Arlington WPCP Solids Master Plan
Final Report 2018
Summary of Public Comments and Staff's Responses

General Staff Comment Regarding Master Planning:
Master planning is the first of many project phases that leads to the construction and startup of plant upgrades. The objective of the planning-level analyses is to develop project goals and compare alternatives that meet the project goals. The analysis is typically completed with the objective of providing a road map for future implementation, and answers the question "will this work at our site?" Additional analysis and concept development, such as equipment sizing, influent flow and load projections, air treatment objectives, on- or off-site use of biogas, etc., will be conducted as part of subsequent project planning and design phases. *Staff considers it critical for the success of the program that health and safety is ensured not only to the people who live around the plant, but also the workers on the plant site.*

In consultation with the External Stakeholder group, Arlington agreed to conduct an emissions study at the Master Planning stage in addition to a confirmatory emissions analysis which will be conducted during a preliminary or detailed design phase. This decision was made after receiving concerns from some members of the community about potential impacts arising from beneficial use of biogas – which could take the form of Combined Heat and Power (CHP) generation on the Plant site, as a fuel source for the Arlington Rapid Transit (ART) fleet, or sold back into the Washington Gas distribution system. The emissions analysis was conducted with current technology and knowledge, and based upon extremely conservative assumptions to project a worst-reasonable case scenario.

The full emissions study can be found at the links below.

- https://projects.arlingtonva.us/wp-content/uploads/sites/31/2018/04/TM-4.4-Air-Emissions-Modeling-Report-main-App-A-H_J.pdf
- https://projects.arlingtonva.us/wp-content/uploads/sites/31/2018/04/TM-4.4-Air-Emissions-Modeling-Report-App-I.pdf

1. Air Emissions from Plant Under Current and Future Recommended Scenario

Comments or assertions were received related to concerns about current air conditions and modeling of future conditions. One resident asked whether current operations were in regulatory compliance holding the belief that ozone concentrations for the 8-hour limit are not being met. There was also the notion that no emissions modeling was performed to project future ozone concentration adding that any additional increment of typical ozone precursors such as VOCs and NOx are important in the Washington area, which is in non-attainment for

ozone. Additionally, a resident felt that long-term/future truck emissions would be much higher with the recommended alternative.

Staff Responses:

The Arlington County Water Pollution Control Plant (WPCP) is currently in full compliance with the Air Permit (registration number 70026) issued by the Virginia Department of Environmental Quality (DEQ).

Ozone is not a pollutant on the WPCP's air permit. Two precursors of ozone formation are in the WPCP's air permit: NO_x and VOC. While the level of each of these precursors increases slightly with all the scenarios, they are still well below the National Ambient Air Quality Standards (NAAQS) for these pollutants.

The marginal attainment status for 8-hour ozone is not specific to the WPCP, but rather is applied to Arlington County as a whole (as well as to the DC Metropolitan region). Ozone is difficult to accurately model, given the complex chemical reactions and temperature and turbulence impacts that all affect ground-level ozone concentrations.

Vehicle emissions are a significant source of ozone, and the reduction in truck hauling should have a positive impact on the ozone generated at the WPCP. Since ozone was not modeled, this reduction in ground-level ozone formation from reduced hauling was not captured in the study.

The WPCP's current and projected increased contribution to ozone precursors is minor compared to other sources, such as vehicles and airplanes, in the area surrounding the plant.

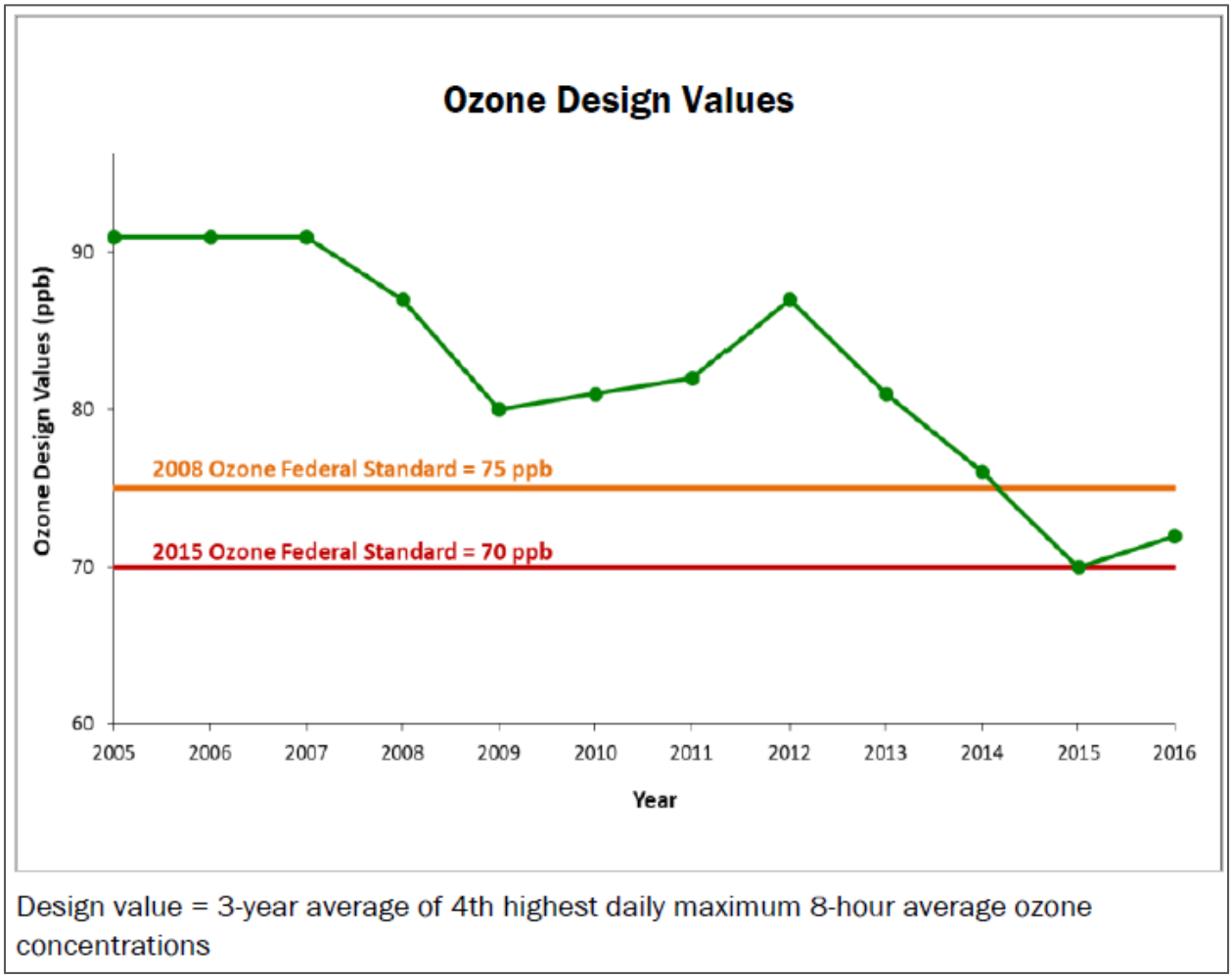
Over the past decades, regional air quality has improved. Per a September 27, 2017 Metropolitan Washington Council of Governments (COG) news release, "air quality continues to improve in metropolitan Washington, according to ozone-season data".

The news release continues with the following information:

> "The region recorded just eight days in 2017 when air quality exceeded levels for ground-level ozone that are unhealthy for sensitive groups—also known as 'Code Orange' days. In 1998, there would have been ten times as many unhealthy air days if using today's 2015 Ozone Standard. None of this year's exceedance days reached more serious 'Code Red' unhealthy levels, despite 24 90-degree days in the region.
>
> We've seen a dramatic improvement in the region's air quality thanks to more than a decade of action and coordination at all levels of government," said Hans Riemer, Metropolitan Washington Air Quality Committee (MWAQC) Chairman and Montgomery County Council Member.
>
> The region meets federal health-based air quality standards for all but one pollutant—ground level ozone. In 2015, the EPA revised the standards for ground-level ozone to

achieve levels that were more protective of public health; current data shows that the region is just above that standard of 70 parts per billion (ppb)."

A COG graph from the 2017 report, Improving The Region's Air: Air Quality Trends for Metropolitan Washington, illustrates the regional downward trend in ozone is below.



Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations

The information in the Master Plan on the long term/future truck emissions under the recommended alternative (Table 2-4) shows that emissions from truck hauling decrease in all circumstances. For example, for NO_x, they go from 0.0016 (or 1.6×10^{-3}) g/s to 0.00039 (or 3.9×10^{-4}) g/s.

2. Greenhouse Gas (GHG) Impact

Comments were received related to projected GHG and carbon footprint impacts compared to current operations, with one respondent questioning the validity of the scientific analysis.

Staff Responses:

Arlington's Community Energy Plan is a long-term vision for transforming how Arlington generates, uses, and distributes energy. The plan was unanimously adopted by the County Board in 2013. Goals listed in the plan include:

- Generating energy locally with the use of renewables and other technologies
- Reaching a 75% lower carbon footprint by 2050

An analysis was performed by DES staff to determine the relative impact of the recommended alternative compared to the existing solids handling process of lime stabilization. Emissions projections for the electricity grid were developed using EPA's eGRID database. The analysis showed that there would be a decrease in GHG with the recommended solids handling option, regardless of whether the gas is used on- or off-site. In 2016, when the analysis was performed, the latest data was from 2012. However, the 2016 data is now available and a brief review of the new data leads the County's Energy Manager to conclude that the newer data "does not alter the fundamental conclusion that the alternatives have a strong positive impact on GHG emissions."

It is difficult to project actual emissions to a high level of precision during the master planning process, which is why staff used conservative projections in its analyses. As additional details are developed and the project progresses into design, the emissions projections will be refined based on equipment selection and sizing. The conclusion of this analysis supports the recommended alternative because it is in alignment with the Community Energy Plan, but it is not the sole determinant in making the recommendation.

3. Flaring of Methane Gas

In regards to the operation of the gas flare, we heard from a resident that their concern was that the flaring stack may be hazardous to low-flying aircraft, the FAA application would not be submitted until after the Board approved the plan and that the flare operation may cause vibrations offsite.

Staff Responses:

Infrequent flaring of biogas will likely occur, and would typically be associated with maintenance of gas handling equipment. The frequency will be minimized by appropriate sizing of tanks and equipment, and the beneficial use of gas elsewhere either on-site or off.

Temperature effects to the surrounding area are minimal and hot air will dissipate quickly upon exiting the flare stack, presenting no threat to planes. At the Master Planning stage, staff does not have adequate details to submit for any of the permits which will be needed for construction (including the location of the flare), but there is no reason to expect any complications or obstacles associated with FAA permitting. Staff will comply with all permit requirements associated with the FAA. Other wastewater treatment plants with flares in close proximity to Reagan National Airport include facilities in Alexandria and DC.

Over a thousand similarly sized low-pressure flameless biogas flares exist nationwide, and there are no known instances of vibrations induced by this type of flare facility.

4. There is Little Room for Error in Meeting Ambient Air Quality Standards

Comments were received regarding the margin for meeting clean air standards for certain uses of biogas. One resident shared that even with available control technology in place, some modeled emissions (particulates, most noticeably) appear to remain at or near their standard — suggesting relatively little room for error in the projections. Also, adding that it will be very important for the County — in conducting the next stages of its facility planning — to review very carefully the equipment proposed by different manufacturers (production and control equipment) to ensure their real-world compliance with federal and state air quality standards at the fence line.

Additionally, a resident shared that the variety of biogas use scenarios in play currently may be appropriate at the "Master Planning" stage, but implementation planning will require a much more careful biogas utilization study, including potential air emissions and control technologies. The greatest potential for air emissions in a combined heat and power biogas plant is the generation of NOx by the new turbines and care should be shown in the selection of equipment, including very careful performance testing to minimize air emissions.

Staff Responses:

Staff agrees that the baseline/background air pollution concentrations for certain parameters make it important that the special care be taken in the specification of equipment and their commissioning to ensure that the design intent is met. This is standard practice on projects at the WPCP. This was done successfully at the WPCP during the MP01 upgrades that significantly increased the capacity and improved the effluent quality of the plant. As a result of these especially targeted specification compliance practices, the Arlington County WPCP has successfully met the strict water and air quality standards established by DEQ since 2010.

5. The Regional Option(s)

A resident felt that the option of processing (or disposing) of solids off-site at a regional facility is, in their opinion, the least expensive option. The resident stated that the regional option might require more trucks to ferry what is essentially hazardous waste. Also, the Covanta-run WTE plant contract permits the county to exercise an option that would give the county free incineration from 2025 to 2038.

Staff Responses:

No regional option or capacity was identified at the time of this study. Staff at DC Water confirmed that they could not commit to providing capacity at their facility at this time, and indicated that Arlington should not presume that capacity will be available at a later date. Arlington also explored whether capacity for biosolids processing exists or will exist at other regional facilities including Fairfax County and Alexandria.

Without any available regional solution on the horizon, it is not practicable to develop cost projections, which would be entirely dependent upon distance to the facility, treatment and receiving characteristics of the facility, and capacity of the facility.

A regional option would require significantly more trucks to haul unstabilized thickened (5%) or dewatered (30%) sludge off-site. Solids thickened to five percent could require more than ten times the trucks than the recommended digestion-based dewatered biosolids solution. Unstabilized dewatered sludge would roughly double the truck hauling anticipated under the recommended alternative.

The master plan explicitly recommends that opportunities for regional treatment solutions be re-examined at the beginning of the final design stages, which is several years away. Staff will also explore regional opportunities for distribution and marketing of Class A biosolids.

The Covanta WTE plant expressly prohibits sewage sludge material in its contract with Arlington County. Therefore, this is not an off-site disposal option for the plant.