LIST 2—INERT INGREDIENTS NO LONGER USED IN PESTICIDE PRODUCTS

Chemical Name	CAS Registry No.
Chloroethane	75–00–3
m-Cresol	108–39–4
p-Cresol	106–44–5

The chemicals *p*-cresol and *m*-cresol were included in List 2 when it was originally published as part of the Inerts Strategy in 1987. They were not delisted in June 24, 1998, but were inadvertently omitted from the updated List 2.

List 3 inert ingredients which are no longer used in pesticide products are identified as follows (with chemical name and Chemical Abstracts Service (CAS) Registry Numbers):

LIST 3—INERT INGREDIENTS NO LONGER USED IN PESTICIDE PRODUCTS

Chemical Name	CAS Registry No.
Dicyclopentadiene	77–73–6
4,4′-Isopropylidenediphenol	80–05–7
Manganese chloride	7773–01–5
Nitrocellulose	9004–70–0
Potassium bromide	7758–01–2
Safrole	94–59–7
Zinc carbonate	3486–35–9
Zinc dodecylbenzene sulfonate	12068–16–5
Zinc sulfide	1314–98–3

According to Agency records, none of the above chemicals is currently used in pesticide products. If a registrant disputes the Agency's determination concerning inert ingredients that are no longer used in pesticide products and still has an active registration for a pesticide product containing one of the chemicals identified as no longer used in pesticide products, the registrant should immediately notify the Agency as detailed in the ''ADDRESSES'' section of this notice. The registrant should include the inert ingredient name, CAS Registry No. for the inert ingredient in question and the EPA Registration Number of the pesticide product containing the inert ingredient.

IV. Future Use of Chemicals that are No Longer Permitted for Use as Inert Ingredients

Because of the toxicological and other concerns associated with List 1 and List 2 ingredients, and the fact that the EPA does not have adequate data to show that these chemicals do not result in unreasonable adverse effects on human health and the environment, the Agency does not expect to approve future applications involving the use of any of the above List 2 chemicals as ingredients. Data requirements for any such future requests will be determined by the Agency on a case-by-case basis. Use of any of the above List 3 chemicals will be considered by the Agency under the same procedures that apply to new inert ingredients specified in the April 22, 1987, Inert Ingredient Policy Statement.

V. Process for Future Removal of Inert Ingredients that are No Longer Used as Inert Ingredients

As a part of its ongoing inerts strategy, the Agency will continue to perform future reviews of List 1, List 2, and List 3 inert ingredients to identify those inert ingredients which are no longer used. The Agency will issue future **Federal Register** notices removing those chemicals from its list of inert ingredients. Any associated exemptions from the requirement of a tolerance for such chemicals when used as inert ingredients will also be revoked. The Agency will not remove any List 4A or 4B inert ingredients from its list of inert ingredients, since sufficient data have been presented to establish that the use of these chemicals as inert ingredients will not present a hazard to public health or the environment.

In an effort to identify inert ingredients which are no longer used, the Agency may contact registrants of pesticide products or manufacturers/suppliers of substances which are used as inert ingredients in pesticide formulations. This action may be necessary to verify the information currently contained in the Agency's database relative to product formulation information.

The Agency considers all alternate formulations valid for purposes of registration unless a registrant provides specific written notice to the Agency that a particular formulation will no longer be used. Therefore, the Agency encourages registrants as part of their pesticide product stewardship program to provide the Agency with written notice identifying specific formulations that are no longer used as part of the pesticide product registration and amendment process. This action will assist the Agency in better identifying those inert ingredients that are no longer used in pesticide products as well as improving the overall accuracy of the Agency's product formulation information.

List of Subjects

Environmental protection, Pesticides and pests.

Dated: June 2, 1999.

Peter Caulkins,

Acting Director, Registration Division, Office of Pesticide Programs.

[FR Doc. 99–14759 Filed 6–10–99; 8:45 am]

BILLING CODE 6560–50–F

ENVIRONMENTAL PROTECTION AGENCY

[FRL–6357–9]

Voluntary Guide for Industrial Waste Management

AGENCY: Environmental Protection Agency (EPA).

ACTION: Release of draft guidance for public comment.

SUMMARY: The EPA, with assistance from State representatives, who serve as members of a Task Force from the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), industry, and public interest stakeholders, has developed a draft voluntary *Guide for Industrial Waste Management.* The purpose of the *Guide* is to assist facility managers, State and Tribal environmental managers, and the public in evaluating and choosing protective practices for managing non-hazardous industrial waste in new landfills, waste piles, surface impoundments, and land application units. The *Guide* recommends best management practices and key factors to take into account in siting, operating, designing, monitoring, and performing corrective action and closure and post closure care. The *Guide* is available in both paper copy and CD–ROM. The CD–ROM version of the guidance incorporates user-friendly ground-water and air models to evaluate potential risks and choose appropriate facility designs. The *Guide* is designed to complement, not supersede, state and tribal industrial non-hazardous waste management programs.

This guidance reflects four underlying principles: Adopt a multi-media approach to protect human health and the environment; Tailor management practices to risks posed by the waste and the location of the unit; Affirm State and Tribal leadership; and Foster a partnership among the public, facility managers and regulatory agencies.

DATES: Information and comments must be received on or before December 13, 1999.

ADDRESSES: Commenters must send an original and two copies of their comments referencing docket number F–1999–IDWA–FFFFF to: RCRA Docket

Information Center, Office of Solid Waste (5305G), U.S. Environmental Protection Agency (EPA, HQ), 401 M Street, SW, Washington, DC 20460. Hand delivery of comments should be made to the Arlington, VA, address below. Comments may also be submitted electronically through the Internet to: *rcra-docket@epa.gov*. Comments in electronic format should also be identified by the docket number F–1999–IDWA–FFFFF. All electronic comments must be submitted as an ASCII file without the use of special characters and any form of encryption.

Commenters should not submit electronically any confidential business information (CBI). An original and two copies of CBI must be submitted under separate cover to: RCRA CBI Document Control Officer, Office of Solid Waste (5305W), US EPA, 401 M Street, SW, Washington, DC 20460.

Public comments and supporting materials are available for viewing in the RCRA Information Center (RIC), located at Crystal Gateway I, First Floor, 1235 Jefferson Davis Highway, Arlington, VA. The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, excluding Federal holidays. To review docket materials, it is recommended that the public make an appointment by calling 703–603–9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost $0.15 per page. The index and some supporting material are available electronically.

The *Guide* is available on the Internet. Follow these instructions to access the information electronically.

WWW: http://www.epa.gov/industrialwaste
FTP: *ftp.epa.gov*
Login: anonymous
Password: your Internet address
Files are located in pub/epaoswer.

The official record for this action will be kept in paper form. Accordingly, EPA will transfer all comments received electronically into paper form and place them in the official record, which will also include all comments submitted directly in writing.

EPA responses to comments, whether the comments are written or electronic, will be developed during the development of the final *Guide*. EPA will not immediately reply to commenters electronically other than to seek clarification of electronic comments that may be garbled during transmission or during conversion to paper form, as discussed above.

FOR FURTHER INFORMATION CONTACT: For general information and copies of the *Guide* and CD–ROM, contact the RCRA Hotline at 800–424–9346 or TDD 800–553–7672 (hearing impaired). In Washington, D.C., metropolitan area, call 703–412–9810 or TDD 703–412–3323. A limited number of paper copies of the Guide and supporting documents (i.e., ground-water and air software technical background documents and user manuals) are available for distribution. These are available on a first-come first-serve basis.

Questions regarding any aspect of the Industrial Waste *Guide* or the CD–ROM may be left on the following voice mail number (703–605–0755.) This voice mail box will be checked frequently and answers will be provided in a timely manner.

Questions of a technical or policy nature regarding the *Guide* or CD–ROM may also be directed to the following individuals:

Paul Cassidy (703–308–7281) for questions on siting, protecting surface water, designing and installing liners systems, operating, monitoring performance, closure and post-closure care and CD–ROM;
John Sager (703–308–7256) for questions on waste characterization, protecting groundwater, corrective action and CD–ROM;
Pat Cohn (703–308–8675) for questions on building partnerships, integrating pollution prevention, and designing a land application program;
Mark Schuknecht (703–308–7494) for questions on designing a land application program only; and
Dwight Hlustick (703–308–8647) for questions on protecting air quality only.

Technical questions or information regarding the ground-water software and supporting materials may be directed to Virginia Colten-Bradley (703–308–8613).

Technical questions or information regarding the air software and supporting materials may be directed to Charlotte Bertrand (703–308–9053).

Questions for these individuals can also be e-mailed to their e-mail address:

cassidy.paul@epamail.epa.gov
sager.john@epamail.epa.gov
cohn.patricia@epamail.epa.gov
colten-bradley.virginia@epamail.epa.gov
bertrand.charlotte@epamail.epa.gov
hlustick.dwight@epamail.epa.gov
schuknecht.mark@epamail.epa.gov.

SUPPLEMENTARY INFORMATION:

Customer Service

How can I influence the development of the final *Guide*? In developing the draft *Guide* and CD–ROM, we have tried to address issues that are of interest to stakeholders. Your comments will improve this *Guide* and CD–ROM. We invite you to provide different views, new approaches, new data, or other relevant information on any aspect of the draft *Guide* or draft CD–ROM. We have developed specific questions (See Section II. Request for Comments: Questions and Issues) that are included in this Supplementary Information Section. Your comments will be most effective if you follow the suggestions below:

Explain your views as clearly as possible and why you feel that way;
Provide solid technical data to support your views;
Tell us which parts you support, as well as those you disagree with;
Provide specific examples to illustrate your concerns;
Offer specific alternatives; and
Refer your comments to specific sections of the *Guide*, e.g., page 12 of Chapter 5, or to specific screen numbers of the CD–ROM, e.g., CA__010.

Outline

I. Background and Overview

A. Setting the Context

About 7.6 billion tons of industrial waste are generated and managed on-site at manufacturing facilities each year. Of this, almost 97 percent is waste water managed in surface impoundments, with the remaining more concentrated solids being managed in landfills, waste piles, and land application units. These wastes come from the broad spectrum of

American industries and are neither municipal wastes nor hazardous wastes under federal or state laws. State and tribal governments have regulatory responsibility for ensuring proper management of these wastes in on-site units, and their programs vary considerably.

EPA and 12 state representatives selected from the membership of the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) began development of this guidance in 1996 with the formation of a State/EPA Steering Committee. The goals of the Steering Committee were threefold: first, to define a baseline of protective management practices; second, to complement existing state and tribal regulatory programs; and third to produce an effective and user friendly *Guide* that all stakeholders will use. The Steering Committee is co-chaired by one EPA and one state member. At the same time, the Steering Committee had the benefit of a Focus Group of industry and public interest stakeholders, chartered under the Federal Advisory Committee Act, to provide advice throughout development of the guidance. Steering Committee and Focus Group members are listed in Appendix I at the end of this notice.

The draft *Guide* reflects the results of this productive consultative process. Focus Group members provided extensive comment and commitment of their time throughout. Their thoughtful input helped to make the draft guidance a better and more effective product, although the final decisions are those of the Steering Committee.

All material that was part of the development of this draft *Guide* is contained in the public docket and is available for viewing. This material includes previous drafts of issue papers, meeting notes, and materials submitted by the Steering Committee and the Focus Group.

B. The Scope

This guidance is useful for a broad array of industrial process wastes, especially those that are managed at the facilities where they are generated. We did not consider certain extractive wastes, such as those from mining or oil and gas production, and recommendations may not be suitable for these wastes. Furthermore, any facilities that receive municipal solid waste, as well as industrial waste, are subject to municipal landfill criteria, 40 CFR part 258, and state or tribal municipal landfill regulations. They are not addressed by this guidance.

The guidance focuses, in particular, on the design of new units. Liner design and siting concerns are clearly directed at new units. However, other management recommendations, such as for ground-water monitoring, operating practices, and closure and post-closure care, may be helpful in making management decisions for currently-operating units as well.

C. Underlying Principles

This guidance reflects four underlying principles:

Protect human health and the environment. This is the focal point. The guidance is multi-media, emphasizing surface water, ground water, and air protection, with a comprehensive framework of technologies and practices that make up a sound waste management system.

Tailor management practices to risks. There is enormous diversity in the nature of industrial wastes and the environmental settings where they are managed. The guidance provides conservative national management recommendations and user-friendly modeling tools to make location-specific adjustments. It also identifies complex analytic tools to conduct comprehensive site-specific analyses.

Affirm State and Tribal leadership. States, tribes, and some local governments have primary responsibility for adopting and implementing programs to ensure proper management of industrial waste. It is important to note that individual states or tribes may have more stringent or extensive regulatory requirements based on local or regional conditions or policy considerations. This *Guide* complements, but does not supersede regulatory programs. It can help you make decisions on meeting requirements and filling potential gaps. Facility managers and the public using this *Guide* should consult with your regulatory agency throughout the process to understand its regulations and how the agency wants you to use the *Guide.*

Foster a partnership. The public, facility managers and regulatory agencies share a common interest in preserving quality neighborhoods, protecting the environment and public health, and enhancing the economic well-being of the community. This *Guide* provides a common technical framework to facilitate discussion. Stakeholders are encouraged to stay involved and work together to achieve meaningful environmental results.

D. Using the Guidance

There are a few key steps to follow:

Understand and comply with all existing Federal, State or Tribal regulations, permits and operating agreements that apply to a waste management unit. The guidance is designed to complement existing requirements, not to take their place.

Thoroughly characterize constituents and concentrations in the waste. Waste characterization is the foundation for choosing and implementing tailored, protective management practices. To assess potential ground-water risks, the guidance provides drinking water maximum contaminant levels (MCLs), when they exist, and health-based reference levels for 191 constituents. To assess potential air risks, the guidance provides inhalation health-based reference levels for 95 volatile and semi-volatile constituents.

Take advantage of pollution prevention, recycling and treatment opportunities. Pollution prevention, recycling, and treatment can minimize reliance on waste disposal, reduce disposal costs and reduce future costs and liabilities for closure and post-closure care and corrective action. Pollution prevention and recycling also conserve raw materials.

Build a partnership between all stakeholders who have an interest in waste management decisions. Keep stakeholders informed and involved on an ongoing basis.

Tailor management practices to the wastes and the environmental setting of the unit. The *Guide* covers all the components of a sound waste management system. It recommends best management practices and the key factors to take into account in siting, operation, design, monitoring, corrective action, closure and post closure care. The guidance also directs you to a wide variety of useful tools and resources, and includes a number of these tools in appendices. In particular, the guidance recommends risk-based approaches and incorporates models to choose liner systems and waste application rates for ground-water protection and to evaluate the need to control volatile organic air emissions.

Here is an example of how the risk-based evaluation would work for choosing a liner system design. For ground water, the approach is three-tiered, relying on modeling fate and transport of constituents through subsurface soils to ground water. Successive tiers in the analysis incorporate more site-specific data to tailor protective management practices to your particular circumstances. The CD–ROM version of the guidance contains ground-water software for Tier 1 and 2 analyses.

Tier 1—National Evaluation: Once you know the concentrations of

constituents in the waste leachate, the *Guide* provides generic recommendations on appropriate liner design. If leachate from wastes going into a unit contains several constituents, choose the most protective liner design indicated for any of the constituents.

Tier 2—Location Adjusted Evaluation: To obtain a recommendation that more closely reflects your site, use location-specific data for up to seven of the most sensitive waste-and site-specific variables to assess whether a particular liner design will be protective.

Tier 3—Comprehensive Site Assessment: This tier relies on a comprehensive analysis of specific waste and site characteristics to assess whether a particular liner design will be protective. The guidance identifies a number of models for this detailed analysis.

E. What Comes Next?

The draft guidance is available in a paper copy, on a CD–ROM, and through the Internet at www.epa.gov/industrialwaste. EPA and the state participants from ASTSWMO welcome your comments on all aspects of this draft including the substantive recommendations and the practicality and user friendliness of the risk-based modeling tools. Section II of this notice frames a number of questions and issues. Based on your comments, we will make revisions and release a final version of this draft *Guide.*

EPA and state representatives participating in this effort believe that the recommendations in the final *Guide* will help to improve management of industrial waste at facilities across the country. EPA and ASTSWMO will widely disseminate the final *Guide* and explain the rationale behind the recommendations to regulators, industries and the public to foster understanding and to encourage stakeholders to integrate final recommendations in future industrial non-hazardous waste planning throughout the country.

The *Guide* is designed for users with different levels of technical knowledge and experience in environmental fields. Because many of the recommendations address complex and highly technical practices and engineered systems, we urge users to seek out technical experts and resources to assist in detailed planning, design and implementation.

We recognize that facility managers, regulatory agency staff and the public all have a different role in ensuring protective waste management. Building an effective partnership between all stakeholders can facilitate sound decisions that protect human health and the environment and make common sense for individual facilities.

Facility managers: The *Guide* can help you make the decisions necessary to ensure environmentally responsible unit siting, design, and operation in partnership with State and tribal regulators and the public.

State and tribal regulators: The *Guide* provides a handy implementation reference that complements your program.

The public: The *Guide* can help you be an informed and knowledgeable partner in addressing industrial waste management issues in your community.

II. Request for Comments: Questions and Issues

A. Overview

Our objectives throughout development of this draft *Guide* have been to provide protective, substantive recommendations, informative discussion of each topic, and references and tools that help users proceed to a more in-depth study and review of each topic. We have attempted to make the guidance easy-to-use, accessible and meaningful to users with a wide range of experience and different levels of technical knowledge. However, we recognize that individual topics are addressed at varying levels of detail. We have developed a series of questions for most chapters of the *Guide.* We have also highlighted some general questions regarding the *Guide* and CD–ROM. We invite comments on all aspects of the *Guide* and CD–ROM, including the following questions.

- Are the recommendations appropriate, realistic, and protective?
- Does the *Guide* meet the needs of small businesses?
- Does the *Guide* meet the needs of the interested public?
- Does the coverage for each topic provide the right level of detail? What could be added, subtracted or handled differently to make each topic more useful?
- Is the *Guide* organized to provide quick access to the information you are seeking?
- Are there other references and sources of information that should be cited in the guidance or included on the CD–ROM?
- For the CD–ROM, does the software work well? Do the interactive portions of the CD–ROM present useful information? Is the CD–ROM organized well?
- For the ground-water and air models, do the individual models work well? Are the models easy to use and understandable? (See sections below for further discussion of issues associated with each model.)

B. Getting Started

Chapter 1. Building Partnerships: We recognize that the process of building successful partnerships between regulators, industry, and the public can be contentious.

- Would it be helpful in the final guidance to provide case studies of successful partnerships? If so, can you provide examples of partnerships that have been successful in solving problems and addressing specific waste management issues?

Chapter 3. Integrating Pollution Prevention: The *Guide* addresses pollution prevention, recycling and treatment in abbreviated fashion. Because the primary focus of the *Guide* is waste management, we chose to defer to the many excellent resources and materials devoted entirely to waste reduction, pollution prevention and treatment rather than attempt to cover them comprehensively. In addressing pollution prevention, our objectives for this guidance have been two. First, the guidance attempts to clearly identify the many linkages between making and implementing sound waste management decisions and pollution prevention, recycling and treatment options that can reduce waste management costs and long term liabilities. Second, we have tried to identify and include references that will give you a jump start to the wealth of resources that are available.

- Are there other references that will provide users with the best points of entry and assistance to address pollution prevention, waste reduction, recycling and treatment?
- Recognizing that the primary focus of the guidance is waste management, are there additional pollution prevention topics that the *Guide* should cover in more detail, such as, recycled product procurement guidelines, beneficial use or reuse of materials, or specific pollution prevention activities that overlap with waste management activities? Provide us with specific information and examples if you can on areas that you believe should be included.

Chapter 4. Considering the Site: This chapter recommends a wide variety of data sources to provide information on the geologic and hydrologic characteristics of a site.

- Can the existing information systems that integrate a wide variety of hydro-geologic information be easily used to make a site-specific determination that a planned unit will be sited in an acceptable location? If not, would it be helpful for users to be able to access one hub that could connect to a variety of data sources to evaluate a planned site?
- Alternatively, are determinations relating to wetlands, floodplains, fault areas, karst terrain, etc. so site-specific that national data bases will not provide sufficiently detailed information to help in the evaluation of an individual site?

As part of EPA's effort to address the siting of industrial waste management

units, the Agency is investigating the potential to develop a tool that would allow a user to quickly get an initial determination as to whether the unit is located in or close to an undesirable location. The EPA is investigating the use of available data from the U.S. Fish and Wildlife Services regarding wetlands, the Federal Emergency Management Agency regarding floodplains, and the U.S. Geological Survey regarding karst and seismic areas and making this information part of the Agency's EnviroMapper application. The EnviroMapper application provides users with interactive Geographic Information System (GIS) functionality using EPA spatial data. EnviroMapper allows users to view spatial data at the national, state, and county levels, as well as utilize GIS functionality, such as displaying multiple spatial layers, zooming, panning, identifying features, and querying single EnviroFacts points. EPA is considering the initial development of a GIS protocol for one State that would map the location of floodplains, wetlands, and seismic and karst locations within the State using the EnviroMapper application. We are interested in receiving comments on the utility of such a protocol. The Agency is also considering the potential addition of cultural (e.g., demographics), administrative (e.g., parks), and physical (e.g., pipelines) information to this planned GIS protocol. Questions concerning the initial development of the GIS protocol can be directed to John Sager whose number was previously listed in an earlier part of today's preamble.

C. Protecting Air Quality

Chapter 5. Protecting Air Quality: The guidance recommends assessing human health risks posed by volatile and semi-volatile compounds released from waste management units and taking appropriate measures to reduce significant risks. Measures to reduce risks include implementing pollution prevention or treatment to reduce or eliminate VOC concentrations in the waste and implementing controls to reduce emissions from the unit.

1. Assessing Air Risks: The *Guide* suggests two approaches to assessing risk. The first is a limited site-specific air assessment using the Industrial Waste Air Model (IWAIR) included in the CD ROM version of the guidance. This air model assesses direct risks through inhalation of volatile and semi-volatile compounds. The second approach is a comprehensive risk assessment that relies on detailed analysis of waste-and site-specific data and the use of models designed to assess multi-pathway exposures to airborne contaminants. The guidance identifies several models for such a detailed analysis.

IWAIR contains three modeling components. The first is an emissions model that estimates emissions of specific constituents from the unit into the atmosphere. The second component of the model estimates atmospheric dispersion of constituents and ambient air concentrations at a specific receptor point. The third component combines constituent concentrations at the specified receptor point with receptor exposure factors and toxicity benchmarks to estimate risk.

Emissions: IWAIR incorporates the emissions model CHEMDAT8. Once a user enters data to characterize the unit and the waste, CHEMDAT8 calculates the emission rate. CHEMDAT8 was developed by EPA and has undergone extensive review. IWAIR allows a user to enter site-specific data for unit and waste characteristics or to rely on default data to calculate emissions.

Dispersion: The dispersion model used in IWAIR is EPA's model Industrial Source Complex Short Term Version 3 (ISCST3). ISCST3 is a complex model and running it to develop a new dispersion factor for each site and waste management unit requires extensive meteorological data and technical expertise. In order to create an easily accessible and user-friendly modeling tool to evaluate the dispersion of air emissions, ISCST3 was previously run to generate a database of dispersion factors. The dispersion factors are included in IWAIR and have been calculated for many separate scenarios designed to cover a broad range of unit characteristics. There is a dispersion factor for each combination of:

—29 meteorological stations, chosen to represent the nine general climate regions of the continental U.S.;
—4 unit types;
—14 surface area sizes for landfills, land application units and surface impoundments, and seven surface area sizes and 2 heights for waste piles;
—6 receptor distances downwind from the unit out to a maximum of 1000 meters; and
—16 directions in relation to the center point of the unit.

The default dispersion factors were derived by modeling each of these scenarios. When IWAIR is run, the maximum dispersion factor, at a distance selected by the user for a specific waste management unit size, is used for the computations.

The advantage of this approach to dispersion modeling is that IWAIR provides you with a quick, easy-to-use method to calculate dispersion. Relying directly on ISCST3 requires significant technical expertise, access to a very complex and resource-intensive model, and substantial amounts of data. On the other hand, a limitation of the IWAIR model is the fact that it does not reflect the exact conditions of a specific location.

Risk model: This component of IWAIR combines the constituent-specific emission rate with the dispersion factor to calculate a VOC's concentration in the air at a specified receptor location. IWAIR calculates adult-worker or resident exposures based on inhalation, body weight, exposure duration and frequency, and ambient concentrations of constituents at a specific receptor location. Default values for these parameters are based on EPA's Exposure Factors Handbook. IWAIR relies on standard health benchmarks (cancer slope factors for carcinogens and reference concentrations for non-carcinogens) to calculate risk or acceptable waste constituent concentrations.

IWAIR can be used two ways. Forward calculation uses known constituent concentrations in a waste to calculate risk to receptors at specified locations. Backward calculation starts with a target risk level at a specified receptor location. The model then calculates the concentration levels in a waste that can be protectively managed in a unit without exceeding a pre-selected target risk level.

The Air Model User's Manual and Background Document contain detailed discussion on all components of the model. We invite comments on all aspects of the model, the values and data sources used to characterize specific parameters, and the modeling approach, including the following questions.

- Is the modeling approach that relies on matching limited site specific information to previously calculated dispersion factors a reasonable method to estimate dispersion of constituents from a unit? Are there refinements to this approach that could improve site-specific calculations and still be incorporated into a similar user-friendly and accessible model?
- Are the assumptions built into various components of the model reflective of the range of unit characteristics and conditions encountered in real situations?

We are also obtaining peer review of IWAIR by a group of technical experts who have been commissioned to provide an independent analysis of the model and the way it is used in the

guidance. The results of the peer review will be noticed in the **Federal Register**, as soon as they are available, so that interested parties may obtain copies for review.

2. Controls:

• Are there other control techniques or technologies that are effective in minimizing the release of particulates or VOCs from waste management units besides those discussed in Chapter 5 of the *Guide*? (While the Guide addresses VOC's through modeling, best management practices are identified as appropriate activities for addressing particulates from these units.)

D. Protecting Ground Water

Chapter 7. Protecting Ground Water: The guidance recommends tailoring protective liner systems to the wastes that are managed in a unit and evaluating whether land application of a waste is appropriate using a three-tiered approach to ground-water modeling and risk assessment. The type of assessment you choose depends, in part, on the complexity of a site and the characteristics of the waste. All three rely on ground-water modeling to evaluate the potential for ground-water contamination. Each successive tier incorporates more site-specific data to tailor recommendations to your circumstances.

The modeling tool for Tiers 1 and 2 is the EPA Industrial Waste Evaluation Model (IWEM) incorporated into the CD ROM version of this guidance. This is a stand-alone, simple-to-use model that does not require previous modeling experience. Tier 1 tables are also in the paper-copy version of the guidance.

Tier 1—National Evaluation: Once you know the expected leachate concentrations of constituents in a waste, generic design recommendations (e.g., liner system or whether land application is appropriate) are provided. This tier of analysis uses a summary of site conditions that exist across the country.

Tier 2—Location-Adjusted Evaluation: You can enter data for up to seven of the most sensitive waste-and site-specific variables to assess whether an alternative design will be protective.

Tier 3—Comprehensive Risk Assessment: This tier relies on a comprehensive analysis of all waste and site characteristics to assess whether an alternative design will be protective.

Chapter 7a. Assessing Risk: IWEM analyzes different liner scenarios over a 10,000 year time frame. Tier 1 and 2 risk evaluations work as follows. IWEM can evaluate 191 constituents with toxicity reference levels that are either drinking water maximum contaminant levels (MCLs) set under the Safe Drinking Water Act or health-based numbers (HBNs) derived from several sources. In addition, the model allows a user to add additional chemicals for analysis and to adjust MCLs and HBNs to reflect state-specified or other values.

First, IWEM identifies a benchmark concentration (MCL or HBN) for each constituent in a receptor well associated with a waste management unit. The goal is not to exceed the benchmark concentrations in the receptor well (defined as a monitoring well). The model starts from this benchmark concentration in the receptor well and uses the effects of dilution and attenuation and leakage rate from a unit to determine the leachate concentration threshold values for wastes that can be protectively managed in a particular unit design. In a similar fashion, the model determines leachate concentration threshold values for wastes that are being considered for land application.

Leachate concentration threshold values for constituents are based on toxicity reference levels, with two exceptions. First, the 39 hazardous waste toxicity characteristic (TC) constituents are capped at their TC levels, because concentrations above those levels would cause the waste to be regulated as a hazardous waste and thus outside the scope of this *Guide*. Second, the model caps each leachate concentration threshold value at 1000 mg/l, because we do not expect constituent concentrations in leachates exceeding 1000 mg/l to be released from industrial waste management units.

The IWEM Technical Background Document accompanying the model thoroughly explains the model, including the parameters that have the greatest effect on modeling results. The parameters that a user can input are:

- Infiltration rate from the unit;
- Surface area of the waste management unit;
- Depth to water table;
- Distance to the well;
- Thickness of the aquifer;
- Retardation rate; and
- Degradation rate.

One of the most sensitive parameters is the infiltration rate or the rate at which leachate is released from a unit and moves into subsurface soils. The infiltration rate is influenced by a number of factors, including the amount of precipitation, the level of liquid in the unit (head), and the hydraulic conductivity of the liner material. For synthetic liners, the occurrence of tears, rips or holes also influences the infiltration rate.

Units that rely only on natural soils underlying the unit, including units for direct land application of waste, generally have higher leakage rates. A single clay or synthetic liner can reduce the leakage rate to some extent. However, composite and double liners that combine two or more layers of liner material with leachate collection and leak detection (for double liners) significantly increase the effectiveness of the containment system in minimizing leakage to the subsurface during the period when the leachate collection system is actively managed.

For a landfill that no longer receives waste and for surface impoundments and waste piles where waste remains in place at closure, the cap that is placed over the unit becomes an important component of the final containment system. One key purpose of the final cap is to minimize the infiltration of precipitation into a closed unit. Precipitation generates leachate that may eventually migrate into subsurface soils and to ground water. The liner system in the short term, and the cap and the liner system together in the long term, to a large extent determine the infiltration rate from the unit. The infiltration rate that is associated with various unit designs is one of the most sensitive variables in evaluating the degree of protectiveness provided by a particular liner system.

The *Guide* recommends a comprehensive approach to design, construction, operation and long term care of a waste management unit to minimize the potential for problems affecting liner performance . This includes:

- Recommending a liner design, taking into account the characteristics of the waste managed in the unit;
- Emphasizing construction quality assurance and control;
- Emphasizing compatibility between the liner and the waste;
- Continuing operation and maintenance practices to protect liner performance;
- Ground-water monitoring, to assess liner performance, as an integral component of a protective management system;
- Closing the unit with a cap that meets or exceeds the design of the liner (infiltration through the cap equal to or less than leakage through the liner); and
- Post-closure care and monitoring to maintain the cap for the time period necessary to ensure the waste no longer poses a risk to human health.

Assumptions concerning liner performance have a significant impact on the modeling results. A brief summary of the modeling scenarios for each liner type follows (the model currently assumes that performance

levels remain constant for the 10,000 year time frame of the modeling effort).

No liner: This is a waste management unit that sits in direct contact with native soil. Monte Carlo analysis of a range of infiltration rates is based on water balance and native soil type for 97 meteorological stations. In Tier 2, the model can provide a regional infiltration rate based on a user-specified location.

Single liner: This consists of three feet of compacted clay with a hydraulic conductivity of 10^{-7} cm/sec. Monte Carlo analysis of a range of infiltration rates is based on water balance for 97 meteorological stations. In Tier 2, the model can provide users with a regional infiltration rate based on a user-specified location.

Composite liner: This is an engineered system that consists of three feet of compacted clay and a synthetic liner. The system is assumed to include a leachate collection system that maintains a hydraulic head of no more than 12 inches for landfills and waste piles. The leakage rate is a single value calculated using an equation, developed by Giroud and Bonaparte, based on one 0.005 $in.^2$ hole per acre. For landfills, the calculated leakage rate is 0.1 gallon/acre/day and for surface impoundments the calculated leakage rate is 0.9 gallon/acre/day. This would represent a high performing liner. The assumptions regarding the composite liner leakage rate are discussed in the IWEM Technical Background Document.

In general, we have learned much over the past 20 years about the performance of liner systems and caps, and there have been many improvements in construction, installation, and quality assurance and control procedures. However, we recognize that there is still uncertainty associated with liner performance, both in the near term as well as in the long term. While some studies indicate that engineering properties of liners may last for many (perhaps several hundred) years, there are a variety of factors that may influence longevity and performance, such as poor construction, installation or facility operation, or geologic movement below the liner that can cause holes, tears or larger failures. Some defects are likely to have little to moderate effect on the leakage rate. Other defects may have a significant effect and may even necessitate corrective action.

We have conducted some preliminary sensitivity analyses to compare infiltration rates from a variety of theoretical composite liner scenarios. Scenarios varied the size of holes and tears; the number per acre; contact between the geomembrane and the clay layer; the conductivity of the underlying clay layer, and the head of liquid on top of the geomembrane. Results of these preliminary analyses provided a range of infiltration rates ranging from well below to well above the infiltration rate of 3.3E–05 meters/year used in the Tier 1 analysis for landfills. These results indicate several key areas in which EPA, the Steering Committee, and the Focus Group could conduct additional evaluations to evaluate liner effectiveness more thoroughly:

- What empirical data are available concerning liner defects at the time of installation and over time to serve as a basis for identifying reasonable performance scenarios?
- What are reasonable methods for estimating leakage? Some estimation methods may be reasonable within specific bounds or time frames for various performance scenarios, but may not work for a wide range of performance scenarios or time frames.
- If we were to conduct a Monte Carlo analysis of leakage rates for composite liners, what is a reasonable range to include in the analysis?
- How should we account for degradation of the liner system over time? (A more thorough discussion of the sensitivity analyses is in the IWEM Technical Background Document.)

Another area of uncertainty is the fate of constituents within a unit. Over time, a number of degradation processes may be under way that reduce the hazards associated with some constituents. On the other hand, a landfill with an intact cover may be reasonably dry, reducing leachate generation, but also slowing down degradation. Other toxic constituents, such as heavy metals, can not degrade.

Covers present continuing engineering challenges over time, because they are more susceptible to factors such as freezing and thawing, wetting and drying, temperature fluctuations, root infiltration, and subsidence. Covers are, however, not subject to chemical attack from waste constituents, nor are they subject to the same stresses from waste placement as a bottom liner. Also, final covers are simpler to repair, which would help control the risk of infiltration into the landfill, assuming there is an active program to monitor or periodically replace the cover. Unless the final cover is regularly repaired or replaced, the bottom liner could outlast the cover. While covers containing a synthetic membrane are likely to prevent precipitation from entering a closed unit during the period that they are performing as designed and assuming there are no failures, uncorrected failure of a cover would allow precipitation to enter the unit. After leachate removal is discontinued, this could lead to a ''bathtub effect,'' where the unit has increasing leachate volumes and hydraulic head that could lead to increased leakage rates or overflow.

We invite comments on all aspects of the model, the values, and data sources used for specific parameters, and the modeling scenarios for liner performance, including the following questions.

- Is the cap of 1000 mg/l concentration for constituents in leachate from a non-hazardous industrial waste management unit realistic? If not, please provide data on which waste units may generate leachate that contains constituents at higher concentration levels and what those levels and constituents are likely to be.
- What performance assumptions, modeling approaches and design scenarios are reasonable to address the question of the changing effectiveness of liners and caps over time?
- Can you provide data on the occurrence of defects in liners at the time of installation and on changes in leakage rates or indicators of possible changes in liner defects that occur over time?
- The hazardous waste program deals with uncertainties associated with liner and cap performance by requiring treatment prior to disposal. How should such uncertainties be dealt with for non-hazardous industrial wastes? One possibility is to rely on quality assurance and quality control, long-term ground-water monitoring, and corrective action to address non-hazardous waste management units. Where uncertainties are too great, EPA could elect to rely on the hazardous waste program to list such wastes as hazardous and require treatment. A second approach could be to rely on treatment of certain non-hazardous wastes. What other approaches are available? Please provide any expressions of support for or concerns about any of these approaches.
- Should the composite liner scenario use a different infiltration rate, or Monte Carlo analysis to reflect a range of performance levels, rather than the single value currently used in our Tier 1 analysis? What values should be used, and what is the basis for using them? The IWEM Technical Background Document presents the range of infiltration rates used in the Tier 2 analysis and discusses the limitations of the Tier 2 modeling results if one were to use infiltration rates outside the modeled range of infiltration rates.

We are also obtaining peer review of the ground-water model by a group of technical experts who have been commissioned to provide an independent analysis of the model and the way it is used in the guidance. The results of the peer review will be noticed in the **Federal Register** as soon as they are available so that interested parties may obtain copies for review.

In Chapter 7a of the *Guide,* EPA makes reference to an alternative Tier 2

model developed by the American Petroleum Institute (API). API's Graphical Approach for Determining Site-Specific Dilution-Attenuation Factors (DAFs) was presented to the Steering Committee and the Focus Group during the development of this *Guide*. API developed this approach to simplify calculation of facility-specific DAFs. A copy of API's User Manual for this graphical approach has been included on the CD-ROM. EPA solicits comment on API's request that this model be incorporated in the Guide as an alternative Tier 2 assessment tool.

Chapter 7b. Designing and Installing Liners and Caps: Construction and installation quality assurance and quality control are critical to ensuring liner and cap performance. The guidance is intended to reflect up-to-date installation practices and techniques and the appropriate materials and techniques for installing a liner system and a final cap.

- Are there additional practices and techniques that should be reflected in the guidance?
- For those with experience installing liners and operating lined units, how do you measure liner performance and what are your experiences over time when monitoring and addressing liner performance?

Chapter 7c. Designing a Land Application Program: The *Guide* recommends an evaluation framework for a number of waste and soil parameters, in addition to the constituents in Tier 1, that are important in designing an effective land application program. The *Guide* discusses the waste and soil parameters and their relationship to the establishment of an appropriate application rate as part of an effective land application program at a unit.

- Are there models or other tools available to simplify design and evaluation of a land application program?

E. Ensuring Long Term Protection

Chapter 9. Monitoring Performance: The *Guide* urges a multi-media approach to protective waste management. While the Monitoring Performance chapter briefly addresses monitoring other environmental media such as air, soil, and surface water, the chapter is devoted primarily to ground-water monitoring.

Should the guidance expand discussion and recommendations concerning monitoring other environmental media, and if so, how?

Chapter 11. Performing Closure and Post Closure Care: As discussed above under Protecting Ground Water: Assessing Risk, proper closure and post closure care are critical elements of a program that ensures long term protection.

- Please comment on factors that should be taken into account in determining the time frame for post-closure care and in determining when it is appropriate to end post-closure care.
- What experience can you report regarding materials and construction techniques for final caps that work particularly well or that may pose problems?

The draft *Guide* represents a substantial amount of time and effort on the part of the Steering Committee and Focus Group representatives. EPA believes that the *Guide* has the potential to be widely used by States, industry, and the environmental community based on the voluntary nature of the guidance, the multi-media aspects of the *Guide*, and, in EPA's opinion, the quality of the work that will continue through the development of the final *Guide*. EPA looks forward to receiving comments on this *Guide* and working with the Steering Committee and the Focus Group as we develop a final *Guide* for industrial non-hazardous solid waste management.

Dated: May 14, 1999.

Elizabeth Cotsworth,

Acting Director, Office of Solid Waste.

Appendix 1—Current and Past Steering Committee Representatives

James Warner, Minnesota Pollution Control Agency
Anne Dobbs, Texas Natural Resource Conservation Commission
Cyndi Darling, Maine Department of Environmental Protection
Jon Dilliard, Montana Department of Environmental Quality
Richard Hammond, New York State Department of Environmental Conservation
Elizabeth Haven, California State Water Resource Control Board
Jim Hull, Missouri Department of Natural Resources
Jim Knudson, Washington State Department of Ecology
Marc Crooks, Washington State Department of Ecology
Chris McGuire, Florida Department of Environmental Protection
Gene Mitchell, Wisconsin Department of Natural Resources
William Pounds, Pennsylvania Department of Environmental Protection
Bijan Sharafkhani, Louisiana Department of Environmental Quality
Kerry Callahan, Association of State and Territorial Solid Waste Management Officials
Paula Clark, Maine Department of Environmental Protection
Norm Gumenik, Arizona Department of Environmental Quality
Steve Jenkins, Alabama Department of Environmental Management
Jim North, Arizona Department of Environmental Quality
Robert Dellinger, EPA
Richard Kinch, EPA
Paul Cassidy, EPA
John Sager, EPA
Pat Cohn, EPA
Dwight Hlustick, EPA
Virginia Colten-Bradley, EPA
Charlotte Bertrand, EPA
Mark Schuknecht, EPA

Current and Past Focus Group Representatives

Paul Bork, The Dow Chemical Company
Walter Carey, Nestle, USA, Inc. and New Milford Farms
Rama Chaturvedi, Bethlehem Steel Corporation
H.C. Clark, Rice University
Barbara Dodds, League of Women Voters
Chuck Feerick, Exxon Company, USA
Robert Giraud, Dupont Company
Jonathan Greenberg, Browning-Ferris Industries
John Harney, Citizens Round Table/PURE
Richard Jarman, National Food Processors Association
James Meiers, Indianapolis Power and Light Company
Andrew Miles, The Dexter Corporation
Scott Murto, General Motors and American Foundry Society
James Roewer, Edison Electric Institute
Edward Repa, Environmental Industry Association
Tim Saylor, International Paper
Amy Schaffer, American Forest and Paper Association
Ed Skernolis, WMX Technologies, Inc.
Michael Wach, Western Environmental Law Center
David Wells, University of South Alabama Medical Center
Pat Gwin, Observer from the Cherokee Nation of Oklahoma
Dorris Cellarius, Sierra Club
Brian Forrestal, Laidlaw Waste Systems
Michael Gregory, Arizona Toxics Information and Sierra Club
Gary Robbins, Exxon Company
Kevin Sall, National Paint and Coatings Association
Bruce Steiner, American Iron and Steel
Lisa Williams, Aluminum Association

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FEDERAL COMMUNICATIONS COMMISSION

[CC Docket No. 92–237; DA 99–1105]

Next Meeting of the North American Numbering Council

AGENCY: Federal Communications Commission.

ACTION: Notice.

SUMMARY: On June 7, 1999, the Commission released a public notice announcing the June 22 and June 23, 1999, meeting and agenda of the North American Numbering Council (NANC).