TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Taminco Inc.
4575 Highway 90 East
Pace, Florida 32571

Taminco Pace Plant
Facility ID No. 1130004

PROJECT

Project No. 1130004-019-AC
Application for Title V Air Construction Permit
DIMLA Production Unit

COUNTY

Santa Rosa, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Air Resource Section
Northwest District Office
160 W. Government Street, Room 308
Pensacola, Florida 32502-5740

February 8, 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); 62-296 (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.

Facility Description and Location

Taminco Inc., is an existing chemical process plant, which is categorized under Standard Industrial Classification Code No. 2869 and produces a variety of alkyl amines as well as dimethyl formamide. The facility is located in Santa Rosa County at 4575 Highway 90 East in Pace, Florida. The UTM coordinates of the existing facility are Zone 16, 486.9 km East, and 3382.7 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to state and federal Ambient Air Quality Standards (AAQS).

Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- The facility has no units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Project Description

A new production unit will be constructed for manufacturing dimethyl laurylamine (DIMLA) from either a C12 alcohol (lauryl alcohol) or a C14 alcohol (myristal alcohol) or a mixture of the two. The alcohol feed (ROH) will be reacted with dimethylamine (DMA) in a catalyzed reaction with hydrogen present. A second methylation reaction using either formalin or formic acid completes the conversion of any partially reacted DIMLA. New equipment consists of reactors, separators, storage tanks and equipment such as pumps, compressors and piping for transporting materials from one vessel to another. Process vents will be routed through scrubbers to recover materials for reuse as feedstocks in the existing methylamines processes. Wastewater will be treated in the existing wastewater treatment system. Process waste materials will be burned in the existing boilers for energy recovery. Emissions of NOx will increase primarily due to increased steam production for the process and increased VOC emissions will result from additional loading to the wastewater treatment system.

Processing Schedule

Oct. 29, 2010 Received the application for a minor source air pollution construction permit.

Nov. 19, 2010 Requested additional information.

Dec. 20, 2010 Received additional information; application complete.

2. PSD APPLICABILITY

General PSD Applicability

For areas currently in attainment with the state and federal AAQS or areas otherwise designated as unclassifiable, the Department regulates major stationary sources of air pollution in accordance with Florida's PSD preconstruction review program as defined in Rule 62-212.400, F.A.C. Under preconstruction review, the Department first must determine if a project is subject to the PSD requirements ("PSD applicability review") and, if so, must conduct a PSD preconstruction review. A PSD applicability review is required for projects at new and existing major stationary sources. In addition, proposed projects at existing minor sources are subject to a PSD applicability review to determine whether potential emissions *from the proposed project itself* will exceed the PSD major stationary source thresholds. A facility is considered a major stationary source with respect to PSD if it emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant; or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the following 28 PSD-major facility categories: fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (with thermal dryers), Kraft pulp mills, portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plants, glass fiber processing plants and charcoal production plants.

Once it is determined that a project is subject to PSD preconstruction review, the project emissions are compared to the "significant emission rates" defined in Rule 62-210.200, F.A.C. for the following pollutants: carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less (PM_{10}); volatile organic compounds (VOC); lead (Pb); fluorides (Fl); sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as particulate matter; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as non-methane organic compounds (NMOC); and mercury (Hg). In addition, significant emissions rate also means any emissions rate or any net emissions increase associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 $\mu g/m^3$, 24-hour average.

If the potential emission exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant and the applicant must employ the Best Available Control Technology (BACT) to minimize the emissions and evaluate the air quality impacts. Although a facility or project may be *major* with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

<u>PSD Applicability for Project</u>

Fresh alcohol (ROH) and dimethylamine (DMA) are fed, along with recycled hydrogen, to a new ROH evaporator. The evaporator overhead is fed to a reactor vessel containing a catalyst. Effluent from the reactor flows to a separation column where Crude DIMLA is separated from unreacted DMA and hydrogen which are recycled. A combination of absorption

and desorption are used to recover unreacted DMA, which is recycled to the existing #4 Methylamines plant. Unreacted hydrogen goes overhead in the absorption column and is recycled to the ROH evaporator. The concentrated crude DIMLA is further purified by decanting to remove water. The DIMLA phase from the decanter is fed to a methylation reactor, containing catalyst, with either formalin or formic acid and additional hydrogen to finish converting any partially reacted DIMLA. The effluent from the methylation reactor is decanted again and the DIMLA phase is fed to a flash separator under vacuum. Product DIMLA is separated from remaining water using vacuum distillation.

Vent streams from the amines absorption column, the methylation reactor and the amines desorption column are sent to the existing low pressure absorber in the #1 Methylamines plant which vents to the existing flare. Wastewater from the amines desorption column goes to the existing wastewater treatment system. The water phase from the decanters is also sent to the existing wastewater treatment system via a new wastewater storage tank, TK-62057. Residue from the ROH evaporator and a portion of the DIMLA purification column residue are burned for energy recovery in the existing Riley Stoker Boiler. Off gases from the vacuum system are recovered using a new atmospheric scrubber that feeds the amines absorption column.

NOx emissions increase primarily from the burning of additional fuel in the existing boilers and cogen units that will supply the additional steam needed for the process. There is also an increase in NOx emissions from the flare. To avoid PSD for NOx, the amount of DIMLA purification residue that can be burned in the boiler is limited to 5000 gallons per year and the total amount of steam fed to the process is limited to 29,200 lb/hr.

Emissions of VOC are primarily from fugitive emissions associated with the new process and with the additional loading from the new process to the existing wastewater treatment system.

Emissions of CO, PM/PM10 and SO2 result primarily from the existing boilers and cogen units supplying steam to the new process. There is also an increase in CO and SO2 emissions from the existing flare due to the new process and an increase in PM/PM10 due to an increase in the circulation rate of one of the cooling towers.

As provided in the application, the following table summarizes potential emissions and PSD applicability for the project.

Table A. Potential Emissions (Tons/Year) and PSD Applicability

Pollutant	Baseline Actual Emissions (TPY)	Projected Actual Emissions* (TPY)	Project Emissions Increase (TPY)	Significant Emissions Rate (TPY)	Subject To PSD?
CO	142.04	158.56	16.52	100	No
NO_X	383.28	423.18	39.9	40	No
PM/PM_{10}	20.67 / 20.66	21.85/21.84	1.18/1.18	25/15	No
SO_2	13.72	14.71	0.99	40	No
VOC	107.4	141.0	33.6	40	No
Methanol (HAP)	49.88	67.38	17.5	NA	NA
Formaldehyde (HAP)	0	0.857	0.86	NA	NA

*****Information provided with 1130004-019-AC, including projected emissions from the DIMLA project.

As a chemical processing plant with emissions of NOx, CO and VOC greater than 100 TPY, this facility is a major stationary source with respect to PSD. However, as shown in the above table, project emissions will not reach or exceed the PSD significant emissions rates; therefore, the project is not subject to PSD preconstruction review.

3. APPLICATION REVIEW

Application Fee: No application fee is required for a Title V facility.

Discussion of Emissions

The only activity that increased emissions in the last five years was "rail car cleaning." That increased VOC by 3 TPY, which was considered insignificant and accomplished via letter. Project 017-AC, production of amietols and triazine, would have required a new boiler and increased emissions of CO and NOx significantly, 53.89 and 25.91 TPY respectively, but the project was not done and the permit was relinquished as part of this project.

Projected emission estimates for NOx add the emission estimates for burning the byproduct fuels from the process (ROH residue and DIMLA Purification residue) in the Riley Stoker Boiler to the emission estimate based solely on the steam requirements for the new process. Additionally, the emission factors used for the ROH residue are multiplied by two and the assumption is made that all nitrogen in the byproduct fuels is converted to NO2. For these reasons, the projected NOx emission estimate is believed to be conservatively high**.**

PSD avoidance for NOx is further ensured by limiting the amount of DIMLA purification residue burned in the Riley Stoker Boiler to 5000 gallons per year and by limiting the total steam fed to the process. Emissions for the steam generating units and the flare will be monitored for a period of ten years after the startup of the DIMLA process. Within 60 days after the end of each year, a post-project emissions report will be submitted to the Department. The annual emission report will compare the actual emissions to the post project projections and provide an explanation for any emissions that exceed the post project projections. In the event that actual post project emissions indicate that the PSD trigger levels have been exceeded, all provisions in 62-212.400 will apply as if the permit had never been issued.

State Requirements

Rules 62-210.300(1), 62-210.370, 62-212.300(1)(e), 62-213 and 62-212.400(12), F.A.C.

Federal NSPS Provisions

The proposed DIMLA production unit is subject to 40CFR 60 subparts VVa, NNN and RRR. Compliance with the requirements for process vents and recovery devices in 40 CFR 63 subpart FFFF constitutes compliance with 40 CFR 60 subparts NNN and RRR.

New nozzles will be installed in the Riley Stoker boiler to enable the combustion of DIMLA purification residue. However, based on the EPA Determination Detail (Control Number 0700016) Titled "Change of Nozzle Tip to Accommodate Residual Fuel," submitted with the RAI response, this change is not believed to constitute a "modification" as defined in 40 CFR 60.2, and thus, does not result in the boiler becoming subject to NSPS regulation (Subpart Db).

Storage tanks for the new process are subject only to the recordkeeping requirements of 40 CFR 60 subpart Kb.

Federal NESHAP Provisions

The proposed DIMLA production unit is subject to 40CFR 63 subpart FFFF (Miscellaneous Organic NESHAP, or MON).

Other Draft Permit Requirements

The applicant shall maintain and submit to the Department on an annual basis for a period of ten years from the date of the permit, information demonstrating in accordance with Rule 62-212.300(1)(e), F.A.C., that all affected emission units together do not result in a significant emissions increase.

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. Teresa Knepper 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 850/595-0670 or teresa.knepper@dep.state.fl.us.