8.0 Additional Impact Analyses

As required by PSD regulations, this section addresses possible impacts on visibility, vegetation and soils, growth, PSD Class I areas, and nonattainment areas.

8.1 PSD Class I Areas

The impact on visibility in the nearest PSD Class I areas (i.e., the Bradwell Bay National Wilderness Area and St. Marks National Wildlife Refuge, approximately 165 km and 180 km southeast of the Facility, respectively) attributable to the operation of the proposed Facility is not expected to be either significant or measurable. With the exception of SO_2, the increase in emissions associated with the operation of the proposed Facility will result in only an insignificant impact on ambient air quality in the vicinity of the Facility. SO_2 emissions will result in a significant impact within approximately 700 meters of the fenceline and the de minimis impact level is reached within approximately 900 meters of the fenceline. It is unlikely that the operation of the proposed Facility will cause any impairment to visibility at any location. The Federal Land Manager for the Bardwell Bay Wilderness Area confirmed that a detailed analysis of the impacts on the PSD Class I area is not required.

8.2 Effects on Visibility

8.2.1 Introduction

The Facility will be constructed in a rural area that is remote from other industrial sources. From an air quality perspective, this application has assessed the maximum impact attributable to facility operation and the "radius of significant impact" as defined by EPD and EPA for SO_2 (3-hour, 24-hour, and annual averaging periods) has been predicted and found to be 3 km.

A visual impacts assessment has been conducted at selected 'sensitive' sites in the region surrounding the Facility to identify potential visual impacts that could result from the operation of the Facility. Each of these sites is located in the PSD Class II area that surrounds the Facility. This assessment utilized EPA's VISCREEN model (version 1.0). The VISCREEN

model was developed to evaluate potential visual impacts at PSD Class I areas. As a result, the model contains visual impacts screening criteria, which are presently considered to be important in preserving scenic vistas in and around such areas. These criteria include the identification of potential worst-case meteorological conditions under which industrial plumes may begin to be visually perceived. No applicable screening criteria have been developed to address visual impacts in Class II areas. For this reason, the VISCREEN model is considered to be very conservatively applied in Class II areas when utilizing Class I visual impacts criteria.

With the exception of the proposed mechanical draft cooling tower, no visual impacts are expected to result near the Facility since highly effective combustion controls and air pollution control equipment have been incorporated into the Facility design. All emission sources are subject to the proposed BACT emission limits as described in Section 5.0 of this application. Given the relatively low emissions and the very low air quality impacts, Facility emissions are not expected to have an adverse impact on visibility at any visibility sensitive site or location. (It is also noted that all sources are subject to a 20 percent opacity standard.) The cooling tower plume will have a limited impact on visibility in the immediate vicinity of the plant, primarily during very cold weather when conditions are favorable for condensation of the vapor plume.

The visual impacts under evaluation in this assessment involve specific geometries of line-of-sight, usually looking through a considerable length of plume, and solar angle. The occurrence of such geometries is not frequent, and may not occur at all for certain situations, such as a ground-based observer looking through the plume toward the sky, as the model conservatively considers the stack, the observer, and the plume centerline to be at the same elevation.

8.2.2 Level I Screening Analysis

The sites deemed to be sensitive to visual impacts in the area surrounding the Facility are identified in Table 8-1.

TABLE 8-1
VISUAL IMPACTS ANAYLSIS RECEPTORS
Yellow Pine Energy
Clay County, Georgia

Sensitive Site	Distance from Yellow Pine Energy (km)	
	Minimum	Maximum
Early County Airport	11.8	12.8
Kolomoki Mounds Historic Park	12.0	15.0
George T. Bagby State Park	20.0	23.0
Headland Municipal Airport	31.7	33.5

The Level I screening analysis involved the maximum Facility emission rates of PM-10 and NO_X over a 24-hour period. Other quantitative model input data includes the minimum distance to the 'sensitive' site (which is conservatively also entered as the minimum distance between the source and the observer), the maximum distance between the source and the 'sensitive' site, and the background visual range of the area, as indicated on Figure 4-3 of the Tutorial Package for the VISCREEN Model.

The Level 1(default) meteorology, stability class "F" and 1 meter/second wind speed, were provided by the model, as were default values of particle size and density, and other parameters. The summary output report for each sensitive area is included on CD-ROM as a part of this application. Under these maximum worst-case conditions, the most distant 'sensitive' site was predicted to be free of any visual impact as a result of the operation of the Facility.

The sites closest to the Facility were found to exceed the very restrictive Class I criteria by the maximum worst-case Level I analysis. This indicates that for only the closest areas and only for the maximum worst case Level 1 analysis conditions modeled for certain geometries of source, observer, wind direction, cloud cover, and solar angle, that a plume may possibly be perceived by an observer looking toward the Facility. Note that the undulating terrain and the heavily wooded areas between the Facility and these sites will make it difficult to see any plume.

8.2.3 Level II Screening Analysis

The Level II screening analysis is also conducted with the VISCREEN model. The Level II

analysis incorporates more specific information regarding the source, topography, visual range, and appropriate meteorological conditions.

The Level II approach implemented in this analysis consisted of the elimination of meteorological conditions with a low probability of occurrence. Raw hourly meteorological data files were located for five years of data (1985 - 1989). Occurrences of meteorological stability class F were found to occur with a 1 meter/second wind less 0.2% of the time in any sector. Such conditions were considered "calm" meteorological conditions by the EPA meteorological data pre-processor used to format the data for air quality modeling. By definition, during a "calm" meteorological condition, wind direction is subject to a large range of meander. The wind direction is not likely to persist in a single 22.5-degree sector for an entire hour. In addition, during meteorological calm periods, wind speed is not likely to persist at a single speed for an entire hour. As a result, wind speeds of 1 meter/second or less were eliminated from further analysis.

The five years of meteorological data were processed by the WRPLOT View software program, which produced a joint frequency distribution of the occurrence of 6 classes of wind speed, 16 22.5-degree sectors of wind direction, and 6 meteorological stability classes. The stability classes were A, B, C, D, E, and F.

The wind sector with the greatest number of occurrences of D, E, and F conditions was studied. E and F conditions, by definition, can only occur at night with some allowance for transitional hours. By definition, D-daytime conditions with wind speeds of 1 meter/second or less can only occur when the sky is completely overcast. Since there is no sun to illuminate the plume under an overcast condition, this condition was eliminated from further consideration.

With no "D", 1 meter/second conditions, and no "E", or "F" conditions to be assessed, the next most conservative dispersion condition is "D", with a 2 meter/second wind speed. However, no "D", 2 conditions were found in this wind sector. The next most conservative dispersion condition is "D", with a 3 meter/second wind speed. The fact that many "D", 3 conditions exist in the data is considered an additional degree of conservatism.

The Level II analysis was conducted for the Early County Airport, Kolomoki Mounds Historic Park, and George T. Bagby State Park site using a "D" condition with a 3 meter/second wind speed. The modeled output indicates that, even under the worst-case conditions, the sites were predicted to be free of any visual impacts as a result of the operation of the Facility.

8.3 Effects on Vegetation and Soils

One indicator of potential vegetation and soils effects is a comparison of predicted ambient concentrations with ambient air quality standards. Of most significance here is the fact that the secondary NAAQS were established to prevent adverse "welfare" effects such as direct damage to vegetation and harmful contamination of soils. In light of the fact that it has been shown that the operation of the Facility will not threaten or exceed any ambient standard at any location, there should not be any discernible effects on vegetation and soils.

8.4 Effects on Associated Growth

Employment at the Yellow Pine Energy Facility is expected to total approximately 32 personnel once the Facility becomes operational. No significant impact on local air quality conditions is expected that might otherwise accompany significant population growth. Personnel hired for this project will most likely be drawn from the existing regional population, with no appreciable changes in traffic or other growth associated parameters.

Timber harvesting in the region is already substantial and supplies two large pulp and paper mills and several wood product/saw mills within a sixty mile radius of the Facility. Biomass harvest and supply is expected to add approximately 100 personnel in this 2,800 square mile region. Yellow Pine Energy is designed to receive fuels by barge and truck. No significant impact on local air quality conditions is expected from this population growth or harvesting/shipping activity, because this activity is so wide-spread and not location specific as harvesting is principally driven by demand for saw timber and pulp logs. In addition, there may be a net reduction in pollution/smoke as wood wastes are gathered and combusted in a controlled environment rather than open-air burned. Note that the Facility is considered "carbon neutral" and a "renewable resource" as a continuous cycle of forest

growth, harvest, combustion of wood waste and adsorption by forest re-growth, giving rise to subsequent harvest.

8.5 Impacts on Nonattainment Areas

Clay County is currently designated as being in attainment of the NAAQS for all pollutants. The Facility is not expected to have a significant impact on any nonattainment area based on the air quality impact assessment performed.