

# Georgia Air Dispersion Modeling Guidance

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The State of Georgia requires air dispersion modeling to evaluate design atmospheric contaminant concentration compliance with three main programs:

1. *Prevention of Significant Deterioration* (PSD, 40 CFR 52.21),
2. Georgia *Guideline for Ambient Impact Assessment of Toxic Air Pollutant Emissions*, and
3. Georgia *Guideline for Assuring Acceptable Ambient Concentrations of PM10 in areas impacted by Quarry Operations Producing Crushed Stone*.

The latter two programs are 'State-only', and will continue to utilize models (primarily SCREEN3 and ISCST3) and modeling techniques as described in the two Georgia Environmental Protection Division (GA EPD) guideline documents. It is expected that the ISCST model-compatible meteorological data files will remain on the GA EPD website (georgiaair.org) for use with these programs until further notice.

Modeling guidance beyond that contained in the guideline documents can be found on the EPA web site (epa.gov/scram001) as model user's guides, Model Clearinghouse Memos and/or Determinations, Public Forum discussions, etc. GA EPD Data & Modeling Unit (DMU) staff should approve use of guidance not contained in the guideline documents. Review of modeling submitted for 'state-only' or federal programs will be expedited by the accompanying submittal of spreadsheets showing the calculation of Acceptable Ambient Concentrations (AACs, see air toxics guideline), modeled ground-level concentrations (adjusted, if necessary to compare with time-averaged AACs), and, where applicable, air contaminant emission rates.

In addition to the guidance above, for federal program air dispersion modeling, two important references are the Guideline on Air Quality Models (40 CFR 51, Appendix W, which may also be found on the EPA website above) and the New Source Review Workshop Manual (DRAFT, 1990), which can be located at (epa.gov/ttn/nsr/gen/wrkshpman.pdf).

The promulgation of the AERMOD modeling system in November, 2005 as an EPA 'preferred refined air dispersion model' requires the use of AERMOD (without substantial, site/situation-specific justification for use of another model) to evaluate design contaminant concentrations in ambient air for federal programs (including PSD) after December 8, 2006. Modeling protocols submitted prior to November 9, 2006 proposing the use of the ISCST model for federal programs may be approved. Site/situation-specific justifications for use of an alternate model need to be submitted to Region IV EPA for primary approval, with a copy to the GA EPD DMU.

**Modeling Protocols.** Modeling protocols should be prepared by the applicant for any refined modeling studies. Such protocols allow the GA EPD DMU to comment on modeling techniques in advance of significant modeling resource expenditure on the part of the applicant. At a minimum, modeling protocols should contain:

1. Listing of the models proposed to be used (including version number or last-modification date);
2. Description of the proposed receptor array(s), including the extent of 100-m spaced receptors and other receptor densities, confirmation that elevations will be derived for each receptor, and a description of that process;
3. Description of how downwash effects will be handled;

4. Description of the site, such as site size, site geographic setting, surrounding land use, height of the tallest building on site or a BPIP-PRM input file, nearest city, county in which located;
5. Description of any complex terrain within 50 km of the site;
6. Listing of the facility total (in tons-per-year) of each criteria pollutant emitted, and a listing of the net tons-per-year proposed to be emitted from the project to be modeled;
7. Distances to all the Class I areas within 300 km, and the modeling techniques, models, and data sources to be used to assess Class I area impacts of the project;
8. Description of the process by which an off-site facility emissions inventory will be prepared, if necessary;
9. Description of the process by which Class II visibility issues will be addressed;
10. Description of the process by which an ozone impacts analysis may be conducted;
11. Description of any efforts to assess air toxics impacts, including derivation of Acceptable Ambient Concentrations (AACs); and
12. Description of the meteorological data to be used in the modeling.

**Meteorological Data for Modeling.** Due to the impending release of AERSURFACE and anticipated modifications to the AERMOD system components, GA EPD recommends the following approach to the development of meteorological data files for use with AERMOD.

1. The applicant should discuss the project with DMU staff, providing the project Latitude and Longitude.
2. The DMU will determine the meteorological data set that meets acceptable levels of data integrity (number-of-calms, amount-of-missing/misinterpreted-data, etc.), filling-in missing data and developing appropriate surface characteristics for AERMET. The DMU will process the data through AERMET and send the applicant the processed surface and upper air profile files with the surface characteristic parameters used in their processing.
3. The applicant will prepare, as a component of the air quality analysis, a comparison between the surface characteristics of the project vicinity and the surface characteristics developed near the surface meteorological station used to process the meteorological data. This comparison will be used to substantiate the use of the meteorological data for the project as appropriate.

**Receptor Data for Modeling.** Model receptors will be processed in the Universal Transverse Mercator (UTM) coordinate system with the current version of AERMAP to develop terrain elevations and critical slope parameters. No model flat plane terrain exists in Georgia for federal programs. Digital Elevation Model (DEM) data may be downloaded by U.S.G.S. 7.5 minute quadrangle set from the website ([data.geocomm.com/catalog](http://data.geocomm.com/catalog)). Model receptors need not be spaced closer than 100 m from each other, including those located along project property boundaries. Model receptors at 100-m spacing should extend outward from the facility at least 2 km in all directions (since the design concentration must be determined to the nearest 100 m).

**Building Downwash Dimensions.** The most recent version of the Building Profile and Input Program (BPIP) contains an option to calculate building dimensions for ISC-Prime. These are the appropriate building dimensions for AERMOD and CALPUFF processing.

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