexandriava.gov/tes/info/default.aspx?id=82377>.

HDR Inc. (HDR) was engaged to monitor the Facility performance and to perform regular assessments of the Facility on behalf of the Jurisdiction's Facility Monitoring Group (FMG). On a quarterly basis, HDR meets with the management of the Facility to discuss operational and maintenance issues, to acquire data, to perform an independent visual assessment of the Facility, and issue a detailed report of quarterly performance. Covanta is ultimately responsible for the operation, maintenance, environmental performance, and safety issues of the Facility.

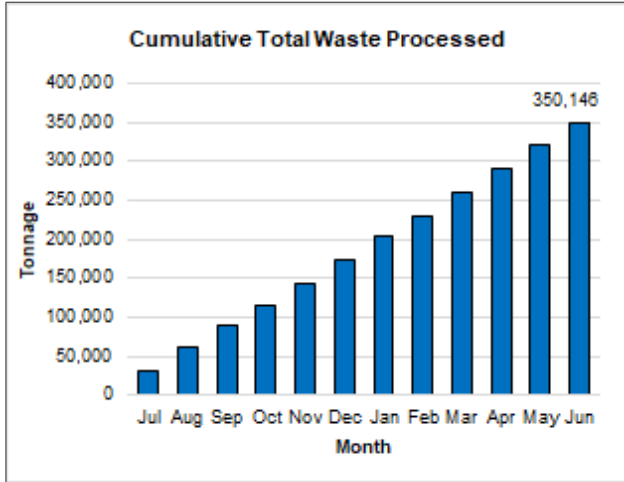
Facility Performance

The Process

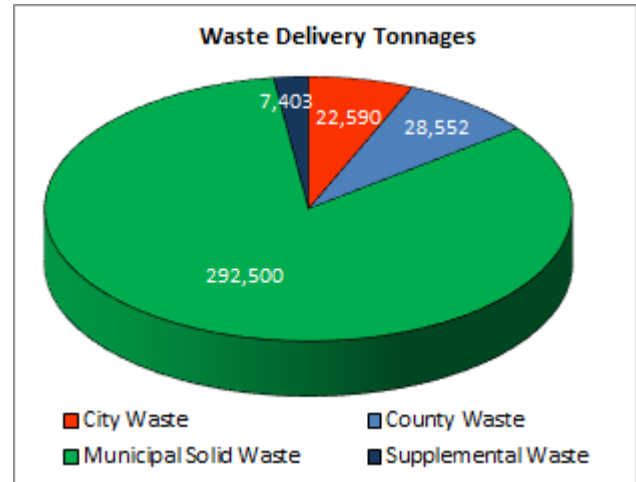
Household waste that is collected by the two Jurisdictions is brought to the Facility and discharged into a large refuse pit. Operators at the Facility screen the incoming material to keep inappropriate waste out of the combustion process. The waste is then moved by cranes to the combustion chambers, where the waste is burned at high temperatures, heating water to create steam which drives turbine generators (TGs) to create electricity. The ash residue from the process is screened and ferrous metals are

extracted via a magnet and recycled. The remaining ash is then sent to an approved ash disposal facility.

Quantities of Waste



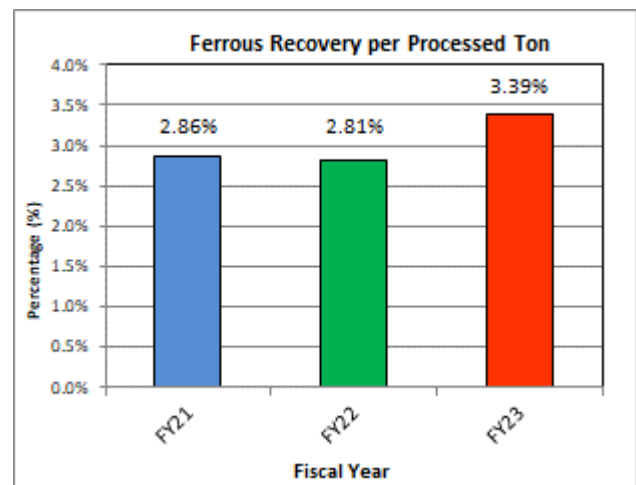
In FY23, the Facility processed a total of 350,146 tons of Municipal Solid Waste (MSW). The quantity of waste delivered by the Jurisdictions has remained fairly consistent over the past several years. In FY23, 22,590 tons were delivered by the City, which is 2.0% less than FY22, and 28,552 tons were delivered by the County, which is 2.6% less than the previous year. In FY23, the City accounted for 6.4% of total waste deliveries, and the County accounted for 8.1% of total waste deliveries. The remainder of total deliveries to the Facility were classified as waste collected by commercial haulers within the two Jurisdictions, accounting for 83.3% of total waste deliveries, and Supplemental Waste, which accounted for approximately 2.1% of total waste deliveries in FY23.



Supplemental Waste is primarily confidential documents, pharmaceuticals and similar non-hazardous materials which require secure destruction. The amount of Supplemental Waste received at the Facility in FY23 totaled 7,403 tons, which is 4.4% more than last year.

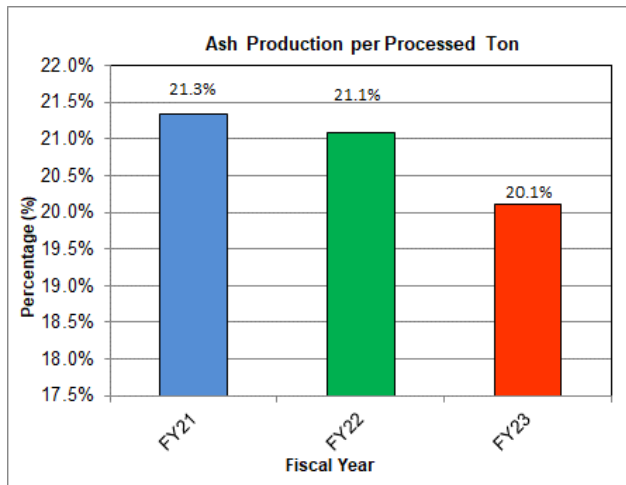
Ferrous Metal Recycled

In FY23, 11,874 tons of ferrous metals were recovered from the ash and recycled. This is a significant increase (20.5%) from the total recovered in FY22. This increase in year over year metal recovery is attributable to Covanta replacing the ferrous drum magnet in February 2022.



Ash Disposed

In FY23, 70,384 tons of ash generated at the Facility were disposed of, which represents a decrease of 4.7% compared to FY22. The ash production rate, i.e. the tons of ash produced per ton of waste processed, was 20.1%, and has remained in the range of 20 to 22 percent for a number of years, which compares favorably to other well-operated, mature WTE facilities.



Steam

The Facility is regulated by its Title V permit with the Virginia DEQ (VADEQ), which has set an annual facility steam production limit of 1,170,400 tons and is based upon an assumption that each pound of waste processed generates 3.34 pounds of steam. The Facility complied with this permit limit during all FY23. To compare boiler performance on a year-to-year basis, when the actual waste content varies, steam production is also analyzed by converting raw waste tonnages to a “reference ton basis”. This metric in FY23 was 2.86 tons of steam per reference ton of waste, which is higher (1.5%) than the rate in FY22 and represents an improvement in boiler operations. The TG performance is evaluated in terms of the quantity of steam that it takes to generate one gross kWhr of electricity, where a lower steam rate indicates better performance. In FY23, this metric was 15.2 lbs of steam per gross kWhr, was

higher (5.3%) than FY22; which normally indicates a decrease in performance. However, this metric was negatively impacted by the scheduled TG No. 2 Overhaul that occurred in September 2022 (556 hours), and an unscheduled TG No. 2 outage (898 hours) for a lube oil system failure in October 2022 (following the overhaul).

Facility Maintenance

Significant and routine maintenance was performed at the Facility throughout FY23, with each of the three boilers and two turbine generators experiencing downtime for the completion of various maintenance items. As previously mentioned, Covanta completed a scheduled major overhaul of TG No. 2 in September 2022 which required significant downtime and negatively impacted overall electrical production and performance metrics. It is the opinion of HDR that Covanta continues to implement an effective maintenance regimen and is performing routine and preventative maintenance and selected equipment replacements in a timely manner.

Facility Enhancements

During FY23, Covanta relocated its residential drop-off area and installed improved signage around the Facility to clarify acceptable waste. Covanta also installed a high-speed roll-up door for trucks exiting the Tipping Floor.



Photo: New location of resident drop-off and signage.

Operational Performance

The boilers experienced 1,726 hours of downtime (scheduled, unscheduled and standby) in FY23, and had an overall availability of 93.9%, which compares favorably to mature, well-operated, WTE Facilities. The turbine generators experienced 1,614 hours of downtime (scheduled, unscheduled, and standby) and had an overall availability of 90.8%. Again, the overall TG availability was negatively impacted by the scheduled TG No. 2 Overhaul in Fall 2022.

Overall, Covanta is performing needed repairs and replacements of equipment as required, to overcome wear, tear, obsolescence, and end of life of equipment and materials. These efforts will need to continue in order for the Facility to operate reliably, efficiently, and safely for the next twenty years.

Housekeeping

Routine inspections have shown that Covanta is performing facility housekeeping and maintaining plant cleanliness in accordance with acceptable industry practices. Housekeeping ratings for each major area of the facility, both internally and externally, have been found to be acceptable during each of the quarterly assessments performed by HDR. HDR also identifies deficiencies during its assessments and maintains a running list of the deficiencies which is updated as corrective actions are taken. In general, the deficiencies identified have been minor and do not require immediate attention. Throughout FY23, ten new deficiencies were reported by HDR, and eight new or existing deficiencies were addressed by Covanta. At the end of FY23, 17 items remained on the list requiring attention.

Environmental Performance

Air Emissions

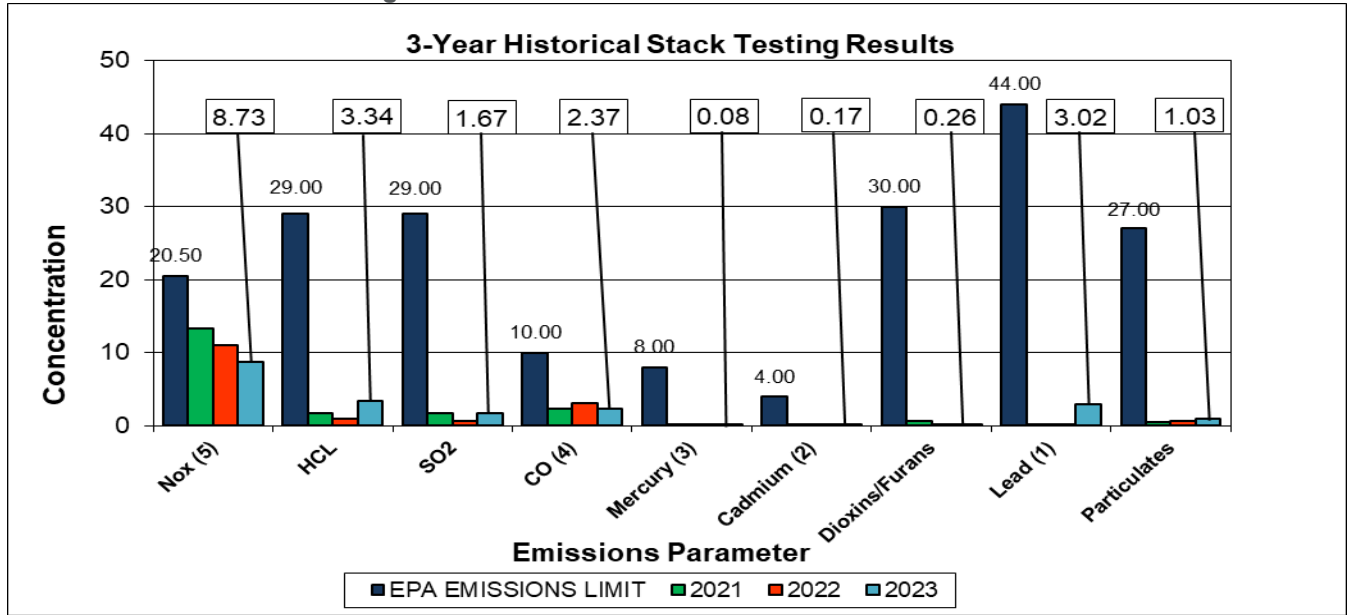
Emissions from the facility are controlled by the combination of good combustion practices, and by use of gas scrubbers and fabric filter baghouses. Ammonia injection and activated carbon systems are also used to control oxides of nitrogen and mercury emissions, respectively. Key emissions variables are continuously monitored with state-of-the-art emissions monitoring equipment, supplemented by annual stack testing.

Throughout FY23, the air pollution control equipment-maintained emission concentrations well within the established regulations, and the Facility experienced one permit deviation, which was reported to VADEQ and was considered exempt. As of the end of FY23, the Facility operated a total of 304 days without a permit deviation. FY23 was the first year of full implementation of the low NOx system operating on all three boilers. Annual stack testing was conducted in March 2023 and results demonstrate compliance well within the permit limits for all parameters, reflecting the success of the installation.

Ash Conditioning

The ash is periodically sampled and tested for its potential to leach toxic compounds, using ash toxicity (TCLP) procedures. This testing, which occurred in November 2022 and May 2023 showed that the TCLP results were well below the regulatory threshold. The Facility uses pebble lime to control Sulfur Dioxide (SO₂) emissions in the flue gas and residual lime in the ash helps balance the pH.

3-Year Historical Stack Testing Results



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): NOx emissions have been decreased by a factor of 10 for trending purposes

Safety & Environmental Training

The Facility had one OSHA recordable accident in FY23 that occurred in December 2022. Each month, Covanta conducts training for its employees covering a number of varying safety and environmental issues, including hearing conservation, hand and power tools, fall protection and respiratory protection.



Photo: New high-speed roll-up door installed for trucks exiting tipping floor.

Outreach

Facility Tours

Covanta provides tours of the Facility to groups or individuals representing numerous educational and civic groups. During FY23, Covanta provided tours to (but not limited to) Alexandria High School, the City of Alexandria Fire Department, and Volunteer America.

Community Engagement

During FY23, Covanta hosted multiple events for community outreach and engagement. Some major events included the Earth Day E-Waste and Battery Collection event partnered with COG (Council of Governments), the Hauler Safety Day and Lunch, and a food distribution event with Volunteer America. Covanta continues to engage in the community monthly in an effort to maintain positive public relationships.