

QA-QC for ODOT Air Quality Documents

QA-QC Definitions

Quality Assurance – a system for ensuring a desired level of quality in the development, production, or delivery of products and services.

Quality Control – a system for verifying and maintaining a desired level of quality in an existing product or service by careful planning, use of proper equipment, continued inspection, and corrective action as required.

Quality Assurance (QA)

QA is focused on process. The ODOT Hydraulic Engineering and Environmental Section (HEES), develops Agency policies, templates, guidance and training to effectively meet state and federal environmental permit and clearance requirements. Statewide QA for Air Quality is handled by the Environmental Engineering and Policy Unit (EEP) within HEES.

The [Air Quality Manual](#) contains guidance, methodology, outlines and state specific inputs for Air Quality analyses and documents. The manual was developed and will be updated as necessary by Air Quality Program Coordinator in HEES in collaboration with internal and external stakeholders. The external stakeholders include the Federal Highway Administration (FHWA), Oregon Division, Federal Transit Administration (FTA), Oregon Department of Environmental Quality (ODEQ), and Region 10 Environmental Protection Agency (EPA). Additionally, ODOT maintains templates for air quality statements of work (SOW) that are updated regularly and include appropriate standards and general requirements, tasks, deliverables and schedules for air quality documents and analyses. Both the SOW templates and the air quality manual are vetted through the stakeholder groups prior to approval for use.

In addition to the Air Quality Manual and SOW, there are also links to technical guidance, templates, checklists and samples documents on the ODOT Air Quality webpage¹. Sample documents included on webpage a PM10 Hot Spot Analysis and Air Conformity Status for current STIP. Examples of templates for Categorical Exclusion (CE), Environmental Assessments (EA) and Environmental Impact Statements (EIS) Air Quality Statements of work are also included on the [webpage](#).

¹ [Hydraulic Engineering and Environmental Section Air Quality and Energy Web Page](#)

Air Quality Specialists in HEES offer training to regional offices on request. National training is available through FHWA and EPA on transportation air quality modeling and transportation conformity. The main models used in transportation air quality work are USEPA Motor Vehicle Emission Simulator (MOVES) (emission model), CAL3QHC (screening dispersion model), AERMOD (dispersion) and ICE (construction emissions). More details about these models including manuals, guidance and executables are found at the following weblinks:

[Conformity Training \(FHWA\)](#)

[MOVES Training Sessions \(EPA\)](#)

[Air Quality Dispersion Modeling \(EPA\)](#)

[FHWA Infrastructure Carbon Estimator \(ICE\) Final Report and User's Guide](#)

Quality Control (QC)

QC is focused on the product. ODOT QC is an outcome-driven process and all Regions operate under its own Tech Center QC Plan of which environmental is only one component. QC plans may vary among Regions as a consequence of differences in geography, workload, however, environmental documents of record are standardized across Regions.

The main document products for Air Quality area:

- Quantitative or qualitative Carbon Monoxide (CO) hot spot analysis,
- Qualitative particulate matter of less than or equal to 10 micrometers in diameter (PM₁₀) and particulate matter less than or equal to 2.5 micrometers in diameter (PM_{2.5}) analysis,
- Qualitative or quantitative Mobile Source Air Toxics (MSATs) analysis, and
- Green House Gases (GHGs) emissions and Climate Change documents.

These documents are generated for ODOT Regions by ODOT air quality staff or qualified consultants using ODOT report outlines and guidance given in the Air Quality Manual and checklists. The quality of the air quality document begins with the expertise of the individual writing the document and the accuracy of the information contained within it. The following are standard QC practices to ensure that only qualified individuals write air quality documents and conduct air quality analysis that use appropriate data (traffic data or model inputs), and that QC is adaptively managed. Local government projects should follow ODOT's air quality procedures when their projects are federally funded.

Personnel

ODOT staff who conduct air quality modeling and write air quality documents are required to have ODOT-defined degree/experience and EPA and/or FHWA training as described below.

Degree/Experience: Air analysts must have at a minimum a bachelor's degree in environmental engineering, atmospheric sciences, transportation engineering or a closely related field or be a registered professional engineer in civil, environmental, or closely related field. In addition, the analyst must have a minimum of four years of experience in research, analysis, and performing complex air quality modeling for transportation projects. The reviewer must have recent experience in conducting and reviewing air quality analyses. If the project work involves an EA or higher, the analyst and reviewer must have experience working on transportation projects requiring National Environmental Policy Act (NEPA) documentation at the level of an EA or higher.

Additionally, the analyst and reviewers should have extensive knowledge of the National Ambient Air Quality Standards (NAAQS), transportation air dispersion models, various air pollutants and air toxics, and experience in both qualitative and quantitative (mesoscale and microscale) analysis. For example, for conformity, the consultant should understand applicability, pollutants of concern, frequency of conformity, consultation requirements, quantitative analysis criteria, procedures and modeling related to transportation conformity.

Training: The analyst and reviewer must have attended a formal classroom training for USEPA Motor Vehicle Emission Simulator ("MOVES") with project level and county level analysis (no older than MOVES2010) with EPA or FHWA. Analyst and reviewer must have used the MOVES model at project or county level on multiple projects within the past 5 years or have relevant experience in quantitative CO, MSAT, GHG, PM₁₀ or PM_{2.5} emissions analyses. The analyst must have formal training or mentorship and prior experience on the dispersion models used (CAL3QHC or AERMOD).

It is preferred that the consultant have training in the most recent version of MOVES.

ODOT air quality analysts receive in-house training as issues arise. Training occurs at team meeting and one-on-one.

Air Quality Analyses and Documents

The analyst is required to determine what type of air quality analyses or documentation are required for each project based on location, funding source and project description. Section 4 of the Air Quality Manual briefly reviews the triggers for each type of analysis. The most common

analyses are for transportation conformity, MSATS and GHGs. The transportation conformity pollutants of concern include CO, PM₁₀ and PM_{2.5}. Projects in Lane County may also be required to obtain an “Indirect Source Construction Permit”. Locations that are subject to transportation conformity are summarized in Section 3 of the Air Quality Manual. The methodologies for each analysis are included in Section 5 of the Air Quality Manual. Section 7 of the Air Quality Manual includes the outlines required for air quality documents.

All federally funded or approved projects in nonattainment and maintenance must show that the project does not cause or contribute to a new hot spot violation of the NAAQs, does not increase the severity and frequency of an existing NAAQs violation or standard and does not delay the timely attainment of NAAQs, transportation control measures or any other regulation. Additionally, the project must be part of a conforming Regional Transportation Plan (RTP), Metropolitan Transportation Improvement Program (MTIP) or Statewide Transportation Improvement Program (STIP). Project funded or approved by FHWA and FTA must satisfy these transportation conformity requirements.

Additionally, for NEPA a MSAT or GHGs quantitative analysis may be needed. The need for air quality analyses should be approved prior to starting the air quality work.

Quality Standards

During Design, the ODOT Air Quality Specialists or Consultant shall:

- 1) Use [statement of work template](#) on ODOT website under ‘Forms and Templates’ prepared by ODOT Air Quality Specialist to ensure that all the necessary steps are followed for the air quality analysis and documentation.
- 2) Once analyses are identified, use Air Quality Manual Appendix C to make traffic data requests. Review traffic data for errors.
- 3) Refer to the Air Quality Manual Section 5 for analysis methodology.
- 4) For CO hot spot analysis obtain emission rate from ODOT Air Quality Specialists. For other emission modeling see correct version of [EPA MOVES](#) model and have modeling methodology reviewed by ODOT Air Quality Specialist.
- 5) Use EPA’s dispersion model CAL3QHC for screening analysis to estimate the 1-hour CO concentrations adjacent to the affected intersections for traffic operations (include ambient background concentrations in the 1-hour results).
- 6) In PM₁₀ or PM_{2.5} areas, Air Quality Specialist will need to collect project information to share at an Inter-agency Consultation to determine if the project is a project of local air quality concern. For PM₁₀ or PM_{2.5} analysis use AERMOD. Analyst will need formal training of this model. Quantitative PM analyses infrequently occur in Oregon because of low traffic

volumes in those nonattainment and maintenance areas. If required verify the need with ODOT Air Quality Specialists.

- 8) Use appropriate [EPA modeling guidance](#) for air quality emissions and dispersion models.
- 9) Analyst must have the required experience with air quality models as given above in the "Personnel Section".
- 10) Use FHWA Interim Guidance for MSAT Analysis and FHWA's Frequently Asked Questions for Conducting Quantitate Mobile Source Air Toxic Analysis for FHWA NEPA documents (December 2016 or current).
- 11) Use ODOT guidance in Air Quality Manual for GHG Analysis and confirm methodology with ODOT Air Quality Specialist, ODOT NEPA Specialist and FHWA prior to conducting quantitative GHG analysis. This guidance is in the process of being updated, so check with ODOT Air Quality Specialist.
- 12) Verify if Lane County project will need an Indirect Source Construction Permit.
- 13) Use Microsoft Word and Microsoft Excel to process data.
- 14) Rely on project-related information from the Regional Environmental Coordinator (REC), traffic engineers and designers.
- 15) Rely on modeling inputs provided by ODOT, DEQ or other Agency for MOVES.

During Review, the ODOT Air Quality Specialists or Consultant shall:

- 1) Compare the outlines provided in the Air Quality Manual: Section 7 and Air Quality Checklists location on [ODOT Air Quality Webpage](#) to ensure analysis is sufficiently documented.
- 2) Compare final document with Project Scope of Work (SOW) for air quality to ensure that all air quality tasks in SOW have been completed.
- 3) Conduct reality check on traffic data provided. (Does vehicle miles traveled (VMT) really triple between no build and build?)
- 4) Verify that the traffic data provided by traffic engineer was used in the modeling files and summarized in report tables.
- 5) Review modeling analysis to ensure all steps of preprocessing and post processing were done correctly. Ensure that the Air Quality report adequately describes all the pre-processing and post-processing steps. All modeling input and output files should be provided electronically for reviewer as well as index table describing all electronic project files.
- 6) Review modeling coordinates in the dispersion model to ensure they reflect sources and receptors for existing, no build and build conditions.
- 7) Ensure input and output modeling files match the numbers presented in the report.

- 8) Review emission results to ensure emission trends make sense and the differences between alternatives are reasonable with regards to design changes.

Reviewers: Only HEES or Region 1 Air Quality Specialists review both internally and externally produced air quality documents. Reviewers ensure that the document is complete, logical and well-written.

Corrective Action

- 1) Air Quality Staff are encouraged to address template concerns and suggest improvements to the HEES Air Quality Program Coordinator. Changes to templates are discussed at Air Quality Team meetings.
- 2) At any step in the document review process, reviewers may provide constructive comments to the originators of the document and require document revisions if necessary for completeness, clarity and accurateness.

Project Milestones

Preliminary Plans: Air Quality documents are generally completed as part of NEPA and occur in or prior to the Preliminary Plans.

Final Plans: Air Quality documentation is due by the Final Plans and is part of the CE Closeout Documentation Package.

Plan, Specification and Estimates: In Lane County, if an Indirect Source Construction Permit is required, it must be in hand prior to the final Plan, Specifications, and Estimate (PS&E) date. The project cannot proceed until the ISCP is acquired.

Document Storage & Retention

ProjectWise: Air Quality Staff must store electronic versions of Air Quality documents in ProjectWise, ODOT's data management system for projects.

Region Files: Supporting information for project air quality documents may be stored in Region & HEES environmental files following Region & HEES storage processes.

An electronic copy of the air quality report(s) and modeling files (if applicable) must be provided to ODOT's Hydraulic Engineering and Environmental Section and the Regional Office for preliminary and final review. The draft and final reports should be accompanied by the Air Quality QC Checklist. For all quantitative analyses electronic files must be submitted for emission and dispersion model input and output files, databases, and spreadsheets used for model input, traffic data and design data. An index should be provided in report which explains each file names accompanying the electronic submission. The agency/consultant

performing the analyses must also retain copies of the plans, traffic, air quality models and all other related information and documentation in accordance with the contract.