TECHNICAL EVALUATION
AND
PRELIMINARY DETERMINATION

I. GENERAL INFORMATION

A. APPLICANT

JEA
21 West Church Street, T-8
Jacksonville, Fl 32202

Draft Permit No.: 0310166-013-AC
County: Duval

B. PROJECT

On November 18, 2011, the applicant, JEA applied to the Permitting Authority for an air construction permit to modify the biosolids process at the Buckman Water Reclamation Facility located at 2221 Buckman Street, Jacksonville, Duval County, FL 32206.

The permit includes the construction of an anaerobic digester tank with a concrete cover, the installation of a new membrane gas storage unit, the construction of a new digester control building, the installation of a new boiler, the demolition of existing biofilters in Odor Control Systems No. 1, 2 and 3. The biofilters for Odor Control Systems No. 1 and 2 will be replaced with newly installed bioscrubbers. Odor Control System No. 3 (Emissions Unit No. 006) will be eliminated. The Pre-Aeration system which it served will be converted into a grit removal process. This eliminates the need for an odor control unit, since air will no longer be injected into the influent wastewater stream, thereby preventing the generation of odors. Additionally, a new odor control system equipped with a new bioscrubber will be installed. This permit replaces Air Pollution Construction Permit No. 0310166-012-AC which was issued to the facility on February 24, 2011.

II. RULE APPLICABILITY

The facility is located in an area designated as unclassifiable for the air pollutant particulate matter less than or equal to ten (10) micrometers, and in an air quality maintenance area for particulate matter and ozone pursuant to Rule 62-204, Florida Administrative Code (FAC), and Jacksonville Environmental Protection Board (JEPB), Rule 2.201.

The facility is a Title V major source of air pollution because it has the potential to emit 100 tons per year or more of any regulated air pollutant pursuant to Chapter 62-210, FAC, and JEPB Rule 2.301. Based upon the air construction permit application received on November 18, 2011, this facility is not a major source of hazardous air pollutants (HAPs).

A Best Available Control Technology Determination applies to the hot water boiler [Rule 62-296.406, FAC, and Rule 2.1101, JEPB]. Prevention of Significant Deterioration (PSD) requirements do not apply since the facility's potential to emit any one PSD pollutant is below 250 tons per year and the facility is not on the list of 28 listed in Rule 62-212.400, FAC, and Rule 2.401, JEPB.

The project shall be subject to the provisions of General Pollutant Emission Limiting Standards, Volatile Organic Compounds Emissions or Organic Solvents Emissions, Rule 62-296.320(1)(a), FAC, and JEPB Rule 2.1101, Unconfined Emissions of Particulate Matter, Rule 62-296.320(4)(c), FAC, and JEPB Rule 2.1101, and Rule 62-296.320(2), FAC, Rule 2.1101, JEPB, and City of Jacksonville Ordinance Code, Chapter 376 limiting the emission of Objectionable Odors.

III. TECHNICAL EVALUATION

Odor Control Systems

Odor Control System No. 1 will be equipped with a new 12-ft bioscrubber (replaces the biofilter, which will be demolished) sized for a maximum capacity of 14,000 cubic feet per minute (cfm) and will treat odors from the influent junction box, wet well, and pump station.

Odor Control System No. 2 will be equipped with a new 12-ft bioscrubber (replaces the biofilter, which will be demolished) sized for a maximum capacity of 15,500 cfm and will treat odors from the Biosolids Building only.

Odor Control System No. 2A is a newly installed system equipped with a new 8-ft bioscrubber sized for a maximum capacity of 4,000 cfm and will treat odors from the Raw Sludge Storage Tank.

Odor Control System No. 3 will be will be eliminated. The Pre-Aeration system which it served will be converted into a grit removal process. This eliminates the need for an odor control unit, since air will no longer be injected into the influent wastewater stream, thereby preventing the generation of odors.

The odor control systems will each be limited to the following emissions in parts per million (ppm):

5 ppm of Hydrogen Sulfide (H2S)
1 ppm of Dimethyl Sulfide (DMS)
1 ppm of Dimethyl disulfide (DMDS)
1 ppm of Methyl Mercaptan (MM)

Hot Water Boiler

The new hot water boiler with a maximum heat input rating of 3.8 MMBtu per hour shall be subject to a Best Available Control Technology Determination. The boiler shall be fired by natural gas, bio-gas, or a combination of both. Visible emissions shall be limited to a maximum of 20 % opacity, except for one six minute period per hour where a maximum of 27 % opacity shall be allowed. The boiler is exempt from Reasonably Available Control Technology requirements and from the requirements of 40 CFR 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units, because it is below the applicability threshold. [Rule 62-296.406, 62-204.800, and 62-296.700, FAC, and Rule 2.201, and 2.1101, JEPB]

Facility Limits

Total sulfur dioxide potential to emit from the sludge dryer, three boilers, flare and internal combustion engine (generator) is limited to 175 tons per year (calendar basis). The sulfur content of the bio-gas shall not exceed 12,500 parts per million on a volume basis. Special conditions have been added to the permit to insure that ambient air quality standards for sulfur dioxide are not exceeded and to maintain the facility potential to emit sulfur dioxide below 250 tons per year.

Test Methods

Testing to demonstrate compliance shall be conducted in accordance with EPA Reference Method 16 (as described in 40 CFR 60, Appendix A) for the determination of the emissions of H2S, DMS, DMDS, and MM.

Testing for demonstration of compliance shall be performed in accordance with Environmental Protection Agency (EPA) Reference Method (RM) 9 (as described in 40 CFR 60, Appendix A), for the visual determination of opacity. [Rule 62-297, FAC, and Rule 2.1201, JEPB]

Testing shall be performed on the bio-gas in accordance with one of the following test methods:

D 5504-98
D 1072-80
D 3031-81
D 4084-82
D 3246-81

The method most appropriate for the sulfur content range of the bio-gas fuel shall be used. Updated versions of the referenced test methods may also be used upon approval of the Permitting Authority. [Rule 62-4.070, FAC, and Rule 2.1401, JEPB]

Bio-gas fuel consumption shall be limited using the following equations:

Daily fuel consumption (DFC) = $1.215 \times 10^6/C$

DFC is in terms of standard cubic feet per day (scf/day), C is in terms of bio-gas sulfides (as hydrogen sulfide) concentration in parts per million by volume (ppmv)

Annual fuel consumption (AFC) = $2.036 \times 10^6/C$

AFC is in terms of million standard cubic feet per year (mmscf/yr), C is in terms of bio-gas sulfides (as hydrogen sulfide) concentration in parts per million by volume (ppmv)

In no case shall the AFC of bio-gas exceed 438 mmscf. Annual refers to a calendar year basis.
[Rule 62-4.070, FAC, and Rule 2.1401, JEPB]

Recordkeeping and Reporting

The permittee shall maintain records of the quantity and quality of the bio-gas produced at the facility on a monthly basis. Direct measurement using acceptable engineering measurement methods shall be used to determine the quantity of bio-gas produced. The quality (sulfide content) of the bio-gas produced shall be determined in accordance with above referenced method(s) on at least a weekly basis. The permittee shall calculate the sulfur dioxide emissions on a monthly basis using information required by this permit. This information shall be recorded and summarized in a log.

Semi-annual reports of the quantity and quality of bio-gas produced [including the weekly gas analysis test reports (only submit semi-annually)], and the calculated sulfur dioxide emissions on a semi-annual basis shall be submitted to the Permitting Authority. These reports are due by the end of the month following completion of each six month period (i.e.: JAN-JUN reporting period due July 31, JUL-DEC reporting period due January 31).

IV. CONCLUSION

Based upon information provided by JEA, the Permitting Authority has reasonable assurance that the proposed modification of the bio-solids process and associated appurtenances, as described in this evaluation and subject to the conditions proposed herein, will not cause, or contribute to a violation of any ambient air quality standard or other technical provision of Chapters 62-296 and 62-297, FAC, or Rules 2.1101 and 2.1201, JEPB.