Prevention of Significant Air Quality Deterioration Review
of the Johns Manville International, Inc.
Fiberglass Insulation Manufacturing Facility
located in Winder (Barrow County), Georgia

PRELIMINARY DETERMINATION

State of Georgia
Department of Natural Resources
Environmental Protection Division
Air Protection Branch

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SUMMARY

The Environmental Protection Division (EPD) has reviewed the Johns Manville International, Inc. (JM) PSD application for their existing fiberglass insulation manufacturing facility located in Winder, Georgia. The proposed change is considered a change in the method of operation. The change consists of adding an oxidation-reduction agent to the raw materials placed in the two melters of the Line 106 fiberglass insulation manufacturing line.

A summary of the net emissions changes from the proposed change in the method of operation, and the significant emissions levels as defined by the PSD regulations, is shown in Table 1. Net emissions increases of Sulfur Dioxide (SO_2) and Carbon Monoxide (CO), from the proposed operational change, will be below the PSD significant quantities.

Table 1. Emission increases for the JM Fiberglass Insulation Manufacturing Line Project

Pollutant	Line 106 PTE Prior to This Amendment (tpy)	Emissions Increase From the Line 106 Proposed Project (tpy)	Total Line 106 Emissions After the Current Increase (tpy)	PSD Significant Emission Rate (tpy)	Original Line 106 PSD BACT analysis Limit Contained in Permit (Yes/No)	Subject to Additional PSD Review? (Yes/No)
PM_{10}	122	0	122	15	**Yes**	**No**
NO_x	171	0	171	40	**Yes**	**No**
SO2	4.2	20	24	40	**No**	**No**
CO	794	34.58	828	100	**Yes**	**Yes**
VOC	125	0	125	40	**Yes**	**No**

Carbon monoxide (CO) emissions are generated from the oxidization of the oxidation-reduction agent's carbon in the glass mix. The Line 106 melter CO emissions have been limited to 1.277 pounds per hour. Although this limit was previously set with the intention that it would cover all potential batch formulations, it failed to anticipate the operational necessity for adding this new raw material. The facility found, after operating the new melters, that over time they experienced higher than expected wear on the electrodes and lining of the melters. The addition of the oxidation-reduction agent counteracts this problem. When adding this new raw material, their application indicates they will need to be allowed to emit 7.845 pounds per hour more CO so the limit will have to be increased to 9.122 pounds per hour. That is an annual increase of 34.58 tpy, which is less than the 100 tpy PSD significant level. However, the emissions of CO from Line #106 was subject to a BACT determination when originally permitted in 2001, so any existing CO limits are BACT limits and cannot be increased without a new BACT determination. The CO emissions from the melter were limited by Permit Number 3296-013-0005-P-01-0 to 1.277 pounds/hr. This limit was used in the modeling analysis for the PSD NAAQS and increment analyses so therefore the modeling must also be revisited. In the case of CO emissions from the melters on Line #106, BACT was determined to be good operating practice. A new PSD review was carried out to allow the limit to increase. The results of this PSD review is that BACT was determined to still be good operating practice and, although the CO limit is higher, the modeling shows that the CO increment will not be violated by this emissions increase. Therefore, it is the preliminary determination of the EPD that the proposal provides for the application of Best Available Control Technology (BACT) for the control of CO as required by federal Prevention of Significant Deterioration (PSD) regulation found in 40 CFR Part 52.21(j).

The change in emissions of criteria pollutants, due to the proposed change in the method of operation, will also include a very minute increase in the emissions of particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}), and Sulfur Dioxide (SO_2). SO_2 emissions result from reducing sulfur trioxide (SO_3) to SO_2.

The agent changes the chemistry in the melters such that less sulfur contained in the raw materials is retained in the fiberglass produced so more is presumed to be emitted to the atmosphere. However, even assuming that all sulfur not retained in the fiberglass is released as SO_2, the maximum SO_2 emissions under worst-case operating conditions are far less than the 40 tpy PSD Significant Emission Rate. The SO_2 emissions are most directly correlated to the usage rate of:

(1) cullet, which accounts for the majority of sulfur in the batches, and
(2) the sulfur in the oxidation-reduction agent.

Operating constraints on usage of sulfur-containing raw materials and the oxidation-reduction agent ensure that the facility cannot operate under conditions that result in SO_2 emissions above the 40 tpy threshold.

As alluded to above it has been determined, through approved modeling techniques, that the estimated emissions increases caused by this proposed change in the method of operation will not cause or contribute to a violation of any ambient air standard or allowable PSD increment in the area surrounding the facility. It has further been determined that the proposed operational change will not cause impairment of visibility or detrimental effects on soils or vegetation. Any air quality impacts produced by the operational change should be inconsequential.

The control technology selected as BACT for the Line 106 melters CO emissions is good operating practices. The Preliminary Determination indicates that the current Title V Air Quality Permit should be revised and issued to JM to allow the use of the oxidation-reduction agent in the glass mixture used for the fiberglass insulation manufacturing line. Various conditions will be made a part of the construction / operating permit to ensure and confirm compliance with all emissions limits proposed. A copy of the draft permit conditions is included in Appendix A.

1.0 INTRODUCTION

1.1 PSD Requirements

The regulations for Prevention of Significant Deterioration (PSD) contained in 40 CFR Part 52.21 require the review of any new major source or modification of an existing major source to determine the potential emissions of all pollutants subject to regulations under the Clean Air Act. The PSD review requirements apply for any new or modified source that:

- Belongs to one of the 28 specific source categories having potential emissions of 100 tons per year or more of any regulated pollutant, or
- All other sources having potential emissions of 250 tons per year or more of any regulated pollutant, or
- Modification of a major stationary source which results in a significant net emissions increase of any regulated pollutant.

The PSD regulations require that any source subject to the regulations meet the following requirements:

- Application of the best available control technology (BACT) for each regulated pollutant that would be emitted in significant amounts;
- Analysis of the ambient air impact;
- Analysis of the impact on soils, vegetation, and visibility;
- Analysis of the impact on Class I areas; and
- Public notification of the proposed project in a newspaper of general circulation.

1.2 History and Proposal

On April 8, 2003 Johns Manville International, Inc. (JM) submitted an application to revise their Title V air quality permit to operate equipment at JM's existing facility near Winder, Georgia. They proposed to change their method of operation by retrofitting the raw material handling equipment to allow the inclusion of an oxidation-reduction agent in the raw materials being added to the glass melters for Line # 106. This oxidation-reduction agent will convert oxygen (O2) to carbon monoxide (CO), reducing oxidation of the melter's electrodes and lining, thus increasing their useful life and stability.

The addition of this agent will take place at the bulk raw material receiver (Emission Unit ID# 621E) for Line 106, which is part of Manufacturing Step #1 shown in Table 2 below. No other part of the process will be affected or changed by this operational change.

Table 2. Process Line #106 System Outline and the Manufacturing Steps

System	Manufacturing Step	Description
General Bulk Raw Material Handling for Plant and Line #106 Preparation	1	*Bulk Raw material handling, storage and preparation
	2	Creating the molten glass
Line #106 Forming and Curing	3	Formation of the fibers, application of the binder, and mat formation
	4	Curing the binder-coated fiberglass
	5	Cooling the mat
Line #106 Finishing, Handling, and Packaging	6	Backing, cutting, and packaging
*The bulk handling and storage equipment are shared between the newer 106 line and older 105 line.		

Note that the addition of the oxidation-reduction (reducing) agent was requested for process Line #106 and not the older line[1] #105. Also note that, since the last PSD evaluation, the facility has ceased using a formaldehyde resin and is now using an acrylic resin for both their fiberglass-manufacturing lines. This eliminated the toxic pollutants phenol and formaldehyde from the processes. Ammonia emissions were also significantly reduced.

Step 2 of the fiberglass manufacturing process involves the creation of molten glass. The process line for Line 106 employs two electric melters, which use multiple electrodes to heat the batch raw materials into a molten state. Solid raw materials are added to the melters at the top of the molten mass of glass. The emissions from the space above the molten mass and the top of the melter housing are drawn through a baghouse. These emissions consist of PM and small amounts of SO_2 and CO emissions. It is at this location that the increased emissions of CO and SO_2 will occur due to the use of the oxidation-reduction agent. As the molten batch exits the bottom of the melting operation, the molten glass is diverted to rotary fiberizing units.

The JM permit application for the new process line, which includes supporting data, is included in Appendix B.

[1] The oxidation problem is more pronounced on the Line #106 melters because they are larger and have higher temperatures than the melters on Line #105.

1.3 Applicability

Title 40 of the Code of Federal Regulations (CFR), Section 52.21(b)(1)(i)(a), lists the 28 source categories with a 100 ton per year "major" source PSD threshold. Glass fiber processing plants are included on this "list of 28." Since the Winder Plant was emitting several pollutants with current emissions in excess of the 100-ton per year major source threshold prior to the installation of Line #106, the Winder Plant was then a "major" source under the PSD rules for PM, PM_{10}, NO_X, CO and VOCs.

A summary of the net emissions changes from the proposed operational change and the significant emissions levels as defined by the PSD regulations is shown in Table 1. Net emissions increases of SO_2 from the proposed operational changes will be below the PSD significant quantities. The total increase of CO emissions for Line #106 are well above the 100-tpy significant emission rate (see column number 4 of Table 1). The CO limit from the Line #106 melters will have to be increased from the present BACT limit of 1.277 pounds per hour to 9.122 pounds per hour. This is a 34.58 tpy increase on an annual basis. So, even though the emissions increase of CO for the current proposed project is below the PSD Significant Emission Rate, because a BACT CO emission limit for the affected emission unit contained in their current permit must be changed, a PSD review is needed to allow the increase.

1.4 Preliminary Determination

Through its new source review procedure, EPD has evaluated the JM proposal for compliance with state and federal requirements. The findings of EPD are assembled in this preliminary determination. Additionally, the applicability of other air quality rules, including New Source Performance Standards (NSPS) and Georgia State Implementation Plan (SIP) requirements, is discussed.

2.0 EMISSION CONTROL STRATEGY

2.1 General

Once the PSD applicability determination has been made, the PSD regulations require that BACT be applied to all new or physically modified units. BACT by definition results in an emission limit based on the maximum degree of pollutant reduction that the permitting authority determines is available and achievable for the source on a case-by-case basis. In all cases BACT must establish emission limitations or specific design characteristics at least as stringent as applicable NSPS. This section summarizes results of the BACT analysis for each pollutant under scrutiny (i.e., CO) for each source, which has an increase in emissions (i.e., the Line #106 melters).

2.2 CO

The collection modules and curing oven are the primary sources of CO. The previous PSD analysis included a BACT determination; the required BACT control equipment has been installed. Since there will be no new emissions from these sources of emissions, no further analysis is needed for them. However, in the PSD analysis, the emissions from the melters was considered too low to require add-on controls; with the increase, that has changed, so BACT must be reviewed again for the melters. I note that the analysis for add-on control devices for the large CO sources, in the original BACT analysis, contains information that is applicable for the much smaller CO emission increases from the proposed changes to the raw materials to the melters. During the analysis for the collection modules, two candidates for add-on CO controls had been found. One was a RTO and the other a Catalytic CO oxidizer. At that time (1999), neither of these had been "demonstrated in practice" for the use of CO control. Also, JM performed a cost analysis using 1999 dollars and supplied the results in both the original and their current applications. Table 3 below shows, as it did in the original analysis for Line 106 melters, that the annual costs are still extremely high for each ton of CO removed. Accordingly, these have to be rejected. The only feasible option that is available is the use of good operating practices (GOP). [Note that both of the add-on control options would have added NO_x emissions, which would contribute to ozone. Since that the facility is located in Barrow County, which will soon be designated as an ozone non-attainment area, an increase in NO_x would be counter-productive.]

Table 3. Possible CO Add-On Control Technologies Supplied by the Facility in their Application.

Source	Control Options	Efficiency %	Feasibility			
			Technical	Environmental	Total Annualized Cost	Cost per Ton*
Melters on Line #106	RTO	90	Maybe	Maybe	$503,431	$12,598
	CO Oxidizer	90	Maybe	Maybe	$387,472	$9,696
	GOP	0	N/A	N/A	0	0
*Using 1999 dollars						

2.3 SO2

Because the potential emissions of SO2 from the melters are well below the PSD significance level of 40 tpy, PSD permitting is not required and a BACT analysis was not performed. JM has demonstrated that potential SO_2 emissions, when operating under a worst-case theoretical batch formulation, cannot exceed 40 tpy.

Therefore, a PSD avoidance limit for SO_2 from the melters is not necessary.

2.4 BACT Analysis Summary

The control technology selected as BACT for Line 106 melter CO emissions is good operating practices (GOP). No BACT analysis was needed or conducted for SO2 emissions from the melters.

3.0 AIR QUALITY REVIEW

3.1 General

The PSD regulations require a demonstration that the allowable emissions from the proposed source, in conjunction with all other applicable emissions increases or decreases, will not cause or contribute to a violation of:

- Any National Ambient Air Quality Standard (NAAQS) in any air quality control region; or
- Any applicable maximum allowable increase over the baseline concentration in any area (PSD increment).

The proposed change to the PSD project (Line #106) will cause net emissions increases of CO and SO2. Because the increase in the allowable CO emissions will exceed the original Line 106 Melters BACT limit, the air dispersion modeling analyses must be redone to demonstrate compliance with the NAAQS and PSD Increments for that pollutant.

3.2 Monitoring

EPD does not maintain ambient air monitors for CO in Barrow County. The ambient air quality in Barrow County can be adequately estimated by using background concentrations for similar areas in Georgia. The existing network of Georgia monitors has been determined to be able to provide representative data that may be used in place of pre-construction monitoring by JM.

3.3 Modeling

To comply with the PSD rules, EPD assesses the ambient impact of a source through the use of mathematical dispersion models. The models are based upon the assumption that the dispersion of pollutants is primarily a function of wind speed and direction; atmospheric stability conditions; and the characteristics of the effective point discharge of the exhaust plume. To predict ambient air concentrations the models simulate the plume exhausting from the stack, rising a certain distance in the atmosphere, leveling off, and continuing downwind over relatively flat terrain. The concentrations of pollutants are assumed to have Gaussian distribution about the downwind axis centerline of the plume.

In analyzing the air quality impact of these operational changes, the U.S. EPA Industrial Source Complex Short-Term Version 3 (ISCST3) model was used for all modeling results presented in the preliminary determination. ISCST3 is a Gaussian plume dispersion model that estimates hour-by-hour ground-level concentrations of emissions from an elevated source. The model provides maximum 24-hour and annual average concentrations for receptors located on many grid types around the source for various downwind distances. The model also takes into account the effect of downwash caused by nearby buildings and

structures.

For this review of the proposed JM fiberglass line at the Winder Plant, the models utilized preprocessed hourly meteorological data based on surface measurements made in Atlanta, Georgia, and upper air measurements made in Athens, Georgia, for the period 1974-1978. The anemometer height used in the analysis is 20 feet.[2]

There are a number of emission sources associated with the new process line. Many of the smaller emission sources exhaust from fabric filter dust collectors or other roof vents that are discharged horizontally or are obstructed. These sources were modeled as volume sources with initial lateral and vertical dimensions of 2 meters to approximate the initial exhaust plume. Releases from these sources were assumed to have no buoyant lift and therefore only the release height was input to the model.
The larger emission sources are exhausted vertically from stacks. The modeling of these sources was performed using actual stack heights since each of these sources have a uniform stack height of 33.53 m, which conforms to "good engineering practice" (GEP) requirements. In performing the modeling, the stack height input may not exceed GEP stack height. This constraint is based on U.S. EPA's policy of restricting dispersion enhancement credit where stacks exceed GEP. GEP is defined as the greater of 65 meters, or: $HG = H + 1.5L$

Where: HG = Good engineering practice stack height

H = Height of nearby structure

L = Lesser of dimension (height or width) of nearby structure.

Each source associated with the process line was evaluated in terms of its proximity to nearby structures. The purpose of this evaluation was to determine whether the stack discharge might be entrained in a structure's turbulent wake leading to downwash of the plume. Wind blowing around a building creates zones of turbulence that are greater than if the building were absent.

The current version of the ISCST3 dispersion model treats building wake effects following the algorithms developed by Schulman and Hanna.[3] This approach requires the modeler to input wind direction-specific building dimensions for structures located within 5L of a stack, where L is the lesser of the height or projected width of a nearby structure. Stacks taller than the structure height plus 1.5L are not subject to the effects of downwash in the ISCST3 model.

For this analysis, the direction-specific building dimensions used as input to the ISCST3 model were calculated using the *BREEZE-AIR* software, developed by Trinity Consultants. This software incorporates the algorithms of the U.S. EPA-sanctioned Building Profile Input Program (BPIP), version 95086.[4] BPIP is designed to incorporate the concepts and procedures expressed in the GEP Technical Support document, the

[2] National Oceanic and Atmospheric Administration (NOAA), *Local Climatological Data - Annual Summaries for 1991 - Part II - Eastern Region,* Asheville, North Carolina.

[3] L.L. Schulman and S.R. Hanna, "Evaluation of Downwash Modifications to Industrial Source Complex Model," *JAPCA* 36:258-264, 1986.

[4] U.S. Environmental Protection Agency, *User's Guide to the Building Profile Input Program,* Research Triangle Park, NC, EPA-454/R-93-038.

Building Downwash Guidance document, and other related documents.[5]

3.4 Modeling Significance Analysis

The first step in the air quality analysis was to determine whether the incremental ambient impacts due to the emissions from the project, including the increased CO, were greater than U.S. EPA-prescribed Modeling Significance Levels. This "significance analysis" determined whether JM could forgo a full-scale impact analysis to demonstrate compliance with the NAAQS and PSD Class II Increments.

The results of the CO significance analysis conducted for the JM process line are summarized in Table 4. The impacts due to the total project emissions of CO were calculated in this analysis using the ISCST3 dispersion model.

Table 4. Results of the Modeling Significance Analysis Performed in 2001 and 2003.

Pollutant	Averaging Period	Maximum Ambient Impact 2001 Results ($\mu g/m^3$)	Maximum Ambient Impact 2003 Results ($\mu g/m^3$)	Modeling Significance Level ($\mu g/m^3$)	Monitoring *de minimis* Concentration ($\mu g/m^3$)
CO	1-hour	422	448	2,000	-
	8-hour	236	251	500	575

As shown in Table 4, ambient receptors per both the 2001 and the 2003 analysis do not have pollutant concentrations exceeding their corresponding Modeling Significance Levels. The data shows that CO emissions can reasonably be assumed to have no significant impact on the air quality surrounding the facility since ambient CO impacts. Even with the increase over the 2001 figures, the modeled concentrations do not exceed the Modeling Significance Levels (448 vs. 2000 for the 1-hr and 251 vs. 500 for the 8-hr significant levels). Therefore, per U.S. EPA modeling procedures, no NAAQS analysis for CO is required.

[5] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised)*, Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.

3.5 Ambient Air Quality

The NAAQS are established as ambient ceilings applicable to the entire country, and they must be attained and maintained. The PSD NAAQS analysis was performed in 1999 for PM_{10} and NO_x and will not have to be performed again since there will be no increases in PM_{10} and NO_x. The analysis was not performed for CO because it was below the significance levels, as discussed in the previous section and shown in Table 4.

The Significant impact area analysis performed demonstrates that emissions from the Winder Plant will not cause or contribute to a significant impact level (SIL) for CO with respect to either the one hour or 8 hour averages.

3.6 Increment Consumption

There was no increment consumption as a result of this project.

3.7 Impact on Class I Areas

PSD review requires that sources located within 100 kilometers of a Class I area be evaluated for possible impact on that area. The nearest Class I area to the Winder Plant is the Cohutta Wilderness Area of the Chattahoochee National Forest. This area is located approximately 120 kilometers from the Winder Plant. Therefore, no adverse impacts on the Class I area as a result of this project are to be expected. Therefore, no analysis of Class I Increment consumption was necessary in 2001 and is still not necessary.

4.0 ADDITIONAL IMPACT ANALYSES

PSD requires an analysis of impairment to visibility, soils, and vegetation that will occur as a result of the facility and an analysis of the air quality impact projected for the area as a result of the general commercial, residential, and other growth associated with the facility.

4.1 Visibility

Visibility impairment is any perceptible change in visibility (visual range, contrast, atmospheric color, etc.) from that which exists under natural conditions. Poor visibility is caused when fine solid, liquid particles (usually in the form of volatile organics), or gases such as nitrogen oxides or sulfur oxides, absorb or scatter light. This light scattering or absorption actually reduces the amount of light received from viewed objects and scatters ambient light in the line of sight. This scattered ambient light appears as haze.

Another form of visibility impairment in the form of plume blight occurs when particles and light-absorbing gases are confined to a single elevated haze layer or coherent plume. Plume blight, a white, gray, or brown plume clearly visible against a background sky or other dark object, usually can be traced to a single source such as a smokestack.

Line #106 was predicted, in the 1999 PSD review, to not change the status of visibility in the area surrounding the Winder Plant; that prediction remains the same. The potential for visibility impairment is low due to the inherent design features of the new process line and the controls (i.e., scrubbers) JM has installed on the new sources, both of which limit particulate matter emissions. Therefore, other than condensation, there was not anticipated to be any visible plume from the proposed process units. However, to quantitatively demonstrate that the original Line 106 proposed project will not create a noticeably visible plume in sensitive areas around the Winder Plant, an exhaust plume visibility analysis was performed in the 2001 analysis. The closest Class I area to the Winder Plant, the Cohutta Wilderness, was chosen for this evaluation.

The primary variables that affect whether a plume will be visible or not at a certain location are (1) quantity of emissions, (2) types of emissions, (3) relative location of source and observer, and (4) the background visibility range. For this project, a Level-1 visibility analysis was performed by JM, and verified by EPD, using the latest version of the U.S. EPA VISCREEN model following to the guidelines published in the *Workbook for Plume Visual Impact Screening and Analysis*.[6] The VISCREEN model is designed specifically to determine whether a plume from a facility may be visible from a given vantage point.

[6] U.S. Environmental Protection Agency, *Workbook for Plume Visual Impact Screening and Analysis*, EPA-450/4-88-015, 1988.

For a Level 1 analysis, default particulate size and density and worst-case meteorological conditions of F stability with a 1.0 m/s wind speed are used. These worst-case meteorological conditions are assumed to persist for 12 hours with a wind direction that would transport the plume directly adjacent to the observer. In the visibility analysis, the PM_{10} and NO_x emission increases associated with the proposed project were used as input to the model. Remaining Level 1 input parameters were set to those values specified by the VISCREEN user's manual.[7] As directed in the *Workbook*, a background visual range of 25 km was used for the area of central Georgia where the Winder Plant is located.

For both views inside and outside the areas selected, calculations were performed by the model for two assumed plume-viewing backgrounds (horizon sky and a dark terrain object). VISCREEN assumes that the terrain object is black and located adjacent to the plume on the side of the centerline opposite the observer. The VISCREEN model output shows separate tables for inside and outside of the Class I Area. Each table contains several variables: theta, azi, distance, alpha, critical and actual plume *?E*, and critical and actual plume contrast. These variables are defined as:

Theta - Scattering angle (the angle between direction solar radiation and the line of sight). If the observer is looking directly at the sun, theta equals zero degrees. If the observer is looking away from the sun, theta equals 180 degrees.

Azi - The azimuthal angle between the line connecting the observer and the line of sight.

Alpha - The vertical angle between the line of sight and the plume centerline.

?E - Used to characterize the perceptibility of a plume on the basis of the color difference between the plume and a viewing background. A *?E* less than 2.0 signifies that the plume is not perceptible.

Contrast - The contrast at a given wavelength of two colored objects such as plume/sky or plume/terrain.

The analysis is considered satisfactory if *?E* and *Contrast* are less than critical values of 2.0 and 0.05, respectively.

Results from the VISCREEN model were obtained for the two worst-case angles of 10 and 140 degrees. At these angles, the light that scatters plume particles is maximized. The results show that the visual impact criteria (*?E* and *Contrast*) inside and outside the areas are not exceeded as a result of the proposed project. Since the project passes the Level 1 analysis, no further analyses of exhaust plume visibility was warranted as part of this air quality analysis.

The proposed 2003 / 2004 Line 106 melters CO emissions increase will not change the status of the visibility in the area because CO is a clear gas and does not reduce visibility. The amount of SO2 emitted is small and is also presumed not to effect visibility. Therefore, no revision to the previous VISCREEN analysis discussed above was made as part of this permit amendment.

[7] U.S. Environmental Protection Agency, *Tutorial Package for the VISCREEN Model*, U.S. EPA OAQPS, Research Triangle Park, NC, June 1992.

4.2 Soils and Vegetation

The effect of the proposed project's PM_{10}, NO_x, and CO emissions on local soils and vegetation were evaluated through comparison of modeled impacts to the secondary NAAQS (or primary NAAQS in the case of CO). The secondary NAAQS have been established to protect general public welfare and the environment. Thus, on-going compliance with the secondary PM_{10} and NO_X NAAQS is considered to be sufficient to protect soil and vegetation in the area surrounding the Winder Plant. Since the results of the NAAQS analysis for PM_{10} and NO_2 from the 1999 analysis showed that there are no modeled impacts above the secondary NAAQS, then a presumption can be made that this new project will have no adverse impacts on soils and vegetation because there was no increase in either PM_{10} or NO_2. CO does not have a secondary NAAQS standard, mainly because it does not cause any impacts on soils and vegetation. The Fish and Wildlife service[8], which administers PSD reviews for some Class 1 areas in the state, was consulted during the original Line 106 PSD review. They explained that CO is not considered by them in PSD reviews because there is no impact on soil and vegetation and the effects on wildlife are too small to measure.

4.3 Growth

The purpose of the growth analysis is to predict how much new growth is likely to occur as a result of a project and the resulting air quality impacts from this growth. However, no quantitative analysis of growth impacts is warranted for this project since there should be no change resulting from this operational change. Therefore there will be no impact on the air quality of the area surrounding the Winder Plant due to growth.

[8]The US Fish and Wildlife Service in Denver, Colorado, which is responsible for managing the Wolf Island National Wildlife Refuge in southeast Georgia, has stated that they have not proposed AQRVs for CO because CO has little affect on plant and wildlife at the maximum concentrations expected from sources not on site.

5.0 OTHER APPLICABLE AIR QUALITY RULES

5.1 New Source Performance Standards

New Source Performance Standards (NSPS) require new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except as noted.

Line 106 is subject to Subpart PPP, *Standards of Performance for Wool Fiberglass Insulation Manufacturing Plants.*[9] Subpart PPP applies to rotary spin wool fiberglass insulation manufacturing lines that commence construction, modification, or reconstruction after February 7, 1984. The modified fiberglass line will continue to be subject to NSPS Subpart PPP. Principally, this regulation limits particulate matter emissions from the manufacturing line to 11.0 lb/ton of glass pulled. Since the proposed operational change will not effect PM emissions, there will not be any changes in Subpart PPP applicability and therefore no changes to existing conditions related to the NSPS as a result of the operational change.

5.2 National Emission Standards for Hazardous Air Pollutants

Final rule-making promulgating National Emission Standards for Hazardous Air Pollutant (NESHAP) for the wool fiberglass manufacturing industry was published on June 14, 1999[10] as 40 CFR 63.1380 (Subpart NNN). This NESHAP applies to those facilities involved in wool fiberglass insulation manufacturing that are a major source of hazardous air pollutants (HAP), meaning that they have the potential to emit more than 10 tpy of an individual HAP and/or more than 25 tpy of aggregate HAP. The Winder Plant was an affected source and there were permit conditions contained in their original PSD permit requiring the facility to comply with this standard. In February 2002 Johns Manville announced that they would switch to a new formaldehyde-free resin. Johns Manville petitioned the US EPA to determine that their plant was not considered subject to Subpart NNN anymore. EPA OAQPS agreed with Johns Manville in the spring of 2002. Johns Manville converted to the acrylic based resin before the Title V permit was issued on December 19, 2002. Therefore Subpart NNN need not be addressed in this PSD review. The PSD permit therefore contains no NESHAP requirements.

5.3 Georgia Air Quality Rules

This project is being permitted under the regulations contained in Georgia's *Rules for Air Quality Control, Chapter 391-3-1 (June 2003, the latest revision)*. Pursuant to 391-3-1-.03(1)(a), unless exempted by determination from the Georgia EPD, an air permit must be obtained for any new or modified facility that may result in air pollution. This permit is proposed to be issued by the agency upon determination that the facility can reasonably be expected to comply with the *Rules*. This section of the application highlights specific Georgia SIP regulations that will apply to the proposed project.

Visible emissions from the equipment is regulated by 391-3-1-.02(2)(b). Opacity from all emission units

[9] 40 CFR 60.680.

[10] 64 FR 31695.

including the melters will be limited to 40%. The emission units on the fiberglass line 106 are all well-controlled and exhausts will have normal opacities far below this SIP limit.

The proposed manufacturing line is also be subject to 391-3-1-.02(2)(e), *Particulate Emissions from Manufacturing Processes* and 391-3-1-.02(2)(n), *Fugitive Dust*. *Rule (e),* limits particulate emissions from equipment to a rate proportional to the equipment's process mass input rate. The BACT limits for particulate matter for the Line #106 sources are all to be less than those allowed under *Rule (e),* based on the proposed process rates. *Rule (n)* is a general provision requiring facilities to take reasonable precautions to prevent fugitive dust.

Air Quality Rule 391-3-1-.02(2)(oo) regulates particulate matter emissions from Fiberglass Insulation Manufacturing Plants. Certain process units installed on Line #106 are subject to this rule. These include the Collection Modules (641E, 642E, 643E, 644E) and the Curing Oven (654E), but not the melters. Therefore the changes proposed by this application do not change Rule (oo) applicability and therefore will not affect *Rule (oo)* limits.

6.0 EXPLANATION OF DRAFT PERMIT AMENDMENT CONDITIONS

Table 5 below provides an outline of the 17 permit conditions contained in the JM permit amendment. The new or modified permit conditions were put into the appropriate Title V section (there are 8 sections contained in the permit; some sections did not have any conditions changed). The actual permit conditions are contained in Appendix A.

Table 5. Explanation of Permit Conditions Added or Modified as part of this Permit Amendment

Section and Title	Permit Cond. Number	Description
1.0 FACILITY DESCRIPTION	1.3	Modified Condition Added a paragraph to describe the addition of a new raw material (oxidation-reduction agent) to reduce corrosion of the melter electrodes and sidewall.
PART 2.0 REQUIREMENTS PERTAINING TO THE ENTIRE FACILITY	N/A	No change to this section.

Table 5. Explanation of Permit Conditions Added or Modified as part of this Permit Amendment		
Section and Title	Permit Cond. Number	Description
PART 3.0 REQUIREMENTS FOR EMISSION UNITS	3.1	Modified Emission Unit Table 521E The Receiver (522E) and Blender (521E) emission units were transposed in the original application and the titles of these emission units were corrected in this amendment to correct this typo. 522E The Receiver (522E) and Blender (521E) emission units were transposed in the original application and the titles of these emission units were corrected in this amendment to correct this typo. 554E Deleted the word "baghouse" from description of pollution control equipment 554C. The HEAF is not a baghouse; it is a moving filter media type PM control device that uses a flat filter media that advances when the pressure drop across the media reaches a set-point value. 621E Added the new condition numbers applicable to this emission unit. 622E Added the new condition numbers applicable to this emission unit. 623E Added the new condition numbers applicable to this emission unit. 624E Added the new condition numbers applicable to this emission unit. 631E Added the new condition numbers applicable to this emission unit. 632E Added the new condition numbers applicable to this emission unit.

Table 5. Explanation of Permit Conditions Added or Modified as part of this Permit Amendment		
Section and Title	Permit Cond. Number	Description
	3.3.5	Modified Condition To correct a typo in the air pollution control device identification number (APCD ID No.). Now 654E will be 654C. Also, moved the curing oven emission unit (ID# 654E) from Condition 3.3.5 to new Condition 3.4.5, so that it would be listed with other emission units subject to the same rules.
	3.3.7	Modified Condition To change the CO emissions limit for stack 630P in Table 3.3.a, which services emission units 631E and 632E (Line 106 melters), from 1.277 pounds per hour to 9.122 pounds per hour. The CO limit contained in this table is the new BACT limit.
	3.4.5	Modified Condition The PSD analysis assumed that gaseous fuels were used; therefore this condition was modified to specify the fuels that may be used. Gaseous fuels, especially (sweet) natural gas, usually contains less than 0.01 weight percent sulfur, therefore easily meeting the sulfur specification limits contained in State Rule (g). State Rule (g) specifies that fuel-burning equipment cannot burn fuel with a sulfur content greater than 2.5 weight per cent.
PART 4.0 REQUIREMENTS FOR TESTING	4.1.3	Modified Condition Added the EPA test method for Sulfur Dioxide concentration (Method 6 or 6c).
	4.2.5	New Condition To require the facility to do an initial performance test on the combined Line 106 melters (Stack 630P) for CO emissions. This performance test must be used to demonstrate that the facility can comply with the revised PSD BACT limit contained in Condition 3.3.7, while putting the oxidation-reduction agent into the melters at the maximum rate currently planned. [Also see discussion under Condition 4.2.8 about emissions / process correlations.] During the test, the maximum production rate, including the maximum cullet rate, should be used. This will ensure that the CO emissions measured during the testing is representative of the maximum possible emission rate that will (under normal conditions) be emitted.
	4.2.6	New Condition To require the facility to do an initial performance test on the combined Line 106 melters (stack 630P) for SO2 emissions. This performance test must be used to demonstrate that the facility provided emissions data is well below the PSD significance level while putting the oxidation-reduction agent and glass cullet into the melters at the maximum rate currently planned. [Also see discussion under Condition 4.2.8 about emissions / process correlations.] During the test, the maximum production rate, including the maximum cullet rate, should be used. This will ensure that the SO2 emissions measured during the testing is representative of the maximum possible emission rate that will (under normal conditions) be emitted.

Table 5. Explanation of Permit Conditions Added or Modified as part of this Permit Amendment		
Section and Title	Permit Cond. Number	Description
	4.2.7	New Condition This condition requires monitoring and recording, during testing of the Melters on Line 106, using the glass pull rate and batch process monitors. The following parameters are specifically mentioned in this condition: 1. Glass pull rate, in pounds per hour (4.2.7.a). 2. The time each batch of material is transported to the Line 106 Blender 620E (4.2.7.b). 3. The mass of each batch of material transported to the Line 106 Blender 620E (4.2.7.c). 4. The mass of cullet glass material in each batch (4.2.7.d). 5. The mass of oxidation-reduction agent in each batch (4.2.7.e).
	4.2.8	New Condition This condition ensures that important data is collected and documented along with the CO and SO2 stack emission test results submitted to the Division. This condition requires the facility to determine hourly average values of the glass pull rate, the cullet glass injection rate and the usage rates of the other bulk raw materials and their sulfur contents during the performance tests required for CO and SO2. This information is important because it characterizes the configuration of the process at the time of the testing. Also, the values recorded show the operating ranges for which EPD can presume compliance with the CO emission limit. For SO2 emissions, the test is expected to substantiate EPD's belief that no limits are required for SO2 emissions as a result of this operational change.
	4.2.9	New Condition This condition requires that CO and SO2 stack emissions from the Line 106 melters be retested if the oxidation-reduction agent spool piece size is increased. The mass of oxidation-reduction agent injected into the melters is specifically tied to the physical dimensions of a valved pipe section (also called a spool piece). If a larger spool piece is installed the mass of oxidation-reduction agent injected will go up. As discussed previously the amount of CO and SO2 emissions are related to the amount of oxidation-reduction agent added to the melters. Therefore an increase in mass injected may cause an emissions increase so a test will be required to show that it is still in compliance with the emissions limits set.

Table 5. Explanation of Permit Conditions Added or Modified as part of this Permit Amendment		
Section and Title	Permit Cond. Number	Description
	4.2.10	New Condition This condition requires that sufficient monitoring data is collected on the materials injected into the melters prior to the testing so that a steady state condition is assured during the performance test. Because there is a time lag between a change in raw materials injected and when any change in emissions will occur, it is important to document that the melters, with their respective emissions, will be indicative of the raw material throughput rates measured during the testing.
PART 5.0 REQUIREMENTS FOR MONITORING (Related to Data Collection)	5.2.1	Modified Condition Added subparagraph "j." to this condition to include the requirement to install a continuous monitor / recorder for the glass pull rate for each Line 106 melter. A pull rate monitor was installed several years ago as part of the original PSD permit for the new Line 106 since it was needed by the facility for process quality control.
PART 6.0 OTHER RECORD KEEPING AND REPORTING REQUIREMENTS	6.2.3	New Condition To require the facility to record the sulfur content of each raw material injected into the melter during performance tests for CO and SO2 on the melters. Samples of the raw material must be taken of each raw material and analyzed. The Condition does not specify the method to be used but specifies it must be acceptable to the Division. If the facility is able to obtain sulfur content data from the vender, that can be used instead.
	6.2.4	New Condition This condition contains a requirement for the facility to maintain an operator's log to record whenever a valved section of pipe (spool piece) on the oxidation-reduction agent addition system was changed. Each size spool piece introduces a specific amount of oxidation-reduction agent to the system per batch. The larger the spool piece volume the more oxidation-reduction agent is added per batch. The facility has several spool pieces that have been calibrated to introduce a specific amount of material.
	6.2.5	New Condition This condition contains a requirement for the facility to maintain an operators log to record the total amount of a batch and cullet material whenever the amount added per batch (i.e. the batch recipe) is changed.
Part 8.0 General Provisions	8.14.1	This template condition related to compliance certifications was revised to reflect changes to 40 CFR Part 70.

Table 5. Explanation of Permit Conditions Added or Modified as part of this Permit Amendment		
Section and Title	Permit Cond. Number	Description
Appendix B	N/A	Modified Tables in Appendix B To move the water heaters with emission unit ID # 80 and 83 (small fuel burning equipment) to the "GENERIC EMISSION GROUPS" table of the permit. These emission units were inappropriately placed in Section 4.50 "INSIGNIFICANT ACTIVITIES BASED ON EMISSION LEVELS" of the Title V application instead of Section 4.20 "GENERIC EMISSION GROUPS" of the Title V application. Also added to the Title V permit appendix is the table for the "Insignificant Activities Based on Emissions Levels" emission units that were listed on the original application but then left off the Title V permit by mistake. This includes the following 25 units: Six tanks that are used for process water storage or surge tanks Two vaporizers Three mechanical draft cooling towers One battery charging station used for electric mobile warehouse equipment One inking station used for marking packaging Three production heaters with emission unit ID's 84 through 86 ($0.4x10^6$ Btu/hr heat input each) Six warehouse direct fired space heaters with emission unit ID's 88 and 89 ($8.8x10^6$ Btu/hr heat input each) and 90 through 93 ($10.31x10^6$ Btu/hr heat input each)

Appendix A
Permit Conditions

Appendix B
Permit Application Documents
PSD Preliminary Review
Johns Manville, Inc., Winder GA Fiberglass Insulation Manufacturing Plant

Appendix B
Permit Application Documents

Appendix C
EPD's Dispersion Modeling Summary
PSD Preliminary Review
Johns Manville, Inc., Winder GA Fiberglass Insulation Manufacturing Plant