Colorado Department of Public Health and Environment

# Technical Guidance Series: Air Quality Modeling

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# Modeling Protocol Checklist

The purpose of an air quality modeling protocol or plan is to document in detail how a modeling analysis will be performed and how the results will be presented. Protocols should address relevant modeling requirements and recommendations from state/federal regulations and air quality modeling guidelines. In most cases, the approved protocol may serve as the foundation of the modeling report.

APCD recognizes the fact that many air quality specialists have their own preferred formats for protocols. Thus, APCD does not want to require the use of a specific format. Instead, this protocol checklist has been created as an aid during protocol development. This checklist does not address all possible components of a protocol. Case-by-case judgement should be used to decide if additional aspects of the analysis should be included in the protocol or if certain elements are not necessary in a given situation.

The following checklist presents topics commonly addressed in the modeling protocol for a major stationary source subject to Prevention of Significant Deterioration (PSD) review. The example protocol is presented in a checklist format for convenience in determining which parts are applicable for a given modeling analysis.

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The set of documents comprising the ***Technical Guidance Series*** contain information and procedures that do not have the force and effect of a rule and are not intended to supersede statutory or regulatory requirements or recommendations of the U.S. Environmental Protection Agency (EPA). If appropriate, individual documents of the ***Technical Guidance Series*** are published according to the requirements of Section 25-6.5-102, Colorado Revised Statutes. For general modeling guidance and procedures, refer to the ***Colorado Modeling Guideline for Air Quality Permits***.

## ☐ Introduction

- ☐ General Overview
- ☐ Goals of the Air Quality Modeling Analysis
- ☐ Applicable Regulations and Requirements

## ☐ Project Description

- ☐ Project Overview
- ☐ Facility Processes and Emission Controls
- ☐ Good Engineering Practice (GEP) Stack Height Analysis
- ☐ Emission Inventory and Emissions-Related Parameters for the Proposed Source or Modification
- ☐ Residential, Industrial, Commercial Growth Analysis

## ☐ Project Site Description

- ☐ Facility Layout: Location of Sources, Buildings, Fence Line
- ☐ Terrain Description

## ☐ Air Quality Modeling Methodology

- ☐ Model Selection
- ☐ Model Setup and Application
  - ☐ *Land Use Analysis*
    - ☐ *Selection of Dispersion Coefficients*
  - ☐ *Building Downwash*
  - ☐ *Treatment of Chemical Transformations (e.g., NO to $NO_2$, parameterizations)*
  - ☐ *Deposition*
  - ☐ *Averaging Periods*

- ☐ *Other Parameters*

- ☐ Treatment of Terrain

- ☐ Receptor network
  - ☐ *Description of Receptor Grids*
  - ☐ *Determination of Receptor Elevations*

- ☐ Meteorological Data
  - ☐ *Selection of the Meteorological Database*
  - ☐ *Meteorological Data Processing*
  - ☐ *Meteorological Data Analysis (e.g., Wind Roses, Frequency Distributions)*

## ☐ Background Air Quality

- ☐ Treatment of Nearby Sources and Other Background Sources
- ☐ Background Concentration to Account for Sources Not in the Model

## ☐ Air Quality Impact Analysis

- ☐ NAAQS and CAAQS
- ☐ PSD Increments
  - ☐ *Class I Increments*
  - ☐ *Class II Increments*
  - ☐ *Special Colorado SO2 Increment Analysis (Regulation No. 3, Part B, Section V.B)*
- ☐ Vegetation and Soils
- ☐ Water
- ☐ Visibility
- ☐ Air Quality Related Values, Including Visibility in Class I Areas

## ☐ Presentation of Results

- ☐ Comparison of Impacts to Primary NAAQS and CAAQS
- ☐ Comparison of Impacts to PSD Increments
- ☐ Comparison of Impacts to Acceptable Levels of Change for Class I AQRVs, Including Visibility
- ☐ Impacts to Scenic and/or Important Views
- ☐ Impacts to Soils, Vegetation, and Water
- ☐ Other Modeling-Related Regulatory Requirements

## ☐ Pre- and Post-Construction Air Quality Monitoring Requirements

- ☐ Comparison of Impacts to Monitoring De Minimis Values
- ☐ AQRV monitoring, Including Visibility

## ☐ Data Access

- ☐ File Naming Conventions
- ☐ Description of Preprocessor Input/Output Files
- ☐ Description of Model Input/Output Files
- ☐ Description of Postprocessor Input/Output Files

## ☐ References