(15) * * *
(iii) * * *
(D) * * *

Harvest limits	Open season
HUNTING:	
* * * * * * *	
Moose:	
Unit 15 (B) and (C)—1 antlered bull with spike-fork or 50-inch antlers or with 3 or more brow tines on either antler, by Federal registration permit only.	Aug.10–Sept. 20.
Remainder of Unit 15	No open season.
* * * * * * *	

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Dated: July 27, 1995.

Richard S. Pospahala,

Acting Chair, Federal Subsistence Board.

Dated: July 28, 1995.

Robert W. Williams,

Regional Forester, USDA—Forest Service.

[FR Doc. 95–19483 Filed 8–8–95; 8:45 am]

BILLING CODE 3410–11–M; 4310–55–M

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 51 and 52

[AH–FRL–5268–8; Docket No. A–92–65]

RIN 2060–AG04

Requirements for Preparation, Adoption, and Submittal of Implementation Plans

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The ''Guideline on Air Quality Models (Revised)'' (hereinafter, the ''Guideline''), as modified by supplement A (1987) and supplement B (1993), sets forth air quality models and guidance for estimating the air quality impacts of sources and for specifying emission limits for them. The Guideline, codified as appendix W to 40 CFR part 51, is referenced in the PSD (Prevention of Significant Deterioration) regulations and is applied to SIP revisions for existing sources and to all new source reviews. On November 28, 1994 EPA issued a Notice of Proposed Rulemaking to augment the final rule that was published on July 20, 1993. Today EPA takes final action that makes several additions and changes as supplement C to the Guideline. Supplement C does the following: incorporates improved algorithms for treatment of area sources and dry deposition in the Industrial Source Complex (ISC) model, adopts a solar radiation/delta-T (SRDT) method for estimating atmospheric stability categories, adopts a new screening approach for assessing annual NO_2 impacts, and adds SLAB and HGSYSTEM as alternative models. This action is responsive to public comments received. Adoption of these new and refined modeling techniques and associated guidance should significantly improve the technical basis for impact assessment of air pollution sources.

EFFECTIVE DATE: This rule is effective September 8, 1995.

ADDRESSES: Docket Statement: All documents relevant to this rule have been placed in Docket No. A–92–65, located in the Air Docket (6102), Room M–1500, Waterside Mall, Attention: Docket A–92–65, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. This docket is available for public inspection and copying between 8:00 a.m. and 5:30 p.m., Monday through Friday, at the address above.

Document Availability: Copies of supplement C to the Guideline may be obtained by downloading a text file from the SCRAM (Support Center for Regulatory Air Models) electronic bulletin board system by dialing in on (919) 541–5742. Supplement C may also be obtained upon written request from the Air Quality Modeling Group, U.S. Environmental Protection Agency (MD–14), Research Triangle Park, NC 27711. The ''Guideline on Air Quality Models (Revised)'' (1986), supplement A (1987), supplement B (1993), and supplement C (1995) are for sale from the U.S. Department of Commerce, Technical Information Service (NTIS), 5825 Port Royal Road, Springfield, VA 22161. These documents are also available for inspection at each of the ten EPA Regional Offices and at the EPA library at 401 M Street SW., Washington, DC.

FOR FURTHER INFORMATION CONTACT: Joseph A. Tikvart, Leader, Air Quality Modeling Group, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711; telephone (919) 541–5561 or C. Thomas Coulter, telephone (919) 541–0832.

SUPPLEMENTARY INFORMATION:

Background [1]

The purpose of the Guideline [2] is to promote consistency in the use of modeling within the air management process. The Guideline provides model users with a common basis for estimating pollution concentrations, assessing control strategies and specifying emission limits; these activities are regulated at 40 CFR 51.46, 51.63, 51.112, 51.117, 51.150, 51.160, 51.166, and 51.21. The Guideline was originally published in April 1978. It was incorporated by reference in the regulations for the Prevention of Significant Deterioration of Air Quality

[1] In reviewing this preamble, note the distinction between the terms ''supplement'' and ''appendix''. Supplements A, B and C contain the replacement pages to effect Guideline revisions; appendix A to the Guideline is the repository for preferred models, while appendix B is the repository for alternate models justified for use on a case-by-case basis.

[2] Guideline on Air Quality Models ''(Revised)''(1986)[EPA–450/2–78–027R], with supplement A (1987) and supplement B (1993), hereinafter, the ''Guideline''. The Guideline is published as appendix W of 40 CFR part 51. The text of appendix W will be appropriately modified to effect the revisions incorporated as supplement C.

in June 1978 (43 FR 26380). The Guideline was subsequently revised in 1986 (51 FR 32176), and later updated with the addition of supplement A in 1987 (53 FR 393). The last such revision was supplement B, issued on July 20, 1993 (58 FR 38816). The revisions in supplement B included techniques and guidance for situations where specific procedures had not previously been available, and also improved several previously adopted techniques.

During the public comment period for supplement B, EPA received requests to consider several additional new modeling techniques and suggestions for enhanced technical guidance. However, because there was not sufficient time for the public to review the new techniques and technical guidance before promulgation of supplement B, the new models and enhanced technical guidance could not be included in the supplement B rulemaking. Thus, in a subsequent regulatory proposal, EPA proposed to revise the Guideline and sought public comment on the following four items: incorporation of improved algorithms for treatment of area sources and dry deposition in the Industrial Source Complex (ISC) model, adoption of a solar radiation/delta-T (SRDT) method for estimating atmospheric stability categories, adoption of a new screening approach for assessing annual NO_2 impacts, and addition of SLAB and HGSYSTEM as alternative models.

Final Action

Today's action amends appendix W of 40 CFR part 51 to effect the revisions known as supplement C, slightly modified in form since proposal. All significant comments have been considered, and whenever they revealed any new information or suggested any alternative solutions, such were considered in EPA's final action.

As proposed, EPA is replacing the area source algorithm in the Industrial Source Complex model with a new one based on a double integration of the Gaussian plume kernel for area sources. This replacement includes that of the finite line segment approximation employed by the short term version of ISC and of the virtual point source technique used in the long term version of ISC.

As proposed, EPA is replacing the dry deposition algorithm in ISC with an improved technique that is more accurate for estimating deposition for small (i.e., < 20μm diameter) particles. Use the deposition algorithm in modeling analyses in which particle settling is considered important will remain optional.

EPA will adopt the solar radiation/delta-T (SRDT) method for Pasquill-Gifford (P–G) stability classification discussed in section 9 of appendix W. However, instead of adopting the SRDT method as a replacement for the currently accepted turbulence-based methods (i.e., σ_ϕ and σ_θ), as proposed, SRDT will join them as an ensemble of acceptable methods. Furthermore, while the current hierarchy of acceptable methods is eliminated, the Turner method using on-site wind speed and representative cloud cover observations, remains the preferred classification method.

As proposed, EPA revises the annual NO_2 screening technique described in section 6 of appendix W. The new technique, known as the Ambient Ratio Method (ARM), is simpler and less conservative than the Ozone Limiting Method (OLM) it replaces.

As proposed, EPA adds two new models, namely SLAB and HGSYSTEM, as alternative models for use on a case-by-case basis.

Discussion of Public Comments and Issues

All comments submitted to Docket No. A–92–65 are filed in Docket Category IV–D. EPA has summarized these comments, developed detailed responses, and drawn conclusions on appropriate actions for this Notice of Final Rulemaking in an external Agency document.[3] In this document, all significant comments have been considered and discussed. Whenever the comments revealed any new information or suggested any alternative solutions, such were considered in EPA's final action.

Major issues raised by the commenters, along with EPA responses, are summarized below. Guidance and editorial changes associated with the resolution of these issues are adopted in the appropriate sections of the Guideline and are promulgated as supplement C (1995) to the ''Guideline on Air Quality Models (Revised)'' (1986) (Docket Item V–B–1). See the ADDRESSES section of this Notice (above) for general availability.

Although a more detailed summary of the comments and EPA's responses are contained in the aforementioned response-to-comments document (Docket Item V–C–1), the remainder of this preamble section overviews the primary issues encountered by the Agency during the public comment period. This overview also serves to explain the changes to the Guideline from today's action, and the main technical and policy concerns addressed by the Agency. In our view, all of the changes being made reasonably implement the mandates of the Clean Air Act, and are in fact beneficial to both EPA and the regulated community. While modeling by its nature involves approximation based on scientific methodology, and entails utilization of advanced technology as it evolves, EPA believes these changes respond to recent advances in the area so that the Guideline continues to be comprised of the best and most proven of the available models and analytical techniques, as well as reflect reasonable policy choices.

1. Enhancements to the Industrial Source Complex (ISC2) Model

While for clarification these enhancements are discussed separately, EPA will integrate these enhancements into one model for actual use. Several conforming Guideline revisions will be made: (a) the latest version of ISC that integrates the revised algorithms will be called ISC3, and will hereafter be specified only in main references (section 12) and in its description in appendix A; (b) the term ''ISC2'' (the version of ISC currently in use) in all but appendix A (i.e., in sections 7.1, 7.2.2, 7.2.5, 7.2.8, 8.2.5 and 8.2.7) will be revised to the more generic ''ISC'' to make future Guideline revisions more manageable; and (c) section 4.2.1 will be amended to say that the latest version of SCREEN (i.e., SCREEN3), a screening model that uses ISC algorithms, will be specified in the main references, and ''SCREEN2'' in section 4.2.1 and 5.2.1.1 will be changed to ''SCREEN''.

A. Area Source Algorithm

There was general public support for adoption of the proposed area source algorithm. Some concern, however, was expressed over the evaluation of the algorithm's performance being based on wind tunnel simulations. A commenter urged the Agency to evaluate the algorithm using a particular ''available field data'' set. EPA had been aware of the value of such data for evaluation purposes generally but the use of the specific data set cited by the commenter was recommended against by EPA's contractor. And since other such data sets were unavailable, EPA feels that the wind tunnel evaluation was the best possible. EPA will therefore adopt the algorithm, as proposed.

[3] ''Summary of Public Comments and EPA Responses on the Proposal for Supplement C to the Guideline of Air Quality Models (Revised)''; August 1995 (Air Docket A–92–65, Item V–C–1).

B. Dry Deposition Algorithm

No comments were received about the proposed algorithm's performance in ISCST. Regarding ISCLT, however, concern was expressed over the algorithm's 50-fold increase in deposition estimates for small particles from near-surface releases compared with the current algorithm. As explained in the response-to- comments document, EPA investigated the commenter's perception and explained the apparent disparity in performance is explicable in terms of a series of independent effects related to the improvements made in the new algorithm. EPA will adopt the algorithm, as proposed.

In the proposal, EPA solicited public comment on whether it would be appropriate to require that the new dry deposition algorithm be used for all ISC analyses involving particulate matter in any of the programs for which Guideline usage is required under 40 CFR parts 51 and 52. No comments were received. EPA will continue to allow optional use of the algorithm on a case-by-case basis, depending on the application and on the availability of source specific, fractionated emissions data.

2. Enhancements to On-Site Stability Classification

Much of the expressed public concern was based on a perception of substantial added costs the SRDT method would add to meteorological monitoring programs. As stated in the response-to-comments document, investigation of the cost factors associated with instrumenting a meteorological tower to implement the SRDT method (i.e., ΔT and insolation) showed that such would add approximately $2500–$3500. Relative to the cost of all the monitoring equipment, including data acquisition systems, tower, etc., the added instrumentation costs for implementing the SRDT method are approximately 25 to 45 percent of the total costs (depending on tower height). Thus, as was pointed out in public comment, there is a capital cost associated with implementation of the SRDT method, but EPA believes that cost is not excessive, particularly in relation to the total monitoring program.

While no analyses were offered to directly refute the viability of the SRDT method on a technical basis, there was general concern over the SRDT method's proposed replacement of the currently acceptable turbulence based methods (i.e., σ_ϕ or σ_θ), particularly given that the evaluation report for the SRDT method did not demonstrate its superiority over the latter methods.

Therefore, in an effort to balance an array of concerns, consistent with the intent and motivation for the proposal, EPA will adopt the SRDT method but revise the current hierarchical system of stability classification in Guideline section 9.3.3.2. Specifically, the Turner method using site-specific wind speed and representative cloud cover and ceiling height will be preferred for estimating P–G stability categories. This preference is founded in the fundamental radiation basis for P–G categories. In the absence of requisite data to implement the Turner method, however, the SRDT method or one of the turbulence based methods may be used. Regarding the collection of requisite representative cloud cover data for implementing the preferred Turner method, it should be noted that the operative word is representative. The previous distinction made for ''off-site'', associated with the last choice in the current hierarchy, is semantic. ''On-site'' is a preferable ideal; what is important is representativeness. As aptly pointed out in public comments, when representative off-site'' cloud cover data are judiciously used, there can be good P–G category correspondence with what would have been obtained using strictly on-site observations. The emphasis on representativeness, inherent in EPA's final action, should obviate the historical contention over this semantic issue. As stated in the proposal, the on-site guidance [4] will be revised by addendum to reflect the new stability classification system, including the SRDT methodology. The document will also be revised to add some additional guidance on considerations of representativeness with respect to the Turner method.

3. Screening Approaches for Assessing Annual NO_2 Impact

Public comments were generally supportive of the proposed NO_2 screening approach: the ARM. Some, however, recommended the retention of OLM that ARM was proposed to replace. As stated in EPA's response, this recommendation would imply that OLM, applied on an hourly basis as a tertiary screening method, would yield a better estimation of annual NO_2 impact. EPA believes, however that application of OLM in this manner is affected by several technical and logistical problems. Because the oversimplified OLM approach does not necessarily result in more accurate estimates, adding OLM as a third tier screening method to be implemented on a hourly basis for screening is unnecessary. Therefore, EPA will adopt the Ambient Ratio Method, as proposed.

4. Modeling Techniques for Toxic Air Pollutants

There was support for EPA's proposal to adopt two new models for treating dense gas releases. Therefore, as proposed, EPA will add these models, SLAB and HGSYSTEM Version 3.0, to the Guideline where they will accompany DEGADIS, another appendix B model for treating dense gas releases for use on a case-by-case basis.

Administrative Requirements

A. Executive Order 12866

Under Executive Order (E.O.) 12866 [58 FR 51735 (October 4, 1993)], the Agency must determine whether the regulatory action is ''significant'' and therefore subject to review by the Office of Management and Budget (OMB) and the requirements of the Executive Order. The Order defines ''significant regulatory action'' as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs of the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Order.

It has been determined that this rule is not a ''significant regulatory action'' under the terms of E.O. 12866 and is therefore not subject to OMB review.

B. Paperwork Reduction Act

This final rule does not contain any information collection requirements subject to review by OMB under the Paperwork Reduction Act on 1980, 44 U.S.C. 3501 et seq.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires EPA to consider potential impacts of regulations on small ''entities''. The final action taken today is a supplement to the notice of final rulemaking that was published on July 20, 1993 (58 FR 38816). As described earlier in this

[4] Environmental Protection Agency, 1987. On-Site Meteorological Program Guidance for Regulatory Modeling Applications. EPA Publication No. EPA–450/4–87–013. U.S. Environmental Protection Agency, Research Triangle Park, NC.

preamble, the revisions here promulgated as supplement C to the Guideline encompass the use of new model algorithms and techniques for using those models. This rule merely updates existing technical requirements for air quality modeling analyses mandated by various Clean Air Act programs (e.g., prevention of significant deterioration, new source review, SIP revisions) and imposes no new regulatory burdens. As such, there will be no additional impact on small entities regarding reporting, recordkeeping, compliance requirements, as stated in the notice of final rulemaking (aforementioned). Furthermore, this final rule does not duplicate, overlap, or conflict with other federal rules. Thus, pursuant to the provisions of 5 U.S.C. 605(b), EPA hereby certifies that the attached final rule will not have a significant impact on a substantial number of such entities.

D. Unfunded Mandates

Under Section 202 of the Unfunded Mandates Reform Act of 1995 (''Unfunded Mandates Act''), signed into law on March 22, 1995, EPA must prepare a budgetary impact statement to accompany any proposed or final rule that includes a Federal mandate that may result in estimated costs to State, local, or tribal governments in the aggregate; or to the private sector, of $100 million or more. Under Section 205, EPA must select the most cost-effective and least burdensome alternative that achieves the objectives of the rule and is consistent with statutory requirements. Section 203 requires EPA to establish a plan for informing and advising any small governments that may be significantly or uniquely impacted by the rule.

EPA has determined that the action promulgated today does not include a Federal mandate that may result in estimated costs of $100 million or more to either State, local, or tribal governments in the aggregate, or to the private sector. Therefore, the requirements of the Unfunded Mandates Act do not apply to this action.

List of Subjects

40 CFR Part 51

Administrative practice and procedure, Air pollution control, Intergovernmental relations, Reporting and recordkeeping requirements, Ozone, Sulfur oxides, Nitrogen dioxide, Lead, Particulate matter, Hydrocarbons, Carbon monoxide.

40 CFR Part 52

Air pollution control, Ozone, Sulfur oxides, Nitrogen dioxide, Lead.

Authority: This rule is issued under the authority granted by sections 110(a)(2), 165(e), 172 (a) & (c), 173, 301(a)(1) and 320 of the 1990 Clean Air Act Amendments, 42 U.S.C. 7410(a)(2), 7475(e), 7502 (a) & (c), 7503, 7601(a)(1) and 7620, respectively.

Dated: July 25, 1995.

Carol M. Browner,

Administrator.

Parts 51 and 52, chapter I, title 40 of the Code of Federal Regulations are amended as follows:

PART 51—REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS

1. The authority citation for part 51 continues to read as follows:

Authority: 42 U.S.C. 7410(a)(2), 7475(e), 7502 (a) and (b), 7503, 7601(a)(1) and 7620.

§ 51.112 [Amended]

2. In § 51.112, paragraphs (a)(1) and (a)(2) are amended by revising ''and supplement B (1993)'' to read '', supplement B (1993) and supplement C (1995)''.

§ 51.160 [Amended]

3. In § 51.160, paragraphs (f)(1) and (f)(2) are amended by revising ''and supplement B (1993)'' to read '', supplement B (1993) and supplement C (1995)''.

§ 51.166 [Amended]

4. In § 51.166, paragraphs (l)(1) and (l)(2) are amended by revising ''and supplement B (1993)'' to read '', supplement B (1993) and supplement C (1995)''.

5. Appendix W to part 51, section 4.2.1 is amended by removing ''SCREEN2, is available.[19, 20]'' in the last sentence of the first paragraph and adding ''SCREEN2, is available.[19, 20] For the current version of SCREEN, see reference 20.''

6. Appendix W to part 51, section 4.2.2 is amended by revising Table 4–1 to read as follows:

Appendix W to Part 51—Guideline on Air Quality Models

* * * * *

TABLE 4–1.—PREFERRED MODELS FOR SELECTED APPLICATIONS IN SIMPLE TERRAIN

	Land use	Model [1]
Short Term (i.e., 1–24 hours):		
Single Source	Rural	CRSTER
	Urban	RAM
Multiple Source	Rural	MPTER
	Urban	RAM
Complicated Sources [2].	Rural/ Urban.	ISCST [3]
Buoyant Industrial Line Sources.	Rural	BLP
Long Term (i.e., monthly, seasonal or annual):		
Single Source	Rural	CRSTER
	Urban	RAM
Multiple Source	Rural	MPTER
	Urban	CDM 2.0 or RAM [4]
Complicated Sources [2].	Rural/ Urban.	ISCLT [3]
Buoyant Industrial Line Sources.	Rural	BLP

* * * * *

[1] The models as listed here reflect the applications for which they were originally intended. Several of these models have been adapted to contain options which allow them to be interchanged. For example, ISCST could be substituted for ISCLT. Similarly, for a point source application, ISCST with urban option can be substituted for RAM. Where a substitution is convenient to the user and equivalent estimates are assured, it may be made.

[2] Complicated sources are those with special problems such as aerodynamic downwash, particle deposition, volume and area sources, etc.

[3] For the current version of ISC, see reference 58 and note the model description provided in Appendix A of this document.

[4] If only a few sources in an urban area are to be modeled, RAM should be used.

* * * * *

7. Appendix W to Part 51, section 5.2.1.1 is amended by removing ''SCREEN2'' in the third paragraph and by adding ''SCREEN''.

8. Appendix W to Part 51, section 6.2.3 is revised to read as follows:

Appendix W to Part 51—Guideline on Air Quality Models

* * * * *

6.2.3 Models for Nitrogen Dioxide (Annual Average)

a. A tiered screening approach is recommended to obtain annual average estimates of NO_2 from point sources for New Source Review analysis, including PSD, and for SIP planning purposes. This multi-tiered approach is conceptually shown in Figure 6–1 below:

Figure 6–1.—Multi-Tiered Screening Approach for Estimating Annual NO_2 Concentrations From Point Sources

Tier 1:
Assume Total Conversion of NO to NO_2

Tier 2:
Multiply Annual NO_X Estimate by Empirically Derived NO_2 / NO_X Ratio

b. For Tier 1 (the initial screen), use an appropriate Gaussian model from appendix A to estimate the maximum annual average concentration and assume a total conversion of NO to NO_2. If the concentration exceeds the NAAQS and/or PSD increments for NO_2, proceed to the 2nd level screen.

c. For Tier 2 (2nd level) screening analysis, multiply the Tier 1 estimate(s) by an empirically derived NO_2 / NO_X value of 0.75 (annual national default).[36] An annual NO_2 / NO_X ratio differing from 0.75 may be used if it can be shown that such a ratio is based on data likely to be representative of the location(s) where maximum annual impact from the individual source under review occurs. In the case where several sources contribute to consumption of a PSD increment, a locally derived annual NO_2 / NO_X ratio should also be shown to be representative of the location where the maximum collective impact from the new plus existing sources occurs.

d. In urban areas, a proportional model may be used as a preliminary assessment to evaluate control strategies to meet the NAAQS for multiple minor sources, i.e. minor point, area and mobile sources of NO_X; concentrations resulting from major point sources should be estimated separately as discussed above, then added to the impact of the minor sources. An acceptable screening technique for urban complexes is to assume that all NO_X is emitted in the form of NO_2 and to use a model from appendix A for nonreactive pollutants to estimate NO_2 concentrations. A more accurate estimate can be obtained by: (1) calculating the annual average concentrations of NO_X with an urban model, and (2) converting these estimates to NO_2 concentrations using an empirically derived annual NO_2 / NO_X ratio. A value of 0.75 is recommended for this ratio. However, a spatially averaged annual NO_2 / NO_X ratio may be determined from an existing air quality monitoring network and used in lieu of the 0.75 value if it is determined to be representative of prevailing ratios in the urban area by the reviewing agency. To ensure use of appropriate locally derived annual NO_2 / NO_X ratios, monitoring data under consideration should be limited to those collected at monitors meeting siting criteria defined in 40 CFR part 58, appendix D as representative of ''neighborhood'', ''urban'', or ''regional'' scales.

Furthermore, the highest annual spatially averaged NO_2 / NO_X ratio from the most recent 3 years of complete data should be used to foster conservatism in estimated impacts.

e. To demonstrate compliance with NO_2 PSD increments in urban areas, emissions from major and minor sources should be included in the modeling analysis. Point and area source emissions should be modeled as discussed above. If mobile source emissions do not contribute to localized areas of high ambient NO_2 concentrations, they should be modeled as area sources. When modeled as area sources, mobile source emissions should be assumed uniform over the entire highway link and allocated to each area source grid square based on the portion of highway link within each grid square. If localized areas of high concentrations are likely, then mobile sources should be modeled as line sources with the preferred model ISCLT2.

f. More refined techniques to handle special circumstances may be considered on a case-by-case basis and agreement with the reviewing authority should be obtained. Such techniques should consider individual quantities of NO and NO_2 emissions, atmospheric transport and dispersion, and atmospheric transformation of NO to NO_2. Where they are available, site-specific data on the conversion of NO to NO_2 may be used. Photochemical dispersion models, if used for other pollutants in the area, may also be applied to the NO_X problem.

* * * * *

9. Appendix W to part 51, section 7.1 is amended by removing ''ISC2'' in the fourth paragraph and by adding ''ISC''.

10. Appendix W to part 51, section 7.2.2 is amended by removing ''ISC2'' in the third paragraph and by adding ''ISC''.

11. Appendix W to part 51, section 7.2.5 is amended by removing ''ISC2'' in the second paragraph and by adding ''ISC''.

12. Appendix W to part 51, section 7.2.8 is amended by removing ''ISC2'' in the second paragraph and by adding ''ISC''.

13. Appendix W to part 51, section 8.2.5 is amended by removing ''ISC2'' in the second paragraph and by adding ''ISC''.

14. Appendix W to part 51, section 8.2.7 is amended by removing ''total suspended particulate'' in the first paragraph and by adding ''particle''.

15. Appendix W to part 51, section 8.2.7 is amended by removing ''At least one'' in the second paragraph and by adding ''One''.

16. Appendix W to part 51, section 9.3.3.2, is revised to read as follows:

* * * * *

9.3.3.2 *Recommendations.*

a. *Site-specific Data Collection.* The document ''On-Site Meteorological Program Guidance for Regulatory Modeling Applications'' [66] provides recommendations on the collection and use of on-site meteorological data. Recommendations on characteristics, siting, and exposure of meteorological instruments and on data recording, processing, completeness requirements, reporting, and archiving are also included. This publication should be used as a supplement to the limited guidance on these subjects now found in the ''Ambient Monitoring Guidelines for Prevention of Significant Deterioration''.[63] Detailed information on quality assurance is provided in the ''Quality Assurance Handbook for Air Pollution Measurement Systems: Volume IV''.[67] As a minimum, site-specific measurements of ambient air temperature, transport wind speed and direction, and the parameters to determine Pasquill-Gifford (P–G) stability categories should be available in meteorological data sets to be used in modeling. Care should be taken to ensure that meteorological instruments are located to provide representative characterization of pollutant transport between sources and receptors of interest. The Regional Office will determine the appropriateness of the measurement locations.

b. All site-specific data should be reduced to hourly averages. Table 9–3 lists the wind related parameters and the averaging time requirements.

c. *Solar Radiation Measurements.* Total solar radiation should be measured with a reliable pyranometer, sited and operated in accordance with established on-site meteorological guidance.[66]

d. *Temperature Measurements.* Temperature measurements should be made at standard shelter height (2m) in accordance with established on-site meteorological guidance.[66]

e. *Temperature Difference Measurements.* Temperature difference (ΔT) measurements for use in estimating P–G stability categories using the SRDT methodology (see Stability Categories) should be obtained using two matched thermometers or a reliable thermocouple system to achieve adequate accuracy.

f. Siting, probe placement, and operation of ΔT systems should be based on guidance found in Chapter 3 of reference 66, and such guidance should be followed when obtaining vertical temperature gradient data for use in plume rise estimates or in determining the critical dividing streamline height.

g. *Wind Measurements.* For refined modeling applications in simple terrain situations, if a source has a stack below 100m, select the stack top height as the wind measurement height for characterization of plume dilution and transport. For sources with stacks extending above 100m, a 100m tower is suggested unless the stack top is significantly above 100m (i.e., ≥200m). In cases with stack tops ≥200m, remote sensing may be a feasible alternative. In some cases, collection of stack top wind speed may be impractical or incompatible with the input requirements of the model to be used. In such cases, the Regional Office should be consulted to determine the appropriate measurement height.

h. For refined modeling applications in complex terrain, multiple level (typically three or more) measurements of wind speed and direction, temperature and turbulence (wind fluctuation statistics) are required. Such measurements should be obtained up to the representative plume height(s) of interest (i.e., the plume height(s) under those conditions important to the determination of the design concentration). The representative plume height(s) of interest should be determined using an appropriate complex terrain screening procedure (e.g., CTSCREEN) and should be documented in the monitoring/modeling protocol. The necessary meteorological measurements should be obtained from an appropriately sited meteorological tower augmented by SODAR if the representative plume height(s) of interest exceed 100m. The meteorological tower need not exceed the lesser of the representative plume height of interest (the highest plume height if there is more than one plume height of interest) or 100m.

i. In general, the wind speed used in determining plume height is defined as the wind speed at stack top.

j. Specifications for wind measuring instruments and systems are contained in the ‘‘On-Site Meteorological Program Guidance for Regulatory Modeling Applications’’.[66]

k. *Stability Categories.* The P–G stability categories, as originally defined, couple near-surface measurements of wind speed with subjectively determined insolation assessments based on hourly cloud cover and ceiling height observations. The wind speed measurements are made at or near 10m. The insolation rate is typically assessed using observations of cloud cover and ceiling height based on criteria outlined by Turner.[50] It is recommended that the P–G stability category be estimated using the Turner method with site-specific wind speed measured at or near 10m and representative cloud cover and ceiling height. Implementation of the Turner method, as well as considerations in determining representativeness of cloud cover and ceiling height in cases for which site-specific cloud observations are unavailable, may be found in section 6 of reference 66. In the absence of requisite data to implement the Turner method, the SRDT method or wind fluctuation statistics (i.e., the σ_E and σ_A methods) may be used.

l. The SRDT method, described in section 6.4.4.2 of reference 66, is modified slightly from that published by Bowen et al. (1983)[136] and has been evaluated with three on-site data bases.[137] The two methods of stability classification which use wind fluctuation statistics, the σ_E and σ_A methods, are also described in detail in section 6.4.4 of reference 66 (note applicable tables in section 6). For additional information on the wind fluctuation methods, see references 68–72.

m. Hours in the record having missing data should be treated according to an established data substitution protocol and after valid data retrieval requirements have been met. Such protocols are usually part of the approved monitoring program plan. Data substitution guidance is provided in section 5.3 of reference 66.

n. *Meteorological Data Processors.* The following meteorological preprocessors are recommended by EPA: RAMMET, PCRAMMET, STAR, PCSTAR, MPRM,[135] and METPRO.[24] RAMMET is the recommended meteorological preprocessor for use in applications employing hourly NWS data. The RAMMET format is the standard data input format used in sequential Gaussian models recommended by EPA. PCRAMMET[138] is the PC equivalent of the mainframe version (RAMMET). STAR is the recommended preprocessor for use in applications employing joint frequency distributions (wind direction and wind speed by stability class) based on NWS data. PCSTAR is the PC equivalent of the mainframe version (STAR). MPRM is the recommended preprocessor for use in applications employing on-site meteorological data. The latest version (MPRM 1.3) has been configured to implement the SRDT method for estimating P–G stability categories. MPRM is a general purpose meteorological data preprocessor which supports regulatory models requiring RAMMET formatted data and STAR formatted data. In addition to on-site data, MPRM provides equivalent processing of NWS data. METPRO is the required meteorological data preprocessor for use with CTDMPLUS. All of the above mentioned data preprocessors are available for downloading from the SCRAM BBS.[19]

* * * * *

17. Appendix W to Part 51, section 12.0, is amended by:

a. Revising references 20, 36, 58 and 90; and

b. Adding references 136 through 138.

The revisions and additions read as follows:

Appendix W to Part 51—Guideline on Air Quality Models

* * * * *

12.0 * * *

* * * * *

20. Environmental Protection Agency, 1995. SCREEN3 User’s Guide. EPA Publication No. EPA–454/B–95–004. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS No. PB 95–222766)

* * * * *

36. Chu, S. H. and E. L.Meyer, 1991. Use of Ambient Ratios to Estimate Impact of NO_X Sources on Annual NO_2 Concentrations. Proceedings, 84th Annual Meeting & Exhibition of the Air & Waste Management Association, Vancouver, B.C.; 16–21 June 1991. (16 pp.) (Docket No. A–92–65, II–A–7)

* * * * *

58. Environmental Protection Agency, 1995. User’s Guide for the Industrial Source Complex (ISC3) Dispersion Models, Volumes 1 and 2. EPA Publication Nos. EPA–454/B–95–003a & b. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS Nos. PB–95–222741 and PB 95–222758, respectively)

* * * * *

90. Environmental Research and Technology, 1987. User’s Guide to the Rough Terrain Diffusion Model (RTDM), Rev. 3.20. ERT document No. PD535–585. Environmental Research and Technology, Inc.,

Concord, MA (NTIS No. PB 88–171467)

* * * * *

136. Bowen, B.M., J.M. Dewart and A.I. Chen, 1983. Stability Class Determination: A Comparison for One Site. Proceedings, Sixth Symposium on Turbulence and Diffusion. American Meteorological Society, Boston, MA; pp. 211–214. (Docket No. A–92–65, II–A–5)
137. Environmental Protection Agency, 1993. An Evaluation of a Solar Radiation/Delta-T (SRDT) Method for Estimating Pasquill-Gifford (P–G) Stability Categories. EPA Publication No. EPA–454/R–93–055. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS No. PB 94–113958)
138. Environmental Protection Agency, 1993. PCRAMMET User's Guide. EPA Publication No. EPA–454/B–93–009. U.S. Environmental Protection Agency, Research Triangle Park, NC.

18. Appendix A to Appendix W of Part 51, is amended:

a. The Table of Contents is revised by removing ''ISC2'' and by adding ''ISC3'';

b. Section A.5 is amended by revising the Heading and Reference;

c. Section A.5 Abstract is amended by removing ''ISC2'' and by adding ''ISC3'';

d. Section A.5.a is amended by removing ''ISC2'' in the first line and by adding ''ISC3'';

e. Section A.5.b is amended by removing ''ISCST2'' and ''ISCLT2 in the second paragraph and by adding ''ISCST3'';

f. Section A.5.d is revised;

g. Section A.5.e is amended by removing ''ISC2'' in the first line and by adding ''ISC3'';

h. Section A.5.f is amended by removing ''ISC2'' in the first line and by adding ''ISC3'';

i. Section A.5.g is amended by removing ''ISC2'' in the first line and by adding ''ISC3'';

j. Section A.5.m is revised;

k. Section A.5.n is amended by adding four references in alphabetical order; and

l. Section A.REF is amended by adding a reference at the end.

The revisions and additions read as follows:

Appendix W to Part 51—Guideline on Air Quality Models

* * * * *

Appendix A to Appendix W of Part 51—Summaries of Preferred Air Quality Models

* * * * *

A.5 INDUSTRIAL SOURCE COMPLEX MODEL (ISC3)

Reference

Environmental Protection Agency, 1995. User's Guide for the Industrial Source Complex (ISC3) Dispersion Models, Volumes 1 and 2. EPA Publication Nos. EPA–454/B–95–003a & b. Environmental Protection Agency, Research Triangle Park, NC. (NTIS Nos. PB–95–222741 and PB 95–222758, respectively)

* * * * *

d. Type of Model

ISC3 is a Gaussian plume model. It has been revised to perform a double integration of the Gaussian plume kernel for area sources.

* * * * *

m. Physical Removal

Dry deposition effects for particles are treated using a resistance formulation in which the deposition velocity is the sum of the resistances to pollutant transfer within the surface layer of the atmosphere, plus a gravitational settling term (EPA, 1994), based on the modified surface depletion scheme of Horst (1983).

* * * * *

n. Evaluation Studies

* * * * *

Environmental Protection Agency, 1992. Comparison of a Revised Area Source Algorithm for the Industrial Source Complex Short Term Model and Wind Tunnel Data. EPA Publication No. EPA–454/R–92–014. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS No. PB 93–226751)

Environmental Protection Agency, 1992. Sensitivity Analysis of a Revised Area Source Algorithm for the Industrial Source Complex Short Term Model. EPA Publication No. EPA–454/R–92–015. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS No. PB 93–226769)

Environmental Protection Agency, 1992. Development and Evaluation of a Revised Area Source Algorithm for the Industrial Source Complex Long Term Model. EPA Publication No. EPA–454/R–92–016. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS No. PB 93–226777)

Environmental Protection Agency, 1994. Development and Testing of a Dry Deposition Algorithm (Revised). EPA Publication No. EPA–454/R–94–015. U.S. Environmental Protection Agency, Research Triangle Park, NC. (NTIS No. PB 94–183100)

* * * * *

A.REF (REFERENCES)

* * * * *

Horst, T. W., 1983. A Correction to the Gaussian Source-depletion Model. In *Precipitation Scavenging, Dry Deposition and Resuspension*. H. R. Pruppacher, R. G. Semonin, and W. G. N. Slinn, eds., Elsevier, NY.

19. Appendix B to appendix W of part 51 is amended by:

a. Adding two entries to the Table of Contents in numerical order; and

b. Adding sections B.32 and B.33 immediately following section B.31.

The additions read as follows:

Appendix B to Appendix W of Part 51—Summaries of Alternative Air Quality Models

Table of Contents

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* * * * *

B.32 HGSYSTEM: Dispersion Models for Ideal Gases and Hydrogen Fluoride

References

Post, L. (ed.), 1994. HGSYSTEM 3.0 Technical Reference Manual. Shell Research Limited, Thornton Research Centre, Chester, United Kingdom. (TNER 94.059)

Post, L., 1994. HGSYSTEM 3.0 User's Manual. Shell Research Limited, Thornton Research Centre, Chester, United Kingdom. (TNER 94.058)

Availability

The PC-DOS version of the HGSYSTEM software (HGSYSTEM: Version 3.0, Programs for modeling the dispersion of ideal gas and hydrogen fluoride releases, executable programs and source code can be installed from floppy diskettes. These diskettes and all documentation are available as a package from API [(202) 682–8340] or NTIS (see Section B.0).

Technical Contacts

Doug N. Blewitt, AMOCO Corporation, 1670 Broadway / MC 2018, Denver, CO 80201, (303) 830–5312

Howard J. Feldman, American Petroleum Institute, 1220 L Street, Northwest, Washington, D.C. 20005, (202) 682–8340

Abstract

HGSYSTEM is a PC-based software package consisting of mathematical models for estimating of one or more consecutive phases between spillage and near-field and far-field dispersion of a pollutant. The pollutant can be either a two-phase, multi-compound mixture of non-reactive compounds or hydrogen fluoride (HF) with chemical reactions. The individual models are:

Database program:
- DATAPROP generates physical properties used in other HGSYSTEM models

Source term models:
- SPILL transient liquid release from a pressurized vessel
- HFSPILL SPILL version specifically for HF
- LPOOL evaporating multi-compound liquid pool model

Near-field dispersion models:
- AEROPLUME high-momentum jet dispersion model
- HFPLUME AEROPLUME version specifically for HF
- HEGABOX dispersion of instantaneous heavy gas releases

Far-field dispersion models:
- HEGADAS(S,T) heavy gas dispersion (steady-state and transient version)
- PGPLUME passive Gaussian dispersion

Utility programs:
- HFFLASH flashing of HF from pressurized vessel
- POSTHS/POSTHT post-processing of HEGADAS(S,T) results
- PROFILE post-processor for concentration contours of airborne plumes
- GET2COL utility for data retrieval

The models assume flat, unobstructed terrain. HGSYSTEM can be used to model steady-state, finite-duration, instantaneous and time dependent releases, depending on the individual model used. The models can be run consecutively, with relevant data being passed on from one model to the next using link files. The models can be run in batch mode or using an iterative utility program.

a. Recommendations for Regulatory Use

HGSYSTEM can be used as a refined model to estimate short-term ambient concentrations. For toxic chemical releases (non-reactive chemicals or hydrogen fluoride; 1-hour or less averaging times) the expected area of exposure to concentrations above specified threshold values can be determined. For flammable non-reactive gases it can be used to determine the area in which the cloud may ignite.

b. Input Requirements

1. HFSPILL input data: reservoir data (temperature, pressure, volume, HF mass, mass-fraction water), pipe-exit diameter and ambient pressure.

2. EVAP input data: spill rate, liquid properties, and evaporation rate (boiling pool) or ambient data (non-boiling pool).

3. HFPLUME and PLUME input data: reservoir characteristics, pollutant parameters, pipe/release data, ambient conditions, surface roughness and stability class.

4. HEGADAS input data: ambient conditions, pollutant parameters, pool data or data at transition point, surface roughness, stability class and averaging time.

5. PGPLUME input data: link data provided by HFPLUME and the averaging time.

c. Output

1. The HGSYSTEM models contain three post-processor programs which can be used to extract modeling results for graphical display by external software packages. GET2COL can be used to extract data from the model output files. HSPOST can be used to develop isopleths, extract any 2 parameters for plotting and correct for finite release duration. HTPOST can be used to produce time history plots.

2. HFSPILL output data: reservoir mass, spill rate, and other reservoir variables as a function of time. For HF liquid, HFSPILL generates link data to HFPLUME for the initial phase of choked liquid flow (flashing jet), and link data to EVAP for the subsequent phase of unchoked liquid flow (evaporating liquid pool).

3. EVAP output data: pool dimensions, pool evaporation rate, pool mass and other pool variables for steady state conditions or as a function of time. EVAP generates link data to the dispersion model HEGADAS (pool dimensions and pool evaporation rate).

4. HFPLUME and PLUME output data: plume variables (concentration, width, centroid height, temperature, velocity, etc.) as a function of downwind distance.

5. HEGADAS output data: concentration variables and temperature as a function of downwind distance and (for transient case) time.

6. PGPLUME output data: concentration as a function of downwind distance, cross-wind distance and height.

d. Type of Model

HGSYSTEM is made up of four types of dispersion models. HFPLUME and PLUME simulate the near-field dispersion and PGPLUME simulates the passive-gas dispersion downwind of a transition point. HEGADAS simulates the ground-level heavy-gas dispersion.

e. Pollutant Types

HGSYSTEM may be used to model non-reactive chemicals or hydrogen fluoride.

f. Source-Receptor Relationships

HGSYSTEM estimates the expected area of exposure to concentrations above user-specified threshold values. By imposing conservation of mass, momentum and energy the concentration, density, speed and temperature are evaluated as a function of downwind distance.

g. Plume Behavior

1. HFPLUME and PLUME: (1) are steady-state models assuming a top-hat profile with cross-section averaged plume variables; and (2) the momentum equation is taken into account for horizontal ambient shear, gravity, ground collision, gravity-slumping pressure forces and ground-surface drag.

2. HEGADAS: assumes the heavy cloud to move with the ambient wind speed, and adopts a power-law fit of the ambient wind speed for the velocity profile.

3. PGPLUME: simulates the passive-gas dispersion downwind of a transition point from HFPLUME or PLUME for steady-state and finite duration releases.

h. Horizontal Winds

A power law fit of the ambient wind speed is used.

i. Vertical Wind Speed

Not treated.

j. Horizontal Dispersion

1. HFPLUME and PLUME: Plume dilution is caused by air entrainment resulting from high plume speeds, trailing vortices in wake of falling plume (before touchdown), ambient turbulence and density stratification. Plume dispersion is assumed to be steady and momentum-dominated, and effects of downwind diffusion and wind meander (averaging time) are not taken into account.

2. HEGADAS: This model adopts a concentration similarity profile expressed in terms of an unknown center-line ground-level concentration and unknown vertical/cross-wind dispersion parameters. These quantities are determined from a number of basic equations describing gas-mass conservation, air entrainment (empirical law describing vertical top-entrainment in terms of global Richardson number), cross-wind gravity spreading (initial gravity spreading followed by gravity-current collapse) and cross-wind diffusion (Briggs formula).

3. PGPLUME: It assumes a Gaussian concentration profile in which the cross-wind and vertical dispersion coefficients are determined by empirical expressions. All unknown parameters in this profile are determined by imposing appropriate matching criteria at the transition point.

k. Vertical Dispersion

See description above.

l. Chemical Transformation

Not treated.

m. Physical Removal

Not treated.

n. Evaluation Studies

1. PLUME has been validated against field data for releases of liquified propane, and wind tunnel data for buoyant and vertically-released dense plumes. HFPLUME and PLUME have been validated against field data for releases of HF (Goldfish experiments) and propane releases. In addition, the plume rise algorithms have been tested against Hoot, Meroney, and Peterka, Ooms and Petersen databases. HEGADAS has been validated against steady and transient releases of liquid propane and LNG over water (Maplin Sands field data), steady and finite-duration pressurized releases of HF (Goldfish experiments; linked with HFPLUME), instantaneous release of Freon (Thorney Island field data; linked with the box model HEGABOX) and wind tunnel data for steady, isothermal dispersion.

2. Validation studies are contained in the following references:

McFarlane, K., Prothero, A., Puttock, J.S., Roberts, P.T. and Witlox, H.W.M., 1990. Development and validation of atmospheric dispersion models for ideal gases and hydrogen fluoride, Part I: Technical Reference Manual. Report TNER.90.015. Thornton Research Centre, Shell Research, Chester, England. [EGG 1067–1151] (NTIS No. DE 93–000953)

Witlox, H.W.M., McFarlane, K., Rees, F.J., and Puttock, J.S., 1990. Development and validation of atmospheric dispersion models for ideal gases and hydrogen fluoride, Part II: HGSYSTEM Program User's Manual. Report TNER.90.016. Thornton Research Centre, Shell Research, Chester, England. [EGG 1067–1152] (NTIS No. DE 93–000954)

B.33 SLAB

Reference

Ermak, D.L., 1990. User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-than-Air Releases (UCRL-MA–105607), Lawrence Livermore National Laboratory.

Availability

1. The computer code is available on the Support Center for Regulatory Air Models Bulletin Board System (Upload/ Download Area; see page B–1), and can also be obtained from: Energy Science and Technology Center, P.O. Box 1020, Oak Ridge, TN 37830, (615) 576–2606.

2. The User's Manual (NTIS No. DE 91–008443) can be obtained from: Computer Products, National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161, (703) 487–4650.

Abstract

The SLAB model is a computer model, PC-based, that simulates the atmospheric dispersion of denser-than-air releases. The types of releases treated by the model include a ground-level evaporating pool, an elevated horizontal jet, a stack or elevated vertical jet and an instantaneous volume source. All sources except the evaporating pool may be characterized as aerosols. Only one type of release can be processed in any individual simulation. Also, the model simulates only one set of meteorological conditions; therefore direct application of the model over time periods longer than one or two hours is not recommended.

a. Recommendations for Use

The SLAB model should be used as a refined model to estimate spatial and temporal distribution of short-term ambient concentration (e.g., 1-hour or less averaging times) and the expected area of exposure to concentrations above specified threshold values for toxic chemical releases where the release is suspected to be denser than the ambient air.

b. Input Requirements

1. The SLAB model is executed in the batch mode. Data are input directly from an external input file. There are 29 input parameters required to run each simulation. These parameters are divided into 5 categories by the user's guide: source type, source properties, spill properties, field properties, and meteorological parameters. The model is not designed to accept real-time meteorological data or convert units of input values. Chemical property data are not available within the model and must be input by the user. Some chemical and physical property data are available in the user's guide.

2. Source type is chosen as one of the following: evaporating pool release, horizontal jet release, vertical jet or stack release, or instantaneous or short duration evaporating pool release.

3. Source property data requirements are physical and chemical properties (molecular weight, vapor heat capacity at constant pressure; boiling point; latent heat of vaporization; liquid heat capacity; liquid density; saturation pressure constants), and initial liquid mass fraction in the release.

4. Spill properties include: source temperature, emission rate, source dimensions, instantaneous source mass, release duration, and elevation above ground level.

5. Required field properties are: desired concentration averaging time, maximum downwind distance (to stop the calculation), and four separate heights at which the concentration calculations are to be made.

6. Meteorological parameter requirements are: ambient measurement height, ambient wind speed at designated ambient measurement height, ambient temperature, surface roughness, relative humidity, atmospheric stability class, and inverse Monin-Obukhov length (optional, only used as an input parameter when stability class is unknown).

c. Output

1. No graphical output is generated by the current version of this program. The output print file is automatically saved and must be sent to the appropriate printer by the user after program execution. Printed output includes in tabular form:

2. Listing of model input data;

3. Instantaneous spatially-averaged cloud parameters—time, downwind distance, magnitude of peak concentration, cloud dimensions (including length for puff-type simulations), volume (or mole) and mass fractions, downwind velocity, vapor mass fraction, density, temperature, cloud velocity, vapor fraction, water content, gravity flow velocities, and entrainment velocities;

4. Time-averaged cloud parameters—parameters which may be used externally to calculate time-averaged concentrations at any location within the simulation domain (tabulated as functions of downwind distance);

5. Time-averaged concentration values at plume centerline and at five off-centerline distances (off-centerline distances are multiples of the effective cloud half-width, which varies as a function of downwind distance) at four user-specified heights and at the height of the plume centerline.

d. Type of Model

As described by Ermak (1989), transport and dispersion are calculated by solving the conservation equations for mass, species, energy, and momentum, with the cloud being modeled as either a steady-state plume, a transient puff, or a combination of both, depending on the duration of the release. In the steady-state plume mode, the crosswind-averaged conservation equations are solved and all variables depend only on the downwind distance. In the transient puff mode, the volume-averaged conservation equations are solved, and all variables depend only on the downwind travel time of the puff center of mass. Time is related to downwind distance by the height-averaged ambient wind speed. The basic conservation equations are solved via a numerical integration scheme in space and time.

e. Pollutant Types

Pollutants are assumed to be non-reactive and non-depositing dense gases or liquid-vapor mixtures (aerosols). Surface heat transfer and water vapor flux are also included in the model.

f. Source-Receptor Relationships

1. Only one source can be modeled at a time.
2. There is no limitation to the number of receptors; the downwind receptor distances are internally-calculated by the model. The SLAB calculation is carried out up to the user-specified maximum downwind distance.
3. The model contains submodels for the source characterization of evaporating pools, elevated vertical or horizontal jets, and instantaneous volume sources.

g. Plume Behavior

Plume trajectory and dispersion is based on crosswind-averaged mass, species, energy, and momentum balance equations. Surrounding terrain is assumed to be flat and of uniform surface roughness. No obstacle or building effects are taken into account.

h. Horizontal Winds

A power law approximation of the logarithmic velocity profile which accounts for stability and surface roughness is used.

i. Vertical Wind Speed

Not treated.

j. Vertical Dispersion

The crosswind dispersion parameters are calculated from formulas reported by Morgan et al. (1983), which are based on experimental data from several sources. The formulas account for entrainment due to atmospheric turbulence, surface friction, thermal convection due to ground heating, differential motion between the air and the cloud, and damping due to stable density stratification within the cloud.

k. Horizontal Dispersion

The horizontal dispersion parameters are calculated from formulas similar to those described for vertical dispersion, also from the work of Morgan, et al. (1983).

l. Chemical Transformation

The thermodynamics of the mixing of the dense gas or aerosol with ambient air (including water vapor) are treated. The relationship between the vapor and liquid fractions within the cloud is treated using the local thermodynamic equilibrium approximation. Reactions of released chemicals with water or ambient air are not treated.

m. Physical Removal

Not treated.

n. Evaluation Studies

Blewitt, D.N., J.F. Yohn, and D.L. Ermak, 1987. An Evaluation of SLAB and DEGADIS Heavy Gas Dispersion Models Using the HF Spill Test Data, Proceedings, AIChE International Conference on Vapor Cloud Modeling, Boston, MA, November, pp. 56–80.

Ermak, D.L., S.T. Chan, D.L. Morgan, and L.K. Morris, 1982. A Comparison of Dense Gas Dispersion Model Simulations with Burro Series LNG Spill Test Results, *J. Haz. Matls.*, 6: 129–160.

Zapert, J.G., R.J. Londergan, and H. Thistle, 1991. Evaluation of Dense Gas Simulation Models. EPA Publication No. EPA–450/4–90–018. U.S. Environmental Protection Agency, Research Triangle Park, NC.

PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS

1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

§ 52.21 [Amended]

2. In § 52.21, paragraphs (l)(1) and (l)(2) are amended by revising ''and supplement B (1993)'' to read '', supplement B (1993) and supplement C (1994)''.

[FR Doc. 95–19057 Filed 8–8–95; 8:45 am]
BILLING CODE 6560–50–P

40 CFR Parts 9 and 86

[AMS–FRL–5268–1]

RIN 2060–AE93

Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; Regulations Requiring Availability of Information for Use of On-Board Diagnostic Systems and Emission-Related Repairs on 1994 and later Model Year Light-Duty Vehicles and Light-Duty Trucks

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This final rule establishes requirements for the availability of emission-related service information for all light-duty vehicles (LDVs) and light-duty trucks (LDTs) beginning with the 1994 model year (MY). Section 202(m)(5) of the Clean Air Act (CAA or Act) requires EPA to promulgate rules mandating the availability of emission-related service information for such vehicles. This rulemaking requires vehicle manufacturers to provide to the service and repair industry information necessary to service on-board diagnostic (OBD) systems and to perform other emission-related diagnosis and repair.

EFFECTIVE DATE: This final rule is effective December 7, 1995.

ADDRESSES: Materials relevant to this rulemaking are contained in Docket No. A–90–35. The docket is located at The Air Docket, 401 M Street, S.W., Washington, D.C. 20460, and may be viewed in Room M–1500 from 8:30 a.m. until 3:30 p.m. Monday through Friday. A reasonable fee may be charged by EPA for copying docket material.

FOR FURTHER INFORMATION CONTACT: Cheryl Adelman, Certification Division, U.S. Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, Telephone (313) 668–4434

SUPPLEMENTARY INFORMATION:

Table of Contents