TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

V.J. Usina Contracting, Inc.
4669 Avenue A
St. Augustine, Florida 32095

Clearing Debris Burn Site
Facility ID No. 1090054

PROJECT

Project No. 1090054-002-AC
Application for Air Construction Permit

COUNTY

St. Johns, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Air Resource Section
Northeast District Office
7825 Baymeadows Way, Suite B200
Jacksonville, Florida 32256-7590

August 2, 2011

1. GENERAL PROJECT INFORMATION

Air Pollution Regulations

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Rules 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations on a quarterly basis in Rule 62-204.800, F.A.C.

Glossary of Common Terms

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of this permit.

Project Description and Location

The facility is located in St. Johns County at 900 Big Oak Road, St. Augustine, Florida.

The applicant has proposed to construct an air curtain incinerator (Manufacturer: McPherson, Model: M40F) at the location as described above. The unit is a refuse disposal system (Standard Industrial Classification No. 4953).

In accordance to Rule 62-210.200 (16), F.A.C., an air curtain incinerator is a portable or stationary combustion device that directs a plane of high velocity forced draft air through a manifold head into a pit with vertical walls in such a manner as to maintain a curtain of air over the surface of the pit and a recirculating motion of air under the curtain.

1. Air curtain machine manifold and nozzle directing high velocity air flow into earthen trench.
2. Earthen wall.
3. Material to be burned.
4. Airflow forms a high velocity "curtain" over fire.
5. Continued air flow over-oxygenates fire keeping temperatures high. Higher temperatures provide a cleaner and more complete burn.

The proposed unit will utilize a firebox and will be powered by a 152 HP Cummins internal combustion engine (model: 6BT). The length of the air curtain nozzle is 30 feet and the maximum volumetric air flow is approximately 40,000 cubic feet per minute (cfm).

The facility will use the air curtain incinerator (ACI) to burn *wood waste* and *yard waste*. The unit is designed to be capable of burning 100 tons of waste per day. The unit can operate with or without refractory walls. It is believed that refractory walls (consisting of thermal ceramic panels) can help contain the heat within the combustion chamber and also reduce the maintenance effort since earthen pit walls will partially collapse over time and will require reconstruction.
The initial charge of wood/vegetative debris is loaded into the unit and ignited, usually with diesel fuel or kerosene. Once the debris has ignited, the blower is started and additional debris is loaded into the unit as needed to maintain combustion. The ignition process can generate a temporary puff of black smoke as the diesel fuel ignites, and smoke typically increases for a brief period as subsequent loads of debris are loaded. Generally, no auxiliary fuel is used to maintain good combustion within the unit. It is found that how the operator loads the material into the pit is essential to ensure good combustion. High opacity typically can be observed when the operator "overcharges" the pit by loading a huge amount wood waste or very dense material, loading a huge load instead of more frequent smaller loads, burning very high moisture content wood waste with significant dirt on it, and charging the waste too quickly before the existing material in the pit has sufficiently burned down.
After burn down, the bottom of the pit normally remains very hot under an insulating blanket of ash. As long as the ash is 1/3 of the depth of the pit and does not protrude into the air curtain, the operator can leave the ash in place for the next day's operation since the high temperature makes it easier for a new startup.
After shutdown, the operator typically will have to clean out the pit. When cleaning out the pit, normally water is applied to minimize the fugitive ash emissions and also the risk of fire hazard.

Using an ACI for waste disposal generally produces lower smoke emissions compared to open pile burning and reduces fire risk since the fire is contained and easier to extinguish if necessary. In the event of wood debris generated by storm, disease infected vegetation and emergency disposal of animal carcasses, the use of ACI is required by the Department's rule (see Rule 62-256.700, F.A.C. for details). This is largely due to the unit's ability to burn the wood waste cleaner and quicker for cleanup purpose (since Florida frequently experiences severe storms that generate massive amounts of wood debris) and offers an effective means of disposal for disease infected vegetation and animal carcasses.

Facility Regulatory Categories

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility is not a major source of air pollutants, other than HAPs.
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is not a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is not a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Processing Schedule

May 24, 2011 Received the application for Air Construction Permit.

3. APPLICATION REVIEW

The applicant is proposing to use the unit to burn clean wood waste and yard waste. According to NSPS solid waste incinerator provisions, the definition of clean wood and yard waste are defined below.

Yard waste means grass, grass clippings, bushes, shrubs, and clippings from bushes and shrubs. They come from residential, commercial/retail, institutional, or industrial sources as part of maintaining yards or other private or public lands. Yard waste does not include two items:

(1) Construction, renovation, and demolition wastes that are exempt from the definition of "municipal solid waste" in this section.

(2) Clean wood that is exempt from the definition of "municipal solid waste" in this section.

Clean wood means untreated wood or untreated wood products including clean untreated lumber, tree stumps (whole or chipped), and tree limbs (whole or chipped). Clean wood does not include two items:

(1) "Yard waste," which is defined elsewhere in this section.

(2) Construction, renovation, or demolition wastes (for example, railroad ties and telephone poles) that are exempt from the definition of "municipal solid waste" in this section.

It is worth noting that yard waste is considered MSW while clean wood waste is not. It is not totally clear why NSPS make the distinction between yard waste and clean wood since it is essentially the same material from solid waste management standpoint. One of the explanations is that EPA is attempting to encourage composting yard waste by making the unit that burn 100% yard waste subject to NSPS, Subpart AAAA (therefore discouraging waste disposal by burning). Another explanation is that since yard waste might contain small amount of plastic, paper, and traces of fertilizer and pesticide chemicals, it might not be considered as "clean" compare to the nature of the material described in "clean wood".

The heat value of the material approximately ranges from 4,000 BTU/pound – 5,000 BTU/pound. The moisture content typically ranges from 40 – 60 % since the waste are placed in an open area and weathered. The commonly assumed density of the waste is 0.1 – 0.5 ton/yd^3. The proposed unit is capable of burning 100 tons/day of wood waste. Very often, the operator does not have weight scale on site to measure the incineration rate of the unit. Since weighing the material to determine the incineration rate is difficult and requires significant extra effort, the applicant proposed to limit the hours of operation of the unit to 2340 hours per 12 consecutive months, assuming the unit operates at maximum rate at all time during normal operation, to assure the Department that the unit emit less than 100 tons/year of PM emissions.

Discussion of Emissions

Potential to Emit (PTE) Estimation

Based on the best information available to the Department, the emissions factor for PM is 2 lbs PM per ton material burned.

Calculation method

Based on maximum hours of operation (2340 hours/12 consecutive months) and maximum incineration rate of the unit (100 tons/day, 9 hours/day), the maximum amount of material burned per year is estimated to be 26000 tons.

Pollutant Emissions Rate (tons/year) = Emissions Factor (lbs/ton burned) x Maximum Amount of Material Burned (tons/year) x ton/2000 lbs

Calculation method

Based on maximum hourly burning rate of 7 gallons/hour and maximum hours of operation of 2340 hours/12 consecutive months, the maximum about of diesel fuel burned per year is estimated to be 16380 gallons/year.

Pollutant Emissions Rate (tons/year) = Emissions Factor (lbs/gallon) x Maximum Amount of diesel Burned (gallons/year) x ton/2000 lbs

Federal NSPS Provisions

Air Curtain Incinerator

The applicant proposes to burn 100 percent mixture of only wood waste, and/or yard waste, therefore is subject to 40 CFR 60.2245 through 60.2260 of NSPS, Subpart CCCC - New Source Performance Standards for Commercial and Industrial Solid Waste Incineration (CISWI) units. Details of the requirements are stated in the permit.

Federal NESHAP Provisions

The diesel engine is subject to NESHAP, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines.

State Specific Requirements

The unit is subject to Florida Administrative Code (F.A.C) Rule 62-296.401 (7), for air curtain incinerator.

The diesel engine will burn 16380 gallons of diesel fuel per year. As the engine is subject to NESHAP, Subpart ZZZZ, and will burn less than 64,000 gallons of diesel fuel per year, this engine is exempt from permitting pursuant to F.A.C. Rule 62-210-300(3)(a)35.

In addition to the regulations required by Air Program, this permit also consists of several requirements for solid waste management to ensure that the facility properly handle the waste material on site.

4. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. Brent Steele is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Northeast District Air Program, 7825 Baymeadows Way, Suite B200, Jacksonville, Florida 32256-7590.