

# Alexandria/Arlington Waste-to-Energy Facility Fiscal Year 2022 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 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, several 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, and 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 2022 (FY22). 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 inspection of the Facility, and issue a detailed report of quarterly performance. Covanta is ultimately responsible for the operation, maintenance, environmental performance, and safety issues at the Facility.

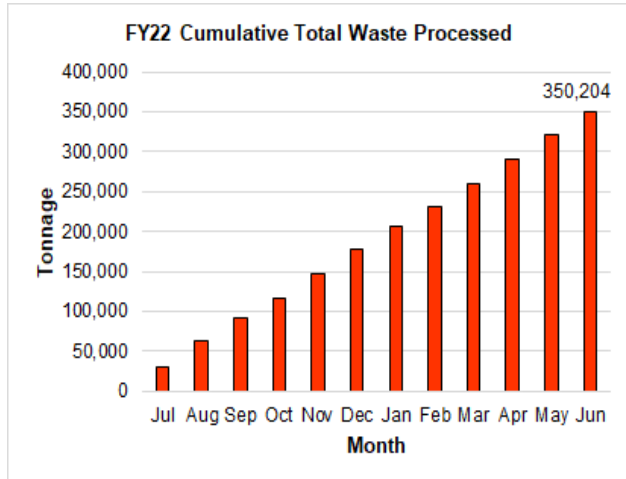
## Facility Performance

### The Process

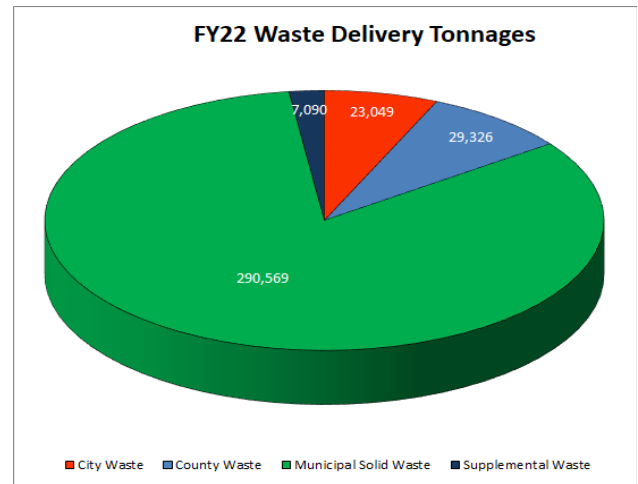
Household waste that is collected by the two Jurisdictions is brought to the Facility and discharged into a large pit. Operators at the Facility screen the incoming material to keep inappropriate wastes out of the combustion process. The waste is then moved by cranes to the combustion chambers, where the waste is burned at high temperatures, heating water to create steam which drives turbine generators (T-Gs) 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 a permitted ash monofil.

### Quantities of Waste



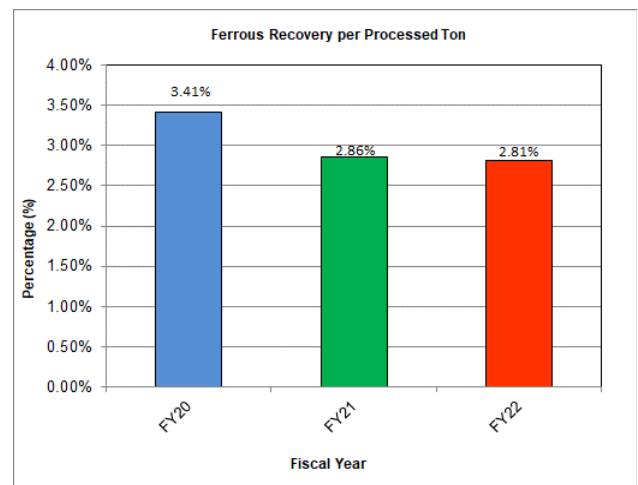
In FY22, the Facility processed a total of 350,204 tons of Municipal Solid Waste (MSW). The quantity of waste delivered by the City over the past several years, has remained fairly steady, and was 6.6% of total waste deliveries. The quantity of waste delivered by the County accounted for 8.4% of total waste deliveries. In FY22, 23,049 tons were delivered by the City, which is 1.0% more than the prior year, and 29,326 tons were delivered by the County, which is a decrease of 2.7% over FY21. The remainder of throughput capacity at the Facility was filled with waste collected by commercial haulers within the two Jurisdictions, and with Supplemental Waste, which constitutes about 2.0% of the total amount.



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 FY22 totaled 7,090 tons, which is 29.9% less than last year.

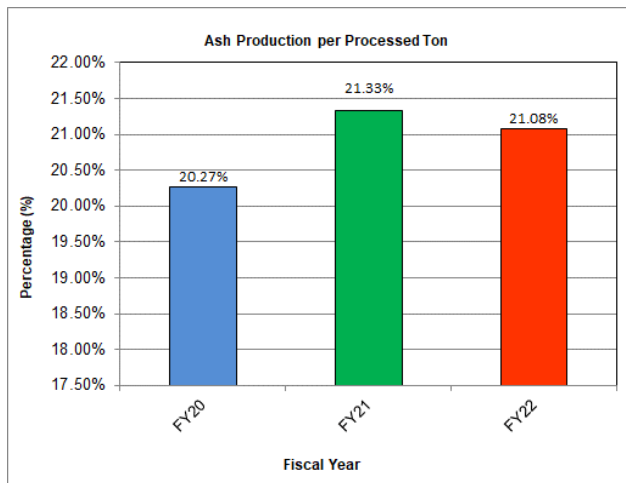
### Ferrous Metal Recycled

In FY22, 9,855 tons of ferrous metals were recovered from the ash and recycled. This is a slight decrease (0.5%) from the amount recovered in FY21. During FY22, the main ferrous magnet failed and, for most of the year, was replaced with a temporary magnet which was less efficient. The decrease from FY20 to FY21 and FY22 is caused by additional cleaning of the metals prior to sending the material to the vendor.



## Ash Disposed

In FY22, 73,839 tons of ash generated at the Facility were disposed which is a slight decrease (0.4%) from FY21. The ash production rate, i.e. the tons of ash produced per ton of waste processed was 21.1%, and has remained in the range of 20 to 22 percent for a number of years, which is excellent compared to other facilities. However, removing the ash from the metals prior to shipping has increased the ash production rate (compared to FY20).



## 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, which is based upon an assumption that each pound of waste processed generates 3.34 pounds of steam. The Facility was in compliance with this permit limit during the majority of FY22 (with the exception of a November 2021 deviation). In order 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 FY22 was 2.82 tons of steam per reference ton of waste, which is slightly higher than the rate in FY21. The T-G performance is evaluated in terms of pounds of steam that it takes to generate one kWhr of electricity, where a lower steam rate indicates better performance.

In FY22, this metric was higher (0.8%), which indicates a slight decrease in performance. It is worth noting that TG No. 2 requires some repair work to restore its original capacity and improve its efficiency (last overhaul in 2013). The TG No. 2 overhaul is scheduled for early FY23.

## Facility Maintenance

Significant and routine maintenance was performed at the Facility throughout FY22, with each of the three boilers and two turbine generators experiencing downtime for the completion of various maintenance items. It is the opinion of HDR that Covanta has been implementing an effective maintenance regimen and is performing routine and preventative maintenance and selected equipment replacements in a timely manner.

## Operational Performance

As a result of routine maintenance activities, the average availability of the boilers was 96.3%, and the average availability of the T-G was 100% during FY22 (excludes standby downtime). The annual availabilities of the boilers and turbine generators are excellent and comparable to that of mature, well-run waste to energy facilities.

## Housekeeping

Routine facility assessments, by HDR, 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 site visits. HDR also identifies deficiencies during its site visits and maintains a running list of the deficiencies and removes them from the list as they are corrected. In general, the deficiencies identified have been minor and don’t require immediate attention. Throughout FY22, 9 new deficiencies were reported by HDR and 7 new

and existing deficiencies were addressed by Covanta. At the end of FY22, 18 items remained on the list requiring attention.



Photo: New ferrous magnet installed

## 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 FY22, the air pollution control equipment-maintained emission concentrations well within the established regulations. However, the Facility experienced two (2) permit deviations. The first deviation occurred during November 2021 when the Facility exceeded the 12-month rolling steam generation limit established in Condition 9 of the Title V Permit. The second deviation occurred in May 2022 when the 6-minute opacity levels averaged 14.0% (10.0% Limit) on Unit 2 due to moisture carryover across the path of the

opacity monitor. The permit deviations were reported to the VADEQ. The VADEQ reviewed and provided questions on the first deviation; and Covanta responded with corrective actions. The second deviation was considered excusable. Annual stack testing was conducted in March 2022 and results demonstrate compliance well within the permit limits for all parameters, and can be seen in the 3-Year Historical Stack Testing Results Graph shown below.

In September 2021, Covanta announced that emissions data for the Facility are now available to the public online<sup>1</sup>. Both the City of Alexandria and Arlington County commend Covanta for its transparency and action to keep residents informed.



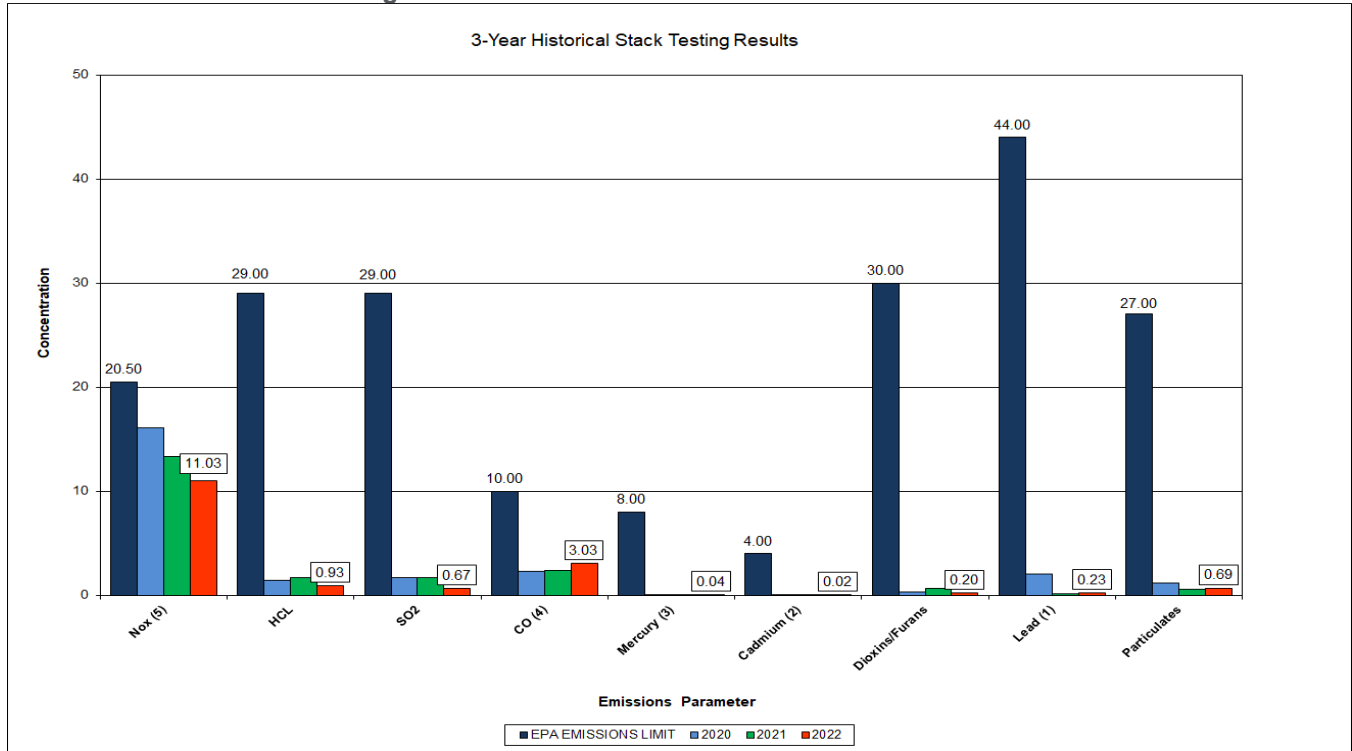
Photo: New LN equipment on Boiler No. 3 as part of the Low NOx Technology Installation

### 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 August 2021 and May 2022 showed that the TCLP results were well below the regulatory threshold. The Facility uses pebble lime to control Sulfur Dioxide (SO<sub>2</sub>) emissions in the flue gas and residual lime in the ash helps balance the pH.

<sup>1</sup> <https://www.covanta.com/where-we-are/our-facilities/alexandria>

### 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

## Air Emissions and Facility Enhancements

The Virginia Department of Environmental Quality (VADEQ) has issued the final RACT permits for the installation and operation of LN™ Technology. By the end of FY22, LN™ Technology has been installed on all three boilers, with each boiler operating under the lower NOx limits of 110 ppm (24 hr) and 90 ppm (annual rolling average) – Boiler No. 1 since June 2021, Boiler No. 2 since June 2020, and Boiler No. 3 since June 2022. In December 2021 CAAI provided VADEQ a notification letter that the Boiler No. 3 LN™ Technology retrofit was underway. Boiler No. 3 completed its period of calibration and optimization on June 29, 2022 and CAAI submitted a letter to VADEQ on June 30, 2022, that the system optimization was

complete and that it is now operating under the lower NOx limits of 110 ppm (24 hr. average) and 90 ppm (annual rolling average).



Photo: New LN Fan on Boiler No. 3 as part of the Low NOx Technology Installation.

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 and even accelerate going forward if the 34-year-old Facility is to continue to operate reliably, efficiently, and safely for the next twenty years.



Photo: Crane Grapple

## Safety & Environmental Training

The Facility had one (1) OSHA recordable accidents in May 2022 when an employee strained their shoulder while clearing a feedchute plug. Since the accident in May, the Facility has operated 60 days without an OSHA recordable accident. Each month, Covanta conducts training for its employees covering several varying safety and environmental issues, including confined space entry and rescue, ladder safety and accident prevention.

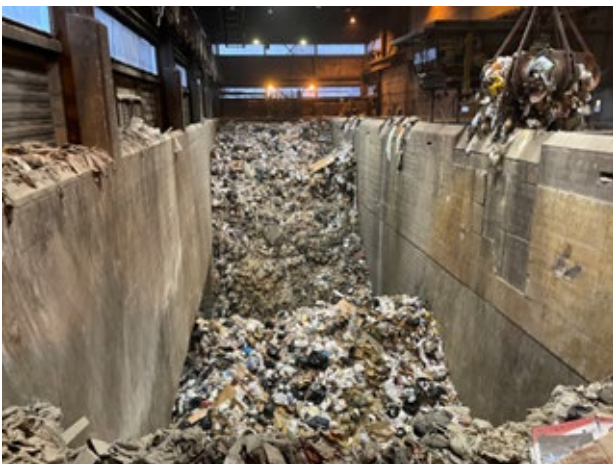


Photo: Refuse pit

## Outreach

Covanta typically provides tours of the Facility to groups or individuals representing numerous educational and civic groups, as well as professionals from other countries. Tours were curtailed during the previous fiscal year due to the COVID-19 Pandemic. During FY22, Covanta began providing tours again to limited sized groups.

Covanta's outreach also included providing no charge disposal for wreaths collected by Wreaths Across America from Arlington National and ensuring the destruction of drugs collected during Virginia Drug Take Back Days. Covanta is active with Volunteer Alexandria helping with food distribution, funds for COVID relief, and the Child Holiday Fund. Covanta continues to provide scholarships to Alexandria High School students via the Scholarship Fund of Alexandria. Other activities included Covanta employees celebrating Earth Day with clean ups of Cameron Park, Ben Brenman Park and along Eisenhower Ave near Covanta and the Van Dorn Station.