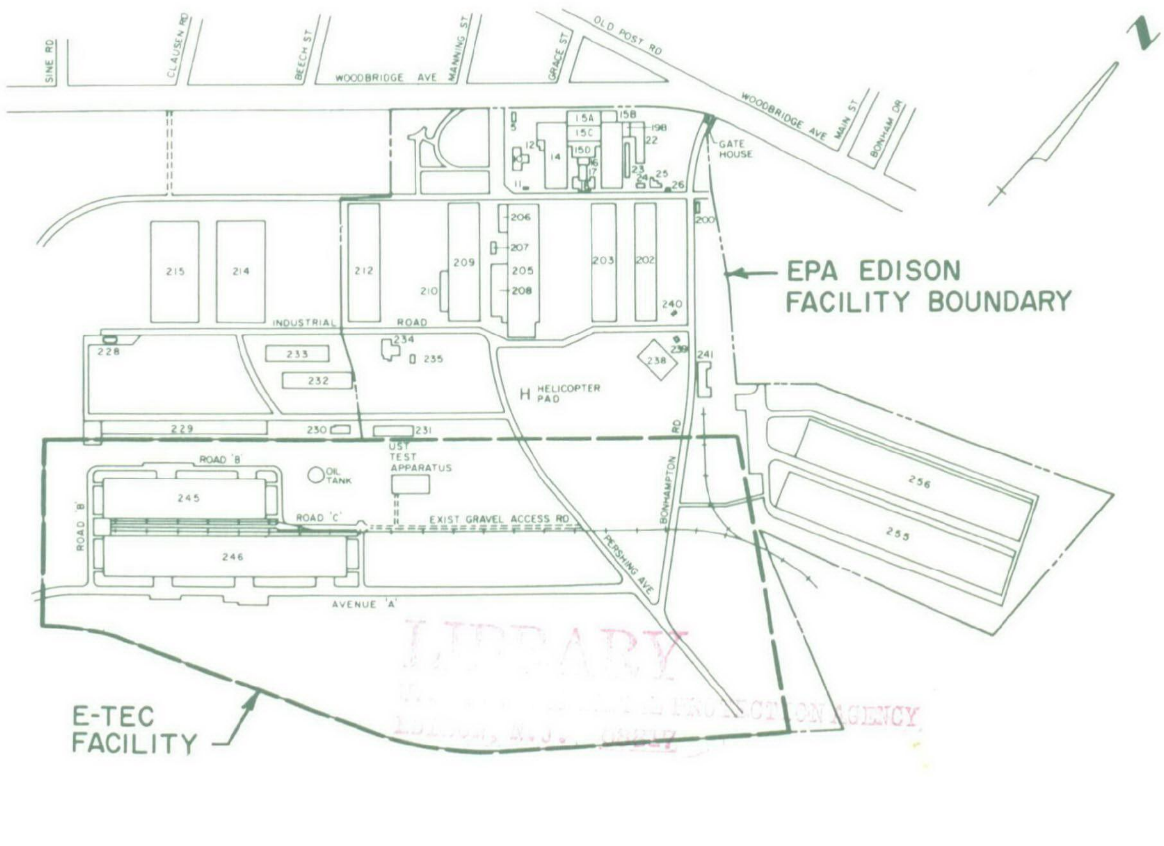
UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

JANUARY 1990

RESEARCH AND DEVELOPMENT

EPA

DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE DEVELOPMENT OF AN ENVIRONMENTAL TECHNOLOGY AND ENGINEERING (E-TEC) FACILITY IN EDISON, NEW JERSEY



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
RESEARCH AND DEVELOPMENT

JAN 05 1990

To All Interested Government Agencies, Public Groups, and Citizens:

Enclosed for your review is a copy of the Draft Environmental Impact Statement on the Environmental Technology and Engineering (E-TEC) Facility. This draft environmental impact statement (EIS) was prepared by the U.S. Environmental Protection Agency (EPA) - Region II and EPA's Office of Research and Development (ORD) with the assistance of Gannett Fleming Environmental Engineers, Inc. and EcolSciences, Inc.

The EIS is an issue-oriented decision-making tool that was prepared for the purpose of evaluating the environmental impacts associated with the construction and operation of an Environmental Technology and Engineering (E-TEC) Facility, and to evaluate the alternatives to locating the facility in Edison, New Jersey. The proposed E-TEC facility would be utilized by government, academic, and industry researchers to develop and evaluate innovative treatment and disposal technologies for hazardous substances.

Major topics addressed in the EIS include potential impacts to air quality, water quality, and public health. Additionally, the EIS evaluates the suitability of alternative locations for the E-TEC Facility in terms of environmental impacts, engineering feasibility, cost-effectiveness, and implementability.

Public participation, especially at the local level, is an essential component of the decision-making process. A public meeting and a public availability session were held during the preparation of the draft EIS to ensure input from local, state, and federal representatives. A public hearing has also been scheduled to receive formal comments on the draft EIS. The hearing information is presented below.

February 27, 1990 at 7:00 PM
Stelton Community Center
328 Plainfield Avenue
Edison, New Jersey 08817

Your participation at this hearing is encouraged. In addition, written comments concerning the content of this draft EIS will be accepted for 45 days after the date of publication of the notice of availability in the Federal Register.

Please address all comments to:

Robert W. Hargrove, Chief
Environmental Impacts Branch
U.S. Environmental Protection Agency
26 Federal Plaza, Room 500
New York, New York 10278

If you need additional information regarding the draft EIS, please contact Mr. Hargrove, at (212) 264-1840.

Sincerely yours,

Erich Bretthauer

Erich W. Bretthauer
Acting Assistant Administrator
for Research and Development

Enclosure

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Draft
Environmental Impact Statement
on the Environmental Technology and Engineering Facility
Edison, New Jersey

Prepared by:
U.S. Environmental Protection Agency (EPA)

Abstract: The proposed action addressed in this draft environmental impact statement (DEIS) is the construction and operation of an Environmental Technology and Engineering (E-TEC) Facility in Edison, New Jersey. The proposed facility would be utilized by government, academic, and industry researchers to develop and evaluate innovative treatment and disposal technologies for hazardous substances. The DEIS addresses the following topics: potential impacts to air and water quality; potential impacts to public health; and alternative locations for the proposed facility. The alternative proposed in the DEIS involves the renovation of existing buildings at the EPA - Edison Facility. This alternative represents the most environmentally sound, cost-effective, and implementable alternatives evaluated in the DEIS. In addition, the DEIS concludes that implementation of the proposed alternative will not result in any significant adverse environmental impacts, or represent a significant risk to public health.

#24163968

Public Hearing:	Contact for Information:
February 27, 1990	Mr. Robert Hargrove
Stelton Community Center	EPA - Region II
328 Plainfield Avenue	26 Federal Plaza, Room 500
Edison, New Jersey 08817	New York, New York 10278
	(212) 264-1840

Written comments will be received by EPA for 45 days following publication of a notice of availability in the Federal Register

Approved by: Erich Bretthauer 1/5/90
Erich W. Bretthauer
Acting Assistant Administrator
for Research and Development
Date

ENVIRONMENTAL TECHNOLOGY AND ENGINEERING FACILITY

DRAFT
ENVIRONMENTAL IMPACT STATEMENT

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY

WITH ASSISTANCE FROM:

GANNETT FLEMING ENVIRONMENTAL ENGINEERS, INC.
HARRISBURG, PA

IN ASSOCIATION WITH:

ECOLSCIENCES, INC.
ROCKAWAY, NJ

JANUARY 1990

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Purpose and Need

The Superfund Amendments and Reauthorization Act (SARA) of 1986 specifically authorized the Environmental Protection Agency (EPA) to establish a technology research, demonstration, and evaluation program to promote the development of innovative treatment technologies for hazardous substances. In response to this legislation, the EPA's goal is to establish an Environmental Technology and Engineering (E-TEC) facility, having state-of-the-art capabilities, for the testing and evaluation of hazardous substances control technologies in a safe and environmentally secure manner. The proposed E-TEC facility would be equipped with appropriate treatment technologies to protect the health of the facility users and the surrounding community. Because of the nature of the proposal and public interest and concern, the EPA determined that an environmental impact statement (EIS) is needed to address key concerns, including feasible alternatives to and environmental impacts of the proposed action, pursuant to the National Environmental Policy Act (NEPA).

Alternatives

Four categories of alternative actions were evaluated in detail to identify the preferred location of the proposed E-TEC facility. The four categories are identified below:

i. no action,

ii. construction of a complete facility,

iii. leasing of space in an existing building or facility, and

iv. renovation of existing buildings at the EPA Edison Facility.

The alternatives were screened based on the criteria of: 1) the availability of siting locations, 2) implementability, 3) environmental soundness, and 4) cost.

Implementation of the no action alternative would mean that EPA would not build and outfit a new E-TEC facility. Hazardous substance treatment technology research and evaluation would have to take place, as needed, at existing EPA facilities. This alternative would not meet the goals and objectives of the SARA legislation. Also, the research would be carried out under less environmentally safe conditions and in a less coordinated manner.

In evaluating the remaining alternative actions, it is necessary to reduce the quantity of possible locations to a finite number that meet the siting criteria. These criteria include: (1) meeting the goals and mission of the SARA legislation and the Superfund Innovative Technology and Evaluation (SITE) Program, (2) coordinating the research activities with industry, academia and other government agencies, and (3) locating the facility on a property large enough to house a large warehouse type building(s) and provide a buffer zone. The urbanized northeast meets these siting criteria and it has many designated Superfund sites, whose clean-up would be greatly facilitated with the location of the proposed E-TEC facility in this geographic region. The northeast has many urbanized areas where the infrastructure, academic institutions, and large scale building facilities would be available.

The second category of alternatives involves the construction of a complete facility on undeveloped land. This alternative would require acquisition of a large plot of land (100 acres) and complete construction of a warehouse type building(s). A desirable attribute of the proposed facility would be to have it located in close proximity to major transportation networks, educational institutions and industrial entities. The cost of undeveloped land in northeastern areas fitting this description is very high. In addition, the cost of constructing a complete, new facility would be very high in an industrial, developed area.

A logical alternative to constructing a complete facility would be to lease space at an existing facility. This category could include leasing space at an EPA facility, military installation, other government property, academic institution, or industrial complex. All of these possibilities were examined in the alternatives analysis but were ruled out on the basis of lack of available space, conflicting use or the cost of leasing private space.

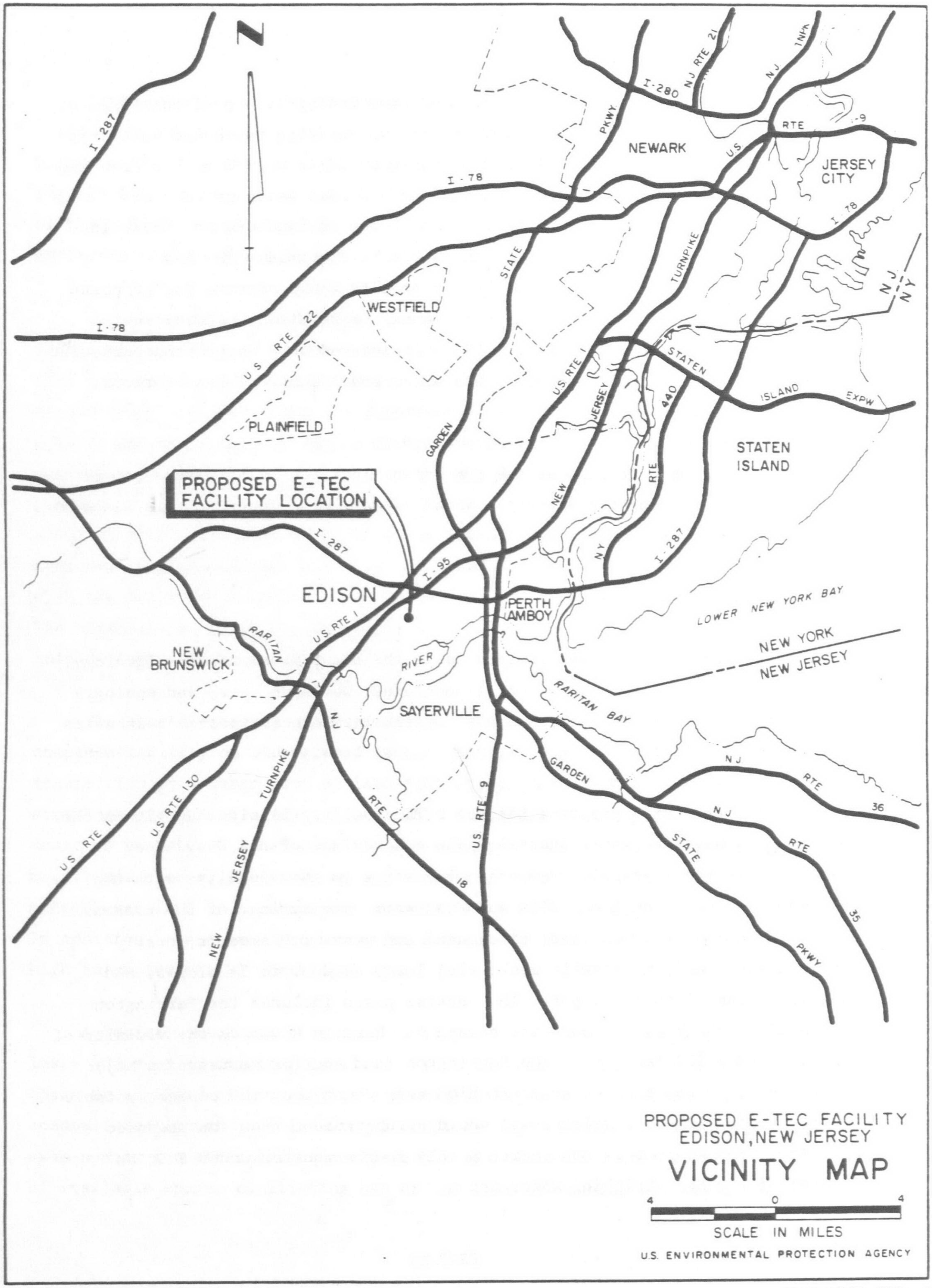
The remaining alternative, renovation of existing warehouse buildings at the EPA Edison Facility, involves upgrading two existing warehouse buildings on a site currently owned by EPA and operated by EPA's Office of Research and Development (ORD). From an implementability and cost perspective, this alternative is superior to the others. No change in land use or conversion from undeveloped land to developed land would be required with this alternative and the ORD personnel already on-site would operate the proposed E-TEC facility so no relocation of staff would be required. Additionally, the EPA Edison Facility (see Figure ES-1) is located near major transportation routes and supporting governmental, academic, and industrial institutions.

The proposed alternative was determined to be the renovation of the existing warehouse buildings at the EPA Edison Facility. The discussion of the affected environment and environmental impacts will focus on this alternative.

<u>Affected Environment</u>

The affected environment includes both the natural environment (geology, soils, ground water, surface water, floodplains, wetlands, air, and ecology) and the man-made environment (land use, cultural resources, noise, aesthetics, and socioeconomics).

The 110 acre site proposed for the E-TEC facility is situated within the northern reach of the Inner Coastal Plain subprovince of the New Jersey Coastal Plain Physiographic Province. The soils in the vicinity, with the exception of the Urban Land, Pits and Psamments, are typical of the coastal plain and include: urban land; pits; sand and gravel; Psamments, nearly level; Atsion sand; Manahawkin muck; klej loamy sand, 0 to 3% slopes; and sassafras loam, 2 to 5% slopes. The coastal plain includes the Farrington Sand Aquifer which flows southeast toward the Raritan River in the vicinity of the proposed E-TEC facility. The Farrington Sand Aquifer serves as a major water source in eastern and southern Middlesex County but the closest potable wells (located 1.5 to 2 miles away) would be upgradient from the proposed facility. The aquifer is considered a sole source aquifer under Section 1424(e) of the Safe Drinking Water Act.



PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY

VICINITY MAP

FIGURE ES-1

The proposed site lies within the Raritan River drainage basin. The drainage from the proposed site would flow through swales, small streams and culverts, to eventually discharge into the Red Root Creek. Red Root Creek is a tributary to the Raritan River. There are no floodplains (100-year or 500-year) in the vicinity of the proposed site. There are some wetland areas associated with small streams or in areas of hydric soils but all of these areas occur in the southern portion of the 110-acre tract, well removed from the existing warehouse buildings and service roadways.

The air quality in the region of the proposed E-TEC facility is in compliance with all established National Ambient Air Quality Standards (NAAQS) except ozone. The State of New Jersey is in violation of the ozone standard.

Because of the development of the area around the proposed site and the fencing of the site itself, few migratory animals can be found on the proposed site, with the exception of some bird species. The undeveloped portion of the proposed site could provide habitat for small mammals and reptiles that could satisfy all of their habitat requirements on the site itself.

The general area to the south and east of the proposed 110-acre site is dominated by light industrial development. The Middlesex County College borders the site to the west. The proposed site itself has been greatly disturbed and has only one area where a natural surface may exist. No known prehistoric sites are recorded in the area but a cultural resources survey is being conducted in the vicinity of the undisturbed area.

The major source of noise in the surrounding area of the proposed site is vehicular traffic and the operation of motorized equipment; the warehouse buildings on the proposed site are not currently in use so the site does not currently contribute significantly to the background noise. Aesthetically, the proposed site is not very appealing. The view is one of abandonment, with overgrown shrubbery, crumbling roads and deserted articles strewn about.

The majority of the residents, 73%, in the surrounding community are over the age of 18 and the property is dominated by residential parcels. There is a substantial transportation network in the vicinity of the proposed site. Interstates and major highways converge near the site and an Amtrak rail line passes through the area.

Environmental Consequences

The main environmental concerns of the operation of the proposed facility focused on five areas - water quality, ground water quality, transportation, air quality, and public health. These issues were examined in the EIS to determine if the facility would cause significant impacts. Mitigative measures would be incorporated into the design and operation of the proposed facility to minimize the potential for adverse environmental impacts.

The primary source of potential impacts to surface water quality would be the discharge of process water from the facility. Thus, rather than establishing a new discharge, the process water generated at the proposed facility would be collected in a holding tank and would be treated, if necessary, prior to discharge to the Middlesex County Utilities Authority (MCUA) plant. No process water would be discharged to the sewer system until the concentrations of contaminants were below the allowable effluent limits specified in the facility's discharge permit. The maximum quantity of process water discharged to MCUA on a daily basis would not be expected to exceed 100,000 gallons per day. Because the capacity of the MCUA treatment plant is 110 million gallons per day, the flow from the proposed facility would not cause a significant impact to the operation of the MCUA plant.

The aquifer underlying the proposed facility has been designated a sole source aquifer by EPA pursuant to the Safe Drinking Water Act (SDWA). Accordingly, the proposed project would have to comply with Section 1424e of the SDWA. The siting and operation of the proposed facility would not cause significant impacts to the ground water quality and, therefore, would comply with the provisions of this Act. The possibility of liquid spills impacting the aquifer would be minimized by the following:

- Product handling would occur on impervious areas.
- Soils tend to attenuate the transport of most hazardous substances through adsorption or absorption.
- Transported materials would be packaged according to the codes and standards established by state and federal regulations.
- The proposed facility staff would be trained in spill containment and clean-up procedures.
- The closest ground water wells in the area are upgradient from the proposed facility.

Material transported to or from the proposed facility would include contaminated or uncontaminated surface water, ground water or soil, as well as equipment. The rate of delivery would average approximately one truckload per week. All transported items would be under the management control of the EPA, which would include the following: 1) all materials would be packaged according to federal and state regulations, 2) only licensed haulers would be used, 3) trucks would travel on major roads and highways to the extent possible, 4) the facility staff would work together with the local agencies to establish contingency plans for traffic accidents, and 5) the proposed E-TEC facility would have a trained emergency response team that could assist local emergency response personnel in the containment and clean-up of spills. These control measures and the low volume of trucks entering and exiting the proposed facility would minimize the potential for a transportation accident and would help to minimize adverse impacts if such a spill occurred.

During the EIS process, air modeling, using EPA-approved models and methodologies, was conducted to determine the impact of the proposed facility's operation on the air quality of the area. The model results indicated that, with the backup air pollution control equipment proposed for installation in the buildings, the operation of the facility would not violate the NAAQS for the criteria pollutants. The background air concentration for ozone in the State of New Jersey currently violates the NAAQS, but the operation of the proposed facility would not be expected to contribute significantly to this existing problem. The proposed facility would have to obtain and comply with an air discharge permit issued by the State of New Jersey which would specify the maximum concentration of pollutants that could be discharged from the proposed facility.

Public health concerns involve both long-term (chronic) exposures from expected daily activities and short-term (acute) exposures from a hypothetical catastrophic release. A risk assessment for each of these health effects was conducted. Chronic health effects include the potential for carcinogenesis so the chronic risk assessment quantitatively addressed the excess risk of developing cancer from exposure to chemicals emitted from the proposed E-TEC facility over 70 years. Public exposure to emissions would be minimized to the extent possible through the use of air pollution control systems and management practices, such as using the least quantity of hazardous substances possible in conducting evaluations.

In the EIS, a catastrophic event causing the vaporization of all stored chemicals was simulated to determine the health impacts of such a release. It was assumed that all chemicals stored within the buildings would become entrained in the air and exit the proposed facility. The health impact of concern with this type of event would be acute exposure to hazardous substances. The risk assessment determined that potential adverse impacts to the exposed public could be mitigated by instituting management controls that would restrict the quantity of chemicals within the buildings to that quantity that would prevent exposure to contaminant concentrations above the threshold concentration (the concentration below which no irreversible adverse impacts are expected to occur), even in the event of a catastrophic release.

Proposed Action

In summary, with appropriate mitigative measures and precautions implemented, the proposed alternative, locating the proposed E-TEC facility at the EPA Edison Facility, would meet the goals and objectives of the SARA legislation and would cause minimal environmental impacts to the surrounding community.

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS
(Cont'd.)

TABLE OF CONTENTS
(Cont'd.)

TABLE OF CONTENTS
(Cont'd.)

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D

TABLE OF CONTENTS
(Cont'd.)

TABLE OF CONTENTS
(Cont'd.)

TABLE OF CONTENTS
(Cont'd.)

LIST OF FIGURES

LIST OF TABLES

TABLE OF CONTENTS
(Cont'd.)

LIST OF TABLES

TABLE OF CONTENTS
(Cont'd.)

LIST OF TABLES

LIST OF ACRONYMS

ACGIH	-	American Conference of Governmental Industrial Hygenists
CRAVE	-	Carcinogen Risk Assessment Verification Endeavor
DERP	-	Defense Environmental Restoration Program
DO	-	Dissolved Oxygen
DOD	-	Department of Defense
EED	-	Exposure Evaluation Division
EIS	-	Environmental Impact Statement
EPA/USEPA	-	United States Environmental Protection Agency
E-TEC	-	Environmental Technology and Engineering Facility
FDA	-	Food and Drug Administration
FEMA	-	Federal Emergency Management Agency
FIT	-	Field Investigation Team
GEMS	-	Graphical Exposure Modeling System
GSA	-	Government Services Administration
HEPA	-	High Efficiency Particulate Adsorption
ID	-	Induced Draft
ISCLT	-	Industrial Source Complex Long-Term
ISCST	-	Industrial Source Complex Short-Term
MCC	-	Middlesex County College
MCUA	-	Middlesex County Utilities Authority
MHW	-	Mean High Water
MSL	-	Mean Sea Level
NAAQS	-	National Ambient Air Quality Standards
NAS	-	National Academy of Sciences
NJDEP	-	New Jersey Department of Environmental Protection
NJIT	-	New Jersey Institute of Technology

NPDES	-	National Pollutant Discharge Elimination System
NRC	-	Nuclear Regulatory Commission
NWI	-	National Wetlands Inventory
ORD	-	Office of Research and Development
OSHA	-	Occupational Safety and Health Administration
OSWER	-	Office of Solid Waste and Emergency Response
OTS	-	Office of Toxic Substances
PAH	-	Polynuclear Aromatic Hydrocarbons
PCBs	-	Polychlorinated Biphenyls
PM-10	-	Inhalable Particulates
PUD	-	Planned Urban District
q*	-	Carcinogenic Potency Factor
RCRA	-	Resource Conservation & Recovery Act
RD&D	-	Research, Development and Demonstration
RfD	-	Reference Dose
RREL	-	Risk Reduction Engineering Laboratory
SARA	-	Superfund Amendments and Reauthorization Act
SCS	-	Soil Conservation Service
SDWA	-	Safe Drinking Water Act
SITE	-	Superfund Innovative Technology Evaluation
STEL	-	Short-Term Exposure Limit
TCE	-	Trichloroethylene
T&E	-	Test and Evaluation
TLV	-	Threshold Limit Value
TSCA	-	Toxic Substances Control Act
TSD	-	Treatment, Storage & Disposal
TSP	-	Total Suspended Particulates

TSS	-	Total Suspended Solids
TWA	-	Time Weighted Average
USDA	-	United States Department of Agriculture
USFWS	-	United States Fish and Wildlife Service
UST	-	Underground Storage Tank
WEP	-	Wet Electrostatic Precipitator
WWTP	-	Waste Water Treatment Plant

LIST OF UNIT ABBREVIATIONS

dBA	-	decibel (using scale similar to human car)
°F	-	degree Fahrenheit
ft	-	feet
gal	-	gallon
g/s	-	grams per second
°K	-	degree kelvin
kg	-	kilogram
km	-	kilometer
L	-	liter
lb/hr	-	pounds per hour
MGD	-	million gallons per day
mg/L	-	milligram per liter
ml	-	milliliters
m/s	-	meters per second
ppb	-	parts per billion
ppm	-	parts per million
ppt	-	parts per thousand
T	-	ton
ug/L	-	microgram per liter
ug/m^3	-	microgram per cubic meter

CHAPTER 1

1. PURPOSE AND NEED FOR ACTION

1.1 PURPOSE OF PROPOSED FACILITY

The United States Environmental Protection Agency (EPA) is proposing to consolidate several of its hazardous waste treatment engineering research programs in a new facility, termed an Environmental Technology and Engineering (E-TEC) facility. Within this proposed E-TEC facility, EPA staff and associated research groups could develop new and innovative technologies for the safe and efficient treatment of soils, leachates, or other waste materials that are found at contaminated sites throughout the country.

The proposed E-TEC facility would be a laboratory facility in which hazardous waste treatment techniques could be safely tested using small amounts of waste material, with appropriate treatment systems to protect the health of the facility users and the surrounding community. The development work would be conducted in closed systems with sophisticated emission controls that would minimize, to the maximum extent practicable, the transport of chemicals from contaminated test materials to the air or water. After testing, the equipment could be transported to an appropriate waste site for further field testing; the technologies would never be used at the proposed E-TEC facility to treat waste sites.

The proposed facility would be operated in compliance with all applicable environmental permits regulating the safe discharge of air and wastewater from the facility. A further description of the proposed facility is presented in Appendix B.

The proposed E-TEC facility would provide a specialized location having state-of-the-art capabilities for the testing and evaluation of hazardous substances control technologies in a safe and environmentally secure manner. Evaluations of technologies could be at bench, pilot, and full-scale levels of testing. Emphasis would be placed on research pertaining to treatment of excavated soils and treatability studies in support of the Environmental Protection Agency's (EPA) Regional Offices. The volume of material used in such testing would be small, would be stored in secure areas, and would be stored at the facility for a limited time period (less than 90 days). As noted above, all discharges from the building -- air and water -- would be closely monitored and treated to levels stipulated in the requisite State discharge permits.

The purpose and mission of the proposed E-TEC facility derive directly from recent legislation. The Superfund Amendments and Reauthorization Act (SARA) of 1986 specifically authorized the EPA to establish a technology research demonstration and evaluation program to promote the development and use of innovative programs directed toward the treatment of hazardous substances and the cleanup of Superfund sites. Pursuant to the SARA legislation, EPA has proposed to implement this Congressional mandate for hazardous substances technology research by establishing an E-TEC facility. The proposed E-TEC facility would provide a dedicated research environment in which new and innovative treatment technologies, principally alternatives to conventional landfilling of wastes, could be investigated.

In general, the proposed E-TEC facility would be intended to be used by any research entity, internal or external to EPA, that needed a specialized facility for the development and testing of environmental contamination control technologies. Entities external to the EPA could include academic institutions and/or academic consortia, private industries, or other research and development groups or individuals. The proposed E-TEC facility would primarily support research and development programs funded by EPA's Superfund program, but could also be available to serve non-Superfund needs. The proposed facility could also entail a broad based training center. The proposed facility would contain conference rooms, classrooms, and inside and, potentially, outdoor training areas. These activities could include the training of personnel located at the proposed E-TEC facility as to proper hazardous substance handling and spill cleanup procedures as well as the training of emergency response teams that deal with the containment and cleanup of hazardous material emergencies. (Appendix G describes the elements of a safety training program for the facility staff).

1.2 NEED FOR PROPOSED FACILITY

The need for a dedicated facility, such as the proposed E-TEC facility, has been pointed out in the "Superfund Innovative Technology Evaluation (SITE) Strategy and Program Plan" issued by EPA in 1986. The SITE document indicates:

> "Concern over the ability to fully characterize contamination at sites and the long-term reliability of containment technologies used for cleanup actions at the Superfund sites is receiving much attention. At present, remedial actions usually consist of moving wastes to land disposal sites (which themselves may become Superfund candidates) or containing the waste in the ground onsite. In some cases, hazardous substances continue to be released to the environment. In response to these concerns regarding both characterization of sites and reliability of technologies, the public and Congress are demanding that innovative and alternative technologies be used to effect permanent cleanups."

Among the goals of the SITE Program is the need and commitment "to conduct a demonstration program of the more promising innovative technologies to establish reliable performance and cost information for site characterization and cleanup decision-making" (EPA, 1986c). This is intended to be a significant, ongoing effort involving the Office of Research and Development (ORD), the Office of Solid Waste and Emergency Response (OSWER), EPA regions, and the private sector. The first round of the demonstration program includes five to ten technology demonstrations of alternative techniques for hazardous site cleanup, all of which must have appropriate preliminary testing results, quality assurance/quality control protocols, and data evaluation procedures in place before field testing can be conducted.

The creation of one or more testing and evaluation facilities is necessary to provide a controlled environment in which to carry out these initiatives - to test innovative or alternative technologies as precursors to field demonstrations, to determine appropriate design details, and to conduct follow-up studies to determine the flexibility of a technology to treat additional wastes and/or media. These alternative technologies will support the general goals of the SITE Program. At present, EPA has testing and evaluation facilities dedicated to improving conventional technologies (e.g., incineration, sludge disposal), but has no dedicated facility where innovative technologies can be evaluated under rigidly controlled conditions and stringent emission safeguards. The proposed E-TEC facility would provide such a resource to the EPA.

CHAPTER 2

2. ALTERNATIVES INCLUDING PROPOSED ACTION

The identification of a preferred location for the proposed E-TEC facility resulted from a systematic evaluation and comparison of a reasonable spectrum of alternative actions. Four categories of alternative actions were evaluated in detail. These alternatives included:

i. No Action;

ii. Construction of a Complete Facility;

iii. Leasing of Space in an Existing Building or Facility; and

iv. Renovation of Existing Buildings at the EPA Edison Facility.

The first category of alternatives, that of No Action, is qualitatively different than the latter three alternative categories. Adoption of the No Action alternative would mean that EPA/ORD would not proceed with the acquisition and outfitting of a new E-TEC facility. Rejection of the No Action alternative as the preferred action would be based on a finding that one or more locations, appropriate for the facility, could be identified, that a facility could be constructed at reasonable cost and with minimal environmental impact, and that such a facility could effectively serve the missions of EPA.

The remaining three categories of alternatives follow from the finding that a positive action should be taken -- that construction of a new E-TEC facility could be done in a feasible, environmentally sound, and cost effective manner at one or more appropriate locations. The bulk of the evaluation under these latter three alternatives is thus directed toward comparing different location alternatives for the facility and evaluating the comparative costs of the new construction, leasing or renovation options. These comparisons can be at the level of general areas and siting options, or, where data permits, at the level of location-specific attributes.

In evaluating these three categories of action alternatives, it is necessary to reduce the realm of possibilities to a finite, and preferably limited, number of locations that could meet the siting requirements for the facility. If such a general screening is not performed early in the analysis, the spectrum of potential sites remains too broad to permit any systematic analysis. Such a general screening was conducted; the initial step was the establishment of a set of boundary conditions that, taken together, define the minimum properties of a suitable E-TEC site. These boundary conditions were then used to screen various location alternatives.

Some of the conditions in the screening analysis arose from the enabling legislation and the mission of the proposed facility relative to other EPA facilities; other constraints arose from considerations of the preferred geographical/demographical area in which the facility might be located; still others addressed the services (e.g., space requirements, transportation networks) that would be needed at a potential site. The constraints that were used to screen alternatives are explained below, and are listed in the order in which they were incorporated into the screening analysis:

1. Enabling Legislation - SARA specifically authorizes the EPA to establish a technology research, demonstration, and evaluation program to promote the development and use of innovative technologies to treat hazardous substances and clean up Superfund sites.

   One goal of that program is the establishment of an E-TEC facility to research, develop, and evaluate new and innovative treatment technologies that may provide alternatives to landfilling of hazardous substances. The E-TEC facility would provide a location where equipment could be isolated, with all necessary safety features, emission controls, and logistical support in place; thereby, providing an ideal testing environment.

2. Mission - The SITE strategy and program plan includes implementation procedures whereby some development work on treatment technologies will be carried out at EPA facilities. At present, the available facilities include:

- Combustion Research Facility; Pine Bluff, Arkansas.
- Combustion Research Facility; Research Triangle Park, North Carolina.
- Test and Evaluation Facility; Cincinnati, Ohio.
- Center Hill Facility; Cincinnati, Ohio.

The SARA legislation calls for five to ten innovative technology demonstrations on an annual basis. To conduct this number of demonstrations using a variety of new technologies, an additional facility with dedicated laboratory resources and space would be highly desirable. The proposed E-TEC facility would provide dedicated research space for such development work on technology research and demonstration.

3. Regional Perspective - SARA identifies some specific locations (i.e., the Gulf Coast and West Coast) where facilities should be sited. The northeast, although not specifically named, is a third location of equivalent importance in hazardous waste treatment research. At present, some major technological facilities of EPA are relatively centralized, while other operations are conducted in specific EPA regions on a less structured "as-needed" basis. As the listing of the existing research facilities above shows, centralized laboratories are located in Ohio, North Carolina, and Arkansas. To involve fully the government, academic, and industrial experts in these technology demonstrations, it is desirable to site a facility where such participation can be encouraged. Certainly, the north-east, and particularly EPA Region II, is an area with many designated Superfund sites, and clean-up of such sites would be greatly facilitated by having a technology center in this geographic region.

4. Coordination of Research - under the Stevenson-Wydler Technology Innovation Act as amended by the Federal Technology Transfer Act of 1986, Risk Reduction Engineering Laboratory (RREL) facilities are to be made available to industry, academia, and other government agencies to pursue cooperative treatment studies, process controls,

equipment research, and development activities. The government, academic, and industrial participation desired in these research efforts can be best accomplished by locating an E-TEC facility in an area close to concentrations of government offices or laboratories, industries, and consortia of universities and colleges. Such siting would preclude the need for extensive relocation of EPA personnel and equipment, and would encourage close coordination of activities among the regulatory, industrial, and academic entities involved in this work. Further, the research/development interests of these three components should lie in the investigation of technologies for treating hazardous substances.

5. Facilities Availability - the minimum site requirements to carry out the missions of the proposed E-TEC facility would dictate the construction or acquisition of a minimum 100-acre property having warehouse-style space of at least 200,000 square feet, with structural steel framing, loading docks, ceilings in excess of 25 feet in height, railroad siding and/or major highway access, and access to adequate public wastewater treatment facilities.

Use of these screening conditions clearly indicates that candidate locations for the E-TEC facility are most likely to be in or on the periphery of urbanized areas, where the infrastructure, academic institutions, and large scale building facilities would be available. This screening information is then applied to consideration of the four categories of alternatives introduced earlier.

2.1 NO ACTION

Under the no-action alternative, no new E-TEC facility would be constructed, leased, or renovated. As noted earlier, the SITE program formulated in response to SARA calls for five to ten demonstrations of innovative alternative technology to be carried out annually; these demonstrations are to be performed at high-priority sites. A principle role of the proposed E-TEC facility would be to serve as a dedicated centralized location for safe testing of certain of these technologies before use on specific sites.

Without such a dedicated facility, the requisite laboratory work could still be carried out as needed in existing EPA facilities, but under less than optimum conditions and in a less coordinated fashion, thus slowing the development process considerably.

2.2 CONSTRUCTION OF A NEW COMPLETE FACILITY

One logical category of alternative actions to locating the proposed E-TEC facility at the Edison site would be the purchase of undeveloped land, followed by construction from the ground up of one or more buildings to house the proposed E-TEC operations. In theory, any parcel of land of adequate size (on the order of 100 acres) could be considered a candidate location; in reality, an acceptable or viable location alternative should satisfy the boundary conditions discussed in the introduction to Section 2.

The direct cost of purchasing 100 acres of developable land in a location close to major transportation networks and infrastructural support systems would clearly be quite substantial. Developable land in the urban northeast is considerably higher in cost than any nationwide average and may vary in cost over two orders of magnitude (i.e., by a factor of 100), depending on the desirability of the particular location. A reasonable, even somewhat conservative expectation for the cost of commercially-developable land in the urban northeast could range from $25,000 to $150,000 per acre. Based on these unit values, the cost of acquiring a 100-acre site in the Northeast would likely be between $2.75 and $16.5 million. New construction costs for warehouse-style structures in this geographic area are likely to range from $70 to $100 per square foot; for a 200,000 square foot facility, the construction costs would range from $14.0 to $20.0 million. The total costs for acquiring new property and building on that property would thus be in a range between $16 and $36 million.

Direct costs notwithstanding, acquisition of privately-owned land could have a variety of other negative considerations. It is likely that EPA personnel and equipment would need to be relocated, that environmentally sensitive areas could possibly be subject to adverse impact, or that the geographic location would not be conducive to the interactive mission of the facility.

The negative considerations of cost in acquiring a privately-owned site could be partially offset by identifying a Federally-owned parcel of land that might be acquired at a lower cost than privately-owned land. Other considerations such as proximity to industry, academic institutions and consortia, the local and regional environmental setting, existing uses of such parcels and risk factors would still need to be considered.

The possibility of identifying such Federally-owned parcels was investigated by screening comprehensive listings of Federal properties (non-DOD (Department of Defense)) in New York and New Jersey. These listings tabulate 844 such properties in New Jersey and 903 in New York. In addition, the listing of DOD military installations in these states (totalling 51 installations), were reviewed. An initial screening to eliminate parcels under 100 acres was carried out; although a full 100 acres is not strictly required for the proposed E-TEC facility buildings, substantial acreage in excess of the buildings themselves is necessary to provide a buffer zone, parking areas, delivery areas and roadways. It is assumed that existing Federal properties (except for preservation areas) have ongoing functions and facilities that occupy much of their respective areas.

The size-dependent screening identified 64 properties greater than 100 acres in size (See Appendix A, Table A-1); the listings were further reduced to eliminate areas whose stipulated uses were incompatible with the proposed mission of the E-TEC facility (e.g., National Wildlife Refuge areas, dams, dredge spoil disposal areas, medical centers, cemeteries, etc.). Of these eleven larger tracts that were not immediately identifiable as unsuited for an E-TEC facility (Table 2-1), some are listed as being 100% occupied (Brookhaven, Niagara Falls and Knolls), some have rather remote locations (Seneca), four have sensitive and incompatible activities (Picatinny, McGuire Air Force Base, Fort Monmouth and Knolls Atomic Power Lab), one has a highly uncertain future (Fort Dix), and one has already been sold (BelleMead). The conclusion of this screening is that there are apparently no easily-identified Federal properties that could easily and immediately incorporate an E-TEC facility into their operations.

Table 2-1

Federally-Owned Properties Potentially Suitable for E-TEC Facility Siting

Facility	Status
New Jersey - Non-DOD Properties	
BelleMead GSA Depot	Property Sold
EPA Edison Facility	Space Available
New Jersey - DOD Properties	
Picatinny Arsenal	Incompatible Use
Fort Monmouth	Incompatible Use
Fort Dix	Highly Uncertain Future
McGuire Air Force Base	Remote Location; Incompatible Use
New York - Non-DOD Properties	
Binghamton GSA DMS Warehouse	Inaccessible to Universities and Industries; Incompatible Use
Niagara Falls Storage Site (Lewistown)	Incompatible Use; 100% Occupied
Brookhaven National Laboratory	100% Occupied
Knolls Atomic Power Laboratory	100% Occupied; Incompatible Use; Security Problems; Training for Nuclear Subs
New York - DOD Properties	
Seneca Army Depot	Remote Location

2.3 LEASING AN EXISTING BUILDING AT AN ALTERNATIVE LOCATION

An alternative to the purchase of land for a new E-TEC facility could be the leasing of space in which to outfit the laboratories required for the E-TEC facility's mission. The initial costs of such an alternative could be lower than for purchase of land; however, the boundary conditions for candidate locations would be equivalent, as would the environmental soundness and implementability concerns.

The approximate annual cost of leasing a warehouse-style facility at a new location would be based on a leasing rate that could vary from $2.25 to $7.50 per square foot. To lease a facility of 200,000 square feet could cost between $.045 and $1.5 million annually. Over a 30-year operational period, such leasing costs could total between $13.5 and $45.0 million. These cost estimates are only for the building itself; additional open space around the buildings (for a buffer zone, parking lots, delivery area, roadways) would elevate these basic costs.

An alternative to leasing private space could be to carry out the E-TEC missions for technology evaluation, if space, equipment, and staffing would permit, using facilities at existing major EPA laboratories. Upon consideration of present and future space requirements of these existing laboratories, the implementability of this alternative, as discussed in the following paragraphs, appears remote.

The Cincinnati area operations do not have space adequate to accommodate the research anticipated to be carried out at the proposed E-TEC facility. The latest facility to be constructed in the Cincinnati area, the Full Containment Facility, was proposed for a new building because existing space was inadequate (EPA, 1987a). More remote locations were considered not to meet the programmatic needs of the facility and its intended mission. Therefore, adding an additional research orientation at the Cincinnati area EPA facilities would be even less feasible.

The Arkansas facility has as a principal focus the investigation of combustion technologies for hazardous substances, and the broader ranges of investigations proposed for the E-TEC facility are not fully compatible with this restricted focus. The Arkansas Facility is located in a rural area; the location does not encourage the governmental, academic, and industrial interactions sought for the proposed E-TEC facility.

The EPA facilities at the Environmental Research Center, Research Triangle Park, North Carolina were recently reviewed (EPA 1988b). This review found that, in order to carry out the existing programs of that facility, new or renovated space would be needed. To attempt to carry out an additional set of research missions at a facility already considered to be too small to accommodate existing research would be infeasible.

The possibility of leasing space at one of the academic institutions or industries who are members in the Hazardous Substance Management Research Center (a consortium of industries and institutions in the New Jersey area researching hazardous waste treatment technologies) was investigated; the finding was that there is no appropriate space available at any of the consortium institutions or industries. Neither the industries nor the institutions have the space to house a facility the size of the proposed E-TEC facility (personal communication with Dr. Dan Watts, NJIT).

2.4 RENOVATION OF EXISTING BUILDINGS AT THE EPA-EDISON FACILITY

Under this alternative, EPA would construct the proposed E-TEC facilities in existing buildings 245 and 246 on the Edison site. (See Figures 2-1, 2-2 and 2-3). Because it is an active EPA facility, the characteristics of the site are well known. The EPA Edison Facility already houses several EPA offices, research areas, and contractors' facilities. Much of the staffing for the proposed E-TEC facility would be drawn from the personnel already working at the Raritan Depot. The warehouses (Buildings 245 and 246) are conveniently located, being close to other EPA operations and situated on a parcel that provides more than adequate room for the activities proposed for the E-TEC facility mission. An academic consortium comprised of local universities is already in existence, and is prepared to take advantage of the research and development opportunities that an E-TEC facility would offer. The local area, and the greater surrounding area, has a wide variety and large number of industrial, commercial and educational enterprises that also would be expected to participate in development of innovative technologies for treatment of hazardous substances. (Appendix B contains a detailed description of the proposed facility and its operation).

The existing warehouse buildings at the Edison site need substantial renovation; the walls, roofs, and other structural elements need repair before interior renovations can be made. The estimated cost of renovating Buildings 245 and 246 at the EPA Edison Facility is $5.6 million. EPA has acquired title to the 110-acre property at nominal cost.

The ground surface of the EPA Edison site has been significantly disturbed for decades by Raritan Arsenal activities, and the outfitting of the facility would have minimal impacts on the natural environmental features of the project site and the surrounding area. Further, the variety of site investigations carried out in the general area of the Raritan Arsenal tract provide a substantial data base from which environmental impact assessments could be readily made. Finally, supporting infrastructural elements (transportation network, utilities, work force) are largely in place and no significant impacts on demographic characteristics of the region would be anticipated. Land use in the vicinity of the EPA Edison Facility is a mix of residential, commercial, academic, and open space areas.

2.5 COMPARISON OF ALTERNATIVES

The No-Action Alternative is by definition the option incurring lowest costs, impacts, and problems with implementation. However, not building an E-TEC facility ignores the pressing needs for dedicated research space for development work integral to the overall SITE program. Those needs have been addressed in Section 1.2 of this EIS, and support the conclusion that the No-Action Alternative is not the preferred alternative.

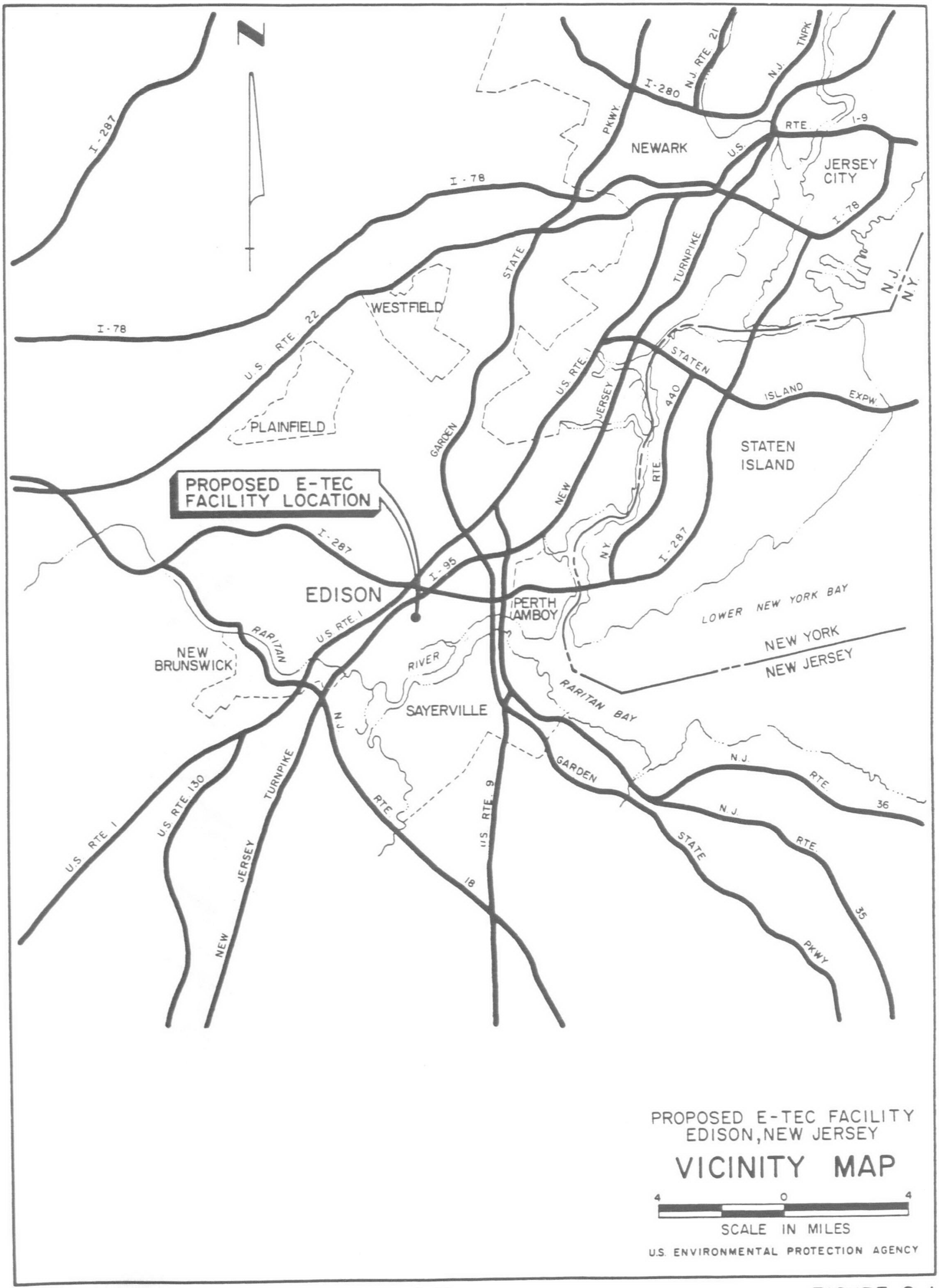

PROPOSED E-TEC
FACILITY LOCATION
EDISON
NEWARK
JERSEY
CITY
WESTFIELD
PLAINFIELD
STATEN
ISLAND
PERTH
AMBOY
NEW
BRUNSWICK
SAYERVILLE
LOWER NEW YORK BAY
NEW YORK
NEW JERSEY
RARITAN BAY
RARITAN
RIVER
I-287
I-78
I-280
I-95
I-9
N.J. RTE. 21
N.J. TNPK
PKWY.
U.S. RTE. 22
U.S. RTE. 1
U.S. RTE. 130
U.S. RTE. 9
GARDEN STATE
NEW JERSEY TURNPIKE
STATEN ISLAND EXPW.
RTE. 440
N.Y.
N.J.
N.J. RTE. 18
N.J. RTE. 36
N.J. RTE. 35
GARDEN STATE PKWY
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
VICINITY MAP
4
0
4
SCALE IN MILES
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE 2-1


CONRAIL
MAIN
N.J. TURNPIKE
INTERCHANGE 10
WOODBRIDGE AVE.
U.S. RTE. 1
MILL BROOK
ST.
OLD POST RD.
RARITAN CENTER
I-95
BONHAMPTON RD.
AVE.
WOODBRIDGE
CONRAIL
PERSHING AVE
MILLVILLE
PROPOSED E-TEC FACILITY SITE
MIDDLESEX COUNTY COLLEGE
CREEK
ROOT
RED
RD.
CONRAIL
MIRROR LAKE
RIVER
EDISON BOROUGH
SAYERVILLE BOROUGH
RARITAN
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
LOCATION MAP
2000 0 2000
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE 2-2

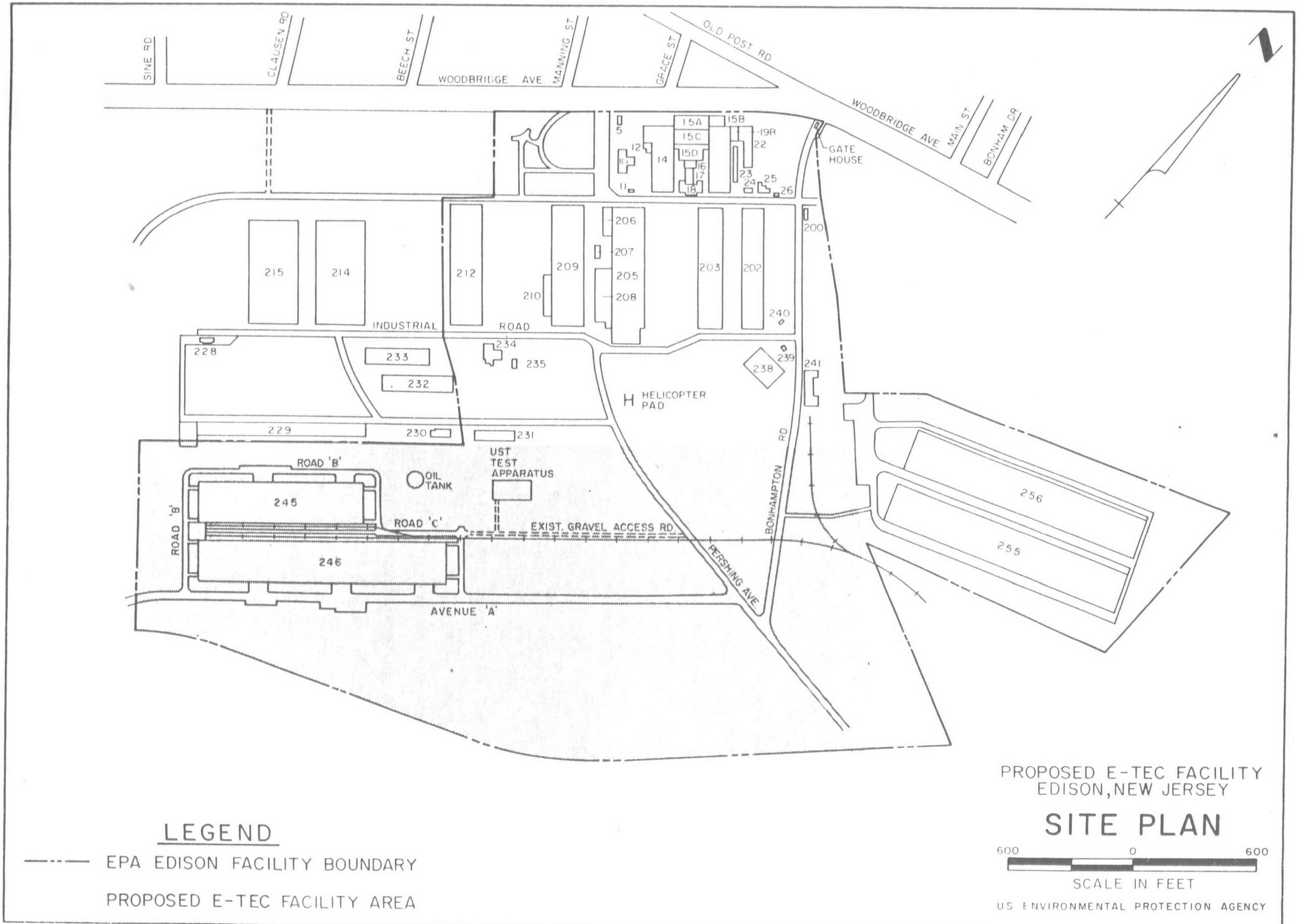

SINE RD
CLAUSEN RD
BEECH ST
WOODBRIDGE AVE
MANNING ST
GRACE ST
OLD POST RD
WOODBRIDGE AVE
MAIN ST
BONHAM DR
N
GATE HOUSE
15A
15B
15C
15D
19B
22
5
12
14
10
16
17
18
11
23
24
25
26
206
207
205
208
209
210
212
215
214
203
202
200
240
INDUSTRIAL
ROAD
228
233
232
234
235
238
239
241
H HELICOPTER PAD
229
230
231
UST TEST APPARATUS
OIL TANK
ROAD 'B'
ROAD 'B'
245
ROAD 'C'
EXIST. GRAVEL ACCESS RD.
246
AVENUE 'A'
PERSHING AVE.
BONHAMPTON RD
256
255
LEGEND
EPA EDISON FACILITY BOUNDARY
PROPOSED E-TEC FACILITY AREA
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
SITE PLAN
600
0
600
SCALE IN FEET
US ENVIRONMENTAL PROTECTION AGENCY

FIGURE 2-3

Among the three categories of alternative positive actions, the important comparisons become the availability of siting locations for an E-TEC facility, and the relative implementability, environmental soundness, and costs for each location alternative considered. The preferred alternative would be the location where the optimum combination of implementability, environmental soundness, and cost factors can be realized.

The alternative of leasing warehouse-style space suitable for outfitting an E-TEC facility is likely to be, over the long-term, the most costly option of the three positive actions. In addition, it is uncertain whether any available building facility would have substantial open space around the building. In terms of environmental soundness, the leasing of an existing facility would have fewer construction-related impacts than would construction of a new building on undeveloped land; in this regard, the leasing and renovation alternatives are generally equivalent. The high, long-term costs and the uncertainty of acquiring adequate open space at an existing warehouse-type facility make the leasing alternative less desirable than either the new construction or renovation alternatives.

Even the lower end of the range of estimated costs for construction of a new building exceeds the estimated cost of renovating the existing buildings at the EPA Edison Facility. Further, the new building alternative would result in a change in land use, with construction-related environmental impacts, and that such environmental impacts would be minimized by renovating structures on the Edison site that has experienced prior land disturbance, the new building alternative is less environmentally sound than the renovation alternative. The implementability attributes of the renovation alternative are clearly superior to any other alternatives; the proposed site is adjacent to an active EPA facility, the proposed site is already owned by EPA, and the building dimensions, transportation networks, and infrastructural support are all eminently suitable for the requirements of an E-TEC facility. Thus, the alternative of the renovation of existing buildings at the EPA Edison facility is superior to the new building alternative.

Based on these comparisons and relative ranking of alternatives, the renovation of existing buildings at the EPA Edison Facility is the alternative recommended for detailed assessment.

CHAPTER 3

3. AFFECTED ENVIRONMENT

3.1 NATURAL ENVIRONMENT

3.1.1 Geology

The 110 acre site proposed for the E-TEC facility is situated within the New Jersey Coastal Plain Physiographic Province, part of the Atlantic Coastal Plain that extends north through Long Island and south along the Atlantic Coast into Mexico. In New Jersey, the Coastal Plain Physiographic Province is further divided into two subprovinces, the Inner and Outer Coastal Plains. The proposed E-TEC facility site is situated within the northern reach of the Inner Coastal Plain, less than 1.5 miles south and west of this subprovince's junction with the Piedmont Physiographic Province.

The geological formations at the surface in the project area and vicinity are Coastal Plain sedimentary deposits, laid down during periods of sea level rise and fall. In the Edison Township region, the deposits belong to the Raritan Formation of Cretaceous age and consist of several layers of unconsolidated clays, silts, sands, and gravels that dip and widen to the southeast. Because the sedimentary layers dip to the southeast, progressively younger sediment layers are exposed as one approaches the Atlantic Ocean (Widmer, 1964).

The Coastal Plain deposits that are exposed at the surface in the project area are themselves underlain by older crystalline bedrock. North of the Delaware-Washington Canal, this parent bedrock is Triassic Brunswick Shale, which dips at 5 to 15 degrees to the northwest. In the vicinity of the Delaware-Washington Canal (south of the project area), the parent bedrock is diabase - an igneous rock that has intruded through the Brunswick Shale to form a sill of highly resistant rock (this diabase is the same resistant rock that has formed the Palisades along the lower Hudson River).

The Raritan Formation is divided into three members: the Raritan Fire Clay, the Farrington Sand, and the Woodbridge Clay. The Farrington Sand is the oldest and deepest of the water-bearing Cretaceous sediment layers; it is described as light gray, well-sorted and fine-grained at the top; medium grained at the middle, and coarser-grained with abundant pebbles and yellowish color at the bottom of the stratum. As part of the larger Raritan Magothy aquifer, the Farrington Sand serves as an important aquifer in eastern and southern Middlesex County. The Farrington Sand is exposed at the surface in an elongated outcrop region extending northeast from South Brunswick to Woodbridge. The Farrington Sand aquifer is hydrologically separated from a shallower aquifer layer, the Old Bridge Sand, by the relatively impermeable Woodbridge Clay layer.

No site-specific geological investigations have been conducted at the proposed E-TEC facility site, but studies conducted in the vicinity of the site, at the abutting Raritan Center area, indicate that consolidated bedrock is not present near the surface. Test borings have confirmed bedrock at depths of 42 feet in the vicinity of the Raritan River, 47 feet near Old Red Root Creek, and 25 to 32 feet in the center of the Raritan Center study area. (Schmid & Co., Inc., 1987).

Alluvial deposits resulting from glacial meltwater flow and scouring of the Raritan River form the most extensive surficial deposits in the vicinity of the project site. Two additional unconsolidated deposits are exposed near the proposed E-TEC site: the Cape May Formation, found in a narrow band to the north of the alluvium, and the Pennsauken Formation, which extends along Woodbridge Avenue. Surface exposures of both the Cape May and Pennsauken formations are more prevalent in southern New Jersey.

3.1.2 Soils

According to the Middlesex County Soil Survey, as prepared by the United States Soil Conservation Service (SCS, 1987, Sheets 10 and 11), two soil mapping units and five soil phases representing five soil series occur on the project site. These include: Urban land (UL); Pits, sand, and gravel (PM); Psamments, nearly level (PN); Atsion sand (At); Manahawkin muck (Ma); Klej loamy sand, 0 to 3 percent slopes (KlA); and Sassafras loam, 2 to 5 percent slopes (SlB).

With the exception of the Urban land and Pits and Psamments, the soils present on the site are typical of the Coastal Plain. The characteristics of each soil are described below. (Figure 3-1 shows the location of the soil types and the proposed 110 acre E-TEC site).

Urban land (UL) - This mapping unit is situated directly adjacent to and north of buildings 245 and 246. Urban land exists as excavated or filled land and is almost totally paved or covered by structures.

Pits, sand, and gravel (PM) - This mapping unit is located to the south of building 246 and corresponds to an eroded area identified on aerial photographs dating back to 1939. Pits generally are the remaining spoil materials following resource extraction operations. The characteristics are highly variable; however, the water table is generally within several feet of the ground surface.

Psamments, nearly level (PN) - This soil phase is located south of building 255 and east of buildings 245 and 246. Psamments are generally moderately well-drained to well- drained soils in regraded sand pits or borrow areas.

Sassafras loam, 2 to 5 percent slopes (SlB) - A small pocket of Sassafras soil is located to the south of building 246. The Sassafras series consists of well-drained soils that formed in acidic, moderately fine-textured Coastal Plain sediments. These soils are found in upland areas on side slopes. The depth to the seasonal high water table usually extends to six feet below the ground surface.

Klej loamy sand, 0 to 3 percent slopes (KlA) - Klej soils underline the wooded portion of the property in the vicinity near the southern boundary. The Klej series consists of somewhat poorly drained to moderately well-drained soils formed in acidic, coarse-textured Coastal Plain sediments. These

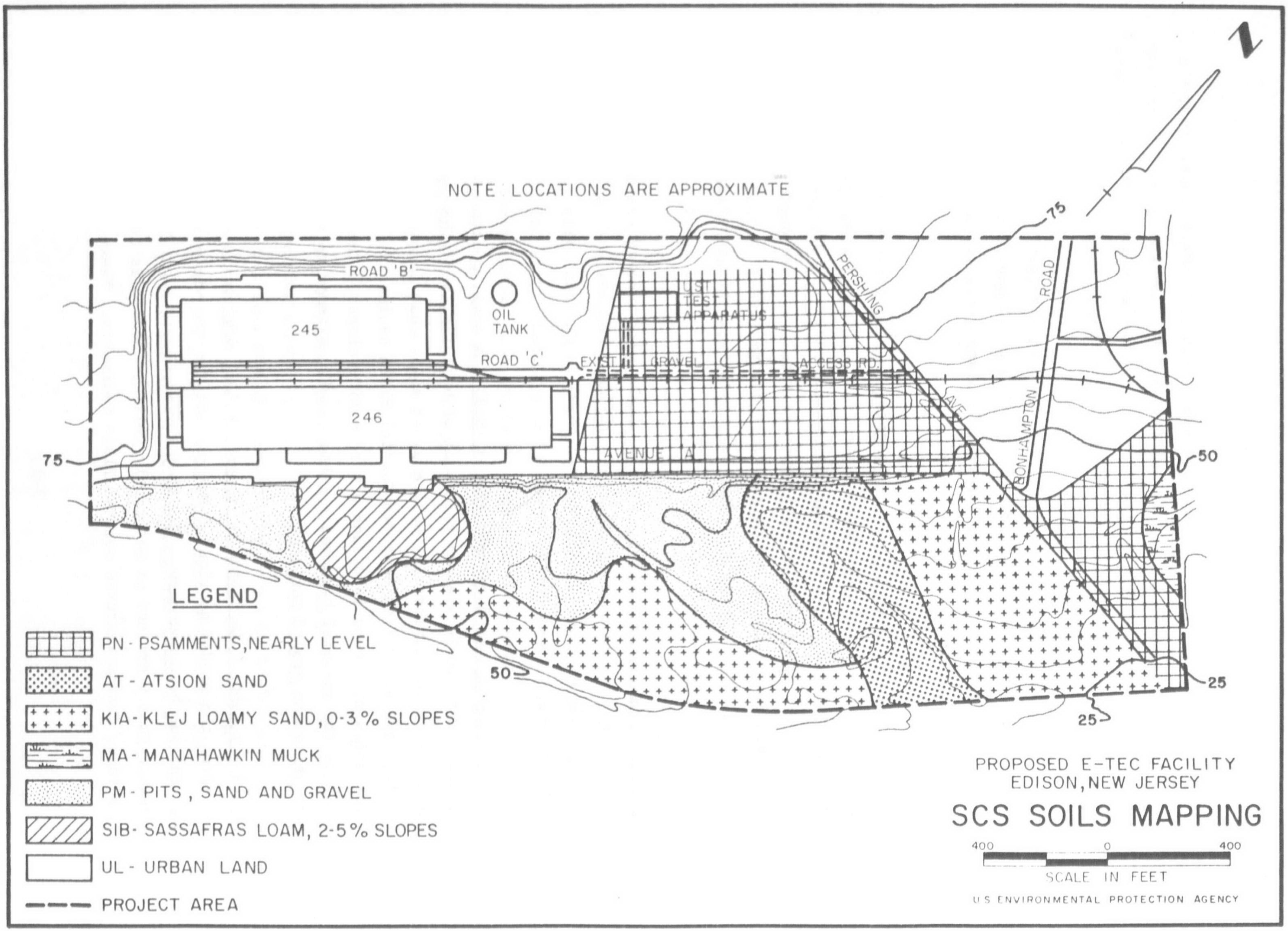

N
NOTE: LOCATIONS ARE APPROXIMATE
ROAD 'B'
245
OIL TANK
ROAD 'C'
EXIST. GRAVEL ACCESS RD.
246
AVENUE 'A'
UST TEST APPARATUS
PERSHING AVE.
BONHAMPTON ROAD
75
50
25
LEGEND
PN - PSAMMENTS, NEARLY LEVEL
AT - ATSION SAND
KIA - KLEJ LOAMY SAND, 0-3% SLOPES
MA - MANAHAWKIN MUCK
PM - PITS, SAND AND GRAVEL
SIB - SASSAFRAS LOAM, 2-5% SLOPES
UL - URBAN LAND
PROJECT AREA
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
SCS SOILS MAPPING
400 0 400
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE 3-1

soils are generally encountered on terraces and at the bases of slopes. The seasonal high water table is encountered at depths of 1.5 to 2.0 feet below the ground surface.

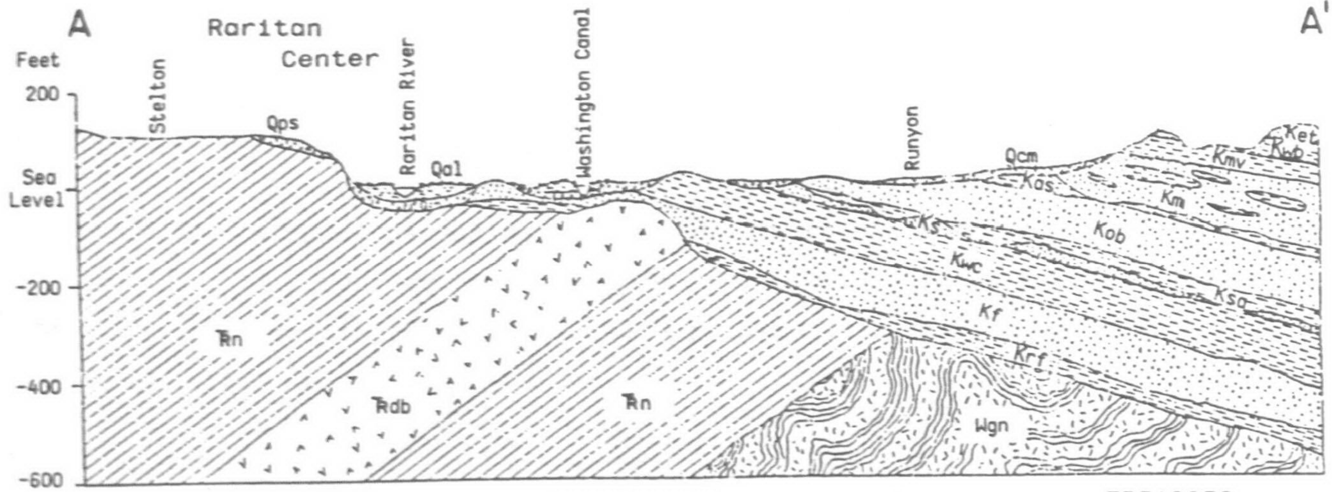
Atsion sand (At) - A band of Atsion soil is mapped within the wooded portion of the site, near the southern boundary. The Atsion series soils are poorly drained soils formed in acidic, sandy Coastal Plain sediments. These soils occupy low positions in the landscape and are classified as hydric soils by the U.S. Fish and Wildlife Service and by the U.S.D.A. Soil Conservation Service.

Manahawkin muck (Ma) - An isolated pocket of Manahawkin muck is located at the southeastern corner of the site. This series consists of very poorly drained organic soils that formed in acidic organic sediments. The seasonal high water table is at the surface. These soils are categorized as hydric soils by the U.S. Fish and Wildlife Service and by the U.S.D.A. Soil Conservation Service.

3.1.3 Ground Water

Edison Township is located on the northern edge of the Coastal Plain Physiographic Province. The Coastal Plain of New Jersey is composed of a wedge-shaped mass of unconsolidated sediments composed of alternating layers of clay, silt, sand, and gravel over crystalline bedrock. These sediment layers dip gently to the southeast at a slope from 10 to 60 feet/mile. This dip in the bedding of the sediments means that, at the edge of this Province, successively older layers (strata) become exposed (Figure 3-2).

The oldest of these sedimentary layers is the Potomac-Raritan-Magothy (or Raritan Magothy) formation, a major aquifer in the Coastal Plain. This aquifer is confined except in outcrop areas by underlying bedrock and by the overlying Merchantville-Woodbury confining unit. In the northern part of the



QUATERNARY

Qal Alluvium

Qcm Cape May fm.

Qps Pensauken fm.

CRETACEOUS

SAND

CLAY

Ket	Englishtown sand	Ksa	South Amboy fire clay
Kwb	Woodbury clay	Ks	Sayreville sand
Kmv	Merchantville clay	Kwc	Woodbridge clay
Km	Magothy fm.	Kf	Farrington sand
Kas	Amboy stoneware clay	Krf	Raritan fire clay
Kob	Old Bridge sand		

TRIASSIC

TRdb Diabase sill

TRn Newark group

PRE-CAMBRIAN ?

Wgn Wissahickon fm.

PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY

GEOLOGICAL CROSS-SECTION

1 0 1 2

SCALE IN MILES

U.S. ENVIRONMENTAL PROTECTION AGENCY

SOURCE: SCHMID & COMPANY, INC.
CONSULTING ECOLOGISTS

FIGURE 3-2

Coastal_Plain, the Raritan Magothy aquifer is divided into the Farrington (Raritan age) and Old Bridge (Magothy age) aquifers (Vowinkel and Foster, 1981).

According to the Critical Natural Features Series maps prepared by the Middlesex County Planning Board (Aquifer Outcrop Areas map, December 1981), the proposed E-TEC facility site is located within an outcrop area of the Farrington Sand Aquifer. The Farrington Sand outcrops exist as a continuous band approximately one mile wide and 18 miles long along the southeastern edge of Farrington Lake and Lawrence Brook in East Brunswick, extending northward into Edison and Woodbridge. The outcrop is divided by the Raritan River estuary. The total outcrop area is approximately 17 square miles; 6.8 square miles lie north of the Raritan River, while 10.2 square miles lie to the south.

Near the Raritan River in the vicinity of a diabase sill, the Farrington Sand becomes thin and discontinuous. This has led some investigators to conclude that the Farrington Sand serves, in effect, as two separate aquifers (to the north and to the south of the Raritan River) due to the poor hydraulic connection across the river (Turk, 1977).

The direction of ground water flow from the proposed E-TEC facility site is south, toward the Raritan River. The general direction of ground water movement in the Farrington Sand Aquifer is southeast toward the Raritan River, with the regional dip. The aquifer has an average thickness of 80 feet, and dips gently to the southeast at a rate of 45 to 55 feet per mile.

The Farrington Sand Aquifer is the principal waterbearing unit in the Raritan Formation and serves as a major water source in eastern and southern Middlesex County. As a result of large-scale ground water withdrawals and development within the aquifer recharge area, salt water intrusion and reduction in yields have led to the abandonment of wells and conversion to public water supply. No potable water supply wells are located within a one-mile radius of the proposed E-TEC facility. Four residential wells are located approximately 1.5 to 2 miles from the proposed facility; these wells are all north of Woodbridge Avenue, upgradient from the EPA Edison Facility (Edison Township Health Department, 1989).

The Middlesex and Elizabethtown water companies are the major public water purveyors supplying water to Edison Township (Edison Township Health Department, 1989). Water is withdrawn from the water-bearing formations of the Newark Group that lie north of the Coastal Plain (up-gradient from the EPA-Edison Facility), or from the Delaware River via the Delaware and Raritan Canal. South of the Raritan River, the Farrington Sand Aquifer is still utilized as a water source.

The Farrington Sand outcrop has been extensively developed, particularly north of the Raritan River. According to 1986 estimates, 25 percent of the total outcrop had been urbanized, and 13 percent of this urbanized area had been paved. Continued loss of recharge area is significant because ground water in the Coastal Plain Aquifer system is derived from precipitation. Recharge to the Farrington Sand Aquifer is estimated to be 16.2 MGD, while actual daily withdrawals are estimated at 18.5 MGD. Total aquifer rights, which include authorized diversions and grandfathered rights, are 68.58 MGD, four times greater than the safe yield (Middlesex County Planning Board, June 1986).

Large scale ground water withdrawal and reduction in the recharge (outcrop) area has reduced the piezometric head of the Farrington Sand Aquifer to elevations below sea level. This has resulted in salt water intrusion into the aquifer. As early as the 1930's, salt water intrusion in the Sayreville area was detected as a consequence of large-scale ground water withdrawals. The advancement of saltwater into the aquifer led to abandonment of wells by several industries in the Sayreville area.

Malcolm Pirnie (1986) monitored fourteen monitoring wells in the southwest portion of the Raritan Center tract. Due to the close proximity of this monitoring area to the proposed E-TEC site, the data collected in the Malcolm Pirnie study should reflect existing ground water conditions at both areas.

Ground water quality characteristics, as shown by the Malcolm Pirnie study, did not comply with GW-2 drinking water standards established by NJDEP, largely as a result of naturally elevated concentrations of some ground water constituents. Salinities ranged from 1 to 2 parts per thousand (ppt); pH levels ranged from 5.8 to 6.6, indicating slightly acidic conditions. Iron concentrations generally exceeded the 0.3 mg/l criterion, with readings of 100 mg/l in two wells. Iron levels are typically elevated in Coastal Plain ground and surface waters (Pinelands Comprehensive Management Plan, 1980). Manganese levels reached a maximum of 15.6 mg/l, well in excess of the 0.05 mg/l drinking water standard. Sulfate, chloride, and dissolved solids exceeded drinking water standards, but remained within the range typically found in tidal marsh environments. Mean depth to ground water at these wells was in the range of 12 to 18 feet below ground level.

Ground water samples collected during 1988 on and adjacent to the proposed E-TEC facility site (O'Brien and Gere Engineers, Inc., 1988) showed total dissolved solids levels less than 40 ppm and hardness levels less than 15 ppm. Iron levels ranged from 2-6 ppm, well in excess of the 0.3 ppm GW-2 ground water standards. Volatile organics, petroleum hydrocarbons, arsenic, barium, cadmium, chromium, and mercury were detected in several of the 30 monitoring wells. Lead and selenium levels were found to exceed GW-2 standards, while high concentrations of sodium and calcium were recorded.

3.1.4 Sole Source Aquifer

As noted earlier, the proposed E-TEC facility site is located within the New Jersey Coastal Plain Physiographic Province. Pursuant to Section 1424(e) of the Safe Water Drinking Act, the EPA administrator has designated the New Jersey Coastal Plain Aquifer System as a Sole Source Aquifer. Section 1424(e) of the Safe Drinking Water Act states that:

> [I]f the Administrator [of the EPA] determines... that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of

that determination in the Federal Register, after the publication of any such notice, no commitment for Federal financial assistance (through a grant, contract, loan, guarantee or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through the recharge zone so to create a significant hazard to public health .... A commitment for Federal assistance may, if authorized under another provision of law, be entered into to plan or design the project to assure that it will not contaminate the aquifer."

On December 4, 1978, the Environmental Defense Fund and the New Jersey Chapter of the Sierra Club petitioned the EPA Administrator to designate the New Jersey Coastal Plain Aquifer System a Sole Source Aquifer. The petition stated in part that the Raritan Magothy Formation is an exceptionally productive aquifer for supply purposes and is probably the most important water supply aquifer of the Coastal Plain. The petition was published in the Federal Register (Vol. 44, No. 56, pp. 17208-17213) on March 21, 1979. Notice of the Sole Source Aquifer Designation by the EPA was published in the Federal Register (Vol. 53, No. 122, pp. 23791-23794) on June 24, 1988. The determination became effective August 8, 1988.

The Raritan Magothy aquifer is recharged by precipitation and by vertical leakage from upper sedimentary layers. In the outcrop area of the Farrington sand aquifer, the recharge to ground water is approximately 12 inches per year (approximately 27 percent of annual precipitation). Approximately 30 percent of the recharge to the Raritan Magothy aquifer system may come from vertical leakage from overlying aquifers (Vowinkel and Foster, 1981).

3.1.5 Surface Water

The site proposed for the E-TEC facility lies within the Raritan River watershed. The Raritan River drainage basin encompasses approximately 1,105 square miles and discharges to Raritan Bay.

Locally, drainage from the proposed E-TEC facility site flows in a southeasterly direction through swales, small streams, and culverts, eventually draining into Red Root Creek, a tributary of the Raritan River. The confluence of Red Root Creek with the Raritan River proper is located approximately 1.5 miles south and east of the site, and approximately 2.5 miles west of the confluence of the Raritan River with Raritan Bay (See Figures 2-1 and 2-2 presented in Chapter 2).

From Landing Lane Bridge to Raritan Bay, the Raritan River and its saline water tributaries are classified as Saline Estuary (SE1) waters by the NJDEP. By definition, SE1 waters must be acceptable for primary and secondary contact recreation, the maintenance, migration and propagation of the natural and established biota, and shellfish harvesting.

All freshwater tributaries to the Raritan River downstream of Landing Lane Bridge are classified as FW-2 Non-Trout (NT) waters. The small tributaries on the proposed E-TEC site tract are freshwater, and thus are classified as FW-2 NT. By definition, FW-2 waters are suitable for public potable water supply after required treatment. This classification category requires that waters be acceptable for primary contact recreation, industrial and agricultural use, and maintenance and migration of the established biota. Waters further classified as non-trout do not possess properties suitable for the maintenance of trout populations, such as high dissolved oxygen levels, relatively low summer temperatures, and low pollutant loadings. However, more tolerant fish species may flourish in such waters.

The Raritan River discharges an average of 503 cubic meters per second into Raritan Bay. The mean tidal range is 5.4 feet at the Sayreville Generating Station. Salinity profiles measured by Schmid & Co. at two transects near Raritan Center area on 21 May 1985 varied from 7.0 to 21.5 ppt, showing typical vertical, longitudinal, and tide-related gradients. A 300-foot wide navigational channel reaching depths of 25 feet extends along the northern portion of the river; this artificial channel has been maintained by dredging since the nineteenth century.

The tidal portion of the Raritan River experiences marginal to poor water quality. Point sources (there are 105 permitted point-source discharges in the lower Raritan River and Bay), and nonpoint sources such as runoff from industrial, residential, and other developed lands are in part responsible for this degraded water quality (Schmid & Co., 1987). Due to these cumulative loadings, the quality of the river water becomes poorer toward its mouth. Excessive fecal coliform bacteria, low dissolved oxygen concentrations, and elevated nutrient levels have commonly been recorded. The river and much of the bay are closed to swimming and commercial fishing.

Elevated PCB levels measured in fish tissue prompted the NJDEP and NJ Department of Health to place a fishing advisory on the tidal portion of the River (NJDEP, 1983). The advisory recommended that striped bass, bluefish in excess of 6 pounds or 24 inches, white perch, white catfish, and American eel not be consumed more than once per week.

The lands encompassing the proposed E-TEC facility site, and the adjoining Raritan Center lands, appear to follow the historical drainage basin of Red Root Creek. The Red Root Creek drainage has been extensively altered, as evidenced by the ditching, piping, diking, and development of the area. Five ditches and the mainstem of Red Root Creek currently discharge to the Raritan River. Waters from West/Southwest Ditch, Central Ditch, lower Red Root Creek, and Black ditch pass through outlet pipes equipped with hinged flaps (tide gates) that exclude tidal water from progressing upstream into these watercourses. Within the Raritan Center area through which Red Root Creek meanders, there are six drainage areas nearly or completely separated by fill and embankments (Schmid & Co., 1987).

Surface water studies were performed by Schmid & Co., Inc. during 1985-1986 on the Raritan Creek property adjoining the proposed E-TEC site. Thirty-three water quality parameters were analyzed at 18 sampling stations. The following paragraphs summarize the results of the Schmid & Co. surface water testing:

Salinity - Near the tide gates on Black Ditch and Red Root Creek, salinities were 1 and 2 ppt, respectively, but there was no measurable salinity at stations 1,000 feet upstream of these tide gate locations. Apparently, some tidewater leaks through the tide gates at the ends of the ditches.

Total Suspended Solids (TSS) - TSS values ranged from 3.2 to 67.4 ppm, and exceeded FW-2, the criterion at Stations A, D, 2, 5 and 10. Concentrations of less than 25 ppm are not known to limit the growth of fish; however, TSS concentrations in the 25 to 80 ppm range are considered capable of reducing fish production.

pH - pH values ranged from 2.72 to 8.15. Low pH readings were recorded in the upper (freshwater) portions of the watercourses. The acidic nature of the surface water is typical of Coastal Plain waters and is likely to be the result of soil influences rather than man-made loadings.

Dissolved Oxygen (DO) - DO concentrations were variable, with summer minima of 1.4 and 2.1 ppm recorded at two small creeks crossing Magazine Road, respectively. These levels are well below the threshold at which fish are stressed. Generally, DO levels were above 5.0 ppm.

Phenol - Phenol concentrations ranged from 0.010 to 0.367 ppm. The high end of this range (measured in West Ditch) could potentially have deleterious effects on fish.

Total and Ortho Phosphate - Total phosphate concentrations ranged from 0.020 to 0.226 ppm. Orthophosphate ranged from 0.003 to 0.008 mg/l. At four stations, total phosphate levels were sufficient to promote eutrophication.

Ammonia - At all stations, un-ionized ammonia concentrations (0.018-1.20 ug/l) were within the range considered deleterious to fish.

Nitrate Nitrogen - Nitrate concentrations ranged from <0.01 to 0.884 ppm. These concentrations are not harmful to aquatic biota.

Metals - Total chromium, arsenic, and selenium concentrations were not present in sufficient concentrations to pose a harm to aquatic biota; however, the possibility exists that the measured concentrations could interact synergistically with other aqueous constituents and/or properties to affect aquatic life. Iron, copper, nickel, zinc, and cadmium concentrations were elevated at one or more locations, and could adversely affect the aquatic biota.

Coliform Bacteria - total coliform estimates ranged from <4 to 12,399 colonies per 100 ml, well in excess of State standards, suggesting the possibility that sanitary wastes are present in drainage to the waterways.

O'Brien & Gere Engineers, Inc., under contract to the U.S. Army Corps of Engineers, collected surface water samples at six locations within the Raritan Center area and analyzed them for organic compounds, petroleum hydrocarbons, total metals, dissolved metals, TNT, and general indicator parameters. Three samples contained detectable levels of volatile organics. Trichloroethylene (TCE) was detected at concentrations from 5 to 22 ppm. Petroleum hydrocarbons were not detected in any of the six samples. One sample contained cadmium (0.010 ppm), while another sample contained chromium (0.01 ppm). Lead was found in four samples (0.008 to 0.109 ppm); magnesium was found in four samples (2-7 ppm). Calcium, sodium, and potassium ions were commonly detected (O'Brien and Gere, 1989).

3.1.6 Floodplains

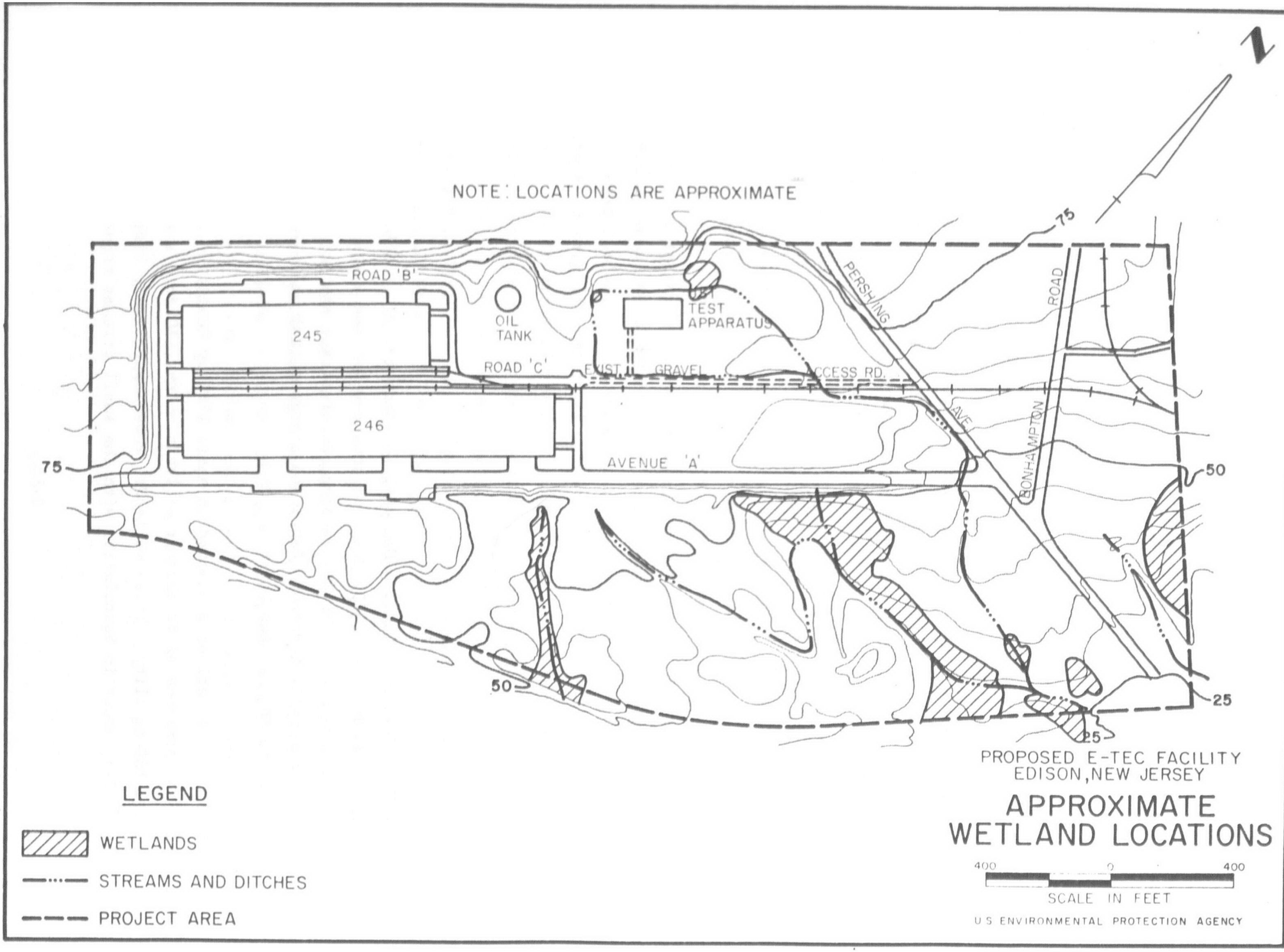
Floodplain areas within Edison Township have been mapped by the Federal Emergency Management Agency (FEMA); in addition, flood elevations of the Raritan River have been determined by the New Jersey Department of Environmental Protection, Bureau of Floodplain Management. The FEMA maps show no encroachment of floodplains within the 110-acre site for the proposed E-TEC facility. Schmid and Co. (1987) report that the 100-year flood elevation for the Raritan River in the vicinity of the arsenal is 10.1 to 12.1 feet (NGVD). The State of New Jersey cites the 12.1 foot elevation as the limit of the 100-year flood, and also cites the 500-year flood elevation as 15.5 feet in the reach of the Raritan River in the vicinity of the project area (personal communication; J. Scordato, NJDEP).

Elevations within the 110-acre project site range from a low of 25 feet at the southeast corner of the site to a high of 90 feet in the northwest corner of the site; all elevations within the project site are well above the 100- and 500-year flood elevations. The flood hazard area for the 100-year flood extends northward from the Raritan River to Newfield Avenue, approximately 2,000 feet south of the southern boundary of the project site (Schmid and Co., 1987); the 500-year flood elevation is in the vicinity of Mayfield Avenue, approximately 1,200 feet from the southern boundary of the project site.

3.1.7 Wetlands

The U.S. Fish and Wildlife National Wetlands Inventory (NWI) mapping (Perth Amboy Quadrangle, 1972) does not show any wetland areas within the proposed 110-acre site. The NWI mapping does indicate the presence of wetlands, principally forested (PFO1) and emergent (EM) wetlands, in areas lying closer to the Raritan River.

Field investigations conducted in April 1989 by EcolSciences, Inc. revealed the presence of freshwater wetlands on the 110-acre site of the proposed E-TEC facility. These wetlands, whose approximate limits are shown in Figure 3-3, occur in association with the small streams traversing the site



NOTE: LOCATIONS ARE APPROXIMATE
ROAD 'B'
245
246
OIL TANK
TEST APPARATUS
ROAD 'C'
EXIST. GRAVEL ACCESS RD.
PERSHING AVE.
BONHAMPTON ROAD
AVENUE 'A'
75
50
25
N
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
APPROXIMATE WETLAND LOCATIONS
LEGEND
WETLANDS
STREAMS AND DITCHES
PROJECT AREA
400
0
400
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE 3-3

or in areas of hydric soils (e.g., where Manahawkin muck soils occur). Apart from an isolated circular wetland area northwest of the Underground Storage Tank (UST) facility, the wetland areas occur in the southern portion of the 110-acre tract, well removed from the existing warehouse buildings and service roadways. The hydrology and vegetation of these wetlands areas have been characterized in a Terrestrial Ecology Survey report detailing the results of the field investigations (EcolSciences, 1989).

3.1.8 Climate

Middlesex County, which contains the proposed project site, has a typical northern temperate zone climate. The average annual temperature at Newark Airport for the period 1942 to 1981 was 54.3°F, with the minimum monthly mean of 31.5°F occurring in January and the maximum monthly mean of 76.4 °F occurring in July. Extremes of cold weather are due to moving masses of cold air that travel southeastward from the Hudson Bay region. Periods of very hot weather, which may last as long as a week, are associated with a west-southwest air flow over land to the left of the Bermuda high - pressure system. Higher than average temperatures were observed during June and July, 1987 and during July through August 1988 in northern New Jersey.

Over this same period (1942-1981) of climatic monitoring, the mean annual precipitation was 42.11 inches. Precipitation is well distributed throughout the year. Thunderstorms occur on about 25 days each year, generally in summer months (SCS, 1987). Precipitation acidity levels increased at all state ambient air quality monitoring stations in 1987. The greatest increases were observed in summer, when, for the first time on record, all sites had some pH values below 4.0.

Prevailing winds for the area are from the southwest (See Figure 3-4), with a mean windspeed (based on records from 1941 to 1970) of 10 mph. Maximum monthly mean windspeeds occur in March. The terrain in this area of New Jersey is of low relief, with ridges to the northwest. Winds from the northwest are downslope and undergo adiabatic temperature increases; the drying effects of these downslope winds account for the relatively few conventional thunderstorms recorded at the meteorological station at Newark Airport.

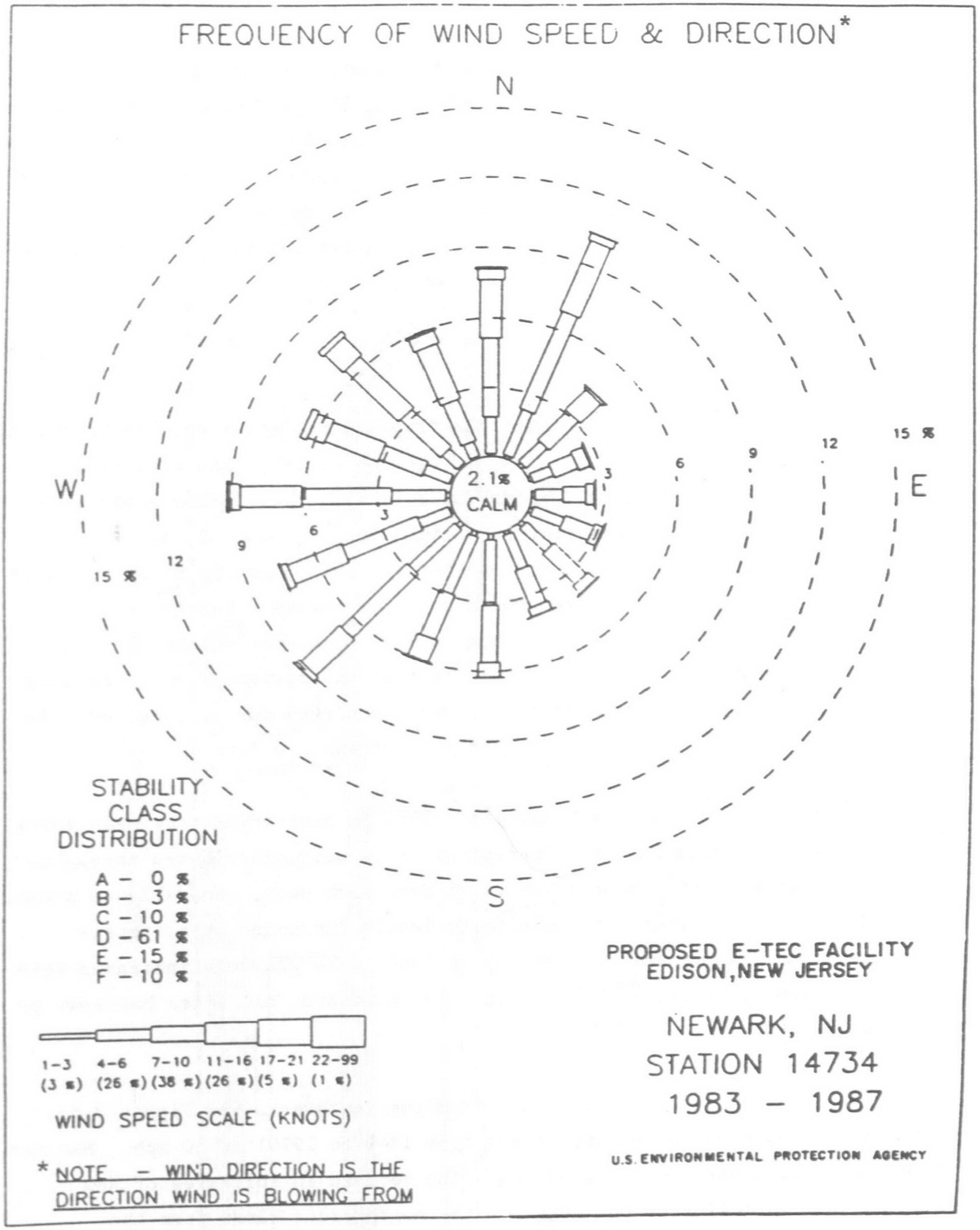

FREQUENCY OF WIND SPEED & DIRECTION*
N
S
E
W
2.1%
CALM
3
6
9
12
15 %
STABILITY
CLASS
DISTRIBUTION
A – 0 %
B – 3 %
C – 10 %
D – 61 %
E – 15 %
F – 10 %
1-3 4-6 7-10 11-16 17-21 22-99
(3 %) (26 %) (38 %) (26 %) (5 %) (1 %)
WIND SPEED SCALE (KNOTS)
* NOTE – WIND DIRECTION IS THE DIRECTION WIND IS BLOWING FROM
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
NEWARK, NJ
STATION 14734
1983 – 1987
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE 3-4

3.1.9 Air Quality

Edison Township is located within the New Jersey/New York/Connecticut air quality control region. The United States Environmental Protection Agency has classified this region as Priority One, indicating that violations of established standards, the National Ambient Air Quality Standards (NAAQS), for each criterion air pollutant have been recorded at one or more monitoring stations within the region. New Jersey as a whole is in violation of the ozone standard.

Air quality monitoring stations located within a 20-mile radius of the project site include: Perth Amboy, 5 miles east of the site; New Brunswick, 4 miles southwest of the site; Elizabeth, 15 miles northeast of the site; Newark, 20 miles northeast of the site; Linden, 11 miles northeast of the site; and Plainfield 6 miles north of the site.

The NAAQS are established for the purpose of protecting the public health and welfare, and are divided into primary and secondary standards. Primary standard limitations are intended to protect the public health with an adequate margin of safety. The secondary standard limitations are intended to protect the public welfare from known or anticipated adverse effects of a pollutant (e.g., corrosion, vegetation damage).

The ambient air quality levels at the monitoring stations listed above are in compliance with all criterion pollution standards except total suspended particulates and ozone (as noted above, New Jersey is in violation of the ozone standard).

Table 3-1 lists background air concentrations for criteria pollutants and metals. The monitoring station for each criteria pollutant was chosen on a proximity basis.

Table 3-1

Background Air Quality Data

Pollutant	Monitoring Station	Averaging Period	NAAQS (ug/m^3)	Year (ug/m^3) 1988	1987	1986
Sulfur Dioxide (SO_2)	Perth Amboy	3-hour	1,300	235.5	178	274.7
		24-hour	365	160	123	128.2
		Annual	80	30	31.4	28.8
Total Suspended Particulates (TSP)	New Brunswick	24-hour	260	216	223	339
		Annual	75	42.3	46	54.1
Inhalable Particulates (PM_{10})	Elizabeth Lab	24-hour	150	71	94	85
		Annual	50	28.1	40.1	39.2
Carbon Monoxide (CO)	Perth Amboy	1-hour	40,000	10,875	9,730	11,103.8
		8-hour	10,000	6,067	6,868.4	7,784.1
Nitrogen Dioxide (NO_2)	Plainfield	Annual	100	45.9	50.8	45.1
Ozone (O_3)	New Brunswick	1-hour	235	423.9	343.4	310
Lead	New Brunswick	3-month	N/A	-	.226	.370
Arsenic	Elizabeth	3-month	N/A	.001	.01	.003
Barium	Elizabeth	3-month	N/A	.031	.071	.039
Cadmium	New Brunswick	3-month	N/A	.001	.006	.017
Chromium	New Brunswick	3-month	N/A	.002	.044	.006
Copper	New Brunswick	3-month	N/A	.074	.255	.107
Iron	New Brunswick	3-month	N/A	.799	2.996	1.445
Magnesium	New Brunswick	3-month	N/A	.245	1.072	.293
Manganese	New Brunswick	3-month	N/A	.022	.120	.015
Nickel	New Brunswick	3-month	N/A	.012	.075	.030
Potassium	Elizabeth	3-month	N/A	.104	.305	.163
Vanadium	Elizabeth	3-month	N/A	.009	.031	.023
Zinc	New Brunswick	3-month	N/A	.118	1.306	.494

Source: NJDEP, 1988.

3.1.10 Ecology

3.1.10.1 Terrestrial

The utility of an area as wildlife habitat depends on many factors. All wildlife species require food, water, cover, and space. The relative abundance or lack of these resources will, in part, determine the species composition of a particular area. In addition, the types of vegetative communities present, the size, shape, and complexity of the habitat, and surrounding land uses will further interact to determine the success of various wildlife species.

The location of the project site, situated between the developed and highly managed areas of the Raritan Center and Middlesex County College, leaves few corridors for the immigration or emigration of wildlife species. Any such movement would be further inhibited by the presence of fences along the southern property line and between the site and the College grounds. The faunal communities, except for the bird species found on the site, are likely to be those that can satisfy all of their habitat requirements in areas on the site.

EcolSciences, Inc. conducted field surveys of the terrestrial ecological systems of the site in April 1989, and has detailed the findings of these surveys in a Terrestrial Ecology Survey report (EcolSciences, 1989). Based on floral species present, SCS soil mapping, and visual indications of prevailing hydrological conditions, four vegetative communities were identified. These are: successional field, upland forest, palustrine scrub/scrub-emergent wetlands (PSS1/EM), and palustrine forested wetlands (PFO1). Each of these communities is briefly described below; a complete listing of plant species identified within the study area and their corresponding U.S. Fish and Wildlife Service (USFWS) indicator status are shown by community type in Tables C-1 and C-2). Wildlife species observed directly or by sign are listed in Table C-3, categorized by the habitat in which they were found. (Figure 3-5 shows the location of the vegetation types).

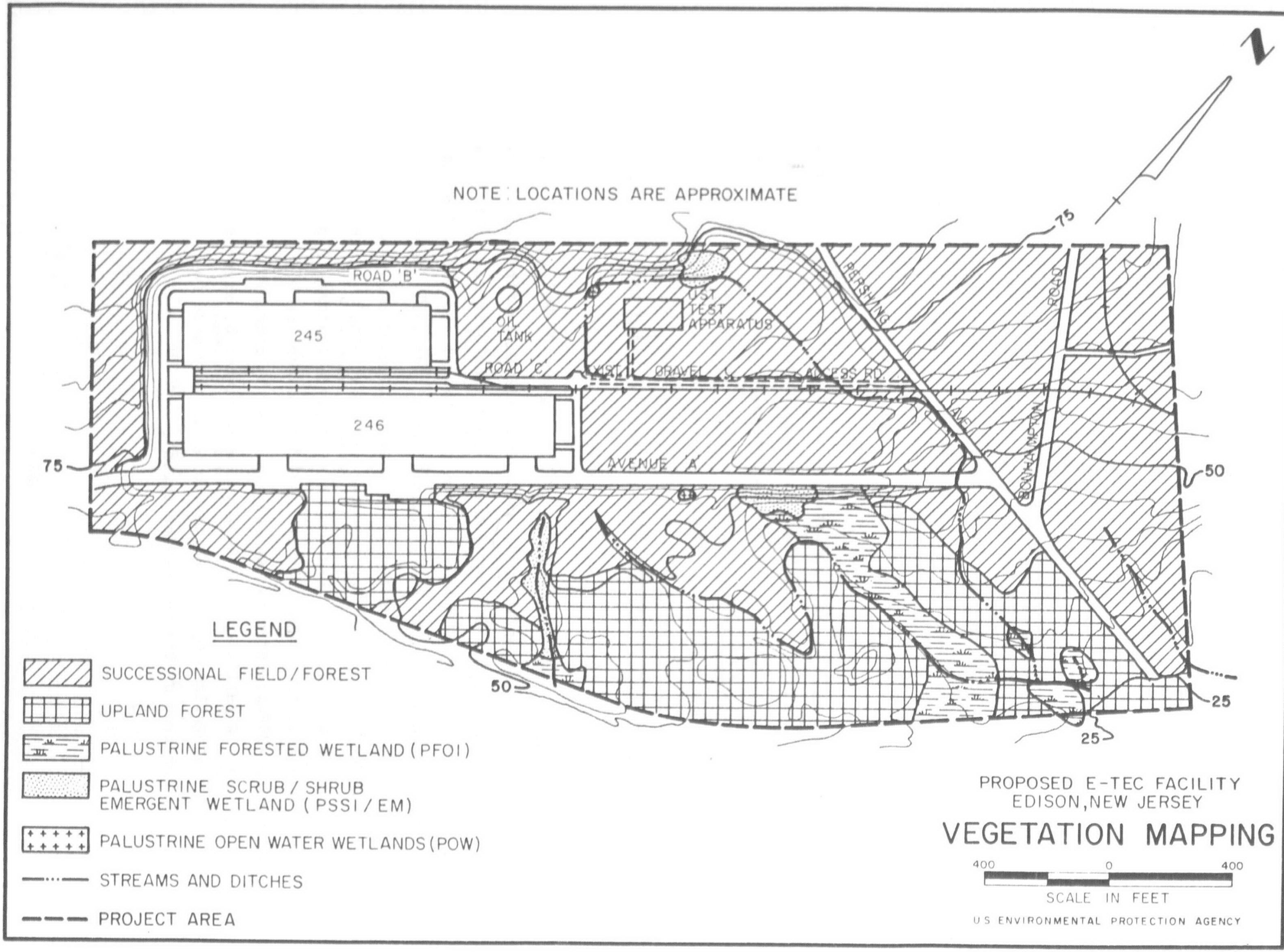

N
NOTE: LOCATIONS ARE APPROXIMATE
ROAD 'B'
245
246
OIL TANK
UST TEST APPARATUS
ROAD 'C'
GRAVEL
ACCESS RD
PERSHING AVE
WOODBRIDGE ROAD
SOUTHAMPTON
AVENUE 'A'
75
75
50
50
25
25
LEGEND
SUCCESSIONAL FIELD / FOREST
UPLAND FOREST
PALUSTRINE FORESTED WETLAND (PFOI)
PALUSTRINE SCRUB / SHRUB EMERGENT WETLAND (PSSI / EM)
PALUSTRINE OPEN WATER WETLANDS (POW)
STREAMS AND DITCHES
PROJECT AREA
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
VEGETATION MAPPING
400
0
400
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE 3-5

Successional Field - species of this community cover most of the northern half of the site, having invaded abandoned parking and storage areas and areas around buildings. Scattered saplings include red oak, black oak, black cherry, pitch pine, and sassafras. Common shrub species include bayberry, smooth and winged sumac, crab apple, and gray birch. The bulk of the vegetative cover is herbaceous, including goldenrod, common mullein, horse nettle, mugwort, Queen Anne's lace, knapweed, English plantain, and clover; these herbaceous species are interspersed with common grass species such as switch grass, broomsedge, poverty oats grass, and orchard grass.

Due to the presence of roadways, buildings, and human activities, limited large mammal use of this area would be expected. However, abundant herbaceous grazing and cover afforded by scattered copses of brush could support deer-mice, cottontail rabbits, and meadow voles, while the numerous seed-producing plants may attract songbirds. Predatory species such as shrews, kestrels, and red-tailed hawks could forage on the small mammal community using these grassy areas. A rock wall and debris pile located near the southeastern corner of the site could provide some cover for snakes and small mammals. Wildlife species observed directly or by sign in the successional field areas included Eastern cottontail, crow, mockingbird, house sparrow, and American kestrel.

Successional field communities located within the southern half of the study area were generally smaller in extent than those to the north, and were found interspersed with upland forest and wetlands communities. Such habitat geometry offers ecotonal (edge) environments that could enhance the overall wildlife value of such field areas. These areas in the southern portion of the project also appeared to have a lesser degree of human disturbance. The successional field areas in this southern portion of the site were more diverse than were those to the north, ranging from primary successional areas of bare sand to densely vegetated, late-successional shrub and sapling areas. Woody vegetation included small stands of aspen and gray birch, arrowwood, pussy willow, greenbriar, highbush blueberry, staggerbush, and sweet pepperbush. Ground cover was generally sparser here than in the larger tracts to the north; species included woodsedge, false heather, field garlic, trailing arbutus, sheep laurel, and broomsedge.

The wildlife value of these more southerly successional field areas is likely higher than the value of areas to the north. As noted, recent disturbance is less pronounced, and the vegetative communities are more diverse in pattern and in species composition. The fruiting shrubs could attract frugivorous songbirds by offering feeding, cover, and breeding sites. Watercourses found in this southern portion of the site provide aquatic habitats and potential breeding areas for aquatic insects, which in turn could provide food for a variety of birds. The shrubs also provide browse for whitetail deer. Species observed in this area included flicker, robin, mockingbird, cardinal, and gray squirrel. Deer trails and Eastern cottontail scat were also noted.

Upland Forest - this community was restricted to the relatively undisturbed southern portions of the site. An extensive area dominated by mature oaks was located in the southwestern portion of the site. Dominant canopy species included chestnut oak, white oak, and red oak, in association with blackgum, red maple, sweetgum, pitch pine, and black-jack oak. Understory species included gray birch, highbush blueberry, greenbriar, red maple, sassafras, fetterbush, and sweet pepperbush. The relatively sparse ground cover included sheep laurel, trailing arbutus, cinnamon fern, lady slipper, and tree club moss.

Mature trees, especially oak species, are important providers of hard mast that is used by many birds and mammals. In addition, trees and snags provide nesting sites for cavity-nesting species such as woodpeckers, raccoons, and gray squirrels. Insect feeding on the leaves of trees provide a food resource for insectivorous birds. The proximity of these wooded areas to open fields and wetland areas provides access to additional food supplies and cover types. Wildlife species observed directly or by sign in upland forest areas on the site included killdeer, chickadee, tufted titmouse, red-tailed hawk, and whitetail deer.

Palustrine Forested Wetland (PFO1) - this forested wetland community was found in association with streams and ditches in the less disturbed southern portion of the site. Red maple and black gum were the dominant canopy species, with pin oak, white oak, and black willow as less common associates.

The understory varied from sparse to moderately dense, with red maple saplings, highbush blueberry, sweet pepperbush, and sweet bay magnolia as the dominant species, and spicebush, swamp azalea, gray birch, arrowwood, blackgum, and smooth sumac also represented. The herbaceous layer included cinnamon fern, sheep laurel, sensitive fern, false nettle, wild yam, and skunk cabbage. This latter species dominated the stream channels and seepage areas.

Wildlife habitat may be provided by the larger overstory species, supplying hard mast for small mammals and whitetail deer. In addition, mature trees provide nesting sites for cavity-nesting birds and mammals. Insect species seeking cover or foraging on leaves or on other insects provide food for insectivorous birds. Wetlands may serve as nesting, feeding, and resting locations for various fur-bearing species (e.g., raccoon, opposum, skunk). Semi-aquatic species such as frogs, turtles, snakes, and salamanders often depend on wetlands for reproduction. The mosaic arrangement of wetlands, upland forest, and open fields increases the value of habitats found on the site.

Palustrine Scrub/Shrub-Emergent Wetlands (PSS1/EM) - this wetland vegetative community was found generally on the southern portion of the site, in association with ditches that channel drainage to lower elevations. In addition, a small pocket of this habitat occurred in the northern portion of the site, north of the UST test apparatus and at the base of a section of steep slopes. Red maple and pin oak occurred on the edges of this pocket on the side slopes. The understory varied from sparse to moderate, with highbush blueberry and sweet pepperbush dominating the vegetation. Lesser amounts of common elder, smooth sumac, pin oak, red maple, gray birch, and bayberry were also noted. Herbaceous species included tussock sedge, burreed, sphagnum moss, common reed, meadow beauty, sensitive fern, soft rush, willowherb, woolgrass, sheep laurel, and bog clubmoss. The wildlife habitat afforded by the vegetative community in this pocket of wetlands is similar to that of the forested wetlands described above.

3.1.10.2 Aquatic and Estuarine Ecology

The principal surface water bodies on the project site proper are small creeks apparently originating from the collection of surface water runoff from urbanized areas upgradient of the site. The site also has a small open water area located just south of the bermed road bordering the south side of Building 246. The freshwater creeks all show evidence of substantial channeling and appear to have permanent flows; the substrata of the streams support some rooted macrophytes and filamentous algae. These aquatic environments may serve as habitats for insects that have aquatic egg and larval (or nymphal) stages, and may also serve as breeding habitats for amphibian species.

As noted in Section 3.1.5, the Raritan River in the vicinity of the project is under tidal influence, and the aquatic communities of the river and contiguous intertidal zone are those tolerant of estuarine conditions. Salinities in the Raritan River at Raritan Center range from 7 to 21 ppt, fluctuating within this general range with depth, tidal phase, and freshwater flow in the river. This range of salinities characterizes the Raritan River in this reach as a mesohaline to estuarine system. Common reedgrass (*Phragmites*) and saltmarsh cordgrass (*Spartina*) are dominant marsh plants on the wetlands bordering the river, yielding further inland to the freshwater wetland and upland plant communities described in the preceding section (Schmid & Co., Inc., 1987).

3.1.10.3 Threatened and Endangered Species

The United States Department of the Interior Fish and Wildlife Service (USFWS) was requested to provide information on the presence of federally listed or proposed endangered and threatened species within the area of the proposed E-TEC facility. The USFWS response (06/09/89 correspondence from Clifford Day [USFWS] to Robert Hargrove [EPA Region II]; see Appendix C) indicated that:

"Except for occasional transient species, bald eagle (Haliaeetus leucocephalus) and peregrine falcon (Falco peregrinus), no federally listed or proposed threatened or endangered flora or fauna are known to exist within the study area. Therefore, no further consultation pursuant to Section 7 of the Endangered Species Act is required with the Service."

The USFWS letter further recommended that the New Jersey Natural Heritage Program be contacted for information concerning State species. The New Jersey Natural Heritage Program was requested to supply information on the presence of threatened or endangered species on the project site. The Natural Heritage response (04/17/89 correspondence from Thomas Breden [New Jersey Natural Heritage Program]) indicated that:

"The Natural Heritage Data Base does not have any records for managed areas, rare plants, animals or natural communities on the site."

The NJDEP Division of Fish, Game and Wildlife has for several years surveyed the wildlife resources of New Jersey. None of the terrestrial efforts thus far have focused on the lands in the vicinity of the Raritan Depot. An ongoing wildlife inventory and evaluation program maintained by the NJDEP has not designated any area in the vicinity of the Raritan Depot as worthy of special study (Schmid & Co., Inc., 1987).

Sixteen species of threatened or endangered species, as designated by the NJDEP, potentially occur in Middlesex County. However, the NJDEP Division of Fish, Game, and Wildlife has indicated a low potential for impacts upon endangered or threatened species at the proposed E-TEC site (8/5/88 correspondence from George Howard [NJDEP]).

Endangered or threatened faunal species were not identified by EcolSciences' personnel during field reconnaissance of the proposed E-TEC site in April 1989. However, avifaunal surveys performed on an adjoining property by Schmid & Co., Inc. confirmed the presence of eleven state designated endangered or threatened birds. These include: pied-billed grebe, American bittern, yellow-crowned night heron, northern harrier, Cooper's hawk, peregrine falcon, merlin, osprey, short-eared owl, bobolink, and savannah sparrow. Red-shouldered hawks were not observed during the course of the Schmid study, but have been reported from Middlesex County Park. The habitat present on the proposed E-TEC facility site suggests that the above-named avifaunal species could utilize the area on a limited basis, primarily for feeding and resting. It is unlikely that breeding and nesting occurs, due to the absence of documented breeding and nesting activities and the lack of critical nesting habitat. As reported by the United States Fish and Wildlife Service (USFWS), bald eagles and peregrine falcons, USFWS Species of Special Interest, may pass through the subject property. Considering the mobility of these species (and other species listed or proposed under the USFWS jurisdiction), and the patterns of existing land use in the vicinity of the proposed site, it is unlikely that significant adverse impacts from the facility's construction would result (correspondence dated 8/2/88 from Clifford Day [USFWS]).

Three species of threatened fish (New Jersey listing) are recorded in the lower Raritan estuary: American shad, Atlantic sturgeon, and Atlantic tomcod. American shad and Atlantic tomcod were collected from the Raritan River in the vicinity of the Raritan Depot during the 1970's. Although striped bass are no longer classified as threatened in New Jersey, the South River, which is nearby, is recognized as one of the two significant nursery areas for this species in the state (Schmid & Co., Inc., 1987).

According to the New Jersey Natural Heritage Program, two reptile species (bog turtle and wood turtle) and two species of amphibian (long-tailed salamander and Pine Barrens treefrog) potentially occur in Middlesex County. Lack of critical habitat, combined with the disturbed nature of the site, makes it unlikely that threatened or endangered reptiles or amphibians utilize the proposed E-TEC site.

Approximately 350 plant species have been recorded in the areas adjacent to the proposed E-TEC facility site (Schmid & Co., Inc., 1987). None of these plants are recorded on the Snyder (1984) list of plant species whose continued survival is in jeopardy in New Jersey or in the United States. None of the plants observed on the proposed site by EcolSciences' personnel have been recorded on the Snyder list.

3.2 MAN-MADE ENVIRONMENT

3.2.1 Land Use

3.2.1.1 Existing Land Use

The proposed E-TEC facility site consists of a 110-acre parcel of land located within a property known as the Raritan Arsenal. The proposed E-TEC facility site is shown as Open Space on the land use map included in the 1989 Master Plan of Edison Township. The land to the south and east of the proposed site is identified as Light Industrial. The proposed E-TEC facility site is bordered to the north and east by portions of the Raritan Depot, to the south by the Conrail Railroad (formerly Lehigh Valley Railroad), and to the west by Middlesex County College. The 110-acre site includes two unused warehouse buildings (Buildings No. 245 and 246), an inactive railroad spur, undeveloped land, consisting of forested woodland and successional fields.

The general area to the south and east of the 110-acre proposed E-TEC facility site is dominated by light industry. This zoning district encompasses light manufacturing, and assembly and warehousing uses. A large industrial park, known as Raritan Center, is located to the east of the site. Prominent companies located at Raritan Center include Nestle, Michelin, UPS, Consumers Distributing, AT&T, Sir Speedy, Wakefern, Inland Container Corp., Shoprite, ITT, and Wilson Sporting Goods.

An Office Hotel zone is located along portions of Woodbridge Avenue and Raritan Center Parkway, to the east of the proposed site. This district provides office, convention center, and support retail uses. A Ramada Inn and a Holiday Inn are located within this zone, as are office buildings used by National Community Bank, SGC Federal Credit Union, Singer, and Summit Associates.

Middlesex County College is located to the immediate west of the project site. To the south of the College is Thomas Edison Park, a Middlesex County recreational facility. Several large apartment complexes are situated to the west of the College, across Mill Road.

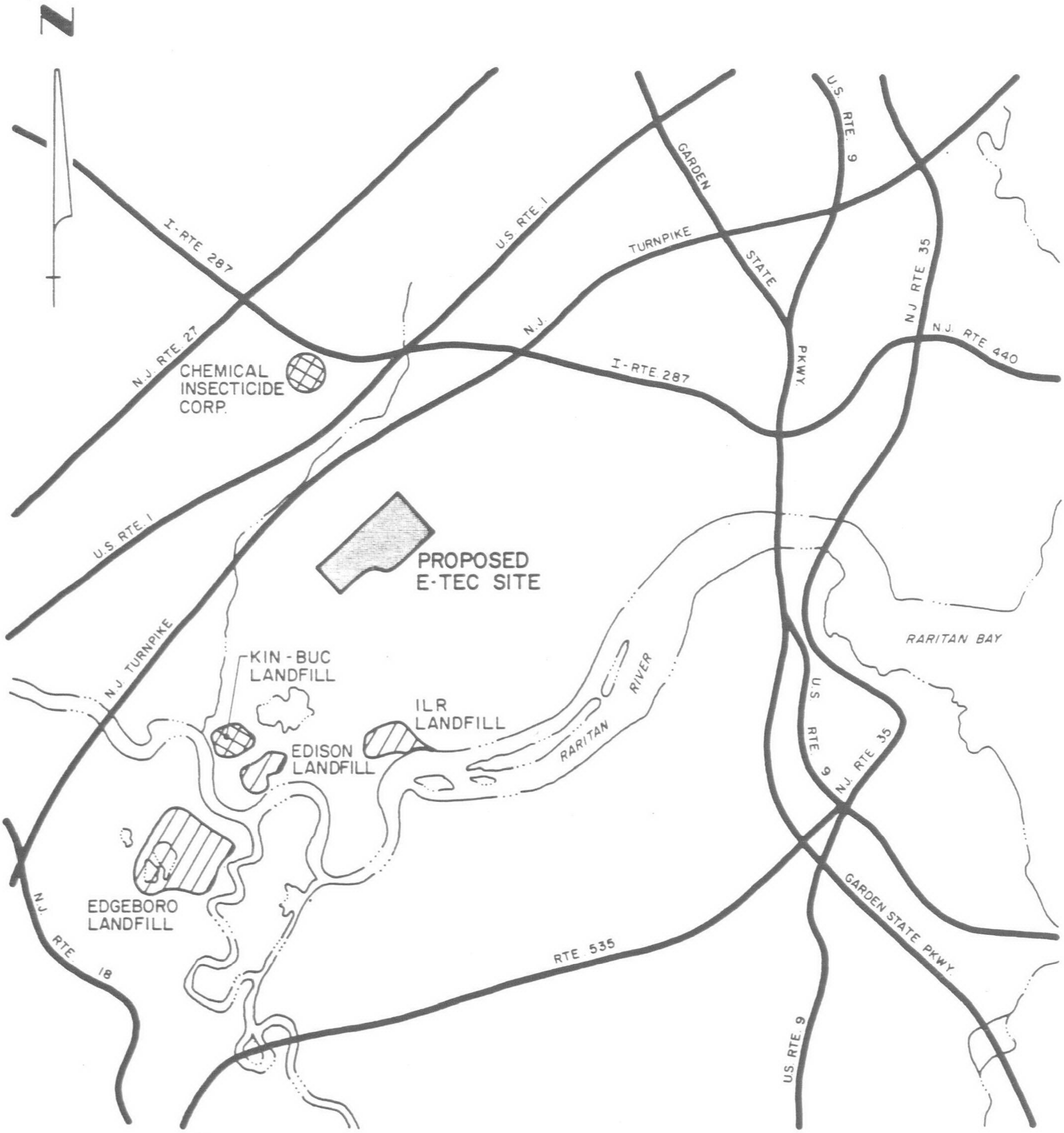
North of the site, along Woodbridge Avenue, land use is principally residential, with single family homes, a church, small businesses, a senior citizens center, a gas station, and several restaurants.

To the southwest of the community college and park is another large industrial area known as Heller Park. Prominent companies located here include Valvoline Oil Co., Castrol, Dean, Twin County Grocers, Emerson Quiet Cool, and United Stationers. A day-care facility, the Family and Children Center, is located in Heller Park, to the east of the principal warehousing area.

Four landfill areas are located to the southwest of the proposed E-TEC site: three of these (Kin-Buc, ILR, and Middlesex County Park Commission) are presently closed; the Edison Township landfill is presently active. The Kin-Buc Landfill and Chemical Insecticide Corporation Sites have been designated EPA Superfund sites and remedial investigations are being conducted to identify ways to manage them. The ILR Landfill also has been shown to have leachate contamination problems. Figure 3-6 shows the locations of these sites relative to the proposed E-TEC site.

3.2.1.2 Future Land Use

The 1989 Edison Township Master Plan indicates a Planned Urban Development District (PUD) to the southwest of the project site. A development called Rivertown is proposed for construction at this site which fronts on the Raritan River. In June of 1988, the plan proposing a 4,000-unit residential development and marina was conditionally approved by Edison Township. The development could add from 8,000 to 14,000 residents to the Township at buildout, estimated to be about 25 years (Enviresponse, 1989).



PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY

SURROUNDING LANDFILLS AND SUPERFUND SITES

1 0 1
SCALE IN MILES

U.S. ENVIRONMENTAL PROTECTION AGENCY

SOURCE: SCHMID & COMPANY, INC.
CONSULTING ECOLOGISTS

FIGURE 3-6

A facility for providing housing for the homeless is currently proposed on Woodbridge Avenue to the west of the project site, at the western border of the Raritan Depot tract. This facility is proposed to be constructed on land now owned by the U.S. Government. More specific details regarding exact site locations were unavailable at the time this EIS was written.

A third proposal that would alter land use in the vicinity of the proposed project site is that for a connector roadway (the Edison-Woodbridge Industrial Connector Highway) that would bisect Raritan Center. This proposed roadway would provide relief for existing roadways outside Raritan Center and improve access to existing and proposed facilities within the Center.

3.2.2 Site History and Cultural Resources

A Stage IA Cultural Resources Survey was conducted on the 110-acre site by Historic Sites Research in 1989. Background information was obtained from Princeton University and South Brunswick Libraries, from the files of the New Jersey State Museum and the Office of New Jersey Heritage, and from EPA. A particularly rich source of material was found in the Alexander Library at Rutgers University, in the files on the Edison and Piscataway Townships and the Raritan Arsenal. This included several base newspapers, information pamphlets, and numerous clippings.

No known prehistoric sites are recorded for the vicinity, but it lies adjacent to a well-traveled contact period Indian Trail, and the banks of the Raritan must have represented an attractive hunting and gathering ground throughout prehistoric times. Occupation of the fast land sites overlooking the extensive marsh lands is probable.

An early colonial map shows a road running from Bonhamtown to the edge of the fast ground adjacent to the salt marsh near the end of Red Root Creek. A structure is indicated somewhere near this point. In the 19th century, this same road alignment is shown with a subsequent fork trending south and southwest, and three structures along it. By 1876 a fourth structure is shown, which appears to have stood in the eastern half of the study area, east of the colonial road. An increasing proportion of the study area was disturbed during the latter 19th century. By the early 20th century the northern portion of the fast land below Bonhamtown has been mined away for sand and clay prospecting. The Raritan Arsenal acquired the tract in about 1917, and it has been enlarged and developed to the present, as a military base until 1964 and under various auspices since then. Most of the study area has been massively disturbed during this period, as indicated in maps and aerial photographs. Based on research and field conditions, it appears that the location of the 1876 structure has been completely destroyed.

Visual examination of surface conditions has confirmed the documentary evidence for massive disturbance of most of the study area. However, aerial photographs indicate that one section of woods was of its present shape in 1939, and has not been disturbed since. This wooded knoll, extending about 500 feet along Avenue D, opposite the middle of Building No. 246, and 300 to 400 feet deep to the study area boundary, was further studied in a Stage 1B Cultural Resource Survey. The survey, conducted by Historic Sites Research in August of 1989, did not reveal any prehistoric or historic archaeological resources.

Immediately adjacent to this wooded knoll on the northeast was a scraped area or former sand pit where two firing ranges were found. Within 120 feet of Avenue D was a pistol range with a covered firing shelter, range markers, and a sand backstop about 150 feet to the northeast. Further southeast along the same embankment was a bunker and spotting tower for small arms practice, with a collapsed firing shelter 300 feet away on the edge of the wooded knoll. Spent bullets are present in the embankment, and some brass casings were seen near the pistol firing shelter. Aerial photographs showed that the northwestern or "pistol" range was constructed between 1951 and 1961, and that the southeastern range was built between 17 April 1961 and 4 May 1963, both in an area that had been stripped of vegetation and possibly excavated since at least 1939.

3.2.3 Current Users of Raritan Depot

Approximately 240 acres of the former Raritan Arsenal now remain as Raritan Depot. As indicated previously, EPA has acquired 190 acres, and General Services Administration (GSA) owns 50 acres. Thirteen buildings and approximately 15 mobile trailers are located at Raritan Depot; these are used by various branches of the EPA and their contractors.

3.2.4 Previous Contaminant Investigations

3.2.4.1 Hazardous Materials

Since the phase-out of Raritan Arsenal began in 1961, several contamination studies have been undertaken at the Arsenal area. The initial study was conducted by the Army (managed by the Letterkenny Army Depot) in 1961 as a survey for potential contamination. Based on this survey, 17 areas were identified as being potentially contaminated with ordinance and/or chemicals and were classified into three categories: "non-use", "surface use only", and "unrestricted use". Deed restrictions to limit soil disturbance in these contaminated areas were imposed during the sale of some parcels.

One of these 17 areas is located within the 110-acre site proposed for the E-TEC facility. This area, Area 1 according to the Letterkenny identification is located in the southeastern corner of the site and was used as a demolition ground for boosters, point- and base-detonating fuses, and 37 mm to 6-inch gun projectiles. These ordinance demolition activities were carried out from the post-WWI era through the early 1930's. Estimates of the areal extent of Area 1 range from approximately 0.6 acres to 11 acres. In 1963, portions of Area 1 were surface-cleaned, and the Army recommended that this area be cleared for surface use only.

In June 1985, EPA's Field Investigation Team (FIT) conducted a preliminary site inspection of the GSA-Raritan Depot property, during which soil and water samples were taken to determine the presence and extent of chemical contamination. The results of this investigation, issued in December 1985, indicated that low level contamination exists within the Raritan Depot. Four main classes of chemicals were detected: metals, pesticides, semi-volatile aromatic hydrocarbons (PAH's) and volatile hydrocarbons (NUS, 1985). The FIT concluded that the levels found were not excessive, were representative of routine use rather than storage or disposal activities, and did not pose a significant public health hazard.

In December 1985, the U.S. Army Corps of Engineers (Kansas City, Missouri Office) initiated a confirmation study under the Defense Environmental Restoration Program (DERP). This study, intended to confirm the presence or absence of ordinance and chemical contamination within the 3,200-acre former Raritan Arsenal site, focused on the 17 sites identified in the Army's 1961 investigation and other areas of suspected contamination. The scope of work for this study was finalized in October 1987, and the field work was initiated by the Corp's contractor, O'Brien & Gere, in July 1988.

Field work included collection of a series of ground water, surface water, deep soil, and shallow soil samples taken in the vicinity of the 17 areas of known and suspected contamination. Sampling conducted within the 110-acre site proposed for the E-TEC facility was limited to the vicinity of Area 1. These samples were analyzed for purgeable organics, total and dissolved metals, petroleum hydrocarbons, TNT and mustard gas residues, cyanides, and general indicators of explosives (sulfate, chloride, nitrate, magnesium, calcium, sodium, potassium, and bicarbonates).

Results of this confirmation study are contained in a March 1989 A-E Quality Control Summary Report for the Former Raritan Arsenal (O'Brien & Gere, 1989). Contamination due to volatile organics, petroleum hydrocarbons, metals, TNT, and indicators of explosives was evident in ground water, surface water, and soils. Little contamination was noted in Area 1; no traces of explosives disposal were found, while slightly elevated levels of trichloroethylene (TCE) were found in ground water samples (J. Valdez, 1989; pers. comm.). In addition, an ordinance search using geophysical survey methods (magnetometers and ground-penetrating radar) was conducted in the vicinity of Area 1; blasting wire was found in this area, but no chemical traces of explosives were found (J. Valdez, 1989; pers. comm.).

3.2.4.2 <u>Radiation</u>

In 1986, the FIT conducted a radiation survey and radon monitoring program for the buildings at the GSA-Raritan Depot. Elevated gamma radiation levels were found in nine buildings, and elevated radon levels were found in one building. A follow-up radiation/radon survey was conducted for three occupied buildings (Building 205 at the GSA site and buildings 216 and 219 on what is now Middlesex County College property) by the EPA Eastern Environmental Radiation Facilities (EERF). The EERF survey confirmed the results of the FIT survey; buildings 205 and 216 were found to have elevated radiation levels and all three buildings were found to have elevated radon levels. Buildings 245 and 246 do not have elevated radiation levels.

3.2.5 Aesthetics

Currently, the proposed site is comprised of two warehouses and untended land. The view is one of abandonment, with overgrown shrubbery, crumbling roads and deserted articles strewn about.

3.2.6 Noise

The warehouse buildings on the proposed E-TEC facility site are not being actively used at the present time, although portions of Building 245 are serving to store equipment for EPA's Emergency Response Unit. Ambient sound levels within the proposed site are thus largely a function of surrounding land use. Given the surrounding land use (see Section 3.2.1.1), the principal source of noise would be vehicular traffic and the operation of various motorized equipment. Such activities, concentrated at the boundaries of the EPA Edison Facility, would be expected to produce ambient sound levels ranging from 40 to 90 dBA (EPA, 1976).

3.2.7 Socioeconomics

3.2.7.1 Population

The Township of Edison has a population of 84,159 (provisional estimate, as of July 1, 1987) (New Jersey Department of Labor, 1988). This 1987 population estimate is a 20 percent increase over the 1980 censused population of 70,193. In the decade between 1970 and 1980, the Township population increased by approximately 4.6 percent (from 67,120 to 70,193).

The demographic profile of the population, as per the 1980 census data, shows a median age of 31.3 for residents of the Township, with 73 percent of the population of age 18 or older.

Most of the residential areas for the Township's existing population are located north of the New Jersey Turnpike, which traverses the Township on a northeast-southwest axis. Some small residential tracts are found to the south of the Turnpike, and a Planned Urban Development (PUD) district is located southeast of the project site along the Raritan River.

3.2.7.2 Transportation and Traffic

Edison Township is situated at a point of convergence for several arterial roadways. Interstate 80 is located approximately 20 miles to the north, Interstate 287 runs to the east of the Township, and the New Jersey Turnpike passes through the Township proper (with Interchange 10 located two miles east of the project site). U.S. Highway 1 and N.J. Highway 27 are major roads within the Township. An Amtrak rail line runs in a northeast-southwest direction through the Township, with one spur line terminating in the Raritan Depot (See Figures 2-1 and 2-2).

These roadways serve to connect major industrial, commercial, and residential centers within the Township, County, and State. Large volumes of traffic are generated by such land uses, particularly in peak morning and evening commuter hours as employees enter or leave the Raritan Center, Heller Industrial Park, Middlesex Community College, and local businesses or residences. The preferred location of Edison for warehousing also generates substantial truck traffic on the major arterial roadways and connectors to industrial/commercial areas.

3.2.7.3 Economics

The overall real property valuation of the Township in 1984 was dominated by residential parcels (55.2 percent), industrial parcels (24.7 percent) and commercial parcels (10.9 percent) (New Jersey Associates, 1987). The 1985 general tax rate was $2.34 per $100, slightly less than that in preceding years. Total Township revenues in 1985 amounted to $91,748,60, with a total tax levy per capita of $827. Debt service per capita (1984) was approximately $70.

CHAPTER 4

4. ENVIRONMENTAL CONSEQUENCES

4.1 CONSTRUCTION IMPACTS & MITIGATION MEASURES

4.1.1 Natural Environment

4.1.1.1 Geology and Soils

Construction activity commonly results in short-term impacts related to soil loss or excavation of bedrock. Removal of topsoil and organic layers during clearing and grading operations reduces the productivity of the soil community, removes ground cover vegetation, generates fugitive dust, and creates unsightly conditions. The introduction of eroded soil materials into surface water bodies may temporarily diminish water quality and disrupt aquatic communities. Excavation of bedrock, where necessary, would have the potential to disrupt the geological integrity of local formations, or alter ground water conditions.

Because of the highly disturbed nature of the proposed E-TEC facility site, and because the modifications proposed for the site would be of limited extent and restricted to existing leveled areas, the potential for adverse impacts to soils and geological formations would be minimal. Standard soil erosion and control measures, including stone tracking pads at access points for construction vehicles, installation of sediment filters along the limits of disturbance, and spraying to control fugitive dust would minimize soil loss and associated adverse impacts. Stabilization of disturbed soils by seeding and mulching would further serve to prevent windborne loss of soil. These control measures would be specified in the Soil Erosion and Sediment Control Plan which would be approved by the Freehold Soil Conservation District. The site modifications would focus on renovation of existing structures, and only limited disruption of the existing geology of the area would be anticipated.

4.1.1.2 Water Quality

Short-term impacts on surface water quality would be generally associated with erosion and sedimentation during construction activities. Soil loss could increase concentrations of suspended material in the water column, leading to increased turbidity, decreased light penetration, and deposition of silt and clay particles on the aquatic substratum and/or biota. As noted in the prior section, adherence to soil erosion and control measures would minimize the export of eroded sediments to surface water bodies draining from the site.

Stormwater runoff from impervious surfaces at or around the facility would follow existing drainage patterns from upland areas to the channelled streams on the site; the volume of stormwater runoff is not anticipated to increase significantly. Parking areas would be situated on previously disturbed areas of the site, portions of which were graded and possibly paved around the time when the warehouses were active. Because many of the vehicles that would be using parking facilities around the facility would belong to employees already working at the EPA Edison Facility, expansion of parking space would be limited, and the increase in stormwater loadings from the construction of the proposed project would be small. Therefore, no adverse impacts to surface water quality would be anticipated.

4.1.1.3 Floodplains

There are no floodplains within the proposed project area boundaries, and construction of the proposed E-TEC facility would have no impact on the Raritan River floodplain, located approximately one half mile from the site.

4.1.1.4 Wetlands

The proposed renovation of the existing warehouse buildings for the proposed E-TEC facility would have no adverse impacts on the wetlands on the 110-acre parcel; the wetlands are located in the southern half of the parcel, and no operations are proposed for that area. However, future expansion of the proposed facility could potentially involve construction or activities in the vicinity of the wetlands. Measures appropriate to assess and mitigate potential impacts, including receipt of necessary permits (e.g., Section 404 Permit), would need to be undertaken if the future expansion of the proposed facility involved the disturbance of wetlands.

4.1.1.5 Air Quality

Short-term impacts on air quality during construction would be related to fugitive dust production and exhaust emissions from construction equipment. These short-term impacts to air quality from construction of the proposed E-TEC facility would be negligible because few modifications to topography would be required; the bulk of the effort would be building renovation. Mitigating measures to be included in the overall construction plan would include dust control practices and the use of efficient anti-pollution control devices on construction equipment.

4.1.1.6 Ecology

Short-term ecological impacts during construction would be associated with the loss of vegetative cover on cleared soils, and the displacement of wildlife species from the area affected by construction activities and noises. The vegetative cover is successional field, a habitat relatively common in the general project vicinity; thus, some vegetative loss would not substantially reduce the availability of this kind of habitat for mobile wildlife.

The areas that would be likely to be directly disturbed during construction would be the warehouse buildings and the immediate surrounding areas. As noted earlier, the area on which the warehouses were constructed was leveled and graded prior to 1961; the area to the east of the warehouses was apparently used for storage and/or parking of vehicles. This level area has grown back in a successional field community dominated by opportunistic plant species; loss of this vegetation would not constitute a significant ecological impact. The wildlife using this successional field community would likely retreat to less-disturbed areas of the EPA Edison Facility. The majority of wildlife species observed on the proposed project site are those that appear to tolerate a high level of human activity, and are commonly seen in urban or suburban areas.

The swales and wetlands located in the southern portion of the site would remain in their present state, continuing to serve as wildlife habitat. No threatened or endangered floral or faunal species are documented for, or were observed on, the proposed site. Thus, no impacts on threatened or endangered species would be anticipated.

4.1.2 Man-Made Environment

4.1.2.1 Land Use

Construction of the proposed E-TEC facility at the EPA Edison Facility site would not significantly alter land use patterns of Edison Township. The proposed site is within a tract designated as Open Space by the Township in its 1989 Master Plan; thus, the proposed site is not in a parcel that is identified for, or could be easily used for, alternate purposes. The warehouse area was at one time an active site; re-use of this location would not constitute a significant change in land use.

4.1.2.2 Cultural Resources

Construction and operation of the proposed E-TEC facility would occur on land that has been disturbed during and prior to the Raritan Arsenal operations. A Stage IA Cultural Resources Survey of the site has not identified any cultural resources of potential value in the northern portion of the site, where the proposed E-TEC facility operations would be centered. However, a wooded knoll was identified in the undeveloped land to the south of the warehouse buildings. This land would not be disturbed with the currently proposed activities, but could potentially be impacted during future facility expansion. Because of the potential for future impacts, a Stage 1B archaeological study was conducted in the wooded knoll area. The study determined that no prehistoric or historic archaeological resources were present.

4.1.2.3 Noise and Aesthetics

Construction activities at the proposed E-TEC facility site could temporarily increase noise levels in the immediate vicinity of the warehouses. Sound levels generated during renovation and outfitting activities could be expected to be in the range of 66 to 78 dBA at 50 feet from construction equipment, based on the use of best available technology for noise reduction (EPA, 1976). Construction equipment in this range of noise generation includes bulldozers, backhoes, concrete mixers and vibrators, mobile cranes, and heavy trucks. Increased sound levels would be of short-term duration, and would be spatially limited to the vicinity of the construction activities.

The aesthetic value of the proposed site would not be adversely affected; the site now presents a view of an abandoned warehousing facility surrounded by overgrown cleared areas. Renovation and outfitting of the facility would temporarily create a cluttered site, with construction equipment generating substantial activity. In the long-term, the building renovations and other site improvements (general cleanup, repaving) would create a view of upgraded facilities on landscaped property which would enhance the vista from adjacent properties.

4.1.2.4 Socioeconomic Impacts

4.1.2.4.1 Population

Construction of the proposed E-TEC facility would not significantly alter the population of the Township. The construction work force would likely be drawn from contractors in the general area of New Jersey; this would not cause significant relocation of construction workers to different residential areas.

4.1.2.4.2 Transportation/Traffic

Construction activities at the proposed E-TEC facility would increase the volume of traffic entering and leaving the EPA Edison Facility. The movement of workers in and out of the site would tend to coincide, or at least partially overlap, peak commuter movements into and out of the Township. This additional traffic would be an insignificant increase along roadways presently carrying high volumes of commuter traffic. Movement of heavier vehicles carrying equipment to the proposed site would be distributed somewhat more evenly through the day, and would have negligible impact on existing traffic patterns.

4.1.2.4.3 Economics

Construction of the proposed E-TEC facility at the EPA Edison Facility would have little effect on the economics of the Township. The residential population would not be expected to change significantly and other sources of additional revenue would likely be limited to markets, restaurants, and hotels used by the additional working personnel.

4.2 OPERATIONAL IMPACTS

The day to day operation of the proposed E-TEC facility could potentially affect the surrounding environment - land, air, surface water, and ground water - as well as the human environment - health, economics, traffic, noise and aesthetics. The manner in which each of these items could be affected is described in detail in the following section.

The health of the population surrounding the proposed E-TEC facility site could be impacted through contact with surface water, ground water or air. The potential for the proposed facility to cause a health impact from the public coming into contact with surface water, ground water or soil that was contaminated with materials from the proposed facility was examined. It was determined that there was not a significant potential for exposure from these routes. The major route of exposure of the population to contaminants handled at the proposed facility would be through the atmosphere. Therefore, the risk assessment conducted in this study focused on health effects caused by airborne contaminants.

4.2.1 Land Use Impacts

The operation of the proposed E-TEC facility would not significantly affect the plans for land use delineated in the Edison Township 1989 Master Plan. Operation of the facility would be only a resumption of activity at a warehouse site that has been temporarily inactive.

4.2.2 Noise and Aesthetics Impacts

Assuming that the operation of heavy equipment outside of the proposed E-TEC facility would occur sporadically rather than constantly, background noise levels at the facility during normal operation could be expected to be in the 63 to 72 dBA range. When outside equipment would be operated, noise levels could transiently increase to the 90 dBA level in the immediate vicinity of the facility. For individuals or residences in the vicinity of Woodbridge Avenue, these noise levels would be virtually indistinguishable from the background noise conditions (principally heavy traffic) that exist at present.

4.2.3 Socioeconomic Impacts

Operation of the proposed E-TEC facility would have a minor fiscal impact on the Township. The small number of additional personnel employed by the facility would contribute some revenue by using stores, gas stations, and hotels in the area, but these would be minor shifts in the Township's socio-economic structure.

4.2.4 Impacts on Facility Users

Impacts on facility users could result from routine handling of hazardous wastes and chemicals or from accidents involving these materials. The hazardous substances and chemicals used at the proposed facility would have varying degrees of toxicity and/or hazards associated with them.

Impacts could occur during either the experimentation with or the storage and handling of these materials. The severity and type of impacts on facility users would depend on several factors: toxicity of materials, volume of material involved in an incident, personal protective equipment used by staff, adequacy of laboratory/storage area safety features (e.g., ventilation hoods and proper training of personnel), and managerial safeguards (e.g., separating worker from hazardous zones).

The implementation and continued use of safety procedures for handling, operating and storing materials would help to minimize impacts. Maintaining only minimum volumes of materials and separating containers in the storage area would also reduce the severity of impacts. All staff would receive the appropriate safety training and would be knowledgeable in the use of personal protective equipment. (See Appendix G for more information concerning training and equipment).

4.2.5 Impacts on Ground Water and the Sole Source Aquifer

Impacts to ground water quality could potentially occur if there were contamination of recharge water. Such impacts would be associated with a short-term spill of waste material or test reagents during delivery or handling. If a liquid spill occurred, the material would have to flow to a pervious area and percolate through the surface soil in order to impact ground water quality. If it were a spill of solid material, runoff water would be required to transport the material to the ground water. The likelihood of impacts to ground water quality are greatly reduced because:

- Product handling would occur on impervious areas.
- Soil tends to attenuate the transport of most hazardous substances.
- There are strict packaging and transport regulations for hazardous materials.
- Knowledge and training of EPA and contractor personnel working at the proposed facility.

Severity of impacts to ground water quality would be determined by the type and extent of the contamination as well as the existing condition and use of the ground water. As described in Section 3.1.3, there are no water supply wells within a 1 mile radius of the proposed E-TEC facility site. The closest supply wells are the four residential wells within 1.5 to 2 miles of the site. These wells, as well as the water supply wells for the Middlesex and Elizabethtown water companies, lie up-gradient from the proposed E-TEC facility site. Therefore, in the unlikely event of a liquid spill onto unprotected ground, any seepage of chemicals into the ground water would not flow toward the supply wells, thus minimizing the potential for direct contamination of water supplies.

The ground water in the vicinity of the proposed E-TEC facility flows toward the Raritan River (Schmid & Co., 1987). Any chemicals or substances that entered the ground water would have the potential to enter the Raritan River. The extent of migration of substances from the ground water to the Raritan River would depend on the quantity entering the ground water, the ability for the soil to adsorb or absorb the substance and biological, physical or chemical transformations of the chemical. Contamination would be minimized by instituting appropriate spill containment and clean-up measures immediately following the spill. Some examples of these procedures include: adsorbing the spilled material onto a sorbent and placing containment around the spill to prevent it from leaving impervious areas.

The aquifer underlying the proposed E-TEC facility (the Raritan Magothy Aquifer) has been designated a sole source aquifer by EPA pursuant to the Safe Drinking Water Act (SDWA). Accordingly, the construction and operation of the proposed facility would have to comply with Section 1424e of the SDWA. This section includes a provision that prevents federal financial assistance for any project that would cause contamination of the sole source aquifer. The construction activities associated with renovating the proposed facility would not result in contamination of the aquifer. The activities associated with the operation of the facility would be contained within the buildings, which would have adequate pollution abatement equipment, and the process water generated from the operational activities would be discharged to the Middlesex County Utilities Authority (MCUA) treatment plant, not to the ground water.

Therefore, it is unlikely that the operation of the proposed facility would adversely impact the sole source aquifer. Additionally, only small quantities of chemicals would be transported to and from the facility so the potential quantity that could be spilled would be small, and the personnel operating the facility would be trained in the proper spill containment and clean-up procedures. The proposed E-TEC facility has been determined to be consistent with Section 1424(e) of the SDWA.

4.2.6 Impacts on Water Quality

The primary potential source of water quality impacts would be the discharge of wastewater to the MCUA treatment plant. This treatment plant discharges its final effluent to Raritan Bay. Because only sanitary wastewater (e.g., showers, toilets) would be connected directly to the sewer system, water quality impacts would be minimized. Process water generated during testing would be collected in a holding tank and would be pretreated, if necessary, before discharge to MCUA. Process water that could not be treated below pretreatment standards would not be discharged to the treatment plant. This process water would be transported off-site for treatment and disposal.

The quantity of wastewater discharged from the proposed facility to MCUA is not expected to exceed 100,000 gallons per day (gpd). The current capacity of the MCUA plant is 110 million gallons per day (MGD) so the input from the proposed E-TEC facility would represent less than 0.1% of the total flow. This additional flow would be negligible and would not cause any significant impact to the MCUA treatment plant.

The possibility would exist that small quantities of materials could be spilled into the sinks or other utilities connected directly to the sewer system. It is not anticipated that the spilled quantity would be sufficient to cause explosive and/or toxic levels to build up in the sewer system. Also, given the capacity of the MCUA treatment plant (110 MGD) compared to potential spilled quantities, the spilled chemicals would not be expected to cause detrimental effects to the MCUA treatment plant or collection system.

Larger spills in storage areas or testing bays would be contained by dikes. No floor drains connecting those diked areas to the sewer system would be installed to prevent larger spills from entering the system. Spilled liquids would be pumped out of the diked areas via suction and collected in the process water holding tank.

Another possible source of water quality impacts would be a traffic accident involving a vehicle transporting waste material to or from the proposed E-TEC facility. If such an accident occurred near a storm drain or surface water, the possibility of contamination would exist. However, the personnel working at the proposed E-TEC facility would be experienced in hazardous substance handling and spill clean-up and would be able to contain and clean-up the spills to keep potential impacts to a minimum.

Because of the safety features that would be built into the site (treatment systems, dikes, no floor drains, personnel training) and the expertise of the personnel, no significant water quality impacts would be expected.

4.2.7 Impacts on Ecology

The overall impacts of operation of the proposed E-TEC facility on local environmental characteristics would be minimal. The proposed site has been disturbed and has many areas in intermediate stages of recovery from these prior disturbances.

Operation of the proposed E-TEC facility would generate background noise levels somewhat higher than currently exist on the site; most wildlife species would habitate to these activities, while intolerant species would be displaced to less active areas. Activities around the warehouses (parking, training exercises) would result in the loss of much of the successional field vegetation in the graded area east of the warehouses. As noted earlier, the swales and wetlands located in the southern portion of the proposed site would currently remain in their present state, experiencing no adverse impacts and would continue to serve as wildlife habitat. No threatened or endangered floral or faunal species are documented for, or were observed on, the proposed project site. Thus, no impacts on threatened or endangered species are anticipated.

4.2.8 Impacts to Transportation

The testing activities of the proposed E-TEC facility would require input material, such as contaminated or uncontaminated soils, surface water, or ground water. The material would be transported to the site via trucks at an average rate of approximately 1 truck load per week. The delivery rate of materials could be more than 1 truck load per week when a new test would be undertaken in order to transport the necessary equipment and feed material to the site. However, there could also be weeks when no material would be transported to or from the facility. Overall, the average rate would be expected to be close to 1 truck load per week. In addition, process wastes, either solid or liquid, would be transported off-site for treatment or disposal or to be returned to the site of origin.

The material entering and exiting the proposed facility would be under the management control of the EPA. This control would include the following safeguards:

- Materials would be packaged in compliance with all federal and state regulations regarding the transport of hazardous materials.

- Materials would be transported by a licensed and approved hazardous waste hauler.

- The truck would carry a list of the materials being transported and the procedures that should be followed in an emergency situation involving the substances.

- The trucks would travel on highways as much as possible to minimize the need for trucks to travel on smaller, more densely populated secondary roads.

- o The facility staff would work with local agencies to establish contingency plans for traffic accidents.

- o The proposed E-TEC facility would have trained emergency response personnel who would be available for transportation emergencies. In addition, Edison also has its own emergency response personnel.

These safeguards and the low number of trucks entering and exiting the facility would minimize the potential for a transportation accident and would help to minimize adverse impacts if such an accident occurred.

In addition to materials, the facility staff would also have to enter and exit the proposed facility. Much of the staff of the proposed facility would be made up of the existing work force at the EPA Facility. Some additional workers would be added but this additional work force would be small and would not be expected to have a significant impact on transportation.

4.2.9 Impacts on Air Quality

Air quality modeling, using EPA approved methods and models, was conducted to determine the impact of the proposed facility's operation on the air quality of the surrounding area. The air quality modeling, including a discussion of the models used, procedures followed, and printouts of model results, is included as Appendix D. Currently, the NAAQS has established ambient concentration limits for criteria pollutants, which include: sulfur dioxide, total suspended particulates, inhalable particulates, carbon monoxide, nitrogen dioxide, and ozone. The modeling results indicated that the operation of the proposed facility would not violate the NAAQS standards for the criteria pollutants. However, the background concentration of ozone in the State of New Jersey already exceeds the NAAQS standard. The proposed facility would not be expected to contribute significantly to the existing ozone problem.

Prior to facility operation, an air permit would have to be obtained from the State of New Jersey. Included in the application process is a requirement for air modeling to verify that there would not be a significant impact to the air quality of the area. The proposed facility could not operate until the air permit was issued and would be required to demonstrate compliance with the emission limits imposed by the air permit on a continuing basis.

4.2.10 Impacts on Public Health

To adequately address concerns regarding impacts to public health, it is necessary to examine exposures to both long-term, low-level (chronic) releases of chemicals due to the daily operational activities at the proposed facility and short-term, higher level (acute) releases caused by a catastrophic event (i.e., a fire in the building). Because of the uncertainties involved in the operation of the facility (e.g., any of the hazardous or toxic substances could be used on-site), a worst case approach was taken with the risk assessments; the assumptions used were based on the worst possible conditions. This health impact evaluation deals only with exposure to airborne contaminants because this route of exposure would provide the greatest potential for the public to be exposed to contaminants from the facility.

A detailed risk assessment of chronic releases was conducted as part of this EIS, following EPA approved methodology, and is included as Appendix E. The potential for chronic exposures to cause carcinogenic health effects was evaluated quantitatively. There is no level of exposure to carcinogenic substances that is considered to be completely safe; therefore, the risk of developing cancer from exposure to chronic releases must be minimized. The risk is minimized by the installation of appropriate air pollution control systems, the use of the least quantity of chemicals possible in the testing activities, and management controls. The preliminary risk assessment conducted as part of this EIS indicated that carcinogenic risks would be minimized to the maximum extent possible. The potential risks from chronic exposure to 21 indicator chemicals were evaluated and the greatest individual risk of developing cancer from exposure to a single chemical was $1x10^{-6}$, or stated as a population risk, one person out of every million people exposed (see Table 4-1 for chemicals and potential risks). This risk estimate was based on very conservative assumptions and represents the risk to the hypothetical maximally exposed individual. The $1x10^{-6}$ risk falls within the range of risks ($1x10^{-4}$ to $1x10^{-7}$) the EPA considers acceptable when evaluating

Table 4-1

Risk Characterization - Worst-Case Long-Term, Low Level Release

Chemical[1]	Excess Individual Lifetime Risk Estimates[2]
Arsenic	2 E-7 [A]
Benzene	1 E-9 [A]
Benzidine	1 E-6 [A]
Bis(2-chloroethyl)ether	1 E-9 [B2]
Beryllium	1 E-11 [B2]
Cadmium	2 E-9 [B1]
Carbon tetrachloride	7 E-8 [B2]
Chlordane	7 E-7 [B2]
Chloroform	9 E-10 [B2]
Chromium VI	9 E-9 [A]
1,1-Dichloroethylene	3 E-11 [C]
Dieldrin	1 E-7 [B2]
DDT	2 E-9 [B2]
Hexachloroethane	2 E-11 [C]
Methyl chloride	3 E-13 [C]
Methylene chloride	3 E-8 [B2]
Nickel	7 E-8 [A]
1,1,2,2-Tetrachloroethane	8 E-11 [C]
1,1,2-Trichloroethane	4 E-10 [C]
Trichloroethylene	5 E-9 [B2]
Vinyl chloride	1 E-10 [A]
Total	2 E-6

[1] The chemicals Benzo(a)pyrene, 2,4-Dinitrotoluene, Di-n-octyl phthalate, Hexachlorobenzene, PAH, PCB, and 2,3,7,8-TCDD were not included because an inhalation slope factor was not available.

[2] Because of risk assessment uncertainties, only one significant digit should be reported with the risk estimate and the weight of evidence to classify the compound as a carcinogen should be reported with each estimate (EPA 1987c). Weight of evidence letters are reported in brackets following the estimate.

A = Human carcinogen.
B1 = Probable human carcinogen, limited evidence of carcinogenicity in humans.
B2 = Probable human carcinogen, sufficient evidence of carcinogenicity in animals but inadequate evidence of carcinogenicity in humans.
C = Possible human carcinogen.

alternatives in Superfund remediation projects (EPA, 1986b). This risk value also falls below the risks other governmental agencies consider acceptable, such as the Occupational Safety and Health Administration (OSHA) (10^{-3}), the Food and Drug Administration (FDA) (10^{-6}) and the Nuclear Regulatory Commission (NRC) ($5x10^{-3}$).

A catastrophic event (i.e., a fire at the proposed facility causing the vaporization of all stored chemicals) was simulated to determine the health impacts of such a release. This catastrophic release scenario was chosen because it represents the worst case for the various assumptions. For example, this event would cause a temperature high enough to vaporize even the low volatility compounds, such as PCB's. Also, this event would cause a sudden release of all stored chemicals which would result in exposure to higher concentrations of chemicals than would a slow release caused by an event such as a smoldering fire. Other scenarios were considered but were abandoned because they would not have yielded as conservative results as the case presented in this EIS.

As part of the worst case analysis, it was assumed that all chemicals stored on-site would become entrained in the air and exit the proposed facility. (The details of the catastrophic release health risk assessment are presented in Appendix F). In the case of a catastrophic release, the health impact of concern is acute exposure to hazardous substances. Unlike carcinogenisis, there is an assumed threshold exposure level below which no irreversible, adverse health impacts would be expected in the exposed population. The quantitative health risk assessment determined whether the public's exposure to airborne contaminants from the catastrophic release would be above or below the threshold concentration for each chemical at the point of maximum impact from the facility (i.e., approximately 1.86 miles from the facility depending on wind speed and direction). In performing the health risk assessment for a catastrophic release, twelve chemicals, that are expected to be found at the facility and have a high potential to cause acute toxic health effects, were evaluated. The assessment is based on the maximum concentrations of these chemicals expected to be stored at the facility, as well as the planned storage capacity (i.e., 5000 gallons of liquid and 70 tons of soil). Ten of the twelve chemicals evaluated were determined not to have the potential for adverse health impacts, at the maximum concentration and storage volumes expected, from a catastrophic release (see Table 4-2). In the

Table 4-2

Risk Characterization - Catastrophic Release

Chemical	Risk Characterization (Exposure/Toxicity)	Exceeds Toxicity Limit
Benzene	0.03	No
Beryllium	<0.01	No
Cadmium	0.06	No
Carbon tetrachloride	0.35	No
Chlordane	21	Yes
Chromium VI	0.04	No
2,4-Dinitrotoluene	<0.01	No
Methyl chloride	<0.01	No
Methylene chloride	0.28	No
Polychlorinated biphenyls (PCBs)	7	Yes
Trichloroethylene (TCE)	<0.01	No
Vinyl chloride	<0.01	No

other two cases, for which contaminant concentrations were expected to be above the threshold concentration, management controls would be instituted to restrict the quantity of chemicals stored within the existing buildings to levels that would prevent adverse health impacts in the event that a catastrophic release were to occur.

4.3 SECONDARY IMPACTS

Secondary impacts are the effects of additional development likely to be constructed or otherwise induced as a result of the construction of a particular project. Secondary impacts can include increases in traffic, demands for infrastructural services, increased rates of construction of residential, and/or commercial space, population shifts, and other off-site impacts generated by project operations that affect the surrounding region.

Construction of the proposed E-TEC facility at the EPA-Edison Facility is anticipated to induce only minor secondary impacts. Because the proposed facility would be built at an active EPA facility and would draw much of its staffing from EPA personnel at the EPA-Edison facility, peak traffic hour volumes and patterns are not expected to be significantly altered. The operation of the facility would not create a significant new demand for housing space or infrastructural services, nor would it induce significant demographic changes in the surrounding region. The presence of an additional EPA facility in Edison Township could induce some additional influx of commercial or industrial firms that conduct developmental research in waste testing and/or site remediation; this would be expected to add to the existing population of such firms in the Edison region rather than create a new category of commercial business in the region.

4.4 MITIGATION OF OPERATIONAL IMPACTS

The following subsections summarize procedures to mitigate operational impacts.

The potential impacts to humans, from the standpoint of release of toxic substances to the atmosphere, are presented and discussed in detail in Sections 4.2.9 and 4.2.10 and Appendices D, E and F. Air pollution impacts would be mitigated through the use of appropriate pollution control equipment. The process off-gasses would pass through a series of pollution control devices that would reduce the concentration of contaminants prior to discharge of the gas to the atmosphere. The concentrations would be reduced so that the potential for adverse health effects from day-to-day exposure would be minimized.

As indicated in Section 4.2.10, ten of the twelve chemicals evaluated in the catastrophic release health risk assessment would not exceed the threshold concentrations for acute toxic health effects at the point of maximum impact from the facility (i.e., approximately 1.86 miles away depending on wind speed and direction) when evaluated at the current plans for maximum concentrations of the chemicals and facility storage levels (i.e., 5000 gallons of liquid and 70 tons of soil). Adverse health effects that could result from a catastrophic release of the other two chemicals would be mitigated by limiting the concentrations and/or amounts of the chemicals present at the facility, at any time, to safe levels. The safe storage quantities of the twelve chemicals for the range of possible concentrations have been calculated and are represented graphically in Appendix F. These graphs would be incorporated into the management plan for the facility to ensure the protection of public health should a catastrophic release occur. The facility's management plan would also include provisions for screening testing operations involving other chemicals that have not yet been evaluated and for adjusting the graphs based on revised operational data or final design data.

Specifically, at the time of the review of the work plan for a potential new technology evaluation, both the concentration and amount of the chemicals needed to conduct the research would be evaluated. It would be determined whether the specified values would have the potential to cause adverse health impacts if a catastrophic release occurred. If that quantity of chemicals could cause adverse impacts, either the concentration of chemical or the amount (or both) would have to be reduced, or storage outside the bays would need to be considered. With this type of management control plan, the level of chemicals on-site would not cause adverse health effects.

Storage of materials outside of the building would reduce the potential for gaseous emissions of the chemicals. There would be a much lower potential for a fire of sufficient heat to cause the vaporization of the chemicals. Also, the gaseous emissions would be spread out over a much larger area, which would lower the maximum ground level impact concentration compared to a similar quantity release from the building. However, the potential for a liquid spill would be greater. To minimize this possiblity, any outside storage area(s) would be designed in accordance with all applicable regulations (e.g., TSCA, RCRA).

The air dispersion modeling presented in Appendix D is also designed to be used within the framework of the management plan. The model could be used to predict the impact concentration for chemicals that would be specified in the work plan that were not included in the DEIS. The management plan would be incorporated into the operations plan of the proposed facility. The plan would be subject to change as more complete design and operational information would become available or additional modeling would be conducted. Also, the model (presented in Appendix D) would be subject to change based on more refined toxicity data, more accurate facility data or the availability of a more suitable model.

Transportation of materials to and from the proposed facility would also be a concern. Trucks bearing potentially hazardous materials would travel to the proposed E-TEC facility via highways and major roads, where possible, rather than secondary roads or side streets. The use of major roads and highways would minimize exposure of populations to hazardous materials and improve access to the spill for emergency response teams dealing with spill cleanup. The traffic flow to or from the proposed E-TEC facility would be very small relative to the total volume of traffic, thereby minimizing the potential increased risk of accidents for people residing along transportation corridors. As required by appropriate statutes (e.g., the New Jersey Administrative Code), only licensed waste haulers would be used to transport hazardous and/or toxic materials to or from the proposed facility.

Any hazardous samples that would be transported to or from the proposed E-TEC facility would be packaged according to federal and state regulations regarding the transport of hazardous materials. The packaging and handling procedures specified in the regulations are designed to minimize container breakage and contain any leakage within the package, and the packages would be labeled. Required packaging should be able to withstand most vehicular collisions, but could result in some release if exposed to a protracted fire or explosion on the road.

The laboratory and testing areas of the proposed facility would be designed for a "shirt-sleeve" environment. Appropriate protective clothing would be worn, as required, during experimentation in the laboratory, pilot plant, and T&E bays to minimize potential exposure. Chemicals of high toxicity, reactivity, flammability, and/or explosivity are used. Development of safety procedures for handling and working around these hazardous wastes would be initiated as exact compositional data for these wastes would become available.

The proposed E-TEC would comply with the federal Emergency Planning and Community Right to Know Act of 1986 (SARA Title III). Pursuant to Subtitle A of SARA Title III, an Emergency Response Plan would be prepared and a facility representative would be designated to participate in local emergency planning (40 CFR 355). Subtitle B of SARA Title III sets forth requirements for hazardous chemical inventory forms and toxic chemical release reporting. The proposed E-TEC facility may have to comply with the requirements of this subtitle depending on the quantity of substances used at the proposed facility. If the quantity on-site exceeded the specified amount in Subtitle B, the proposed facility would comply with this requirement.

Appendix E contains information relating to additional mitigation procedures. Included are: fire protection, training plan, fire protection equipment, decontamination procedures, and spill and leak protection.

4.5 UNAVOIDABLE ADVERSE IMPACTS

The development of the proposed E-TEC facility at Edison would have unavoidable minor impacts on the local area due to construction. For the most part, these impacts would be short-term in nature. They would consist primarily of traffic congestion, construction noise, dust and minor soil erosion. The traffic congestion would result from transportation of construction materials and workers to and from the site.

After project completion, the increased work force, including consortium researchers, could result in a slight increase in overall traffic flow on a localized, long-term basis.

4.6 IRRETRIEVABLE AND IRREVERSIBLE RESOURCE COMMITMENTS

There would be a number of irretrievable and irreversible resource commitments due to construction of the proposed facility. Due to the existence of the buildings at the site, there would be a small resource commitment for this facility, in terms of the consumptive use of construction materials, fuel, potable water and electrical energy for construction and operation. On a long-term basis, there would be consumptive use of chemicals and utilities for the work that would be conducted at the proposed E-TEC facility. It is not likely, however that construction would result in the irretrievable consumption of critical materials in limited supply or other resources of local, regional or national significance.

CHAPTER 5

5. COORDINATION

5.1 INTRODUCTION

There has been a relatively high level of community awareness regarding the Raritan Depot and the proposed E-TEC facility. As such, a public participation program is being conducted as a key element of the planning process for the proposed E-TEC facility. Public participation activities were initiated in the early stages of project planning by the EPA-Office of Research and Development. These activities have continued during EIS preparation. Future phases of the project, including permitting, construction and operation of the proposed E-TEC facility would also involve public participation activities. The primary goal of all of these public participation activities is the establishment and maintenance of a two-way communications network between the affected public and EPA.

5.2 COMMUNITY CONCERNS AND KEY ISSUES

A public scoping meeting was held on September 22, 1988 and was followed by a two week comment period in order to afford the public with the opportunity to provide input on the scope of the DEIS for the proposed E-TEC facility. During the EIS scoping process, a number of comments were received regarding the project's potential impacts on the environment and the surrounding community. Key issues and concerns identified by the public were: impacts associated with air emissions; impacts of the proposed E-TEC facility when combined with the landfills and other hazardous operations that currently exist within the project vicinity; assuring safe operations at the facility through competent operators, suitable technology, and enforcement; identification of the hazards associated with incineration; transportation hazards; storage and disposal of waste samples and hazardous by-products; and health and safety. These have been considered fully and are addressed in the EIS.

5.3 FEDERAL, STATE, LOCAL, AND OTHER SOURCES FROM WHICH COMMENTS HAVE BEEN REQUESTED

Federal Agencies:

- Army Corps of Engineers,
  - New York District, N.Y.
- Council on Environmental Quality
- Department of Agriculture,
  - Office of the Secretary, Washington, D.C.; Soil Conservation Service, New Brunswick, NJ
- Department of Commerce
- Department of Defense - Army,
  - Picatinny Arsenal, NJ; Aberdeen Proving Ground, Aberdeen, MD
- Department of Health and Human Services
- Department of Housing & Urban Development
- Department of the Interior
  - Office of Environmental Project Review, Washington, D.C.; Bureau of Land Management; Fish & Wildlife Service, Pleasentville, NJ; Geological Survey, West Trenton, NJ
- Department of Transportation
  - Coast Guard
- Federal Emergency Management Agency
- Public Health Service

United States Senate:

- New Jersey
  - Honorable William Bradley
  - Honorable Frank Lautenberg

United States House of Representatives:

- New Jersey
  - Honorable Bernard Dwyer

State Agencies:

- New Jersey
  - Office of the Governor
  - Department of Environmental Protection
  - Department of Transportation
  - State Police

New York
Office of the Governor
Department of Environmental Conservation

New Jersey State Senate:
Senator Thomas Paterniti
Chaiman, Energy & Environment Committee

New Jersey State Assembly:
Assemblyman Frank Pelley
Assemblyman George Spadoro
Chairman, Energy & Environment Committee

Regional Agencies:
Interstate Sanitation Commission
Port Authority of New York and New Jersey

Local Agencies:

County
Middlesex
Board of Freeholders
Department of Health
Department of Solid Waste Management
Planning Board
Utilities Authority

Municipal
Edison Township
Mayor's Office
Township Clerk
Business Administrator
Building Department
Department of Civil Defense
Department of Health and Human Services
Department of Public Works
Engineering Department
Environmental Commission
Fire Department
Health Departmen
Planning Board
Police Department
Zoning Board

Edison Township Board of Education

News Media

Asbury Park Press
Bergen Record
Home News of Central New Jersey
Metuchen-Edison Review
New Jersey Network News
News Tribune
Star Ledger
WCTC - Radio

Groups and Organizations

Alliance for Action
Citizens Committee to Close Kin Buc
Citizens Union Foundation
Clean Water Action
Colorado State University
Crummy, Deldeo, Dolan, Griffinger
Elf-Aquitaine
Environmental Defense Fund
Environmental Lobby
Jersey Shore Audubon Society
League of Women Voters of New Jersey
Middlesex County Community College
National Academy of Sciences
National Audubon Society
National Science Foundation
National Wildlife Federation
New Jersey Institute of Technology
New York Academy of Sciences
Princeton University
Regional Plan Association
Rutgers University
Sierra Club
Stevens Institute of Technology
University of Medicine and Dentistry
Women's Environmental Coalition

Industrial/Commercial

AT&T Engineering
Allied-Signal, Inc.
American Cyanamid Company
Amoco Oil Company
B.F. Goodrich Company
BP American

Bethlehem Steel Corporation
Bristol-Meyers Products
CE Environmental Technical Marketing
CIBA-GEIGY Corporation
Chemical Waste Management, Inc.
Exxon Research & Engineering Company
Federal Business Centers
Fuel & Energy Consultants, Inc.
Heller Construction Company
Hoffman-LaRoche, Inc.
IBM Corporation
Jersey Central Power & Light
Manville EMI-Biodex
Merck & Company, Inc.
Middlesex Publications
Mobile Oil Corporation
Public Service Electric & Gas
Schering-Plough Corporation
Stone & Webster Engineering Corporation
Summit Associates
S & W Waste Incorporated
TAMS

Repositories

Edison Township Municipal Building
100 Municipal Boulevard
Edison, New Jersey 08817

Edison Public Library
340 Plainfield Avenue
Edison, New Jersey 08817

EPA - Region II
Edison Library
Woodbridge Avenue
Edison, New Jersey 08837

EPA - Region II
Library
26 Federal Plaza
New York, New York 10278

CHAPTER 6

6. PREPARERS/REFERENCE DOCUMENTS

6.1 LIST OF PREPARERS

The project team for this EIS consisted of staff members of Gannett Fleming Environmental Engineers, Inc. and EcolSciences, Inc., under the technical direction of EPA Region II's Environmental Impacts Branch and EPA's Office of Research and Development. The EPA personnel involved in this project are listed below:

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The staff members of Gannett Fleming Environmental Engineers, Inc. and EcolSciences, Inc. who prepared this document and their areas of responsibility are listed below:

<u>Gannett Fleming Staff</u>:

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EcolSciences Staff:

Michael S. Friedman	Project Administrator
David M. Bell	Project Manager, Principal EIS Writer
Carol L. Campman	Biologist, Public Participation

6.2 REFERENCE LIST

American Conference of Governmental Industrial Hygenists. 1988. Threshold Limit Values and Biological Exposure Indices for 1988-1989. ACGIH, Cincinnati, Ohio.

Auer, Jr. A. H. 1978. "Correlation of Land Use and Cover With Meteorological Anomalies". Journal of Applied Meteorology. 17:636-643.

Crouch, E. and Wilson, R. 1982. Risk/Benefit Analysis. Ballinter Publishing Co., Cambridge, MA.

Dourson, M. L. and Stara, J. F. 1983. Regulatory Toxicology and Pharma-cology. 3:224-238.

EcolSciences, Inc. 1989. Terrestrial Ecology Survey for a Proposed E-TEC Facility, Raritan Depot, Edison Township, Middlesex County, New Jersey. Prepared for USEPA, Region II, New York, New York.

Edison Township, New Jersey. 1989. Edison Township Master Plan.

Edison Township Health Department. 1989a. Personal Communication; Jay Elliot.

Edison Township Health Department. 1989b. Storet Retrieval of Well Data.

Federal Register. 1979. Part 44(56): 17208-17213, March 21, 1979.

Federal Register. 1987. Part 52(74): 12866-12870, April 17, 1987.

Federal Register. 1988. Part 53(122): 23791-23794, June 24, 1988.

Foster Wheeler USA Corporation. 1989. Phase I A/B Report Initial Concept Studies - E-TEC Facility. Prepared for the U.S. Environ-mental Protection Agency, Washington, DC.

Hallenbeck, W.H. and Cunningham, K.M. 1986. Quantitative Risk Assessment for Environmental and Occupational Health. Lewis Publishers, Inc. Chelsea, Michigan.

Lindsay, Willard L. 1979. Chemical Equilibria in Soils. John Wiley & Sons, New York.

Middlesex County Planning Board. 1986. An Inventory of Water Supply Sources Available to the Middlesex County Area. New Brunswick, New Jersey.

National Academy of Sciences. 1983. Risk Assessment in the Federal Government: Managing the Process. National Academy of Sciences Press, Washington, D.C.

New Jersey Department of Environmental Protection. 1974. Land Oriented Reference Data System (LORDS). Bulletin 74, Trenton, New Jersey.

New Jersey Department of Environmental Protection, Division of Fish, Game and Wildlife, and U.S.D.A. Soil Conservation Service. 1980. Endangered and Threatened Species of New Jersey. Trenton, New Jersey.

New Jersey Department of Environmental Protection, Division of Environmental Quality. 1988a. Air Quality Report.

New Jersey Department of Environmental Protection. 1988b. Correspondence from George Howard to Michael Zickler.

New Jersey Department of Environmental Protection, Division of Water Resources. 1989a. Personal Communication; Kevin Berry.

New Jersey Department of Environmental Protection. 1989b. Storet Retrieval; Surface Water Quality Data for Raritan River.

O'Brien & Gere Engineers, Inc. 1989. A-E Quality Control Summary Report (A-E QCSR) for Former Raritan Arsenal, Edison/Woodbridge, New Jersey. Investigation for the Development of Design Criteria. Prepared for the U.S. Army Corps of Engineers, Kansas City District, Kansas City, Missouri.

Rogers, Golden and Halpern. 1987. New Jersey Hazardous Waste Facility Site Search: Task 3 Report - Results of On-Site Testing at the Edison Township Site. Submitted to the New Jersey Hazardous Waste Siting Commission.

Robichaud, B., and M. Buell. 1973. Vegetation of New Jersey. Rutgers University Press, New Brunswick, New Jersey.

Schmid & Company, Inc., Consulting Ecologists. 1987. Environmental Inventory of the Raritan Center Study Area, Vols. I and II. Prepared for Federal Business Centers, Edison, New Jersey and Summit Associates, Inc., Edison, New Jersey.

Sittig, Marshall. 1985. Handbook of Toxic and Hazardous Chemicals and Carcinogens. Noyes Publications, New Jersey.

Snyder, D. B. 1985. New Jersey's Threatened Plant Species. Office of Natural Lands Management, New Jersey Department of Environmental Protection, Trenton, New Jersey.

Turk, A. C. and Frishman, A. M. 1977. Environmental Impact Report on Kin Buc II Sanitary Landfill, Edison, NJ. Dames and Moore.

U.S. Department of Agriculture - Agricultural Research Service. 1982. "Estimating Soil Bulk Density from Particle Size Analysis and Organic Matter Content." Soil Science. pp. 123-125.

U.S. Department of Agriculture Soil Conservation Service. 1987. Soil Survey of Middlesex County, New Jersey. New Brunswick, New Jersey.

U.S. Department of the Interior Geological Survey. 1981. Hydrogeological Conditions in the Coastal Plain of New Jersey. Report 81-405, Trenton, New Jersey.

U.S. Department of the Interior Geological Survey. 1981. Perth Amboy Quadrangle.

U.S. Department of the Interior Geological Survey. 1987. Physical and Chemical Properties and Health Effects of Thirty-three Toxic Organic Chemicals.

U.S. Environmental Protection Agency. 1976. Direct Environmental Factors at Municipal Wastewater Treatment Works: Evaluation and Control of Site Aesthetics, Air Pollutants, Noise, and Other Operation and Construction Factors. EPA 430/9-76-003.

U.S. Environmental Protection Agency. 1984. Facilities Evaluation and Long-Term Planning Study for the United States Environmental Protection Agency at Research Triangle Park, North Carolina. Prepared by Odell.

U.S. Environmental Protection Agency. 1985a. Site Analysis: Raritan Arsenal, Edison, New Jersey. TS-PIC-85022.

U.S. Environmental Protection Agency. 1985b. A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water - Part 1 (Revised 1985). EPA/600/6-85/002a.

U.S. Environmental Protection Agency. 1986a. Environmental Assessment of the New EPA Eastern Environmental Radiation Facility. Prepared by Wapora, Inc.

U.S. Environmental Protection Agency. 1986b. Superfund Public Health Evaluation Manual. EPA/540/1-86/060. OSWER 9285.4-1.

U.S. Environmental Protection Agency. 1986c. Superfund Innovative Technology Evaluation (SITE) Strategy and Program Plan. EPA/540/G-86/001. OSWER 9380.2-3.

U.S. Environmental Protection Agency. 1986d. Guidelines of Air Quality Models (Revised). EPA/450/2-78-027R.

U.S. Environmental Protection Agency. 1987a. Final Environmental Impact Statement for Full Containment Facility, Andrew W. Breidenbach, Environmental Research Center, Cincinnati, Ohio. Prepared by U.S. EPA Region V with assistance from Science Applications International Corporation.

U.S. Environmental Protection Agency, Office of Research and Development. 1987b. Briefing on Edison Testing and Evaluation (T & E) Facility.

U.S. Environmental Protection Agency. 1987c. The Risk Assessment Guidelines of 1986. EPA/600/8-87/045.

U.S. Environmental Protection Agency. 1988a. Program of Requirements for the Testing and Evaluation Facility for the Office of Research and Development in Edison, NJ.

U.S. Environmental Protection Agency. 1988b. Environmental Audit, Revised Draft Report, Environmental Research Center, Research Triangle Park, NC. Prepared by Booz-Allen and Hamilton, Inc.

U.S. Environmental Protection Agency. 1988c. Environmental Information Document for U.S. Environmental Protection Agency, Office of Research and Development, Risk Reduction Engineering Laboratory, Releases Control Branch, Environmental Technology and Engineering Facility at GSA Raritan Depot, Edison, NJ. Prepared by Enviresponse, Inc. January 1989.

U.S. Environmental Protection Agency. 1988d. Superfund Exposure Assessment Manual. EPA/540-1-88/001. OSWER Directive 9285.5-1.

U.S. Environmental Protection Agency, Office of Research and Development. 1989a. Briefing on Environmental Technology and Engineering (E-TEC) Facility. January 27, 1989.

U.S. Environmental Protection Agency. 1989b. Description of Risk Reduction Engineering Laboratory Test and Evaluation Facilities. EPA/600/M-89/002.

U.S. Environmental Protection Agency. 1989c. Health Effects Assessment Summary Tables. OSWER (OS-230). ORD (RD-689).

U.S. Fish and Wildlife Service. 1976. National Wetlands Inventory, Perth Amboy, New Jersey Quadrangle.

U.S. Fish and Wildlife Service. 1988. Correspondence from Clifford Day to Michael Zickler.

Vowinkel, E. F. and Foster, W. K. 1981. Hydrogeological Conditions in the Coastal Plain of New Jersey. USGS Open-File Report 81-405.

Widmer, K. 1964. The Geology and Geography of New Jersey. D. Van Norstrand Company, Inc., Princeton, New Jersey.

APPENDIX A

APPENDIX A

FEDERAL FACILITIES SCREENED
DURING ALTERNATIVES ANALYSIS

Table A-1

Listing of Federally-Owned Properties of 110 Acres or More in New Jersey and New York States

New Jersey - Non-DOD Properties

BelleMead GSA Depot
ICWW Cape May Canal
Cape May Training Center
Lyons V.A. Medical Center
Morristown National Park Service NHP
Mt. Holly National Park Disposal Area
Brigantine National Wildlife Refuge
Pedricktown COE Disposal Area
Penns Neck COE Disposal Area
Pomona Federal Aviation Administration HDQ
Somerville GSA PDMS-Depot
Somerville V.A. Supply Depot
Wildwood Crest USCG Electric Generating Station
COE Artificial Island
COE Delaware River Killcokook Disposal Area
COE Penns Grove Disposal Area
Department of Justice Bureau of Prisons, Newark
USGWS Supawna Meadows National Wildlife Refuge
Delaware Water Gap National Recreation Area
Federal Aviation Administration

New Jersey - DOD Properties

Evans Area
Military Ocean Terminal-Bayonne
Picatinny Arsenal
Chas Wood Area
Fort Monmouth
Fort Dix
Earle Naval Weapons Station
Lakehurst Naval Air Engineering Center
Atlantic City Map AGS
Warren Grove WRS Range
McGuire Air Force Base

New York - Non-DOD Properties

Bath V.A. Medical Center
Fire Island USCG Station
Big Flats Soil Conservation Service PMC

Table A-1 (Cont'd.)

Listing of Federally-Owned Properties of 110 Acres or More in New Jersey and New York States

New York - Non-DOD Properties (Cont'd.)

Binghamton GSA DMS Warehouse
Buffalo COE Disposal Project
Canandaigua Federal Communications Commission Monitoring Station
Cassadaga Department of Labor Training Administration
Castle Point V.A. Medical Center
Cortland USFWS Tunison Laboratory
Farmingdale V.A. National Cemetery
Franklin COE East Sidney Lake
Glenmont Department of Labor Training Administration
Hornell COE Almond Lake
Hyde Park Vanderbilt Mansion National Historic Site
Hyde Park Home of FDR National Historic Site
Hyde Park Home of Eleanor Roosevelt National Historic Site
Islip USFWS Seatuck National Wildlife Refuge
Lake Placid Federal Correctional Institution
Lewiston Department of Energy R&D Administration
Lewiston Department of Labor Training Administration
St. Lawrence Seaway Development Corporation
Montrose V.A. Hospital
Mount Morris COE Project
New Baltimore Hudson River Hough Disposal Area
New York Gateway NRA
Niskayuna Department of Energy R&D Administration
Northport V.A. Medical Center
Oyster Bay USFWS National Park Service Fire Island National Seashore
Riverhead V.A. National Cemetery
Salamanca COE Kinzua Dam
Sayville Federal Aviation Administration IFST
Seneca Falls USFWS Montezuma National Wildlife Refuge
Southampton USFWS Morton National Wildlife Refuge
Stillwater National Park Service Saratoga National Park
Upton Department of Energy R&D Administration
COE Arkport Dam
COE Whitney Point Lake
Department of Energy Knolls Atomic Power Laboratory
Department of Justice Federal Correctional Institution
Department of Agriculture Plum Island Animal Center
Forest Service Green Mountain LUA
USFWS Wertheim National Wildlife Refuge
USFWS Iroquois National Wildlife Refuge
National Park Service Appalachian Trail
GSA National Lead Company

Table A-1 (Cont'd.)

Listing of Federally-Owned Properties of 110 Acres or More in New Jersey and New York States

New York - DOD Properties

Fort Hamilton
Fort Wadsworth
Stewart Annex
Seneca Army Depot
Galeville Training Site
Fort Drum
Watervliet Arsenal
West Point Military Reservation
Bethpage Naval Weapons Reserve
Brooklyn York Naval Station
Calverton Naval Weapons Reserve
Ava Test Annex
Forest Port Test Annex
Lewiston Air Force Plant
Merrillsville Stockbridge Test Annex
New Winsor Stewart Military Airlift Group
Niagara Falls TAC Airlift Group
Plattsburg AFB
Griffiss AFB
Schenectady Airport TAC Airlift Group
Hancock Field TAC Fighter Wing
Verona Test Annex

APPENDIX B

APPENDIX B

DESCRIPTION OF PROPOSED FACILITY

B.1 PHYSICAL PLANT

B.1.1 Pre-Existing Physical Plant

The proposed facility would be located in two interconnected buildings, Building 245 and 246, which are surrounded by 110 acres of land. The buildings are approximately 30 years old and are currently in fair condition. Buildings 245 and 246 consist of 160,000 square feet (sq. ft.) and 240,000 square feet of floor space, respectively, and are set up in large, open 200 ft. by 200 ft. bays. The construction of the bays is concrete block fire walls with 70 ft. column spacing and a floor to ceiling height of 27 ft. The buildings are steel framed, have a raised dock floor (3 ft.-9 in. above grade) and uninsulated concrete block exterior walls.

The structures, constructed by the Department of Defense in 1955-56, were used for warehouse purposes until 1984. Currently, EPA uses a small portion of Building 245 for storage of mobile treatment equipment and other miscellaneous purposes.

Figure 2-3, presented in Chapter 2, shows the layout of the existing Raritan Depot site with the proposed 110 acre E-TEC facility site highlighted.

B.1.2 Proposed Modifications to the Facility

In order to meet the goals of the proposed E-TEC facility, renovation and modification of Buildings 245 and 246 would be required. The proposed renovations to the buildings could potentially provide the following:

- Offices and related spaces
- Technology information library

- Laboratory areas:
  - A regular analytical laboratory
  - A pilot plant laboratory for small-scale equipment
  - Test and environmental (T&E) areas for larger-scale equipment

- Engineering, fabrication, and maintenance shops
- Indoor and outdoor personnel training facility
- Storage space for prefabricated chemical and hazardous waste storage trailers
- Indoor and potential outdoor areas for storing supplies, materials and equipment

- Process water treatment systems - Some examples of potential treatment systems are presented below. The specific system(s) that would be necessary would be determined during process design.

  - Physical/chemical mobile wastewater treatment system
  - Flocculation/sedimentation mobile wastewater treatment system
  - Air stripper wastewater treatment system

- Air pollution control systems

  - High efficiency particulate adsorption (HEPA)/carbon adsorption unit with an ID fan and stack
  - Afterburner, quench, caustic scrubber, wet electrostatic precipitator, ID fan and stack

- Fugitive emission control system

The current design of the proposed modifications calls for two of the existing four bays in Building 245 and one or two of the existing six bays in Building 246 to be renovated for immediate use. The remaining bays would be available for future renovation to provide for facility expansion. The wastewater and air pollution control systems would most likely be housed in a new enclosed area between the two buildings.

B.1.2.1 Laboratories

Analytical work in support of the functions of the proposed E-TEC facility would take place in the regular analytical laboratories. The following facilities would be installed in all laboratories conducting experiments with toxic substances to ensure worker safety.

- Handwashing facility
- Shower facility
- Eye wash facility
- Exhaust air pollution control equipment
- Exhaust ventilation system to control laboratory room air movement

In addition, some operational policies of the laboratories are highlighted below.

- All toxic substance work areas must be identified.
- Only authorized personnel may enter toxic substance work areas.
- Work surfaces must be made of a material suitable for use with toxic substances.
- All procedures generating toxic vapors must take place in a primary containment facility (e.g. fume hood).
- Gases or vapors generated by analytical instrumentation must be captured.
- Respirators must be provided as personal protective equipment to all employees who must enter areas with inhalation hazards.
- The chemicals on-site must be stored in a secured storage area and inventory records must be kept.
- Hazardous and toxic waste must not remain on site for more than 90 days.
- Standard transport practices (i.e. unbreakable outside container) must be used when transporting toxic substances.
- Housekeeping procedures that suppress the formation of aerosols must be followed.
- Vacuum lines must be protected with an absorbent or a liquid trap and a HEPA filter to prevent the entry of toxic substances into the system.

- Prior to initiation of laboratory activities, procedures for the handling and disposal of toxic chemicals must be established.

B.1.2.2 Treatment Systems - Process Water

All process water generated from the activities at the proposed E-TEC facility, with the exception of the sanitary wastewater (e.g., toilets, handsinks), would be collected in an influent holding tank. The sanitary wastewater would be piped directly to the sanitary sewer system and would flow to the Middlesex County Utilities Authority (MCUA) wastewater treatment plant (WWTP) located in Sayreville, New Jersey.

Samples of the collected process water in the influent holding tank would be analyzed to determine the concentrations of the various pollutants in the wastewater. If these concentrations were below permissible limits (as defined in applicable permits), the process water would be discharged to the sanitary sewer system and would flow to the MCUA WWTP for further treatment. However, if the concentrations were above permit limits, one of three actions could be taken: 1) on-site pretreatment could be conducted to reduce the concentrations prior to discharge to MCUA, 2) the process water could be returned to its point of origin, or 3) the process water could be transported off-site to an approved treatment facility for treatment and disposal.

The actual pretreatment systems that would be available on-site would be determined during process design. Some examples of pretreatment systems that could be used on-site include the following: 1) a flocculation/sedimentation mobile treatment system, 2) a physical/chemical mobile treatment system and 3) an air stripper treatment system. Any process water treated on-site would not flow directly to the MCUA treatment plant; following treatment, the process water would be collected in an effluent storage tank. Laboratory analysis would be conducted of the effluent to verify pollutant concentrations were below permit limits prior to discharge.

If the contaminant concentrations were not below compliance standards following on-site treatment, two options would be available. The process water could be recycled back through one or more of the on-site pretreatment systems for additional treatment, or it could be transported, via an approved waste hauler, to receive appropriate treatment off-site. The process water would then be disposed of by the off-site treatment company.

As stated previously, not all process water would be treated on-site. If on-site treatment was determined to be infeasible due to the complexity of the waste or the expense of treatment, the process water could either be transported to its point of origin or to an appropriate off-site treatment company.

Some tests may be conducted that would produce process water containing relatively high concentrations of one or more contaminants or difficult to treat contaminants. This process water would be segregated from the general process water and collected in an alternate process water holding tank. By segregating this process water, the volume of process water requiring a specific type of removal would be kept to a minimum. If the contaminant was one that was difficult or costly to remove with the processes available at the proposed E-TEC facility, the volume and cost of wastewater that would have to be transported off-site for treatment would be minimized.

The process water generation rate would be approximately 100,000 gallons per day. This flow would allow the entire day's generation of process water to be collected, analyzed, and treated, if required, prior to discharge to the MCUA treatment plant or transport off-site for further treatment.

B.1.2.3 Treatment Systems - Air

The proposed E-TEC facility would be equipped with air pollution control systems to reduce the concentrations of contaminants in process off-gases. All process off-gases would flow through the facility treatment equipment; if pollution control equipment would be supplied with the equipment to be tested, this equipment would be used in tandem with the facility equipment. The units to be tested would not be required to have pollution control equipment.

Process off-gases, gases generated during the testing of large-scale units, would be treated by components of the following three systems to minimize pollutant concentrations prior to discharge to the atmosphere. The system components selected would depend on the quantity and type of contaminants contained in the off-gas. The final process design would determine the type and capacity of equipment that would be used; however the components of the three systems would most likely be similar to those listed below.

1) Afterburner, quench, wet electrostatic precipitator (WEP), and induced draft (ID) fan in series or similar treatment system.

2) High efficiency particulate adsorption (HEPA) filter, carbon adsorption filter and ID fan in series.

3) Off-gas combustor or flare.

Treated gases, gases containing contaminant concentrations below NJDEP air permit compliance levels, would exit the facility through a stack. The final design of the proposed facility would specify the exact number of stacks and the stack parameters. The stack height and diameter would be determined through air modeling and state and federal regulations and would be included in the final air permit issued to the proposed E-TEC facility by the State of New Jersey.

In addition to process off-gases, the gases produced in the analytical laboratories may receive treatment before discharge. The final design of the facility would determine whether the laboratory fume hoods, which would collect the gases produced in the laboratories, would need to be equipped with individual air pollution control equipment and stacks.

B.1.2.4 Ventilation Systems

Three separate ventilation systems would be used in the proposed facility. One system would supply ventilation air to the office space. The discharge air from this system would not contain contaminants and would not require treatment prior to discharge. The second system would serve the bench and pilot scale laboratory. This air may or may not contain contaminants so the ventilation system would be piped in such a way to provide discharge flexibility. The air could either be discharged directly to the outside with no treatment or it could be vented to some or all of the components of the air pollution control system. Which component(s) were selected would depend on the type and quantity of contaminants. The third system would supply ventilation to the T&E Bays and would operate in a manner similar to the laboratory system described above. This air could be vented to either the outside with no treatment or could be vented to some or all of the components of the air pollution control system.

The final detailed design would determine if there would be a separate fugitive emission control system, consisting of a caustic scrubber, installed in the facility. If this system was installed, the ventilation air from the T&E and laboratory systems would pass through the scrubber prior to exiting the facility. If a separate fugitive emission control system was not installed, the ventilation air would be passed through the caustic scrubber used in the pollution control system.

B.1.2.5 Storage and Containment Structures

In accordance with Federal regulations, chemical storage areas either inside or outside of the proposed E-TEC facility would be equipped with impervious floor material and a dike. The diked areas would not contain floor drains; if a spill occurred, the liquid would be contained within the diked area. The collected liquid could then be pumped out, via suction, and treated on-site or transported off-site for treatment and disposal.

The design of the proposed facility calls for inside storage areas and limited outside storage. The outside storage areas would have appropriate storage structures that could contain sample material or equipment. Future expansion requirements could necessitate the construction of additional outside storage areas. All storage areas would conform to all applicable codes and standards. Such mandates ensure designs that would help prevent and control spills and minimize environmental impacts.

The entire facility would be designed to control spills and minimize releases that could be caused by the storage and processing of hazardous and toxic substances.

B.1.2.6 Security Systems

Currently, the entire EPA Edison Facility that contains the proposed 110 acre E-TEC facility site is surrounded by a chain link fence with site access controlled through an entrance gate and a guard house. Figure 2-3, presented in Chapter 2, shows the location of this existing guard house. A guard is on duty 24 hours per day. The entrance gate is currently open during normal working hours (7:30 AM to 6:00 PM) and then closed at all other times, with access controlled by the security guard stationed in the guard house.

B.2 FACILITY USERS

EPA's Office of Research and Development (ORD) Risk Reduction Engineering Laboratory (RREL) Releases Control Branch (RCB) would manage the operation of the proposed E-TEC facility and support the research program requirements of the facility users.

The groups that would be expected to use the facility are listed below:

1. EPA Office of Research and Development (ORD) and its contractors.

2. EPA Office of Solid Waste and Emergency Response (OSWER) and its contractors.

3. Academic Institutions, such as the Industrial/University Cooperative Centers for Research in Hazardous and Toxic Substances (consortium).

4. Technology developers and offerors.

B.3 SCOPE OF EXPERIMENTAL STUDIES

The proposed facility is not a treatment, storage and disposal (TSD) facility under the Resource Conservation and Recovery Act (RCRA) and would not be used for the treatment, disposal or storage of hazardous wastes. The only wastes treated or stored on-site would be those minimal quantities necessary for testing purposes.

Evaluation and experimentation would be conducted at all levels from bench scale to full scale and would take place inside the buildings. The proposed facility would evaluate prototype equipment, small-scale units, and full-sized modular waste treatment units. Development and performance tests would be conducted to determine the effectiveness of the equipment, along with reliability tests that would be used to assess the operating range and safety characteristics. Treatment technologies tested may include chemical, physical, biological or thermal processes which would be operated in either batch, continuous or in-situ mode, in combination or separately, to accomplish extraction, immobilization, destruction, or detoxification of wastes. Examples of specific technologies are presented in Table B-1; however, this table is not intended to be all inclusive.

The technologies tested at the facility generally would be equipped with their own pollution control devices. However, the facility would also be equipped with pollution control systems that could be operated in tandem with the equipment's devices. For those units not equipped with individual pollution control devices, the facility's systems would provide full treatment. Emergency shutdown procedures would be implemented in the event of process irregularities, in accordance with regulatory requirements and sound engineering practices.

B.4 EXPERIMENTAL WORK PLANS

Work plans of all experiments would be submitted to EPA for environmental and safety review and approval. No testing would be conducted prior to work plan approval, and the work plans would have to include a determination of the quantity of waste material necessary to conduct the research.

Table B-1

Examples of Treatment Technologies to be Evaluated in the Proposed E-TEC Facility

Technology	Technology Type: Chemical Process	Biological Process	Physical Process	Immobilization Process	Thermal Process
Catalytic Oxidation	X				
Dechlorination	X				
Electrochemical	X				
Neutralization	X				
Precipitation	X				
Aerobic Fixed-Film Fluidized Bed		X			
Anaerobic Fixed-Film Fluidized Bed		X			
In-Situ Bioreclamation		X			
Powdered Activated Carbon		X			
Carbon Adsorption			X		
Centrifugation			X		
Distillation			X		
Evaporation			X		
Filtration			X		
Ion Exchange			X		
Soil Washing			X		
Solvent Extraction			X		
Stripping			X		
In-Situ Vitrification				X	
Stabilization/Solidification				X	
Circulating Fluidized Bed					X
Infrared Incineration					X
Plasma Arc					X
Pyrolysis					X
Rotary Kiln Incineration					X
Supercritical Water Oxidation					X
Wet Air Oxidation					X

Source: EPA, 1988a.

The work plans would include the following steps:

1. Planning - Experimental Design (including environmental and safety considerations)
   - Quality assurance/quality control objectives
2. Equipment setup and shakedown
3. Equipment performance and reliability testing
4. Decontamination - Equipment and facility
   - Demobilization, removal from site
5. Data reduction and analysis; report preparation

B.5 TOXIC SUBSTANCES ON SITE

B.5.1 Hazardous Chemicals

The testing and evaluation that would be conducted at the proposed E-TEC facility could potentially involve almost any chemical or compound including those substances classified as hazardous or toxic. A general list of hazardous substances, as defined by the Environmental Protection Agency, can be found in 40 CFR 261, Subparts C and D, and Appendix VIII. A more specific list of the classes of compounds that may be incorporated into testing at the proposed E-TEC is given below (EPA, 1989c).

- Halogenated non-polar aromatics
- Polychlorinated biphenyls (PCBs)
- Polychlorinated dibenzodioxins
- Polychlorinated dibenzofurans
- Halogenated phenols, cresols and other aromatics
- Halogenated aliphatic compounds
- Halogenated cyclic aliphates/ethers/esters/ketones
- Nitrated aromatics and aliphatics
- Simple non-polar aromatics and heterocyclics
- Polynuclear aromatic hydrocarbons
- Other polar organics
- Non-volatile metals
- Volatile metals

Along with the chemicals and compounds that would be transported to and temporarily stored in the proposed E-TEC facility for use in research, chemicals necessary to facilitate the efficient operation of the laboratories at the proposed E-TEC (e.g., reagants, solvents) would be stored on site. These chemicals would be stored in relatively small quantities. Table B-2 presents a list of chemicals that could be stored at the proposed facility at some time during the life of the facility to facilitate testing and the quantities at which these chemicals might be stored (EPA 1988a).

B.5.2 Hazardous Wastes

The testing and evaluation of hazardous waste treatment technologies may require the use of clean, uncontaminated soils; surrogate materials; and actual wastes, in the form of solids (i.e., clean or contaminated soils) or liquids (i.e., contaminated surface water or groundwater). These materials would have to be transported to and stored at the proposed E-TEC facility. Such wastes would most likely be obtained from Superfund sites and would be transported and stored in the minimum quantity necessary to conduct research. In all cases, the amount of hazardous waste on-site would be limited to that quantity that could be safely stored at the proposed facility. All wastes stored on-site would be kept in appropriate storage containers and would be placed in the diked storage areas.

The process of testing treatment technologies would not only require hazardous waste as an input, but could also generate hazardous waste as a by-product. Any process water generated would be collected in a holding tank and treated with the process water treatment systems described in Section B.1.2.2. Any solid hazardous wastes generated would be contained and most likely be transported back to the site of origin for disposal. These wastes could also be shipped off-site for further treatment or disposal.

B.6 PROPOSED EFFLUENT STANDARDS

Because of the wide variety of activities that would be conducted at the proposed E-TEC facility, the process water generated would vary greatly in its strength and composition. The treated process water would have to comply with

Table B-2

Examples of Chemicals that Could be Stored in the Proposed E-TEC Facility[1]

Chemical	Typical Quantity
Acetone	10 gal.
Benzene	2 gal.
Carbon tetrachloride	2 gal.
Chloroform	2 gal
Ethanol, 95%	20 gal.
Ethylacetate	1 gal.
Formaldehyde solution, 37%	5 gal.
Freon	2 gal.
Hexane	10 gal.
Methanol	10 gal.
Methyl ethyl ketone	2 gal.
Methylene chloride	5 gal.
Mineral spirits	50-gal. drum
Toluene	10 gal.
Tributyl phosphate	3 gal.
Trichloroethylene	1 gal.
Triisooctylamine	10 gal.
Triton N101	5 gal.
Xylene, mixed isomer	3 gal.
p-xylene	30 gal.
Acetic acid	5 gal.
Hydrochloric acid	20 gal.
Hydroflouric acid, 37%	5 gal.
Nitric acid, 70%	20 gal.
Perchloric acid, 70%	5 gal.
Phosphoric acid	3 gal.
Sulfuric acid, 95%	5 gal.
Ammonium hydroxide	15 gal.
Sodium hydroxide	50-gal. drum
Specialty gases	40 cylinders (A-1)
L-ascorbic acid	75 grams avg. (3 bottles)
Boric acid powder	7-8 liters avg. (3 bottles)
Cyclohexane	20 liters avg. (5 bottles)
Ether	2 liters avg. (2 bottles)
Hydrogen peroxide	1 liter avg. (1 bottle)
Monochloracetic acid	1,500 gm. avg. (3 bottles)
Nitric acid, fuming	500 gm. avg. (1 bottle)
Sodium chloride, granular	50 kg. on hand (5 boxes)

1 Chemicals that could be stored at the proposed facility at some time during the life of the facility.

Source: EPA, 1988a.

the effluent limits imposed by the NJDEP. These limits, contained in the facility's indirect discharge permit, would represent concentrations below which no adverse impacts would be expected in the operation of the MCUA treatment plant.

B.7 APPROVALS NECESSARY FOR OPERATION

Prior to the initiation of any activities at the proposed E-TEC, various permits and approvals would be required which are listed below (EPA, 1988c).

Permit/Approval	Applicable Regulation
o Research, Development, and Demonstration (RD&D) Permit	U.S. EPA - 40 CFR Part 270.65 and related RCRA regulations.
o Toxic Substances Control Act (TSCA) Permit	U.S. EPA - 40 CFR 761.40 et. seq. Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
o Permit to Construct and Certificate to Operate Air Pollution Control Permit	New Jersey Department of Environmental Protection (NJDEP) Administrative Code 7:27-8.1 et. seq.
o NJPDES Indirect Discharge Permit	NJDEP Administrative Code 7:14 A-1 et. seq.
o Pretreatment Works Requirements	NJDEP Administrative Code 7:9-1.
o Sewer Extension Permit (Agreement to discharge pretreated effluent to Domestic Treatment Works)	MCUA.

APPENDIX C

APPENDIX C

VEGETATIVE & WILDLIFE SPECIES

Table C-1

Vegetative Species Found in Upland Areas
Proposed E-TEC Facility Site, Edison, NJ

Common Name	Taxonomic Name
Trees	
Red oak	Quercus rubra
Pin oak	Quercus palustris
Black oak	Quercus velutina
White oak	Quercus alba
Chestnut oak	Quercus prinus
Blackjack oak	Quercus marilandica
Black gum	Nyssa sylvatica
Black cherry	Prinus serotina
Red maple	Acer rubrum
Sweet gum	L. styraciflua
Red cedar	Juniperus virginica
Pitch pine	Pinus rigida
Sassafras	Sassafras albidium
Shrubs/Vines	
American holly	Ilex opaca
Arrowwood	Viburnum dentatum
Bayberry	Myrica pennsylvanica
Winged sumat	Rhus copallina
Gray birch	Betula populifolia
Willow sp.	Salix sp.
Tree-of-heaven	Ailanthus altissima
Pussy willow	Salix discolor
Aspen sp.	Populus sp.
Crab apple	Pyrus sp.
Multiflora rose	Rosa multiflora
Silktree	Mimosa sp.
Japanese honeysuckle	Lonicera japonica
Bittersweet	Celastrus scandens
Greenbrair	Smilax rotundifolia
Blackberry	Rhus sp.
Highbush blueberry	Vaccinium corymbosum
Maleberry	Lyaria lingustria
Chokeberry	Aronia sp.
Smooth sumac	Rhus glabra
Staggerbush	Lyonia mariana
Fetterbush	Leucothoe racemosa
Blue beech	Carpinus caroliniana

Table C-1 (Cont'd.)

Vegetative Species Found in Upland Areas
Proposed E-TEC Facility Site, Edison, NJ

Common Name	Taxonomic Name
Herbs	
Azalea	*Rhododendron* sp.
Sweetbay magnolia	*Magnolia virginica*
Sweet fern	*Comptonia peregrina*
Sweet pepperbush	*Clethra alnifolia*
Evening primrose	*Oenothera biennis*
Path rush	*Juncus* sp.
Switch grass	*Panicum virgatum*
Deptford pink	*Prianthus armeria*
Goldenrod sp.	*Solidago* sp.
Moth mullein	*Verbascum blattaria*
Common mullein	*Verbascum thapsus*
Bracken fern	*Pteridium aqulinum*
Sweet everlasting	*Gnaphalium* sp.
Aster sp.	*Aster* sp.
Sweet clover	*Melilotus* sp.
Horse nettle	*Solanum carolinense*
Poverty oats grass	*Dathonia spicata*
Mugwort	*Artemesia vulgaris*
Indian hemp	*Apocynum cannabinum*
Heal all	*Prunella vulgaris*
Yarrow	*Archillea millefolium*
Queen Anne's lace	*Daucus carota*
English plantain	*Plantogo lanceolata*
Knapweed	*Centaurea maculosa*
Orchard grass	*Dactylis glomerata*
Whorled loosestrife	*Lysimachia* sp.
Field garlic	*Allium uneale*
Broomsedge	*Andropogon virginicus*
False heather	*Hudsonia tomentosa*
Wood sedge	*Carex* sp.
Trailing arbutus	*Epigaea repens*
Sheep laurel	*Kalmia angustifolia*
Cinnamon fern	*Osmunda cinnamonea*
Tree pine clubmoss	*Lycopodium obscurum*
Lady slipper	*Cypripedium* sp.
Indian grass	*Sorghastrum nutans*
Bluestem grass	*Andropogon* sp.
Earth star	*Graster* sp.
British soldier	*Cladonia cristatella*
Roundheaded bush clover	*Lepedeza caeitata*

Table C-2

Vegetative Species Found in Wetland Areas
Proposed E-TEC Facility Site, Edison, NJ

Common Name	Taxonomic Name
Trees	
Red maple	Acer rubrum
Pin oak	Quercus palustris
Sweet gum	L. styraciflua
White oak	Quercus alba
Black gum	Nyssa sylvatica
Black willow	Salix nigra
Shrubs/Vines	
Common elder	Sambucus canadensis
Smooth sumac	Rhus glabra
Highbush blueberry	Vaccinium corymbosum
Gray birch	Betula populifolia
Bayberry	Myrica pennsylvanica
Japanese honeysuckle	Lonicera japonica
Sweet pepperbush	Clethra alnifolia
Sweetbay magnolia	Magnolia virginica
Azalea	Rhododendron sp.
Arrowwood	Viburnum dentatum
Smooth alder	Alnus serrulata
Spicebush	Lindera benzoin
Herbs	
Slender mountain mint	
Sedge sp.	Carex sp.
Common reed	Phragmites australis
Sphagnum moss	Sphagnum sp.
Soft rush	Juncus effusus
Woolgrass	Scirpus cyperinus
Purple willowherb	Epilobium coloratum
Sheep laurel	Kalmia angustifolia
Yellow bartonia	Bartonia virginica
Bushy broomsedge	Andropogon glomeratus
Bog clubmoss	Lycopodium appressum
Hayscented fern	Dennstaedtia sp.
Cinnamon fern	Osmunda cinnamomea
Skunk cabbage	Symplocarpus foetidus
Yam	Dioscorea villosa
False nettle	Boehmeria cylindrica
Sensitive fern	Onoclea sensibilis
Canada rush	Juncus canadensis

Table C-2 (Cont'd.)

Vegetative Species Found in Wetland Areas
Proposed E-TEC Facility Site, Edison, NJ

Common Name	Taxonomic Name
Herbs	
Cottongrass	*Eriphorum* sp.
Burreed	*Sparganium* sp.
Tussock sedge	*Carex stricta*
Meadow beauty	*Rhexia virginica*
Swamp St. Johnswort	*Hypericum virginicum*

Table C-3

Wildlife Species Found in Upland or Wetland Areas
Proposed E-TEC Facility Site, Edison, NJ

Common Name	Taxonomic Name
Mammals	
Eastern cottontail	*Sylvilagus floridanus*
Opossum	*Didelphis marsupialis*
Racoon	*Procyon lotor*
Whitetail deer	*O. virginianus*
Grey squirrel	*Sciurus carolinensis*
Woodchuck	*Marmota morax*
Birds	
Cardinal	*R. cardinalis*
Mockingbird	*Mimus polyglottos*
Song sparrow	*Melospiza melodia*
Red-winged blackbird	*Agelaius phoeniceus*
Flicker	*Colaptes* sp.
Robin	*turdus migratorius*
Redtailed hawk	*Buteo jamaicensis*
Killdeer	*Charadrius vociferus*
Blackcapped chickadee	*Parus atricapillus*
Crow	*Corvus brachyrhinchos*
American kestrel	*Falco sparverius*
Rock dove	*Columba livia*
House sparrow	*Passer domesticus*
Herring gull	*Larus argentatus*
Downy woodpecker	*Dendrocopos pubescens*
Tufted titmouse	*Parus bicolor*
House finch	*carpodacus mexicanus*
Mourning dove	*Zenaidura macroura*
Blue Jay	*Cyanocitta cristata*
Amphibians	
Spring peeper	*Hyla crucifer*

APPENDIX D

APPENDIX D

DESCRIPTION OF AIR MODELING

D.1 INTRODUCTION

An assessment of the potential air quality impacts caused by operational activities of the proposed E-TEC facility can be accomplished using air quality dispersion modeling techniques. These modeling techniques estimate the air pollutant concentrations that may be observed in the areas surrounding the source. The concentration predictions are based on the design and operational parameters of the proposed facility, and meteorological and topographical conditions of the proposed site location.

The EPA's Guidelines for Air Quality Maintenance Planning and Analysis, Volume 10 (Revised): Procedures for Evaluating Air Quality Impact of New Stationary Sources (Guidelines) presents a three-phase approach for evaluating the air quality impact of proposed new sources. The rationale of the phased approach is to first use simple screening procedures to evaluate the new source impacts on air quality. If the analysis predicts no potential problems, no further analysis is required. If the simple screening procedures indicate a potential problem, detailed screening procedures are applied and the results evaluated. If the detailed screening procedures indicate a potential problem, refined modeling techniques, as outlined in the Guidelines, are applied to the analysis.

D.2 MODELING PARAMETERS

D.2.1 <u>Terrain Analysis</u>

By definition, complex terrain is terrain that exceeds stack height. This type of terrain has the potential to be significantly impacted by the source being modeled. Local terrain elevations at the proposed Edison site rise above the stack tip elevation of 145 feet mean sea level (MSL), creating a complex terrain situation. The EPA Guidelines on Air Quality Models (Revised) suggest that pollutant concentration impacts for sources to be located in complex terrain be calculated using both a simple terrain model and a complex terrain model, and results used for the analysis be dependent upon the relationship of the stack and plume height to the receptor elevation. The models to be used for this initial screening analysis are the COMPLEX-I Screening Technique for complex terrain analysis and the ISCST model for simple terrain analysis.

D.2.2 Assumed Stack Data

The number of stacks and the design parameters of each would be included in the detailed design of the proposed facility. In the absence of detailed specifications of the stacks, the following stack parameters were assumed (Table D-1). These parameters represent plausible values but would not necessarily be the final design parameters used. The final values would be determined through air modeling and state and federal regulations.

D.2.3 Receptor Locations

According to the Guidelines, receptors must be located up to a distance of 50 km from the proposed source. A total of 27 receptors 0.5 to 50 km from the proposed stack were input into the model. The first 3 receptors were chosen for their close proximity to the proposed stack and for having elevations close to the stack tip. The remaining receptors were chosen because they were points of highest elevation or were approximated to provide a receptor location between two terrain features. For example, if a receptor would happen to be located 5 km away at an elevation of 150 feet and the next closest receptor happened to be 10 km away at an elevation of 200 feet with a valley in between, the receptors located at 6, 7, 8, and 9 km away would be assigned an elevation between 150 and 200 ft. This approximation results in higher concentration predictions for these receptors than would actually be experienced and therefore, provides "worst case" results.

The first 6 receptors were within relatively close proximity to the proposed stack location and are shown on Figure D-1. Table D-2 presents a list of the receptor distances from the proposed source and elevations.

Table D-1

Stack Parameters

Parameter	Value
Stack Height (ft.)	75
Stack Diameter (ft.)	2.5
Stack Base Elevation (ft.)	70
Stack Tip Elevation (ft.)	145
Stack Gas Temperature (°F)	175
Stack Gas Exit Velocity (m/s)	10.36

Source: EPA, 1988c.

Table D-2

Receptor Locations

Receptor	Distance (km)	Height (ft)
1	0.5	70
2	0.64	80
3	0.762	100
4	1.0	103
5	1.5	105
6	2.0	110
7	2.5	115
8	3.0	117
9	3.81	120
10	4.0	143
11	4.18	150
12	4.3	180
13	4.4	200
14	5	210
15	6	215
16	7	220
17	8	230
18	9	250
19	10	300
20	13	400
21	14	500
22	15	540
23	16	600
24	20	600
25	30	600
26	40	600
27	50	600

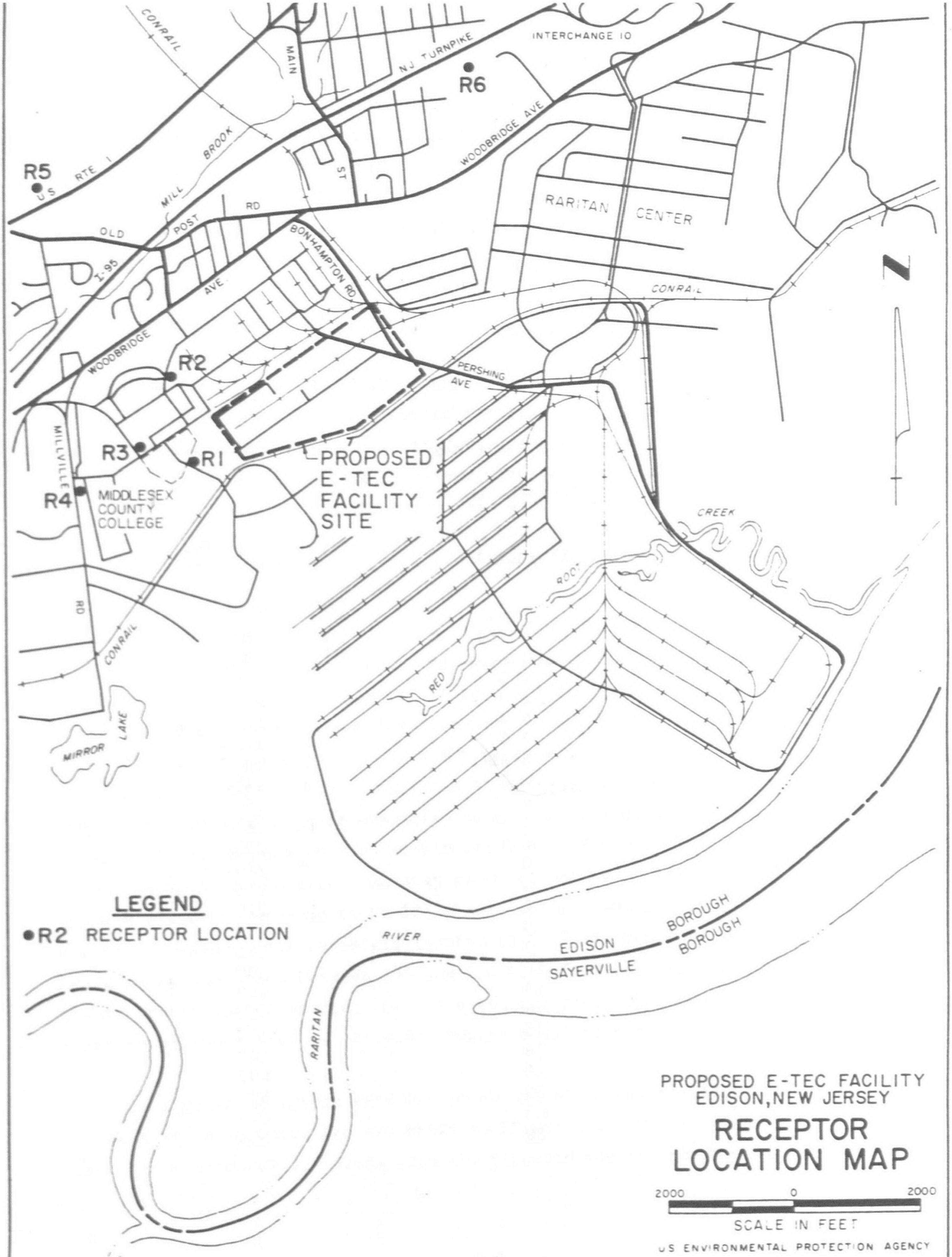

CONRAIL
MAIN
INTERCHANGE 10
N.J. TURNPIKE
R6
WOODBRIDGE AVE.
BROOK
MILL
R5
U.S. RTE. 1
ST
RD
OLD
POST
RARITAN CENTER
BONHAMPTON RD
I-95
AVE
WOODBRIDGE
R2
PERSHING AVE
MILLVILLE
R3
R1
PROPOSED E-TEC FACILITY SITE
R4
MIDDLESEX COUNTY COLLEGE
CREEK
ROOT
RED
RD
CONRAIL
MIRROR LAKE
LEGEND
R2 RECEPTOR LOCATION
RIVER
RARITAN
EDISON
BOROUGH
SAYERVILLE
BOROUGH
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
RECEPTOR LOCATION MAP
2000
0
2000
SCALE IN FEET
US ENVIRONMENTAL PROTECTION AGENCY

FIGURE D-1

D.2.4 Criteria Pollutant Emission Rates

Specific emission rates for the criteria pollutants (e.g. SO_2, TSP) could not be determined because of the variable nature of the activities at the proposed E-TEC facility. An emission rate of 1 g/sec was assumed for each of the pollutants. The use of an equivalent emission rate for all pollutants permitted one modeling run using a "generic" pollutant.

The testing and research activities at the proposed facility would use wastes containing low concentrations of contaminants (on the order of parts per million (ppm) or parts per billion (ppb)) and all process off-gases would pass through the facility's air pollution control system prior to discharge. The emission rate of the criteria pollutants was conservatively estimated to be 1 g/sec. It should be understood that all criteria pollutant modeling results and interpretations presented in this document are based on the assumed 1 g/s emission rate, which may or may not accurately describe the emissions of the facility.

D.3 SIMPLE SCREENING ANALYSIS

To conduct the simple screening analysis, the first of the three modeling phases, a simplistic, worst-case approach was taken. The wind was assumed to blow one direction only, from the proposed stack directly to each receptor, at it's maximum speed and most stable condition. The most stable wind, stability Class F, prohibits vertical mixing. In addition, the terrain features of the area were not accounted for in the analysis; the surrounding area was considered to be flat and mean sea level (MSL) was input for the elevation of each receptor.

To enable the wind to directly impact each receptor, the model would have to be run 27 times (once for each receptor) with the wind direction adjusted to impact the receptor being modeled. To reduce the computer run time without altering the results, the receptors can be lined up in a straight line and the wind can be input as blowing in a direction toward the receptors.

The actual distances from the proposed stack location to the receptors were maintained while the receptors were aligned. Figure D-2 shows this procedure graphically.

A widely used, EPA approved model, COMPLEX-I with the VALLEY option, was used to estimate the air quality impact. The VALLEY model was chosen because its primary use is estimating the 24-hour average pollutant concentrations. This model has been integrated into the Graphical Exposure Modeling System (GEMS), prepared by the EPA's Exposure Evaluation Division (EED), Office of Toxic Substances (OTS) (EPA, 1988d). A description of this model can be found in Section D.7.2. The input parameters for the model are shown in Table D-3.

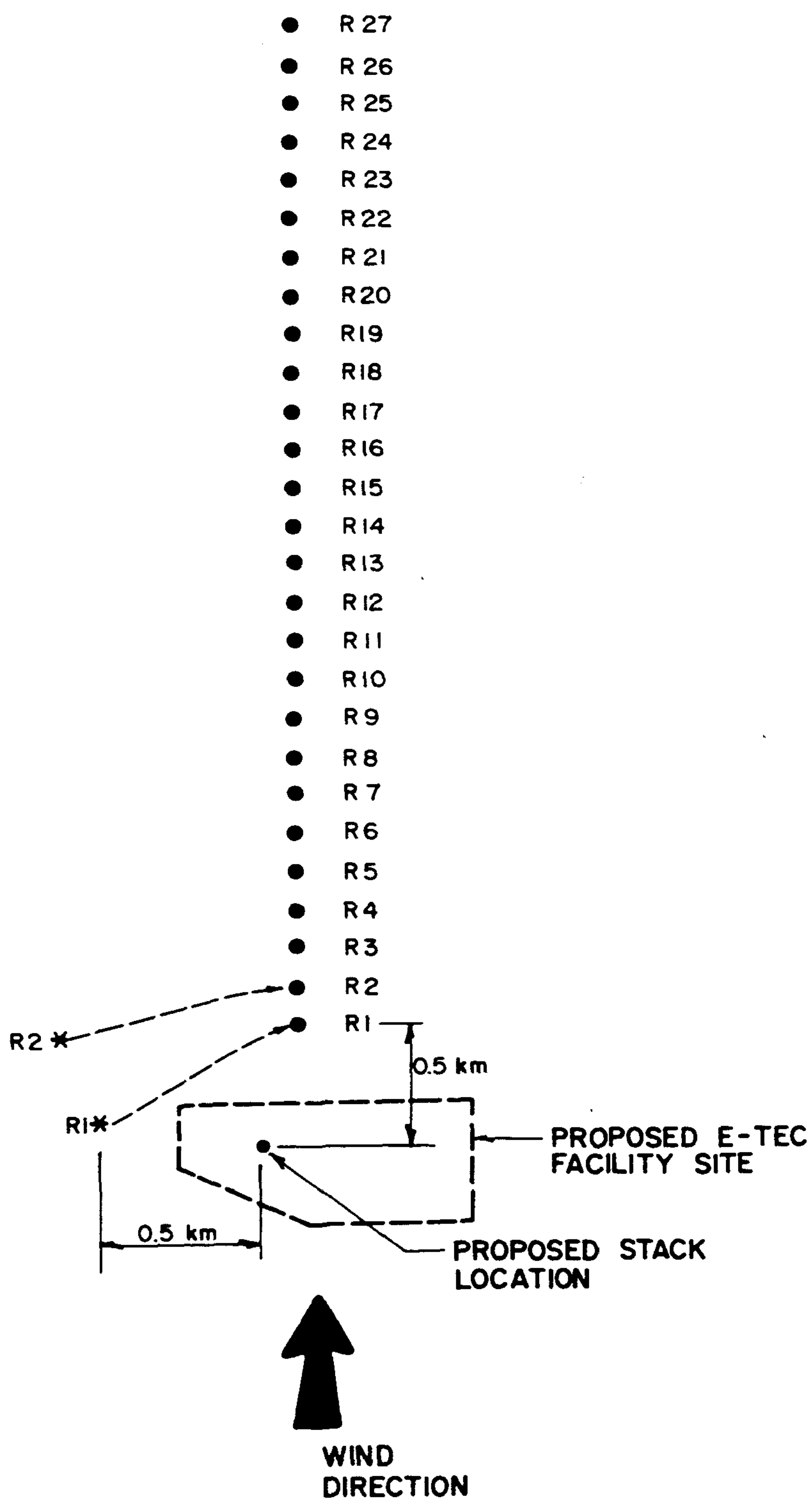
Table D-3

Simple Screening Input Parameters

Parameter	Input
Receptor Heights	MSL (ft.) at appropriate locations
Emission Rate	1.00 g/s
Stack Height	75 ft.
Stack Temp.	352 K
Stack Velocity	10.36 m/s
Stack Diameter	0.76 m
Facility Elevation	70 ft.
Wind Speed	2.5 m/s (preset by model)
Stability Class	F (preset by model)

The results of the simple screening analysis indicated that the maximum impact area would be the 200 ft. terrain feature 4.39 km to the northeast of the proposed site, Receptor 13. The maximum 24-hour ground level impact was predicted to be 0.66 ug/m^3. With the 1 g/s emission rate, the simple screening analysis assumed the plume would not impact terrain. Because the proposed site would be located in a complex terrain situation, a more detailed screening analysis was required that considered the actual terrain features of the site. No conclusions regarding air quality impacts were based on these simple screening results; the simple screening results are presented here only to verify that detailed screening was required.

Computer printouts of model results are included in Appendix H.



LEGEND

* ACTUAL RECEPTOR LOCATIONS IN RELATIONSHIP TO PROPOSED E-TEC FACILITY

● RECEPTOR CONFIGURATION FOR MODELING PURPOSES

PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY

RECEPTOR LOCATION METHODOLOGY

U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE D-2

D.4 DETAILED SCREENING ANALYSIS

The detailed screening analysis considered a somewhat more realistic worst case approach. As with the simple screening analysis, only one wind direction, directly toward the receptors, was considered, but for the detailed screening analysis, the wind speed and wind stability were allowed to vary between 0.5 m/s and 15.0 m/s, and between stability class A and stability class F. (Stability Class A allows complete vertical mixing while stability Class F allows no vertical mixing). The wind speeds and stabilities input were the standard 48 worst case meteorological conditions taken from the PTPLU model.

In addition to allowing wind speed and stability variations, the detailed screening permitted consideration of the topographic features of the surrounding area. Rather than inputting MSL for each receptor, the actual elevation of the receptor was used. As before, to facilitate modeling, the receptors were aligned to permit one modeling run. In this case, however, the distance from the proposed stack to the receptor and the elevation of the receptor were retained.

The area around the proposed facility was modeled as a rural run type. This description was determined from the procedures outlined in the EPA-approved land use method of choosing the urban or rural classification (Auer, 1978). A 3 km radius circle was drawn around the proposed facility and the meteorological land use typing scheme, outlined by Auer, was applied to the total area to determine the rural classification.

For the detailed screening, both the COMPLEX-I and ISCST models (model descriptions are contained in Section D.7) were run using the generic pollutant and the emission rate of 1.00 g/s. These two models were chosen due to their ability to model in a complex or rolling terrain situation. The COMPLEX-I and ISCST models handle industrial source complexes in rural or urban areas. The ISC short-term model has been integrated into the GEM system because of its ability to produce sophisticated analyses of atmospheric fate (EPA, 1988d). The results of the COMPLEX-I and ISCST runs were compared, and the results of the model that produced higher concentrations were used to estimate air quality impacts for a worst-case scenario. For this study, COMPLEX-I yielded higher concentrations.

The COMPLEX-I model predicts the maximum one hour concentration at each receptor location that would result from the modeling conditions. In this case, the greatest maximum impact concentration occurred at Receptor 1 and had a magnitude of 27.55 ug/m^3. To convert the one hour maximum concentrations into maximum 3 hour, 8 hour, 24 hour and annual average values, the EPA recommended factors of 0.9, 0.7, 0.4 and 0.12, respectively, are multiplied by each receptors one hour maximum. The COMPLEX-I results for each of the 27 receptors in terms of maximum 24-hour concentration are presented in Table D-4. As can be seen from the table, the maximum impact occurs at Receptor 1 and has a magnitude of 11.02 ug/m^3 (27.55 ug/m^3 x 0.4 = 11.02 ug/m^3).

Computer printouts of the COMPLEX-I model results are included in Appendix H.

D.4.1 Air Quality Assessment

In order to determine compliance with the NAAQS, the COMPLEX-I model prediction of the maximum impact concentration caused by the proposed facility must be added to the background concentration. The maximum 1 hr., 3 hr., 8 hr., 24 hr. and annual average values occurred at Receptor 1 and were of magnitude 27.55, 24.80, 19.29, 11.02 and 3.31 ug/m^3, respectively. These values were added to the 1988 background concentrations (see Table 3-1). The results of this analysis are presented in Table D-5.

The table shows that none of the NAAQS would be violated with the estimated emissions. Therefore, the activities at the proposed E-TEC facility would have a minimal impact to the ambient air quality.

These findings of no significant air quality impact were based on contrived wind conditions (one direction only and 48 worst case meteorological conditions). These conditions cause the model to predict higher results than would be expected to occur under the actual wind conditions of the area.

Table D-4

Model Results for Complex-I

Receptor	Maximum 24-hour Concentration (ug/m^3)	Meteorological Conditions Wind Speed (meters/sec.)	Meteorological Conditions Stability Class
1	11.02	0.5	A
2	8.50	0.5	B
3	7.90	0.5	B
4	5.62	0.5	B
5	2.83	0.8	B
6	2.37	0.8	D
7	2.22	0.5	D
8	2.00	0.5	D
9	1.64	0.5	D
10	1.63	0.5	D
11	1.58	0.5	D
12	1.61	0.5	D
13	1.62	0.5	D
14	1.40	0.5	D
15	1.10	0.5	D
16	0.90	0.5	D
17	0.74	0.5	D
18	0.63	0.5	D
19	0.54	0.5	D
20	0.38	0.5	D
21	0.34	0.5	D
22	0.31	0.5	D
23	0.28	0.5	D
24	0.20	0.5	D
25	0.11	0.5	D
26	0.07	0.5	D
27	0.05	2.0	F

NOTE: A is a strongly unstable stability which causes a looping plume and allows vertical mixing.

B is an unstable stability which causes a looping plume and allows vertical mixing.

D is neutral stability which causes a coning plume. For a coning plume, vertical mixing is adiabatic.

F is a strongly stable stability which causes a fanning plume and prohibits vertical mixing.

Table D-5

Air Quality Impact Assessment

Pollutant	Averaging Period	NAAQS (ug/m^3)	Maximum Concentration & Background (ug/m^3)
SO_2	3-hour	1,300	260.3
	24-hour	365	171.0
	Annual	80	33.3
TSP	24-hour	260	227.0
	Annual	75	45.6
PM-10	24-hour	150	82.0
	Annual	50	31.4
CO	1-hour	40,000	10,902.6
	8-hour	10,000	6,086.3
NOx	Annual	100	49.2

Therefore, if no significant impact occurs with the results of the detailed modeling, defined modeling, that uses actual meteorological data from the area, does not need to be conducted.

The modeling presented here is preliminary and may change based on the final facility design.

D.5 REFINED MODELING - RISK ASSESSMENT

Because the risk assessment deals with long-term exposures to toxic substances, it was felt that the risk assessment should be based on a long-term model using refined modeling techniques. Refined modeling incorporates five years of actual meteorological data from the Newark Airport, the closest monitoring station to the proposed facility. In addition, the refined modeling should be based on specific stack parameters, which will not be available until the detailed design phase has been completed.

Because refined modeling techniques allow the wind direction to change, the receptors can not be lined up in the manner such as the screening modeling. In this case, a polar grid was used (a cartesian grid was used in the screening) and the receptors were defined in terms of their actual position relative to the proposed stack location. This approach allows the receptors to be impacted by the magnitude and frequency of wind they would most likely be exposed to under actual conditions.

Five years of surface meteorological data from Newark Airport and upper air data from Atlantic City were input into the ISCLT computer model to describe the actual wind conditions. The ISC long-term model was chosen for use in the risk assessment because it has the ability to assess the annual average concentrations that are needed in the risk assessment without the use of conversion factors. The long-term version of the ISC model is also included in GEMS (EPA, 1988d). (A description of this model is contained in Section C.6). Using this information, five years of annual average concentrations were obtained for each of the chosen receptors. The highest annual average for the 5 years worth of results was chosen to represent the annual average concentration. This value occurred at Receptor 3 (see Figure D-1).

The value of annual average concentration generated with the computer model assumed the proposed facility was emitting substances 24 hours a day, 365 days per year. The maximum number of days in which substances would be emitted per year would be 250 (5 days per week, minus 10 holidays). The facility would not emit substances to the atmosphere for a total of 365 days per year due to holidays, weekends and down time between tests. Therefore, the annual averages were multiplied by the factor 250/365 to account for the reduced operation. Taking this factor into account, the maximum annual average concentration, with a generic pollutant and a 1 g/s emission rate, would be 0.145 ug/m^3.

Computer printouts of model results can be found in Appendix H.

D.6 CATASTROPHIC RELEASE SCENARIO MODELING

In this document, it was assumed that a catastrophic release would occur due to a fire at the proposed E-TEC facility. The heat caused by this event was assumed to cause the substances to vaporize and exit the facility through the ventilation fans and stacks located in the roof.

The T and E Bay roofs have four fans each with 0.9 m (3 foot) diameter "stacks" located above each fan. These fans would be lined up linearly along the centerline of the roof.

The fan duct elevations would be 100 ft. (70 ft. above sea level and 30 feet above ground elevation) which is lower than some of the terrain features within the modeling area. The ISCST model cuts off receptor elevations at stack tip elevation (100 feet) which can affect the results. However, if stack downwash is a more important component in determining ground level concentrations than the complex terrain above stack height, the ISCST model can still be used to calculate results.

To determine whether stack downwash is more important, the ISCST model should be run using the closest receptors and the VALLEY computer model (an option of COMPLEX-1) should be run with all receptors. The VALLEY model can accommodate receptors above stack tip elevation and is meant to be a screening model. If ISCST predicts higher 1 hour maximum ground level concentrations (indicating more conservative results), then stack downwash drives the results more than complex terrain and the ISCST model can be used to predict impacts. However, if the VALLEY results are higher, the ISCST model cannot be used. In this case, terrain features drive the results and a model that can account for complex terrain, such as COMPLEX-I, must be used to predict impacts.

The ISCST and VALLEY models were run using the volumetric flow rate of 10.8 m^3/s and velocity of 16.5 m/s (See Appendix F). The input data and results are contained in Table D-6. As can be seen on the table, ISCST yields higher results, indicating the ISCST can be used to predict impacts. (The computer printouts of the VALLEY model run and ISCST screening runs can be found in Appendix H).

Once it was determined that stack downwash was more controlling than complex terrain features, the ISCST model was run with all of the receptors.

Table D-6

Comparison of ISCST and VALLEY

Model	Number of Fans	Volumetric flow rate per fan m^3/S	Velocity m/S	Max 1 Hour Ground Level Concentration ug/m^3
ISCST*	4	10.8	16.5	11.17
VALLEY	4	10.8	16.5	2.74

* Model run with closest receptors only (screening run only; results not used in catastrophic risk assessment).

The following were components of the model run:

- o A polar grid was used
- o Receptor elevations above stack tip were lowered to stack tip elevation (100 feet)
- o Wind speed = 2.5 m/s, stability class F
- o Wind direction varied
- o Total volumetric flow rate = 43 m^3/S
- o Total generic pollutant emission rate = 1 g/s

The input data and model results are contained in Table D-7. The ISCST computer printouts are contained in Appendix H. The maximum 1 hour impact concentration was predicted to be 12.44 ug/m^3 with a generic pollutant emission rate of 1 g/s. The distance to the maximum impact concentration was 3000 meters.

D.7 DESCRIPTIONS OF COMPUTER MODELS

D.7.1 Industrial Source Complex (ISC)

The ISC Model is a steady state Gaussian plume model which can be used to assess pollutant concentrations from a wide variety of sources associated with an industrial source complex. The ISC model was developed by EPA. This model can account for settling and dry deposition of particulates, downwash area, line and volume sources, plume rise as a function of downwind distance, separation of point sources, and limited terrain adjustment. It operates in both short-term (ST) and long-term (LT) modes. The ISCST is the latest version 3.4 and the ISCLT is Version 6.5 (EPA, 1986d).

For regulatory use, ISC is appropriate for the following applications:

- industrial source complexes
- rural or urban areas
- flat or rolling terrain
- transport distances less than 50 km
- one-hour to annual averaging times

Table D-7

ISCST Model Input & Results

Number of Vents	4
Total Volumetric Flow Rate (m^3/S)	43
Volumetric Flow Rate Per Fan (m^3/S)	10.8
Velocity (m/s)	16.5
Ambient Temperature (°C)	25
Stack Gas Temperature (°K)	1000
Stack Height (ft) (above ground level)	30
Emission Time (min)	60
Stack Diameter (m)	0.914
Area (m^2)	0.656
Total Generic Pollutant Emission Rate (g/s)	1
Generic Pollutant Emission Rate Per Fan (g/s)	0.25
Maximum 1 Hour Ground Level Concentration (ug/m^3)	12.44
Distance to Maximum Impact Concentration (m)	3000

D.7.2 <u>COMPLEX-I - Version 86064</u>

COMPLEX-I is a multiple point source code with terrain adjustment. It was developed by the complex terrain team at the Chicago Workshop on Air Quality Models, February 1980. It is a sequential model utilizing hourly meteorological data. It assumes a normal distribution in the vertical and a uniform distribution across a 22.5 degree sector. The initial screening technique for complex terrain applications has been incorporated as an option in COMPLEX-I which is the VALLEY screening model.

The limitation of the model is that until the behavior of a plume in complex terrain situations can be documented and new mathematical constructs developed, the existing dispersion algorithms must be used.

D.7.3 <u>VALLEY</u>

The VALLEY is an analytical technique model. The primary use of this model is estimating the 24-hour average pollutant concentrations due to isolated sources in rural, complex terrain. This model is incuded as an option in the COMPLEX-I model for screening purposes. The limitation of this model is that it presets the worst-case meteorological conditions as stability class F at 2.5 m/s.

D.8 ASSUMED MODEL INPUTS

D.8.1 <u>ISCST and COMPLEX-I Assumed Model Inputs - For Air Quality Modeling (Section D.3 -D.4)</u>

1. Cartesian Receptor Grid - used in screening modeling because only distance from stack to receptor is important not actual position relative to stack (only one wind direction).

2. Rural Run Type - justified due to site conditions. (See Section D.4)

3. Default Wind Profile Exponents - model default.

4. Default Vertical Potential Temperature - model default.

5. Final Plume Rise - regulatory default.

6. No Stack Tip Downwash - stack is at an adequate height to eliminate downwash.

7. Bouyancy Induced Dispersion - regulatory default.

D.8.2 <u>VALLEY Assumed Model Inputs</u>

1. Stability Class F - preset by model.

2. 2.5 m/s wind speed - preset by model.

3. 270° wind angle - receptors lined up to the east.

D.8.3 <u>ISCLT Assumed Model Inputs</u>

1. Polar Receptor Grid - necessary to locate the receptors in relation to the stack and to correspond to the wind direction data.

2. Rural Run Type - justified due to site conditions. (See Section D.4).

D.8.4 <u>ISCST Assumed Model Inputs - Catastrophic Release Risk Assessment (section D.6)</u>

1. Polar Receptor Grid - necessary to locate the receptors in relation to the stack and to correspond to the wind direction data.

2. Rural Run Type - justified due to site conditions (see section D.4).

3. Default Wind Profile Exponents - model default.

4. Final Plume Rise - regulatory default

5. Stack Downwash - stack elevation so low, downwash becomes important.

6. Wind Speed - 2.5 m/s, Stability Class F

APPENDIX E

APPENDIX E

RISK ASSESSMENT - CHRONIC EXPOSURE

E.1 HEALTH IMPACT ASSESSMENT - LONG-TERM, LOW-LEVEL RELEASE

The purpose of this risk assessment is to quantify any additional potential health risks to which the human population surrounding the proposed E-TEC facility would be exposed. There are many potential routes of exposure to substances, such as swimming in contaminated waters, eating fish or shell fish that came from contaminated water, drinking contaminated surface water or ground water, contacting contaminated soil or breathing contaminated air.

Management controls, the experience and specialized training of the proposed facility's staff and the pollution controls built into the proposed facility greatly reduce the chance that substances from the proposed facility would enter the soil, surface or ground water. These routes were examined, but are not considered significant sources of exposure and will not be part of the detailed risk assessment. (For general information regarding the environmental impacts of the proposed facility on surface and ground water see Chapter 4). The potential for children to be attracted to the site and directly contact the hazardous materials would be eliminated through management controls. The proposed facility would be surrounded by a fence and access into the facility would be controlled by a guard.

The major route of potential exposure to hazardous substances would be via inhalation. A detailed risk assessment was conducted to determine the potential risks to the exposed public from this route of exposure.

Health risks could be associated with both long-term, low-level (chronic) exposure due to day to day operational activities and short-term, high concentration (acute) exposure caused by a catastrophic release of a large quantity of a substance or substances (e.g., explosion in the building). (The chronic exposure health risk assessment is presented in Appendix E and the acute health risk assessment is presented in Appendix F).

The National Academy of Sciences (NAS) defines risk assessment as involving one or more of the following steps: hazard identification, dose-response evaluation, exposure assessment and risk characterization (NAS, 1983). The EPA has accepted this definition and uses this approach when conducting risk assessments. In assessing the potential public health risks from the proposed facility all four components were considered:

1. Hazard Identification - Information concerning the chemicals that would be used on-site, such as the health effects and the conditions that would cause exposure, is gathered.

2. Exposure Assessment - The release of contaminants from the facility, the transport of these contaminants through the environment and environmental concentrations are determined or estimated. From this information, maximum individual exposure levels and doses can be estimated.

3. Dose-Response Evaluation - The quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease is examined.

4. Risk Characterization - The first three steps are integrated to determine the risk that humans would experience adverse health effects due to the exposure to the contaminants.

The methods used and the results obtained for each of these components are described in detail in this Appendix and Appendix F.

E.1.1 Risk Assessment Limitations

The health risk assessment should reflect the activities and events likely to take place at the proposed facility and the potential for the surrounding community residents to be exposed to releases from these activities. Ideally, the following information should be known:

- Detailed characterization of experimental activities to enable the prediction of daily or weekly release rates of specific substances to the air pollution control system.

- Removal efficiencies for specific contaminants in the air pollution control system.

- Detailed design information about the air pollution control system (e.g., stack height, stack diameter).

- Typical release rates of substances to the environment from the discharge stack on a daily or weekly basis.

- Activity patterns of residents who potentially could be exposed to releases from the proposed facility.

The detailed operational and design information (e.g., stack design parameters, air pollution control design) was not available at this stage of consideration of the proposed E-TEC facility, so the risk assessment had to be conducted based on the limited information available and realistic assumptions. EPA's Office of Research and Development conducted a literature review to determine potential capacities for the types of treatment systems that might be evaluated at the proposed facility and possible quantities of chemicals that might be released to the pollution control system. The results of this literature review were used to determine estimated feed rates to the pollution control system.

In the absence of specific information regarding removal efficiencies of various contaminants in the air pollution control system, the conservative assumptions were made that 99% of the organic substances would be removed and 98% of the inorganic substances would be removed. The actual removal efficiency of the pollution control system would depend on such factors as the specific equipment used, the size of the units, and the feed rate and composition. The removal efficiencies would need to be determined as part of compliance with the air permit issued by NJDEP.

The detailed design parameters of the proposed stack(s) would be included in the final detailed design of the proposed facility. These parameters would be chosen based on the results of air quality modeling and state and federal regulations and would be specified in the air permit issued by the State of New Jersey. Because these parameters were not known, realistic values had to be assumed. The assumed parameters are included in Appendix D with the description of the air quality modeling input parameters.

Release rates of substances to the environment were predicted based on the estimates of pollution control system feed rates (described above) and the conservative estimates of removal efficiencies.

All of the techniques described above for predicting the information necessary to conduct the risk assessment lead to the prediction of "worst-case" results. In other words, the results obtained should represent the worst potential health risks to which the public would be exposed on a day to day basis. In all likelihood, the actual health risks would be less than the risks predicted by this risk assessment.

E.1.2 Hazard Identification

The operational activities at the proposed E-TEC could potentially involve almost any of the substances identified as toxic or hazardous. It would be neither practical nor possible to conduct a risk assessment involving all of the chemicals that might be used on site. Instead, the recommended approach is to base the risk assessment on indicator chemicals. The selection of these chemicals is based on the following criteria: 1) the potential for the chemical to be found on-site in a significant quantity, 2) the physical and chemical properties of the chemical related to its environmental mobility and persistence, and 3) the toxicity of the chemical. No quantitative matrix was established to select these chemicals based on the criteria above; the selections were based on professional judgement and a qualitative review of the best available information. (This selection methodology is outlined in the EPA, Superfund Public Health Evaluation Manual, 1986). Table E-1 presents a list of the chemicals identified as indicator compounds for this study.

Table E-1

Indicator Chemicals Selected for Carcinogenic Health Effects

Arsenic	2,4-Dinitrotoluene
Benzene	Di-n-octyl phthalate
Benzidine	Hexachlorobenzene
Benzo(a)pyrene	Hexachloroethane
Beryllium	Methyl chloride
Bis(2-chloroethyl)ether	Methylene chloride
Cadmium	Nickel
Carbon tetrachloride	Polynuclear aromatic hydrocarbons (PAHs)
Chlordane	Polychlorinated biphenyls (PCBs)
Chloroform	2,3,7,8 - Tetrachlorodibenzodioxin (TCDD)
Chromium VI	1,1,2,2-Tetrachloroethane
Dichlorodiphenyltrichloro-ethane (DDT)	1,1,2-Trichloroethane
1,1-Dichloroethylene	Trichloroethylene (TCE)
Dieldrin	Vinyl chloride

E.1.3 Exposure Assessment

Following the identification of indicator chemicals, the potential exposure of the public to these chemicals must be assessed. In order to estimate exposure, the following procedure was used: 1) emission rates were estimated, 2) transport of contaminants was modeled, 3) maximum annual exposures were predicted, and 4) individual daily lifetime doses were calculated. In all cases, conservative assumptions were used to protect public health.

Potential emission rates of chemicals from the facility to the atmosphere were not known. Therefore, feed rates of contaminants to the air emission control system were estimated from the information compiled by ORD during a literature review of possible testing activities and quantities of chemicals that may be handled on-site. The feed rates were multiplied by conservative reduction efficiencies (99% for organics, 98% for inorganics) to obtain potential stack emission rates. Table E-2 presents those values. The actual reduction efficiency of the backup air pollution control equipment would have to be demonstrated to assure compliance with the NJDEP required air permit.

Table E-2

Stack Emission Rates for Indicator Chemicals

Chemical	Feed Rate (lb/hr)[1]	Removal Efficiency (%)	Stack Emissions (g/sec)
Arsenic	0.043	98	1.08 E-4*
Benzene	0.762	99	9.6 E-4
Benzidine	0.1	99	1.26 E-4
Benzo(a)pyrene	0.1	99	1.26 E-4
Bis(2-chloroethyl)ether	0.02	99	2.52 E-5
Beryllium	0.00002	98	5.04 E-8
Cadmium	0.003	98	7.56 E-6
Carbon tetrachloride	10.14	99	1.28 E-2
Chlordane	10.0	99	1.26 E-2
Chloroform	0.205	99	2.58 E-4
Chromium VI	0.002	98	5.04 E-6
1,1-Dichloroethylene	0.0005	99	6.30 E-7
Dieldrin	0.1	99	1.26 E-4
DDT	0.1	99	1.26 E-4
2,4-Dinitrotoluene	0.02	99	2.52 E-5
Di-n-octyl phthalate	0.02	99	2.52 E-5
Hexachlorobenzene	0.02	99	2.52 E-5
Hexachloroethane	0.02	99	2.52 E-5
Methyl chloride	0.001	99	1.26 E-6
Methylene chloride	46.4	99	5.85 E-2
Nickel	0.76	98	1.92 E-3
Polynuclear aromatic hydrocarbons (PAHs)	0.28	99	3.53 E-4
Polychlorinated biphenyls (PCBs)	5.0	99	6.3 E-3
2,3,7,8-TCDD	0.0048	99	6.05 E-6
1,1,2,2-Tetrachloroethane	0.0077	99	9.70 E-6
1,1,2-Trichloroethane	0.132	99	1.66 E-4
Trichloroethylene	8.6	99	1.08 E-2
Vinyl chloride	0.001	99	1.26 E-6

* Note: E = exponent (e.g., 1.08 E-4 represents 1.08×10^{-4}).

[1] Source: Air Permit Application to State of NJ for Proposed E-TEC.

The ISCLT dispersion model was used to predict the maximum exposure levels of the substances. (See Appendix D, Refined Modeling - Risk Assessment for a description of the modeling methodology). The model was run using a generic emission rate of 1 g/sec to determine the maximum average annual ground level concentration. The maximum average annual ground level concentration predicted with the 1 g/sec emission rate was 0.212 ug/m^3. However, this value assumes that the facility would operate for 365 days per year, 24 hours per day. ORD does not intend to operate the emissions systems for more than 250 days per year (5 days per week for 52 weeks minus 10 holidays). Therefore, the average value was multiplied by the factor 250/365 to account for the difference. The adjusted value was determined to be 0.145 ug/m^3. This adjusted value was then multiplied by each specific chemical's emission rate to determine maximum annual average exposure levels for each indicator compound.

The maximum exposure levels were then converted into average daily lifetime doses which are expressed as mg of chemical/kg of body weight/day. These doses represent the quantity of chemical the maximally exposed individual would breathe over the course of his/her lifetime (assumed to be 70 years). This hypothetical individual is assumed to be located at the receptor that would receive the highest concentration of contaminants over his entire lifetime. It is also assumed that the maximally exposed individual weighs 70 kg (154 lbs) and breathes 20 m^3/day of air (EPA, 1986b). The assumptions upon which the daily lifetime dose is based are conservative to be protective of public health. An example calculation for benzene is presented below.

$$\underset{(\text{mg/kg/day})}{\text{Average Daily Lifetime Dose}} = \underset{(\text{ug/m}^3)}{\text{Maximum Average Annual Exposure}} \times \frac{\text{mg}}{1000\ \text{ug}} \times \text{breathing rate} \times \frac{1}{\text{body weight}}$$

$$= (1.39 \times 10^{-4}\ \text{ug/m}^3)\left(\frac{\text{mg}}{1000\ \text{ug}}\right)(20\ \text{m}^3/\text{d})\left(\frac{1}{70\ \text{kg}}\right)$$

$$= 3.97 \times 10^{-8}\ \text{mg of benzene/kg of body weight/day}$$

Table E-3 presents maximum average annual exposure levels and average daily lifetime doses for the indicator chemicals.

Table E-3

Exposure and Dose Predictions for Indicator Chemicals

Chemical	Maximum Average Annual Exposure Level (ug/m^3)[1]	Average Daily Lifetime Dose (mg Chemical/ kg body weight/day)[2]
Arsenic	1.57 E-5	4.49 E-9
Benzene	1.39 E-4	3.97 E-8
Benzidine	1.83 E-5	5.23 E-9
Benzo(a)pyrene	1.83 E-5	5.23 E-9
Bis(2-chloroethyl)ether	3.66 E-6	1.05 E-9
Beryllium	7.32 E-9	2.09 E-12
Cadmium	1.10 E-6	3.14 E-10
Carbon tetrachloride	1.86 E-3	5.32 E-7
Chlordane	1.83 E-3	5.23 E-7
Chloroform	3.75 E-5	1.07 E-8
Chromium VI	7.32 E-7	2.09 E-10
1,1-Dichloroethylene	9.15 E-8	2.61 E-11
Dieldrin	1.83 E-5	5.23 E-9
DDT	1.83 E-5	5.23 E-9
2,4-Dinitrotoluene	3.66 E-6	1.05 E-9
Di-n-octyl phthalate	3.66 E-6	1.05 E-9
Hexachlorobenzene	3.66 E-6	1.05 E-9
Hexachloroethane	3.66 E-6	1.05 E-9
Methyl chloride	1.83 E-7	5.23 E-11
Methylene chloride	8.50 E-3	2.43 E-6
Nickel	2.79 E-4	7.97 E-8
Polynuclear aromatic hydrocarbons (PAHs)	5.13 E-5	1.47 E-8
Polychlorinated biphenyls (PCBs)	9.15 E-4	2.61 E-7
2,3,7,8-TCDD	8.78 E-7	2.51 E-10
1,1,2,2-Tetrachloroethane	1.41 E-6	4.03 E-10
1,1,2-Trichloroethane	2.41 E-5	6.89 E-9
Trichloroethylene	1.57 E-3	4.49 E-7
Vinyl chloride	1.83 E-7	5.23 E-11

[1] Annual values adjusted for 250 days of operation per year.

[2] Assuming an individual weighing 70 kg (154 lbs), breathing 20 m^3/d air located at the point of maximum impact (see Figure E-1).

E.1.4 Dose-Response Assessment

In evaluating the potential public health risks of long-term, low level releases of chemicals, it is necessary to focus on potential chronic toxicological effects. A chronic health effect of great concern is carcinogenesis; all of the chemicals identified as indicator chemicals are suspected carcinogens.

The evaluation of a chemical as a potential human carcinogen is a two step process that includes the classification of the chemical as a human carcinogen and the quantification of the potency of the carcinogen (EPA, 1986b). To evaluate a chemical's carcinogenic potential, the available scientific data is evaluated to determine the likelihood that the agent is a human carcinogen. The scientific evidence is characterized for human studies and, separately, for animal studies in terms of sufficient, limited, inadequate, no data, or evidence of no effect. The results of the two characterizations are combined, and based on the extent to which the agent has been shown to be a carcinogen in experimental animals, or humans, or both, the agent is given a provisional weight of evidence classification. The EPA scientists then adjust the provisional weight of evidence upwards or downwards, based on other supporting evidence of carcinogenicity (e.g., pharmacokinetics, structure-activity). The weight of evidence classification is defined as:

A - human carcinogen
B1 or B2 - probable human carcinogen
C - possible human carcinogen
D - not classifiable
E - evidence of non-carcinogenicity in humans

The weight of evidence classifications for the chemicals evaluated in this study are included in Table E-4.

Following the determination of the weight of evidence classification, the toxicity value that defines quantitatively the relationship between dose and response, the "slope factor", is calculated. To obtain the slope factor, the data points are fit to an appropriate model, usually the linearized multi-stage model, to generate a dose-response curve. The upper 95th percentile confidence limit of the slope of the dose-response curve, the slope factor, is then calculated. This slope factor represents a plausible estimate of the probability that a response would occur from a unit intake of a chemical over a lifetime. Because a 95% confidence limit was used, there would only be a 5% chance that the actual probability of a response per unit intake could be greater than the estimated slope factor and a 95% chance that the response per unit intake could be less than the estimated value.

Table E-4 summarizes the slope factors, route of exposure, and weight of evidence classification for the indicator compounds. Slope factors pertain to a specific route of exposure, either ingestion or inhalation, and can not be meaningfully interchanged (i.e., an oral slope factor should not be used to give an indication of the toxic effect due to inhalation of a chemical). The slope factors presented in the table are for the inhalation route, when available. In the absence of inhalation values, oral numbers are presented. However, it should be noted that in the risk characterization section, only those chemicals with specified inhalation carcinogenic slope factors were included.

E.1.5 Risk Characterization

The procedure for calculating the risk from chronic exposure to carcinogenic compounds is well established (USEPA 1987c). A non-threshold dose-response model is applied to the results of animal bioassay or human epidemiological studies to calculate a carcinogenic slope factor for each chemical. The slope factor is then multiplied by the estimated average daily lifetime dose experienced by the hypothetical maximally exposed individual to derive an estimate of risk.

The following equation is used to derive the quantitative risk from exposure to a chemical.

Table E-4

Toxicity of Indicator Chemicals

Chemical	Carcinogenic Slope Factor, (q_1*)[1] $(mg/kg/day)^{-1}$	Route of Exposure[2]	Weight of Evidence [3]
Arsenic	50.0	I	A
Benzene	2.9 E-2	I	A
Benzidine	2.3 E+2	I	A
Benzo(a)pyrene	ND		B2
Bis(2-chloroethyl)ether	1.1	I	B2
Beryllium oxide	7.0	I	B2
Cadmium	6.1	I	B1
Carbon tetrachloride	0.13	I	B2
Chlordane	1.3	I	B2
Chloroform	8.1 E-2	I	B2
Chromium VI[4]	41	I	A
1,1-Dichloroethylene	1.2	I	C
Dieldrin	20	I	B2
DDT	0.34	I	B2
2,4-Dinitrotoluene	0.31	0	B2
Di-n-octyl phthalate	ND		
Hexachlorobenzene	1.7	0	B2
Hexachloroethane	1.4 E-2	I	C
Methyl chloride[4]	6.32 E-3	I	C
Methylene chloride	1.4 E-2	I	B2
Nickel	0.84	I	A
Polycyclic aromatic hydrocarbons (PAHs)	ND		B2
Polychlorinated biphenyls (PCBs)	7.7	0	B2
2,3,7,8-TCDD	1.56 E+5	0	B2
1,1,2,2-Tetrachloroethane	0.2	I	C
1,1,2-Trichloroethane	5.7 E-2	I	C
Trichloroethylene[5]	1.1 E-2	I	B2
Vinyl chloride	2.3	I	A

[1] Carcinogenic slope factors represent upper-bound estimates (within 95% confidence estimate) of the slope of the dose - response curve. Slope factors are given for the inhalation route of exposure (I), when available. Values for the oral route of exposure, (O), are listed in the absence of inhalation data. When no information was available, the letters ND, not determined, were entered into the table. Source: EPA, 1989c and the Integrated Risk Information System (IRIS) unless otherwise noted.

[2] I = inhalation, O = oral. Indicates route of exposure to which the carcinogenic potency factor in the table corresponds.

[3] The classification system for carcinogens is outlined in the Guidelines for Carcinogen Risk Assessment (EPA, 1989c).

A = Human carcinogen

B1 = Probable human carcinogen, with limited evidence of carcinogenicity in humans

B2 = Probable human carcinogen, with sufficient evidence of carcinogenicity in animals but inadequate evidence of carcinogenicity in humans.

C = Possible human carcinogen

D = Not classified

[4] Source: EPA, 1986b

[5] Slope factor subject to change based on current EPA Carcinogen Risk Assessment Verification Endeavor (CRAVE) review.

$$R = D \times q_1^*$$

D = average daily lifetime dose in units of (mg/kg body weight/day)
q_1^* = carcinogenic slope factor in units of (mg/kg body weight/day)$^{-1}$

R is a probabilistic estimate of risk that ranges between 0 and 1. Its value represents the excess risk of developing cancer when exposed to a continuous, constant lifetime exposure, the magnitude of the average daily lifetime dose. Lifetime exposure is defined as 70 years.

The excess lifetime risk of developing cancer caused by a concurrent, continuous lifetime exposure can be characterized by summing the individual chemical lifetime cancer risks (EPA, 1987c, Guidelines for Carcinogen Risk Assessment). The following equation is used to calculate the risk from concurrent exposure.

$$R_T = \sum_{i=1}^{n} [D_i \times q_1{}^*{}_i]$$

D_i = average daily lifetime dose for chemical i
q_1^* = carcinogenic slope factor for chemical i.
R_T = excess lifetime risk from concurrent exposure to carcinogens

Table E-5 presents the average daily lifetime doses, slope factors and excess individual lifetime risk estimates for the indicator compounds. (The indicator compounds that currently do not have established inhalation potency factors were excluded from this table. These compounds included: Benzo(a)pyrene, 2,4-Dinitrotoluene, Di-n-octyl phthalate, hexachlorobenzene, PAH, PCB, and 2,3,7,8-TCDD). The table also presents an estimate of the increased cancer risk caused by concurrent exposure to all 21 indicator chemicals.

As shown in Table E-5, the potential individual risk estimates for exposure to each of the subject chemicals were in the range of 1×10^{-6} [A] to 3×10^{-13} [C]. The potential total risk estimate for exposure to all 21 compounds was calculated to be 2×10^{-6}.

Table E-5

Risk Characterization - Worst-Case Long-Term, Low Level Release

Chemical[1]	Average Daily Lifetime Dose (mg/kg/day)	Carcinogenic Slope Factor[2], q_1* $(mg/kg/day)^{-1}$	Excess Individual Lifetime Risk Estimates[3]
Arsenic	4.49 E-9	50.0	2 E-7 [A]
Benzene	3.97 E-8	2.9 E-2	1 E-9 [A]
Benzidine	5.23 E-9	2.3 E+2	1 E-6 [A]
Bis(2-chloroethyl)ether	1.05 E-9	1.1	1 E-9 [B2]
Beryllium	2.09 E-12	7.0	1 E-11 [B2]
Cadmium	3.14 E-10	6.1	2 E-9 [B1]
Carbon tetrachloride	5.32 E-7	0.13	7 E-8 [B2]
Chlordane	5.23 E-7	1.3	7 E-7 [B2]
Chloroform	1.07 E-8	8.1 E-2	9 E-10 [B2]
Chromium VI	2.09 E-10	41	9 E-9 [A]
1,1-Dichloroethylene	2.61 E-11	1.2	3 E-11 [C]
Dieldrin	5.23 E-9	20	1 E-7 [B2]
DDT	5.23 E-9	0.34	2 E-9 [B2]
Hexachloroethane	1.05 E-9	1.4 E-2	2 E-11 [C]
Methyl chloride	5.23 E-11	6.32 E-3	3 E-13 [C]
Methylene chloride	2.43 E-6	1.4 E-2	3 E-8 [B2]
Nickel	7.97 E-8	0.84	7 E-8 [A]
1,1,2,2-Tetrachloroethane	4.03 E-10	0.2	8 E-11 [C]
1,1,2-Trichloroethane	6.89 E-9	5.7 E-2	4 E-10 [C]
Trichloroethylene	4.49 E-7	1.1 E-2	5 E-9 [B2]
Vinyl chloride	5.23 E-11	2.3	1 E-10 [A]
Total			2 E-6

[1] The chemicals Benzo(a)pyrene, 2,4-Dinitrotoluene, Di-n-octyl phthalate, Hexachlorobenzene, PAH, PCB, and 2,3,7,8-TCDD were not included because an inhalation slope factor was not available.

[2] Source: EPA, 1989c (Chromium VI and Methyl Chloride potency factors were obtained from EPA, 1986b).

[3] Because of risk assessment uncertainties, only one significant digit should be reported with the risk estimate and the weight of evidence to classify the compound as a carcinogen should be reported with each estimate (EPA 1987c). Weight of evidence letters are reported in brackets following the estimate.

A = Human carcinogen.
B1 = Probable human carcinogen, limited evidence of carcinogenicity in humans.
B2 = Probable human carcinogen, sufficient evidence of carcinogenicity in animals but inadequate evidence of carcinogenicity in humans.
C = Possible human carcinogen.

The risk estimates presented thus far correspond to an individual's probability of contracting cancer due to continuous exposure to the average daily lifetime dose of a chemical. The risk estimates can also be interpreted as population cancer risks. For example, the potential individual risk of 1×10^{-6} can also be expressed as the probability that 1 person will contract cancer for every million people in the exposed population over a lifetime (70 year) exposure.

The risk calculations were based on the maximum impact concentration that the air modeling, conducted during the exposure assessment phase, predicted. The location of the predicted maximum impact concentration is shown on Figure E-1. The concentrations in the surrounding areas would be less than the maximum impact concentration and would result in a lower risk of developing cancer.

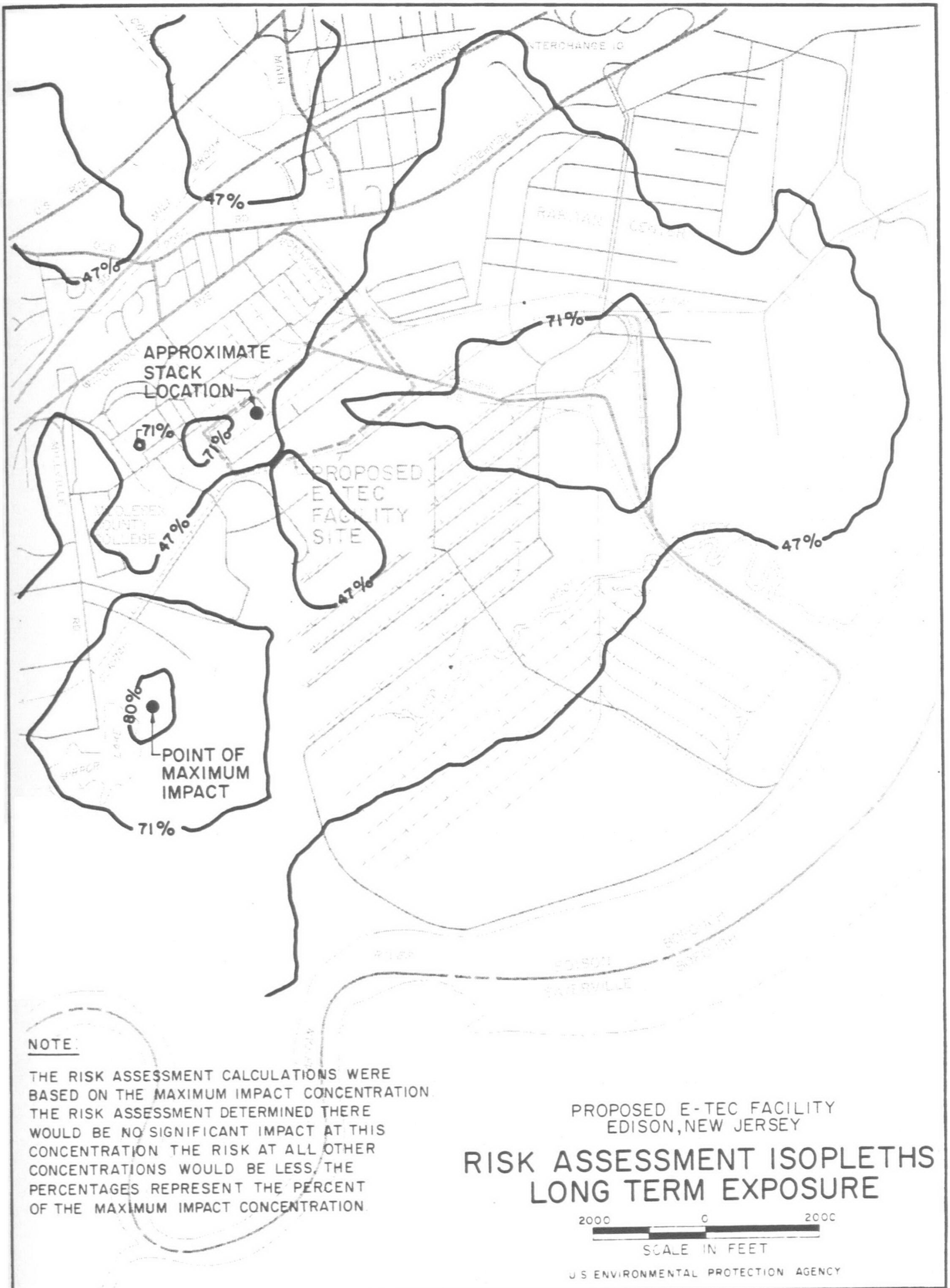
E.2 INTERPRETATION OF RESULTS

The numerical estimates of risk assessment must not be interpreted without also considering the assumptions and uncertainties on which the numbers were based. These assumptions include the following:

- The selection of indicator compounds as the focus of the public health assessment provided an adequate basis for characterizing the risks associated with the operation of the proposed E-TEC facility.

- The average daily lifetime dose was calculated for a maximally exposed individual who was assumed to be an adult weighing 70 kg (154 lbs) and breathing 20 m^3/d of air. This individual was also assumed to be breathing the maximum concentration of contaminants continuously over the course of his/her assumed 70 year lifetime.

- In conducting the air transport modeling used to determine maximum annual exposure, the subject chemicals were treated as conservative (i.e., no physical, biological or chemical transformation occurred).


47%
47%
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APPROXIMATE
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PROPOSED
E-TEC
FACILITY
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47%
47%
47%
80%
POINT OF
MAXIMUM
IMPACT
71%
INTERCHANGE 10
NOTE:
THE RISK ASSESSMENT CALCULATIONS WERE BASED ON THE MAXIMUM IMPACT CONCENTRATION. THE RISK ASSESSMENT DETERMINED THERE WOULD BE NO SIGNIFICANT IMPACT AT THIS CONCENTRATION. THE RISK AT ALL OTHER CONCENTRATIONS WOULD BE LESS. THE PERCENTAGES REPRESENT THE PERCENT OF THE MAXIMUM IMPACT CONCENTRATION.
PROPOSED E-TEC FACILITY
EDISON, NEW JERSEY
RISK ASSESSMENT ISOPLETHS
LONG TERM EXPOSURE
2000 0 2000
SCALE IN FEET
U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE E-1

- The removal efficiency of the air pollution control equipment was assumed to be 99% for organics and 98% for inorganics. The actual removal efficiency would need to be demonstrated to assure compliance with the required NJDEP air permit.

- In the absence of detailed design information, stack parameters were assumed.

- The quantity of chemicals released to the atmosphere was based on a literature review of the types of substances that could potentially be handled at the facility and the treatment methodologies that might be evaluated.

- Releases from the proposed E-TEC facility would be continuous and constant for 24 hours a day, 250 days per year.

- The carcinogenic potency factors published by the EPA were used to quantify chemical toxicity. Inherent in these numbers are numerous assumptions and uncertainties, such as the extrapolation from animal studies to humans or the extrapolation of data from one route of exposure to another. The potency factors are determined with the use of the linearized multistage model which results in a 95% confidence limit. It is anticipated that the actual risks could be at this level or less.

- The effects of exposure to multiple carcinogens were assumed to be additive. No specific interactions between chemicals were considered.

The assumptions discussed above and the limitations in the available data necessitate the use of a "worst case" type of approach to the risk assessment. If the worst case approach demonstrates that the risks to human health would be acceptable, no further evaluation is required.

Because there is no threshold of exposure to carcinogens below which there would be no risk of cancer, the potential risks must be minimized. The EPA considers the range of risks of 10^{-4} to 10^{-7} to be acceptable when evaluating clean-up alternatives in the Superfund program (EPA 1986b). Other governmental agencies, such as OSHA, FDA and the NRC suggest acceptable risks of 10^{-3}, 10^{-6}, and $5x10^{-3}$ respectively (Hallenbeck, et. al., 1986). The maximum estimated potential risk related to exposure to specific chemicals resulting from the daily operational activities at the proposed E-TEC facility of 1×10^{-6} [A] and the maximum estimated risk of concurrent exposure to all the indicator compounds of 2×10^{-6} fall within the ranges of acceptable risks presented above.

To provide a context in which to evaluate the 1×10^{-6} maximum individual chemical risk, Table E-6 presents other activities that would result in a 1×10^{-6} risk.

Table E-6

Activities Resulting in 1×10^{-6} Cancer Risk[1]

Source of Risk	Example of Exposure
Cosmic Rays	One transcontinental round trip by air Living 1.5 months in Colorado compared to New York. Camping at 15,000 feet for 6 days compared to sea level.
Other Radiation	20 days of sea level natural background radiation. 2.5 months working in masonry rather than wood building. 1/7 of a chest x-ray with modern equipment.
Eating and Drinking	40 diet sodas with saccharin. 6 lbs. of peanut butter. 180 pints of milk. 200 gallons of drinking water from Miami or New Orleans. 90 lbs. of broiled steak
Smoking	2 cigarettes.

[1] Source: Crouch and Wilson (1982).

APPENDIX F

APPENDIX F

RISK ASSESSMENT - CATASTROPHIC RELEASE

F.1 HEALTH IMPACT ASSESSMENT - CATASTROPHIC RELEASE

In addition to assessing the potential risks of long-term, low level releases of chemicals, it is necessary to evaluate the potential risks that would be caused by a catastrophic release, such as a fire. A catastrophic release is by definition, a low probability event that would result in a short-term, high level release of chemicals. It should be understood that management controls would be in place to ensure that, in the event of a fire, emissions from the facility would not exceed the threshold value (the level below which no irreversible adverse health effects would be expected to occur). Among these management controls would be restrictions on the amount of a given toxic substance that could be stored in the facility at a particular concentration.

The catastrophic release scenario evaluated in this document involves the following improbable series of events: The natural gas line feeding the facility springs a leak. The concentration of gas builds up to sufficient levels such that a spark in the building causes a fire. The heat of the fire causes all stored chemicals to enter the air. The entrained chemicals then exit the facility through the ventilation stacks in the roof, over the course of an hour.

To evaluate the risks associated with such a catastrophic release, the following items must be determined or estimated.

1. The total quantity of chemicals stored in the building.

2. The rate at which chemicals would exit the building.

3. The details of the exit of the chemicals from the facility.

4. The acute toxicity of chemicals emitted from the facility.

The method of estimating each of these items is discussed in detail in this Appendix.

F.1.1 Hazard Indentification

Indicator chemicals formed the basis of this risk assessment, similar to the case of the chronic exposure risk assessment. The chemicals were selected based on the following criteria: 1) the potential for the chemical to be found in the building in a significant quantity, 2) the physical and chemical properties of the chemical related to its environmental mobility and persistence, and 3) the potential for the released chemical to cause acute health effects in the exposed population. The selected chemicals are presented in Table F-1.

Table F-1

Indicator Chemicals Selected for Potential Acute Health Effects

Benzene	2,4-Dinitrotoluene
Beryllium	Methyl chloride
Cadmium	Methylene chloride
Carbon tetrachloride	PCBs
Chlordane	Trichloroethylene
Chromium VI	Vinyl chloride

F.1.2 Dose - Response Assessment

Unlike chronic exposure to carcinogens, there is an assumed threshold value or toxicity limit associated with acute, non-carcinogenic health effects, below which no irreversible, adverse health effects would be anticipated. To assess potential acute health risks, therefore, the acute toxicity limit associated with each chemical has to be obtained. Acute health effects are defined as being the result of a short-term exposure, on the order of less than a day.

The toxicity limits of choice would ideally be Reference Doses (RfD) for acute toxicity via the inhalation route of exposure. A limited number of inhalation chronic and subchronic (less than a lifetime exposure) RfDs have been developed but none are available for the subject chemicals (Personal Communication, EPA Risk Assessment Personnel).

In lieu of appropriate acute RfD values and in consideration of the fact that the anticipated exposure would be on the order of hours and not days or weeks, the ACGIH short-term exposure limits (STELs) were chosen as the toxicity limits. The STEL is defined as a 15-minute time weighted average exposure which should not be exceeded at any time during the work day. Exposures at the STEL level should be no longer than 15 minutes and should not be repeated more than 4 times in an 8 hour day with at least an hour between exposures (ACGIH, 1988). Not all chemicals have an established STEL. As a substitute, the threshold limit value time weighted average (TLV-TWA) was selected. The TLV-TWA is defined as the time-weighted average concentration to which nearly all workers can be repeatedly exposed, for a normal 8-hour work day and a 40-hour work week without adverse effect (ACGIH, 1988).

The ACGIH did not establish these values to represent acute toxicity limits and the numbers were developed for populations of healthy workers and not the varying population at large. These limitations are acknowledged in this EIS, but the values are used due to the lack of more appropriate data. To account for some of the uncertainty in using the STEL and TLV-TWA values, a safety factor of 10 has been applied. The EPA uses a value of 10 to account for the variation in sensitivity among humans (i.e., the safety factor provides extra protection of sensitive groups, including children, elderly and unhealthy workers) (Dourson and Stara, 1983).

Table F-2 lists the toxicity limit used for each indicator compound. When available, the STEL was preferentially chosen over the TLV-TWA. A safety factor of 10 was applied to each value to account for variations in sensitivity among humans.

Table F-2

Toxicity Limits for Indicator Chemicals[1]

Chemical	STEL[2] (mg/m^3)	TLV-TWA[3] (mg/m^3)	Acute Toxicity Limit[4] (ug/m^3)
Benzene		30	3,000
Beryllium		0.002	0.2
Cadmium		0.05	5
Carbon tetrachloride		30	3,000
Chlordane		0.5	50
Chromium VI		0.05	5
2,4-Dinitrotoluene		1.5	150
Methyl chloride	205		20,500
Methylene chloride		175	17,500
Polychlorinated biphenyls (PCBs)		0.5-1	75*
Trichloroethylene	1,080		108,000
Vinyl chloride		10	1,000

1 Source: ACGIH, 1988.

2 STEL = Short-term exposure limit = value not to be exceeded for greater than 15 minutes 4 times daily with at least 60 minutes between successive exposures at the STEL.

3 TLV-TWA = Threshold Limit Value - Time Weighted Average = the time weighted average for a normal 8 hour workday, 40 hours a week to which workers can be exposed repeatedly without adverse effect.

4 Safety factor of 10 was applied to account for variation in sensitivity among humans.

* Average value for PCB's.

F.1.3 Exposure Assessment - Catastrophic Release

The exposure assessment involves two major components - the determination of the release rates associated with an explosion and the application of an atmospheric transport model to estimate ambient exposure levels of the subject compounds.

For the catastrophic release scenario, it was assumed that the total quantity of chemicals stored in the building would be released to the atmosphere. The first step of the exposure assessment involved determining what the maximum quantity of each chemical would be.

The proposed E-TEC facility would store contaminated liquids and solids for testing activities. For the purposes of the EIS, liquids were assumed to be contaminated surface or ground water and solids were assumed to be contaminated soils. The proposed storage levels are 5000 gallons of liquid and 70 tons of solids.

The quantity of chemicals stored in the building, which is a major component of the risk calculation, is determined by the combination of the concentration of chemical(s) in storage and the quantity of contaminated material. The overall storage capacity of the facility itself is not the important factor because some storage space could be used for the containment of uncontaminated solids or liquids. The 5,000 gallon liquid and 70 ton solid storage levels represent preliminary design estimates but the facility would likely have additional capacity. However, the amount of total chemical in the building would not exceed the quantities indicated as posing a potential health threat if a catastrophic event were to occur. These limitations in the quantity of material stored in the building would be specified in the operations plan of the proposed facility.

To conduct a worst case analysis, it was assumed that each indicator chemical would be found at its maximum anticipated concentration in each of the storage tanks, both solid and liquid. Only a portion of the total quantity of chemicals stored in the building would be available to volatilize and become entrained in the air. The available portion was assumed to be 100%

of the chemicals contained in liquid storage, 100% of the chemicals contained in the liquid portion of the stored soils and 0% of the chemicals contained in the solid portion of the stored soils. (Soils consist of two fractions - solid soil particles and void spaces. The void spaces of natural soils are generally filled at least partially with water. In this study, the water in these void spaces was considered to constitute 25% of the total soil quantity).

Chemicals have preferences for either the water in the soil or the soil itself and each chemical would be expected to be found in a higher concentration in one than the other. However, to simplify the analysis, it was assumed that the concentration of chemicals in the liquid portion of the stored soils would be equivalent to the maximum concentration anticipated. The total quantity of chemicals in the building could then be determined by multiplying the maximum anticipated concentration by the total quantity of liquid stored in the building (the liquid storage + liquid portion of solid storage). The calculation of the total liquid stored in the building is presented in Table F-3.

Table F-4 shows the maximum anticipated concentration of each chemical (determined by ORD through literature survey and past experience) and the total quantity that could be contained in the building in the liquid phase.

For the purposes of air modeling, it was assumed that the total stored quantity of chemicals was released over a one hour period. Therefore, to obtain emission rates, the stored quantity was divided by 3,600 seconds (see Table F-4). No physical or chemical transformations were assumed to occur in the atmosphere following the release.

The air dispersion modeling for the short-term release was conducted using the ISCST model. A description of the ISCST model and a description of the procedures used in conducting this modeling are contained in Appendix D. The model was used to estimate maximum one hour ground level concentrations.

The roofs of the T and E bays are equipped with ventilation fans 3 feet in diameter with discharge stacks, of the same diameter, located directly

Table F-3

Calculation of Total Quantity of Contaminated Liquid On-Site

A. Total Contaminated Liquid On Site = contaminated liquid storage + contaminated liquid in soil

B. Contaminated Liquid Storage = 5,000 gal

C. Contaminated Liquid in Soil Storage

Contaminated Liquid in Soil = (wgt. of soils) x (bulk density) x (water content)

Total weight of soil = 70 T
Average bulk density of soil[a] = 1.4 g/cm^3
Average water content of soil[b] = 25%

$$\text{Contaminated Liquid in Soil} = (70\ T)\times\left(\frac{2{,}000\ lb}{Ton}\right)\times\left(\frac{452\ g}{lb}\right)\times\left(\frac{cm^3}{1.4g}\right)\times\left(\frac{m^3}{(100\ cm)^3}\right)\times\left(\frac{264.2\ gal}{m^3}\right)\times(0.25)$$

= 2,990 gal.

Liters = (2,990 gal) (3.785 L/gal) = 11,317 L

use 11,300 liters (L)

D. Total Contaminated Liquid in Storage = (5,000 gal) (3.785 L/gal) + 11,300 L

= 18,900 L + 11,300 L

= 30,200 L

use 30,000 L

---

[a] Source: USDA, 1982.

[b] Source: Lindsay, 1979.

Table F-4

Catastrophic Release Exposure Assessment

Chemical	Maximum Concentration[1] (ppm)	Maximum Total Quantity On-Site (g)	Emission Rate (g/s)
Benzene	762	22,860	6.3
Beryllium	0.02	0.6	1.7 E-4
Cadmium	3	90	2.5 E-2
Carbon tetrachloride	10,140	304,200	85
Chlordane	10,000	300,000	83
Chromium VI	2	60	1.7 E-2
2,4-Dinitrotoluene	20	600	0.17
Methyl chloride	1	30	8.3 E-3
Methylene chloride	46,400	1,392,000	390
Polychlorinated biphenyls (PCBs)	5,000	150,000	42
Trichloroethylene	8,600	258,000	72
Vinyl chloride	1	30	8.3 E-3

[1] Source: Air Permit Application to the State of New Jersey, 1989.

above each fan. It was assumed that the entrained chemicals would exit the facility through these ventilation ports. It was further assumed that the ventilation fans would not be operating during the release because the fire could cause a loss of electricity.

The fire was assumed to cause the temperature in the building to rise to 1000°K (730°C). This value was chosen because it was necessary to have a temperature great enough to volatilize the least volatile chemical chosen in the analysis. This increased temperature would cause the pressure to rise inside the building and the evaporation of the liquid storage tank. The additional gas from the evaporation would also cause an increase in the pressure.

The pressure gradient created between atmospheric pressure outside the building and increased pressure above atmospheric inside the building would cause a rapid discharge of gas from the building through the ventilation ports. To determine the discharge rate, the pressure inside the building was calculated using the ideal gas law relationships. The volumetric flow rate was then determined by dividing the quantity of pressure that had to be released by the time period of the event (1 hour). The calculations used in this detrmination are presented in Tables F-5 and F-6. The volumetric flow rate per fan was determined to be 10.8 m^3/S, with a corresponding velocity of 16.5 m/s.

The maximum hourly ground level concentration predicted using the ISCST model and the input data described above was 12.44 ug/m^3 with a 1 g/s "generic" emission rate. This concentration occurred 1.86 miles away from the proposed facility. No direction can be associated with the maximum impact distance because the direction would be dependent upon the wind direction at the time of the catastrophic release.

F.1.4 Risk Characterization - Catastrophic Release

Characterization of noncarcinogenic risks of exposure to toxicants is accomplished by comparing estimated exposure levels to a selected acceptable toxicity limit or threshold value for the compound under consideration (USEPA 1987c). This method, often referred to as the quotient method, is based on

Table F-5

Calculation of Pressure Increase

A. Condition #1 - building prior to fire

$V = 1,080,000\ ft^3$

$T_1 = 77°F = 536.7°R$

$P_1 = 1\ atm$

n_1 = number of moles air in building before release

@ 1 atm & 32°F, air occupies 359 ft^3/lb mol

$n_1 = V/[359\ ft^3/lb\ mol\ (T_{77°}/T_{32°F})]$

$n_1 = 1,080,000\ ft^3/[359\ ft^3/lb\ mol\ (536.7°R/491.7°R)]$

$n_1 = 2,756$ lb mol air

B. Condition # 2 - building during fire

$T_2 = 1000°K = 1800°R$

$P_2 = ?$

$N_2 = n_1 + n_e$ (evaporated tank water)

assume MW of tank = MW of H_2O = 18 lb/mol

5,000 gal. of water = (5,000 gal) (8.34 lb/gal)

= 41,700 lb

n_e = 41,700 lb/18 lb/mol = 2317 lb mol

Total $n = n_2 = n_1 + n_e = 2756 + 2317$

= 5,073 lb mol

C. Pressure Calculation @ Condition #2

$P_1V_1/n_1RT_1 = P_2V_2/n_2RT_2$

$V_1 = V_2$, R = constant

$P_1/n_1T_1 = P_2/n_2T_2 \dashrightarrow P_2 = P_1\ (n_2/n_1)\ (T_2/T_1)$

$P_2 = (1\ atm)\ (1000°K/298°K)\ (5073/2756)$

= 6.2 atm

Table F-6

Calculation of Volumetric Flow Rates

A. Total Volumetric Flow Rate

Total Pressure = 6.2 atm

Must leave 1 atm in building to satisfy equilibrium

Need to evacuate: 6.2 atm - 1 atm = 5.2 atm

Assume catastrophic release occurs over 1 hour

5.2 atm/3600 sec. = 0.0014 atm/sec

1 atm = 1,080,000 ft^3 = 30,586 m^3

0.0014 atm/sec (30,586 m^3/atm) =

43 m^3/sec must be evacuated

B. Volumetric flow rate per fan

4 fan ducts

flow rate per fan = 43 m^3/sec/4 fans = 10.8 m^3/s/fan

C. Velocity

Diameter of each duct = 3 ft = 0.914m

Area of 1 fan = 0.656 m^2

Velocity = 10.8 m^3/s/0.656m^2 = 16.5 m/s the assumption that, for noncarcinogenic effects, there is a threshold exposure level below which adverse toxicological effects are not anticipated to occur. Risk of noncarcinogenic effects is characterized as follows:

$$R = E/RfD$$

E = expected exposure

RfD = Inhalation Reference Dose.

The factor R is not a probabilistic estimate of the likelihood of adverse health effects (as is the case for the assessment of carcinogens). In this case, the value of R will vary from <1 to >1. If R is >1, then adverse health effects in exposed receptor groups may be anticipated. The magnitude of the risk numbers (i.e., how far above or below 1) is not a component of this type of risk characterization. (The magnitude of the number above 1 is not used to assess the health impacts to the exposed population.) It is important to recognize that, depending upon the selection of the acceptable limits, risk characterization using the equation above may be used to evaluate a full spectrum of health effects ranging from eye/throat irritation, to central nervous system effects, to mortality.

In this assessment, conservative toxicity limits were selected; as discussed in the section on toxicity assessment, STEL or TLV-TWA values were chosen. These threshold values, when exceeded for a short period of time, would be associated with minor, reversible health effects in exposed individuals -- for example, eye, nose, or throat irritation, dizziness, mild nausea. These limits should thus be considered "trigger levels" indicating concern for potential adverse effects at higher concentrations.

Table F-7 presents a list of the indicator chemicals, the associated maximum one hour exposure levels, acute toxicity endpoints and risk characterization. As shown on the table two of the chemicals had risk numbers greater than one, chlordane and PCBs. The significance of this finding will be discussed in the next section, Interpretation of Results - Catastrophic Release.

Table F-7

Risk Characterization - Catastrophic Release

Chemical	Maximum One-Hour Exposure Level (ug/m^3)	Acute Toxicity Endpoint[1] (ug/m^3)	Risk Characterization (Exposure/Toxicity)	Exceeds Toxicity Limit
Benzene	78.7	3,000	0.03	No
Beryllium	2.1 E-3	0.2	<0.01	No
Cadmium	0.31	5	0.06	No
Carbon tetrachloride	1,057	3,000	0.35	No
Chlordane	1,032	50	21	Yes
Chromium VI	0.21	5	0.04	No
2,4-Dinitrotoluene	2.10	150	0.01	No
Methyl chloride	0.10	20,500	<0.01	No
Methylene chloride	4.9 E3	17,500	0.28	No
Polychlorinated biphenyls (PCBs)	522	75	7	Yes
Trichloroethylene (TCE)	896	108,000	<0.01	No
Vinyl chloride	0.10	1,000	<0.01	No

[1] Source: ACGIH, 1988 (See Table F-2).

F.2 INTERPRETATION OF RESULTS - CATASTROPHIC RELEASE

For 10 of the 12 indicator compounds evaluated, it was determined that no adverse irreversible public health effects would be expected. For these chemicals, the risks are considered acceptable. However, for 2 of the chemicals, chlordane and PCBs, it was determined that there could be adverse health effects due to the catastrophic release.

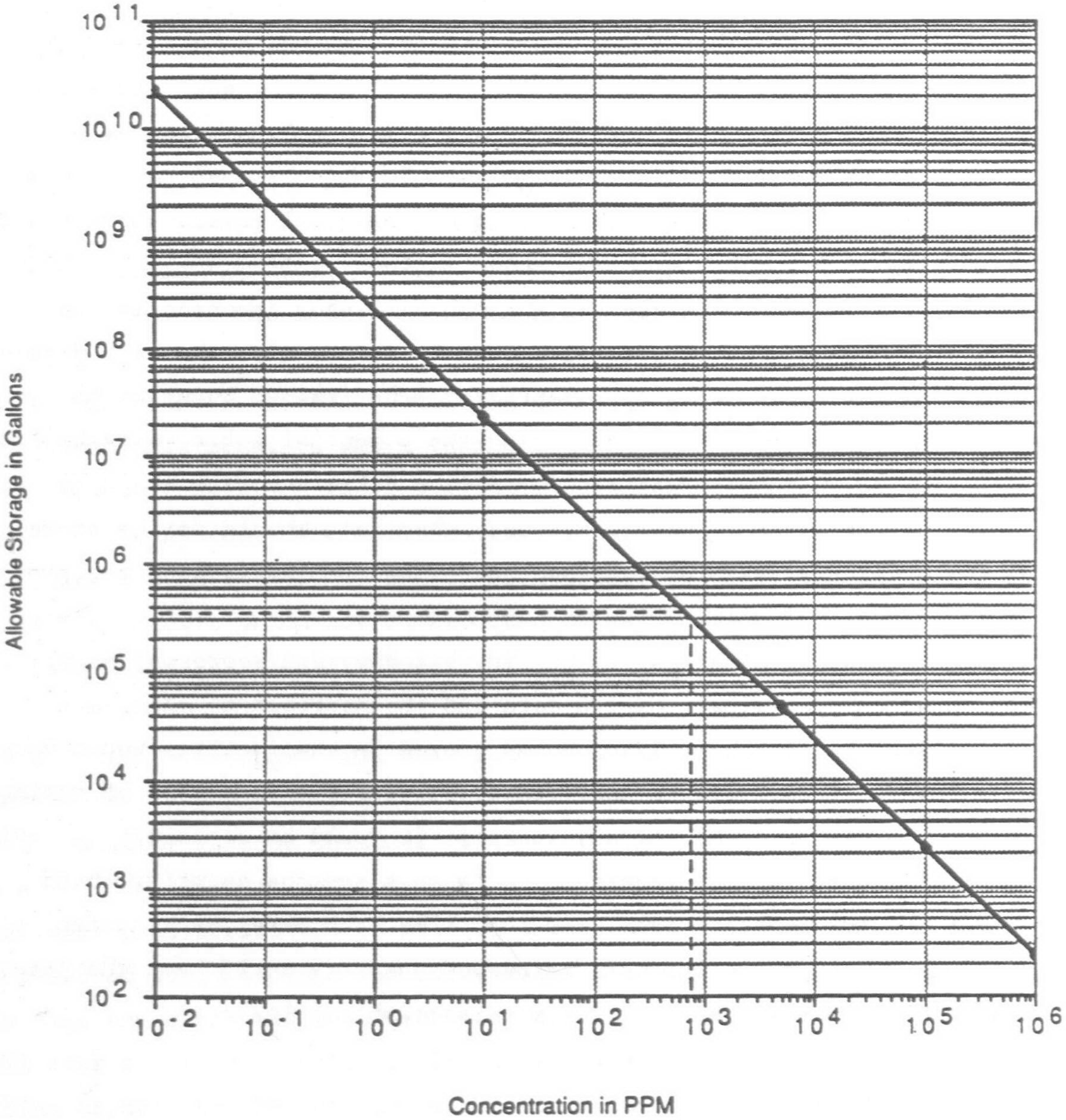
It is important to remember that the risk assessment was based on an absolute worst case scenario which considered all chemicals to be stored at their maximum concentration in each of the storage vessels. This is a very conservative assumption. The tests that would be conducted at the facility would require a wide variety of inputs with different chemical compositions, so specific chemicals would not be expected to be found in each and every storage vessel and not necessarily at their maximum concentrations.

In addition, the assumption that all chemicals stored on-site would be released to the atmosphere is unrealistic. In actuality, only a fraction of the total quantity of each chemical found in the liquid phase would volatilize to the air. The fraction would depend on the temperature inside the building and the vapor pressure of the chemical. The quantity of chemicals in the liquid phase of solid storage was overestimated also. In this study, it was assumed that the chemicals would show no preference for the solid portion of the soil over the liquid portion. In actuality many chemicals, including PCBs, bind tightly to the soil and would be found at much lower concentrations in the liquid portion of the soil than the solid. Therefore, the quantity that would be available to volatilize would be much lower than the study suggests.

It was intended that the catastrophic release scenario be conducted based on an absolute worst case approach to provide a large margin of safety for the public. Therefore, to continue to provide this margin of safety, it would be necessary to institute management controls to limit storage within the buildings to levels that would not cause adverse health effects.

Because the total quantity of chemicals on-site would be dependent on both the concentration of the chemical in storage and the quantity stored, the management control plan would have to incorporate both of these parameters. At low concentrations, a relatively high quantity of chemical could be stored within the existing buildings without causing potential adverse health effects in a catastrophic release. At high concentrations, only a small quantity could be safely stored. Figures F-1 through F-12 show graphically the relationship between concentration and quantity stored for the 12 indicator chemicals. The line on the graphs represents the maximum quantity that could be stored within the buildings to prevent the potential for adverse health impacts. Any concentration/gallon combination below the line would not be expected to cause adverse health effects. Chemicals should not be stored inside the buildings at levels that would fall above the line on the graphs.

The indicator chemicals discussed in this appendix represent example results based on preliminary design data and the approach to management controls. The actual chemicals used and stored in the facility would vary depending on the nature of the research activities. At the time of review of a work plan for a new technology evaluation, it would be necessary to review the chemicals that would be required in the test and the quantity (both concentration and amount) needed. At that time, the management control plan would be used to evaluate whether the needed quantity would have the potential to cause adverse health impacts from a catastrophic release.



NOTE:

THE MAXIMUM EXPECTED CONCENTRATION OF BENZENE = 762 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE).

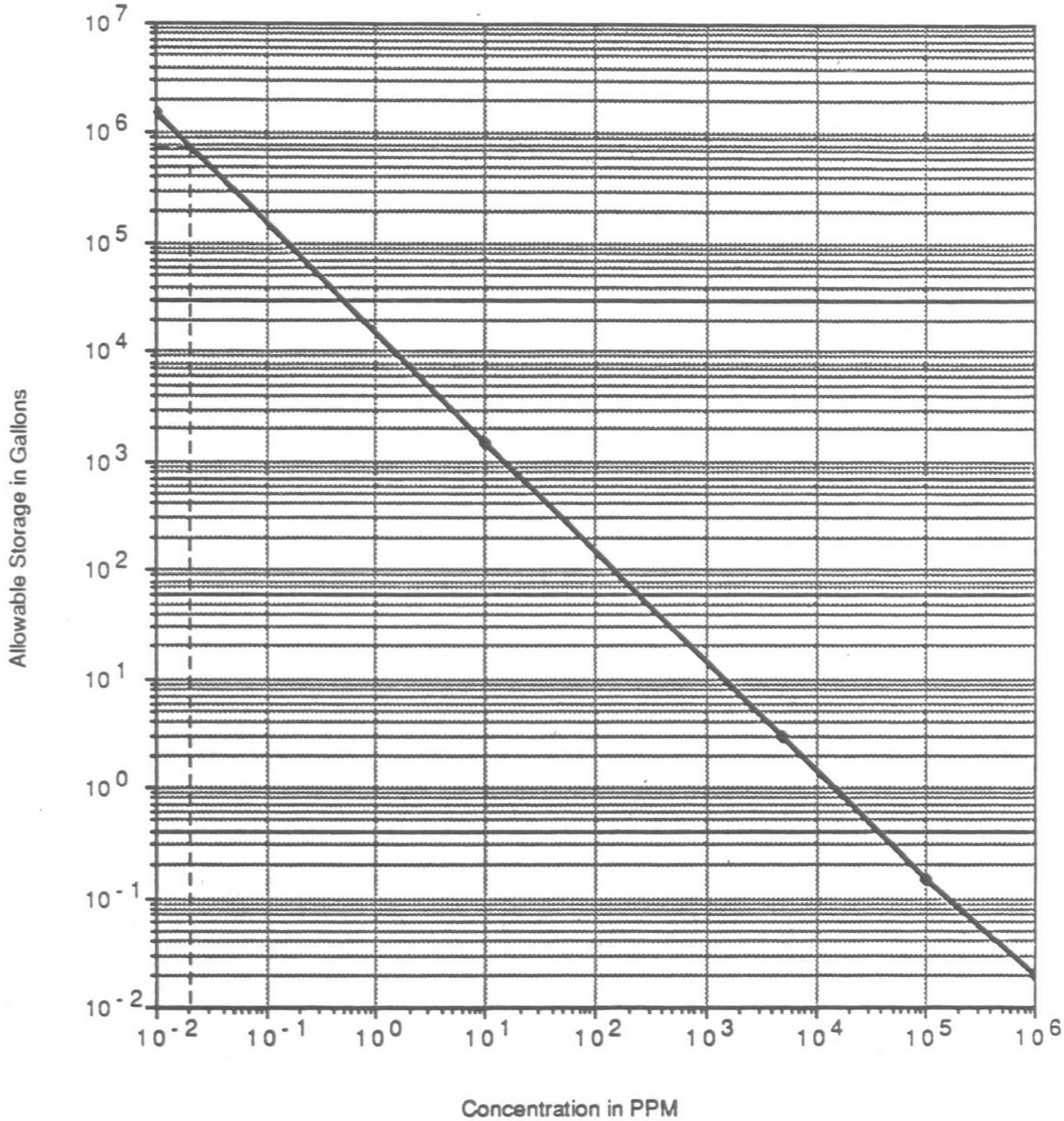
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

BENZENE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F - 1



NOTE:

THE MAXIMUM EXPECTED CONCENTRATION OF BERYLLIUM = 0.02 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE).

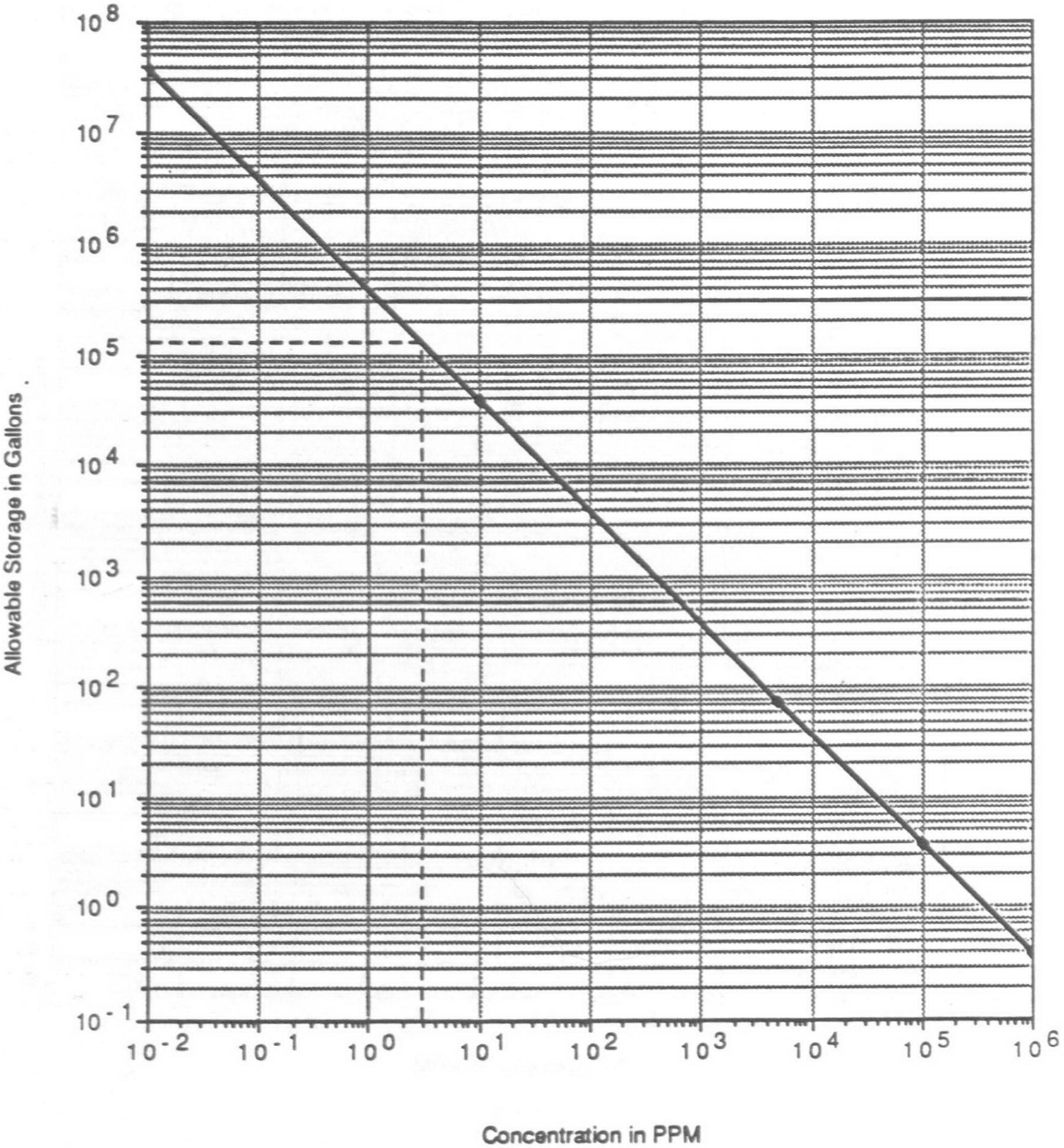
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

BERYLLIUM

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F-2



NOTE:

THE MAXIMUM EXPECTED CONCENTRATION OF CADMIUM = 3 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE).

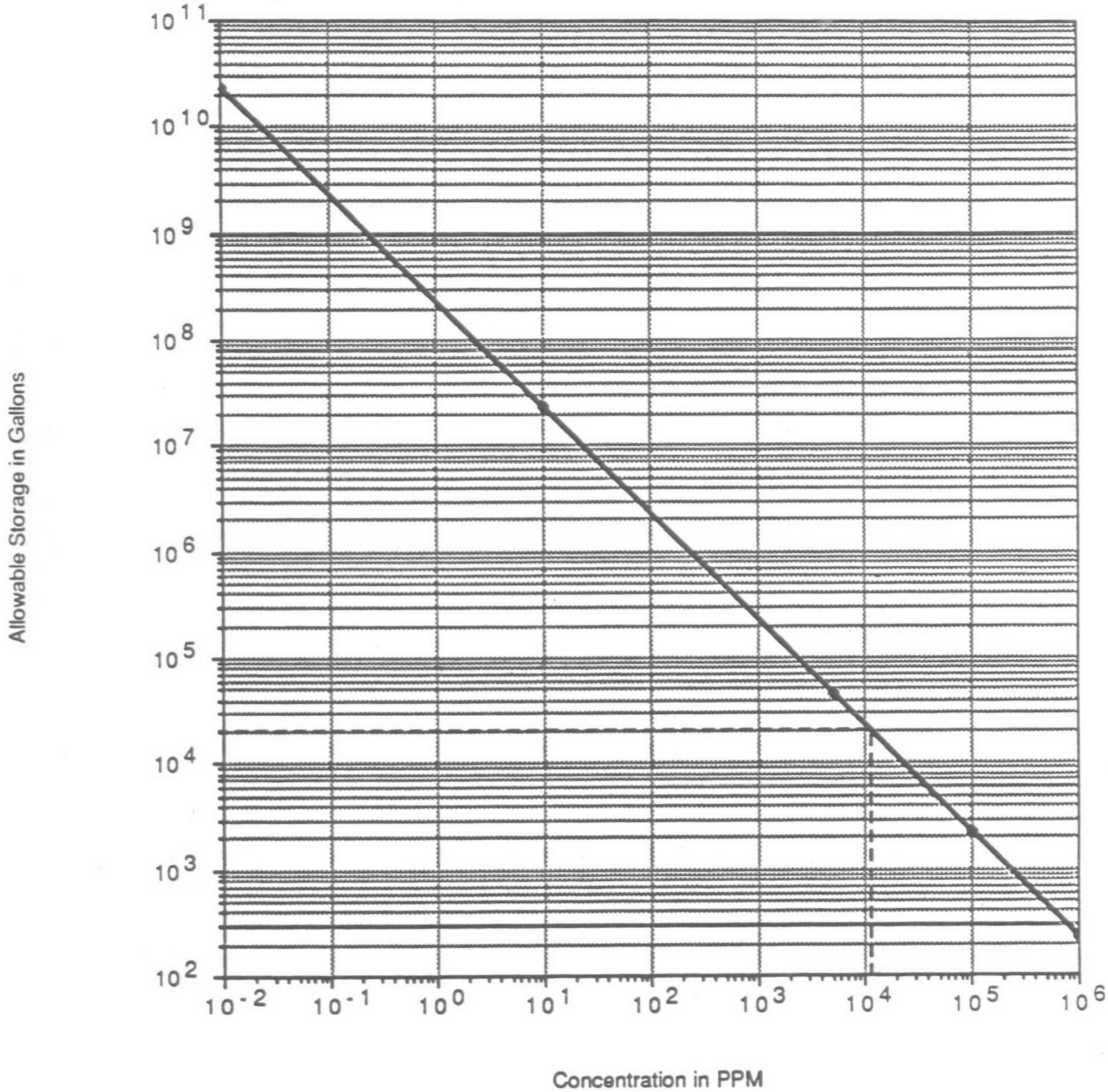
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

CADMIUM

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F-3



NOTE:

THE MAXIMUM EXPECTED CONCENTRATION OF CARBON TETRACHLORIDE = 10,140 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE.)

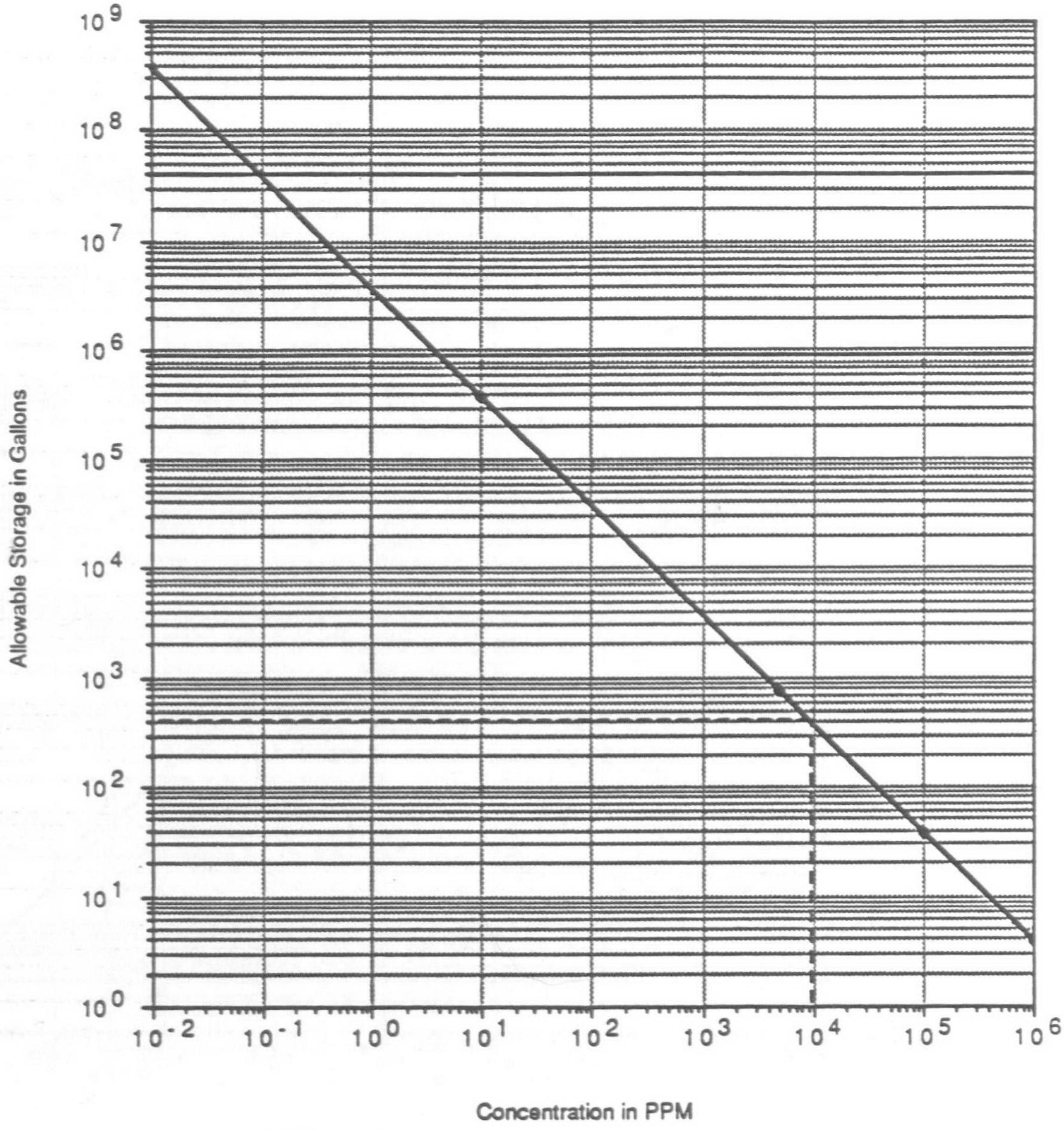
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

CARBON TETRACHLORIDE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F-4



NOTE:
THE MAXIMUM EXPECTED CONCENTRATION OF CHLORDANE = 10,000 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE).

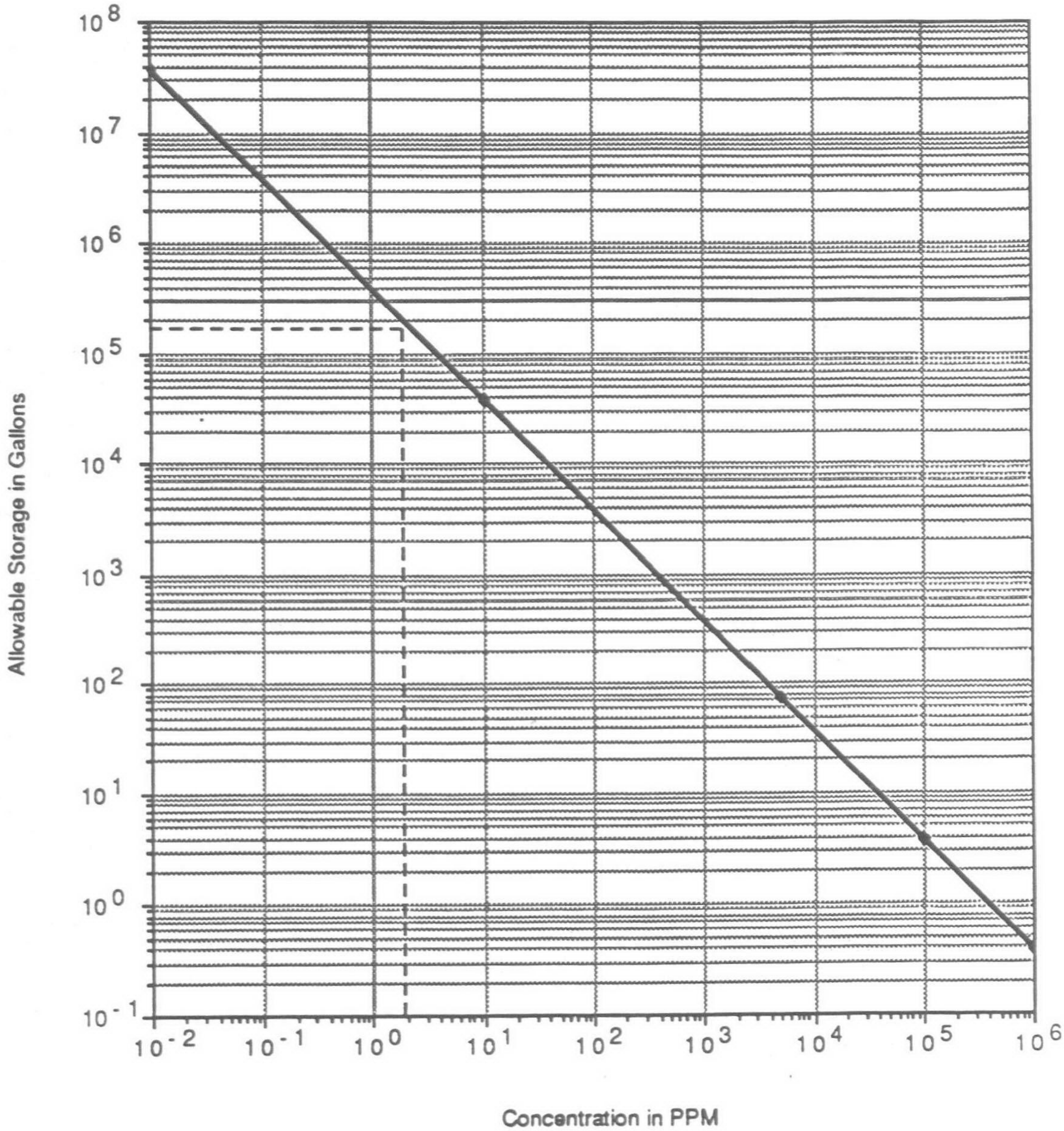
PROPOSED E-TEC STORAGE
VOLUME AND CONCENTRATION
CAPACITIES

CHLORDANE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F - 5



NOTE:
THE MAXIMUM EXPECTED CONCENTRATION OF CHROMIUM VI = 2 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE).

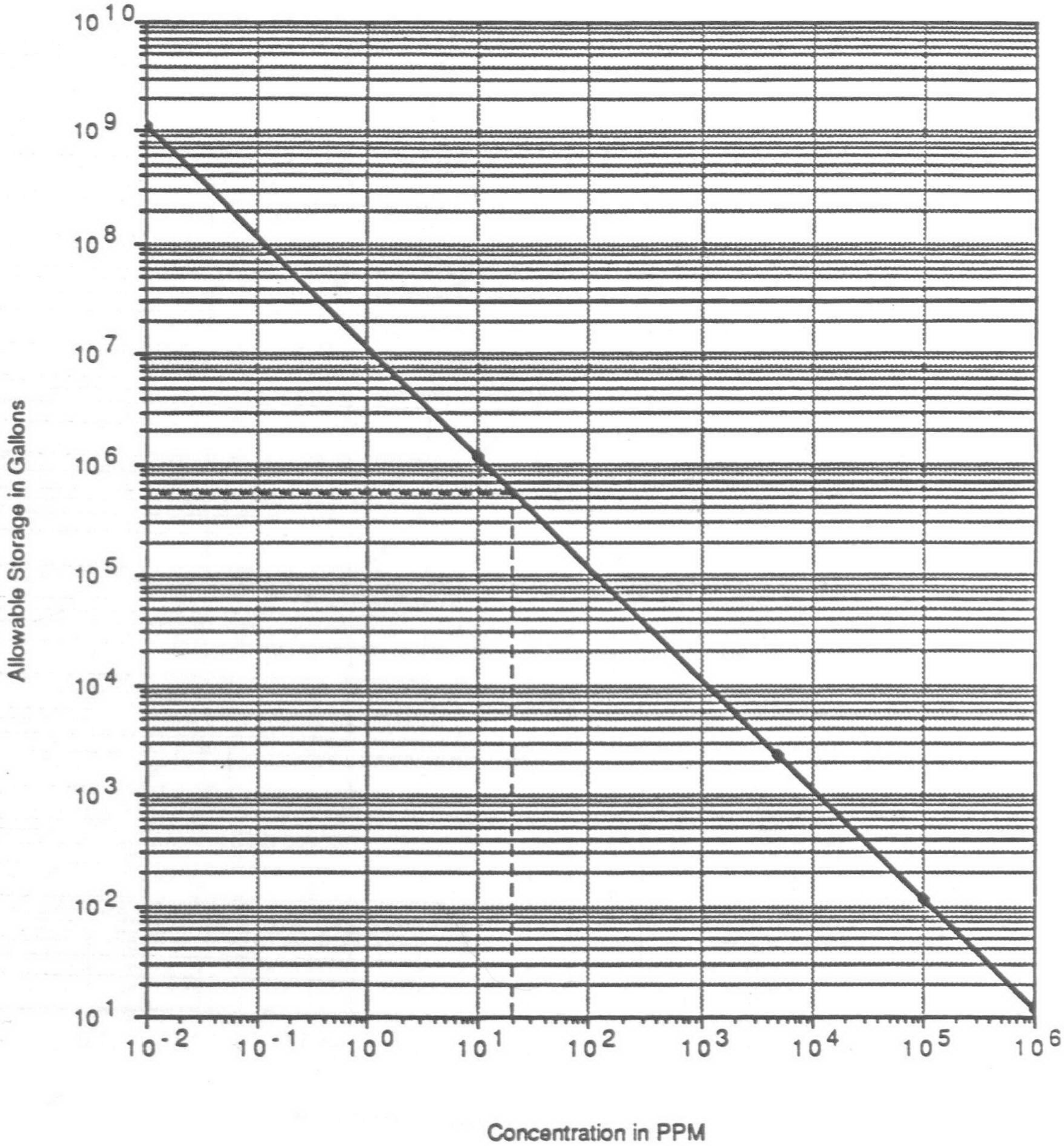
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

CHROMIUM VI

U.S ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F - 6



NOTE:

THE MAXIMUM EXPECTED CONCENTRATION OF 2,4-DINITROTOLUENE = 20 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE.)

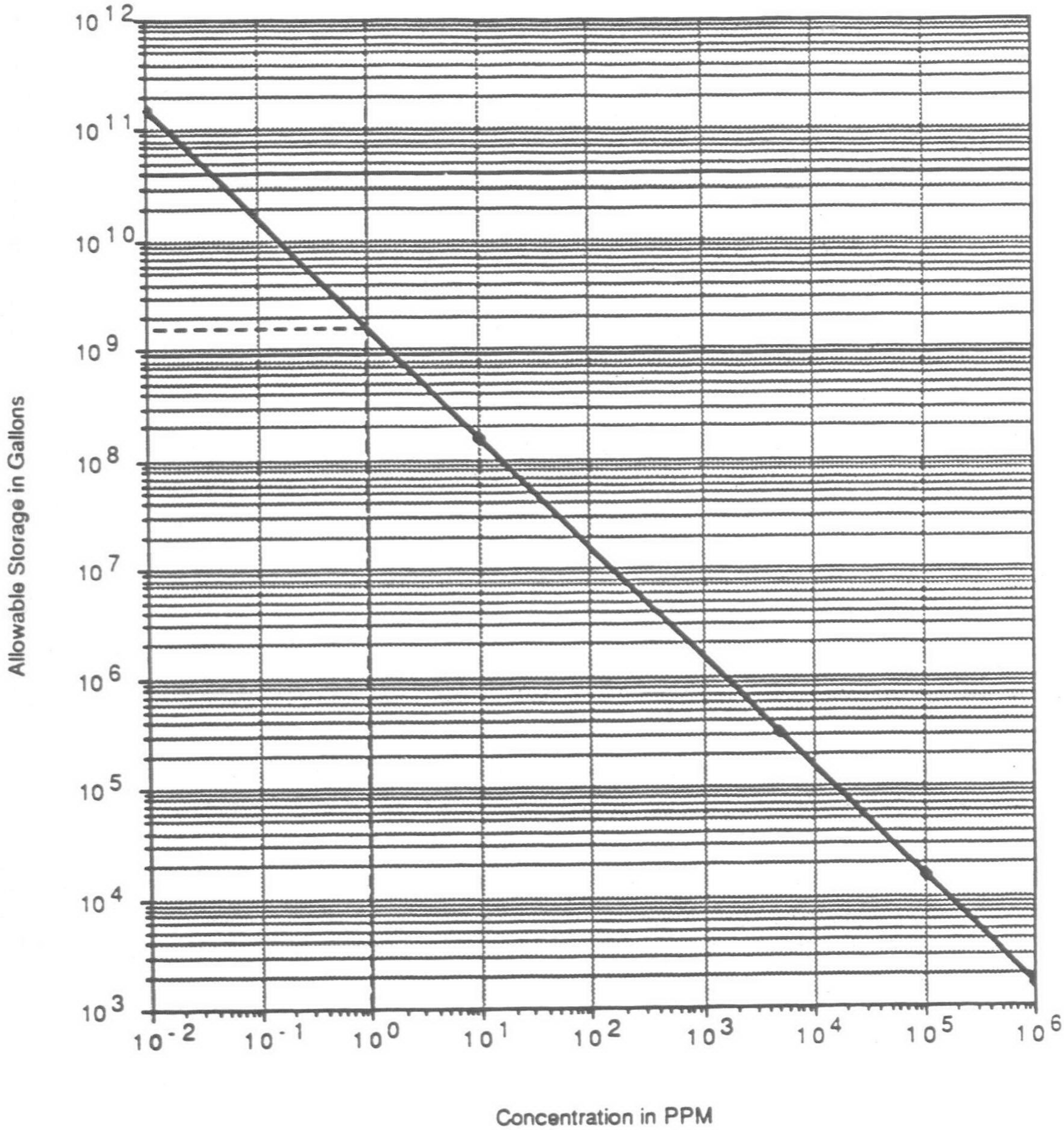
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

2,4-DINITROTOLUENE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F-7



NOTE:
THE MAXIMUM EXPECTED CONCENTRATION OF METHYL CHLORIDE = 1 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE).

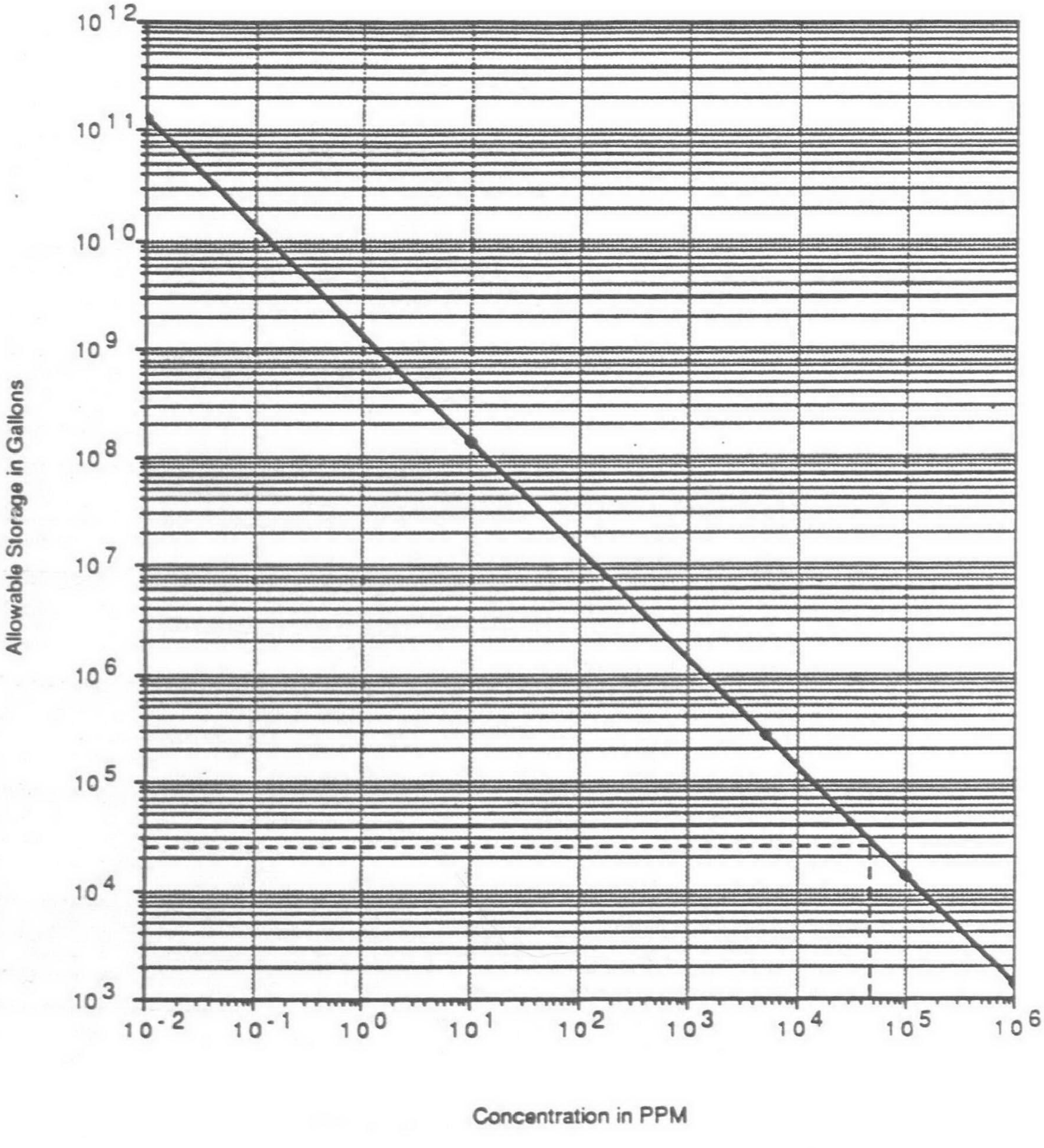
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

METHYL CHLORIDE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F- 8



NOTE:

THE MAXIMUM EXPECTED CONCENTRATION OF METHYLENE CHLORIDE = 46,400 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE.)

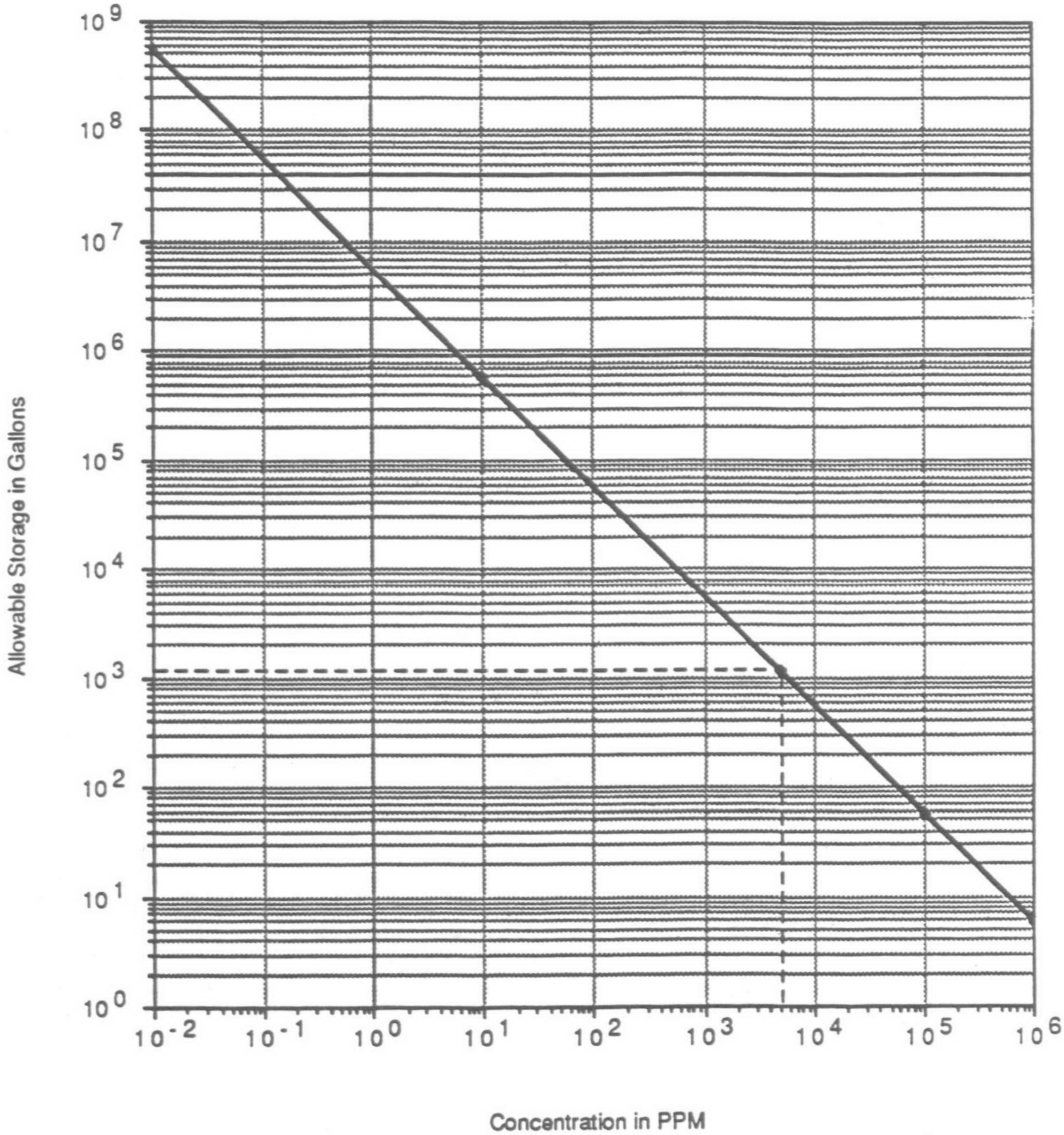
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

METHYLENE CHLORIDE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F - 9



NOTE:
THE MAXIMUM EXPECTED CONCENTRATION OF PCB = 5000 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE.)

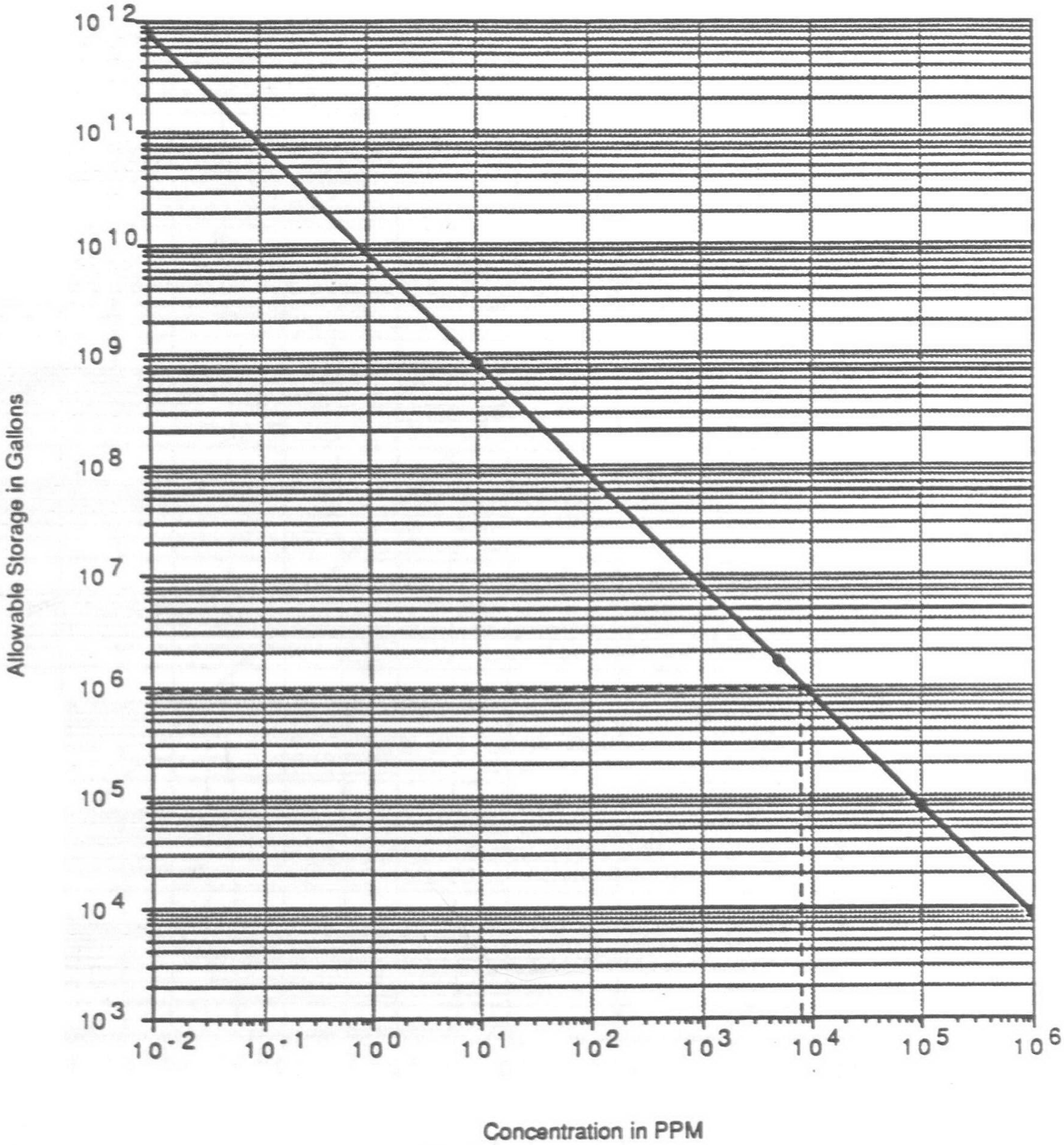
PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

PCB

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F-10



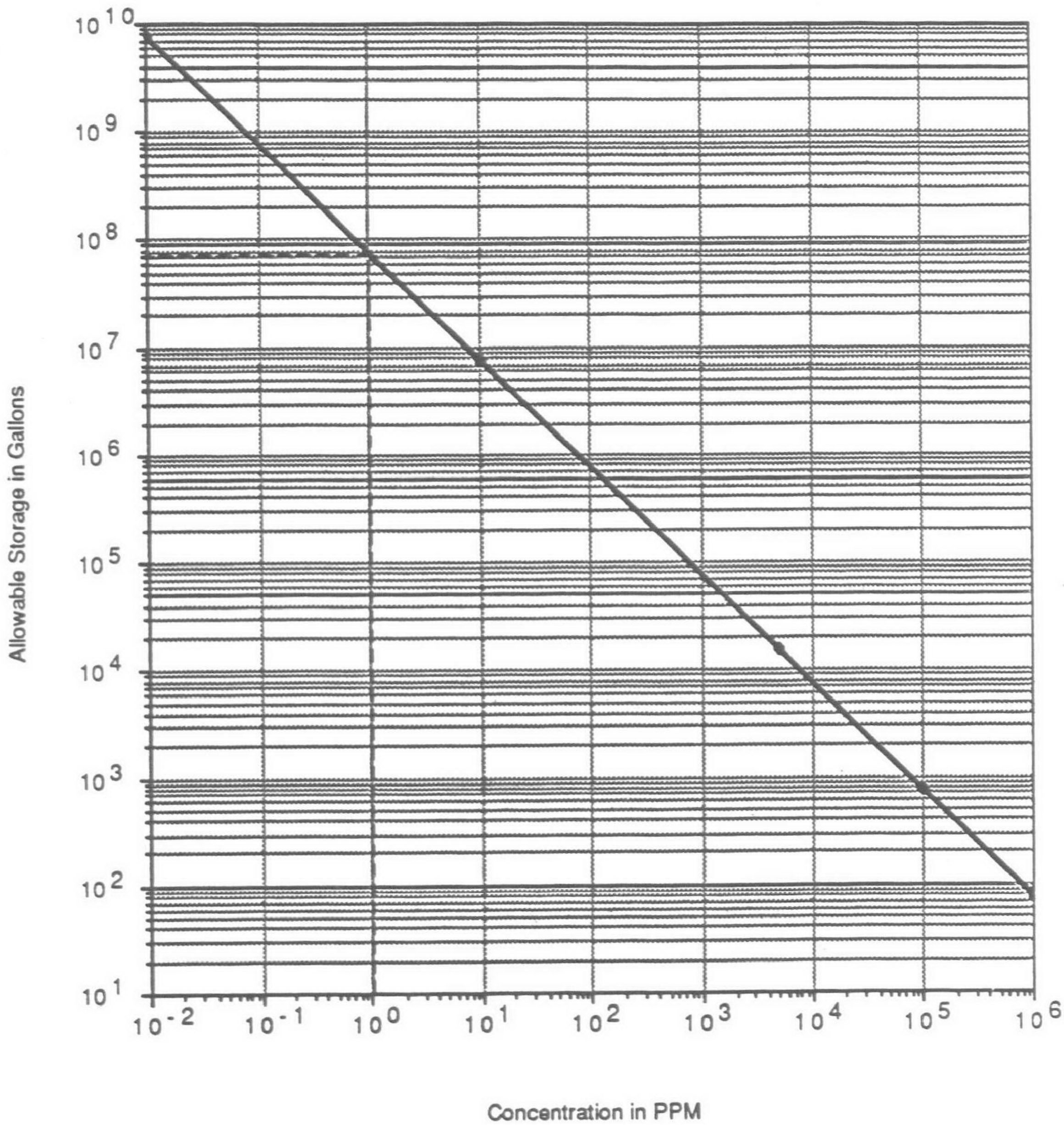
NOTE:
THE MAXIMUM EXPECTED CONCENTRATION OF TRICHLOROETHYLENE = 8600 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE.)

PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

TRICHLOROETHYLENE

U.S. ENVIRONMENTAL PROTECTION AGENCY

FIGURE F-11



NOTE:
THE MAXIMUM EXPECTED CONCENTRATION OF VINYL CHLORIDE = 1 PPM
DASHED LINE INDICATES THE CORRESPONDING MAX. ALLOWABLE STORAGE WITHOUT EXCEEDING THRESHOLD LIMIT.
SOLID LINE REPRESENTS THE BOUNDARY BETWEEN ALLOWABLE STORAGE (BELOW THE LINE) AND QUANTITIES THAT WOULD EXCEED THE THRESHOLD LIMIT IF COMPLETELY RELEASED (ABOVE THE LINE.)

PROPOSED E-TEC STORAGE VOLUME AND CONCENTRATION CAPACITIES

VINYL CHLORIDE

U.S. ENVIRONMENTAL PROTECTION AGENCY

140814

FIGURE F-12

APPENDIX G

APPENDIX G

MITIGATION PROCEDURES

G.1 EMERGENCY SERVICES AND COORDINATION PROCEDURES WITH LOCAL AUTHORITIES

A Contingency Plan has been prepared for the operation of the proposed E-TEC, in accordance with 40 CFR 264.50 et. seq., Subpart D of the Resource Conservation and Recovery Act (RCRA). This plan is part of the RD&D permit application that has been prepared on behalf of the proposed facility. The Contingency Plan contains procedures that would minimize or prevent damage to human health and the environment in the event of a fire, explosion, or unplanned sudden or non-sudden release of hazardous wastes to air, soil, or surface water. Arrangements have been made to coordinate this plan with the local police department, fire department, hospitals, and local emergency response teams if the proposed facility were located in Edison. Middlesex County maintains a specialized unit to respond to hazardous materials incidents. In addition, the EERU, Region II ERT, and OSWER ERT are headquartered at the EPA Facility. These organizations assist the EPA in response to environmental emergencies and could assist local authorities in the event of an incident.

G.2 TRAINING PLAN FOR SAFETY AND EMERGENCY PROCEDURES

A hazardous waste training program for employees of the proposed E-TEC would provide the training necessary to ensure that all research personnel:

- Appreciate the health and environmental risks associated with the hazardous wastes that would be treated;

- Understand the appropriate research and experimentation methods that would minimize such risks;

- Are familiar with all applicable procedures related to storage, treatment, and disposal of the hazardous wastes that could be required within the scope of the RD&D activity; and

- Would be able to handle effectively accidents and emergency situations.

In addition to the initial training of employees, periodic refresher courses should be provided. Also, all necessary management controls should be instituted to ensure that personnel attend the training sessions and comply with safety procedures.

G.3 FIRE PROTECTION SYSTEM

It is intended that all laboratories and testing areas would incorporate safety features designed to safeguard life and property. Such features would include automatic fire protection systems, toxic fume monitoring systems, spill and leak containment, as well as any other code recommended devices.

The facility would have an automatic fire protection system capable of detecting a fire, sounding alarms, and initiating an extinguishing process. An appropriate extinguishing medium would be used where there would exist a potential for a fire that could not be extinguished with water. Additional fire protection system components would consist of:

- Water-based sprinkler systems installed throughout the facility.
- Portable fire extinguishers located throughout the facility.
- A water supply sufficient to meet the fixed fire demand, plus a total of at least 500 gallons per minute for hose lines.
- Manual pull boxes located at all entrance doorways to each storage area, as a minimum.
- All emergency exit doors with automatic alarm devices.
- Fire hydrants located on each side of the building, spaced per code.

G.4 PROTECTIVE EQUIPMENT

It is intended that personnel at the proposed E-TEC would wear appropriate protective equipment when their activities involved known or potential atmospheric contamination; when vapors, gases, or particulates could be released by experimental activities; or when direct contact with skin-affecting substances could occur. Management controls would be required to ensure that personal protective equipment was worn when needed and used correctly.

Equipment that would protect the body against contact with known or anticipated toxic chemicals is classified into four categories according to the degree of protection afforded:

Level A: Should be worn when the highest level of respirator, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection.

Level C: Should be worn when the criteria for using air purifying respirators are met.

Level D: Should be worn only as a work uniform and not in areas of potential respiratory or skin hazards. It provides no protection against chemical hazards.

The level of protection selected for workers at the proposed E-TEC would be based on:

- o Type, measured concentration, and toxicity of the chemical substance in the workplace atmosphere;
- o Potential for exposure to substances in air, splashes of liquids, or other direct contact with material due to work being done; and

- Type of operation/experiment being undertaken, and the particular task involved.

G.5 DECONTAMINATION PROCEDURES

The areas of concern in terms of the potential for contamination would be: the regular analytical laboratories, the bench/pilot unit testing area, the T&E bays, and the designated chemical and hazardous waste storage areas. Both personnel and facilities could become contaminated.

Although appropriate safety practices, including protective equipment, will be mandatorily followed, personnel working in these areas could potentially become contaminated in a number of ways, including:

- Contacting vapors, gases, mists, or particulates in the air;
- Being splashed by materials while sampling or opening containers;
- Walking through puddles of liquids or on contaminated solids; and
- Using contaminated instruments or equipment.

Decontamination consists of physically removing contaminants or changing their chemical nature to innocuous substances. The extent of decontamination that would be necessary would depend on a number of factors, the most important being the type of contaminants involved. The more harmful the contaminant, the more extensive and thorough the decontamination would have to be. Less harmful contaminants would require less decontamination. Combining decontamination, the correct method of wearing personnel protective equipment, and the use of designated work zones would minimize cross-contamination from protective clothing to wearer, equipment to personnel, and one area to another.

Laboratory decontamination procedures would generally follow accepted and standard practices identified in laboratory safety manuals.

G.6 OTHER SAFETY MEASURES

Spill and Leak Protection

The existing slabs on grade would be retrofitted with a spill containment system consisting of an impervious floor and a dike of each test area. The exposed slab and all exposed edges of the sumps and trenches would be coated with a sealant to insure an impervious surface.

The objective of the spill containment system would be to protect the environment from leakage as well as to facilitate cleanup operations.

Other Protection

Hazardous condition monitoring units would be incorporated in the facility. These units would monitor levels of combustible gas, toxic gas, and oxygen deficiency. Monitoring units would provide visible and audible alarms, operate via battery power and be explosion proof. Spill absorption kits would be provided for cleanup of small spills. A combination eyewash and deluge shower station would also be installed at locations per codes, applicable standards and policy.

APPENDIX H

APPENDIX H

COMPUTER PRINTOUTS FOR AIR DISPERSION MODELS

H.1 Source Emission Data for the Proposed E-TEC Facility

H.2 Simple Screening Using COMPLEX-I with VALLEY

H.3 Detailed Screening Using COMPLEX-I

H.4 Refined Modeling Using ISCLT

H.5 Catastrophic Release Modeling

- H.5.1 Screening Using Valley Option of COMPLEX-1
- H.5.2 Screening Using ISCST with Closest Receptors
- H.5.3 Catastrophic Release Modeling Using ISCST

SOURCE EMISSION DATA FOR PROPOSED E-TEC FACILITY

(H.1)

```
"POINT"
   1 "EPA FACILITY     "

         COORDS OF STACK
   0.000000E+00    0.000000E+00

         EMISSION RATES
   1.000000        0.000000E+00
   0.000000E+00    0.000000E+00

         STACK PARAMETERS
   44.200000      7.620000E-01
   10.360000      352.000000
    0.000000      0.00000000
   70.013120
```

SIMPLE SCREENING USING COMPLEX-I WITH VALLEY

(H.2)

```
                  COMPLEX-1 (DATED 86064)
                  AN AIR QUALITY DISPERSION MODEL IN
                  SECTION 4. ADDITIONAL MODELS FOR REGULATORY USE
                  IN UNAMAP (VERSION 6) JULY 86.
                  SOURCE: FILE 31 ON UNAMAP MAGNETIC TAPE FORM NTIS.
                  DATE & TIME OF THIS RUN - 06/28/89 12:16:08
                  INPUT FILE - EDISONV.DAT

                                           COMPLEX I  - VERSION 86064
EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY   MVM
GENERIC  1 GRAM/SECOND EMISSION RATE  / COMPLEX-I RUN
VALLEY SCREENING OPTION
                              GENERAL INPUT INFORMATION

 THIS RUN OF COMPLEX I/VALLEY OPTION IS FOR THE GENERIC POLLUTANT FOR 1 WIND DIRECTIONS.

 A FACTOR OF 1.0000000 HAS BEEN SPECIFIED TO CONVERT USER LENGTH UNITS TO KILOMETERS.

 0 ADDITIONAL SIGNIFICANT SOURCES ARE TO BE CONSIDERED.

 THIS RUN WILL NOT CONSIDER ANY POLLUTANT LOSS.

 HIGH-FIVE SUMMARY 24-HOUR AVERAGE CONCENTRATION TABLES WILL BE OUTPUT FOR EACH RECEPTOR.

  A FACTOR OF       .3048000 HAS BEEN SPECIFIED TO CONVERT USER HEIGHT UNITS TO METERS.
 OPTION       OPTION LIST                    OPTION SPECIFICATION : 0= IGNORE OPTION
                                                                    1= USE OPTION
                       TECHNICAL OPTIONS
     1        TERRAIN ADJUSTMENTS                                   1
     2        DO NOT INCLUDE STACK DOWNWASH CALCULATIONS            1
     3        DO NOT INCLUDE GRADUAL PLUME RISE CALCULATIONS        0
     4        CALCULATE INITIAL PLUME SIZE                          1
                       INPUT OPTIONS
     5        READ MET DATA FROM CARDS                              1
     6        READ HOURLY EMISSIONS                                 0
     7        SPECIFY SIGNIFICANT SOURCES                           0
     8        READ RADIAL DISTANCES TO GENERATE RECEPTORS           0
                       PRINTED OUTPUT OPTIONS
     9        DELETE EMISSIONS WITH HEIGHT TABLE                    1
    10        DELETE MET DATA SUMMARY FOR AVG PERIOD                1
    11        DELETE HOURLY CONTRIBUTIONS                           1
    12        DELETE MET DATA ON HOURLY CONTRIBUTIONS               1
    13        DELETE FINAL PLUME RISE CALC ON HRLY CONTRIBUTIONS    1
    14        DELETE HOURLY SUMMARY                                 1
    15        DELETE MET DATA ON HRLY SUMMARY                       1
    16        DELETE FINAL PLUME RISE CALC ON HRLY SUMMARY          1
    17        DELETE AVG-PERIOD CONTRIBUTIONS                       1
    18        DELETE AVERAGING PERIOD SUMMARY                       1
    19        DELETE AVG CONCENTRATIONS AND HI-5 TABLES             0
                       OTHER CONTROL AND OUTPUT OPTIONS
    20        RUN IS PART OF A SEGMENTED RUN                        0
    21        WRITE PARTIAL CONC TO DISK OR TAPE                    0
    22        WRITE HOURLY CONC TO DISK OR TAPE                     0
    23        WRITE AVG-PERIOD CONC TO DISK OR TAPE                 0
    24        PUNCH AVG-PERIOD CONC ONTO CARDS                      0
    25        COMPLEX TERRAIN OPTION                                0
    26        CALM PROCESSING OPTION                                0
    27        VALLEY SCREENING OPTION                               1
ANEMOMETER HEIGHT IS:     10.00
EXPONENTS FOR POWER- LAW WIND INCREASE WITH HEIGHT ARE: .10, .15, .20, .25, .30, .30
TERRAIN ADJUSTMENTS ARE:  .500, .500, .500, .500, .000, .000 ZMIN IS  10.0
```

BECAUSE THE VALLEY OPTION HAS BEEN SELECTED, THE FOLLOWING
OPTIONS AND PARAMETERS HAVE BEEN SET BY THE MODEL, OVERRIDING VALUES
PROVIDED BY THE USER:

IOPT(5), IOPT(10), IOPT(12), IOPT(15), IOPT(17), IOPT(18) = 1
IOPT(6), IOPT(20) THRU IOPT(26) = 0

NAVG = 1	NAV5 = 0
IHSTRT = 1	CONTER(6) = 0.
ZMIN = 10.	IKST = 6
QU = 2.5	QHL = 9999.

POINT SOURCE INFORMATION

SOURCE	EAST COORD (USER UNITS)	NORTH COORD	(G/SEC) EMISSIONS	PART(G/SEC) EMISSIONS	STACK HT(M)	STACK TEMP(K)	STACK DIAM(M)	STACK VEL(M/SEC)	GRD-LVL ELEV USER HT UNITS	BUOY FLUX F M**4/S**3
1 EPA FACILITY	.00	.00	1.00	.00	44.2	352.0	.8	10.4	70.00	2.47

ADDITIONAL INFORMATION ON SOURCES.
EMISSION INFORMATION FOR 1 (NPT) POINT SOURCES HAS BEEN INPUT
0 SIGNIFICANT POINT SOURCES(NSIGP) ARE TO BE USED FOR THIS RUN
THE ORDER OF SIGNIFICANCE(IMPS) FOR 25 OR LESS POINT SOURCES USED IN THIS RUN AS LISTED BY POINT SOURCE NUMBER:

RECEPTOR INFORMATION

RECEPTOR	IDENTIFICATION	EAST COORD (USER UNITS)	NORTH COORD	RECEPTOR HT ABV LOCAL GRD LVL (METERS)	RECEPTOR GROUND LEVEL ELEVATION (USER HT UNITS)
1	REC 1	.500	.000	.0	70.0
2	REC 2	.640	.000	.0	80.0
3	REC 3	.762	.000	.0	100.0
4	REC 4	1.000	.000	.0	103.0
5	REC 5	1.500	.000	.0	105.0
6	REC 6	2.000	.000	.0	110.0
7	REC 7	2.500	.000	.0	115.0
8	REC 8	3.000	.000	.0	117.0
9	REC 9	3.810	.000	.0	120.0
10	REC 10	4.000	.000	.0	143.0
11	REC 11	4.180	.000	.0	150.0
12	REC 12	4.300	.000	.0	180.0
13	REC 13	4.390	.000	.0	200.0
14	REC 14	5.000	.000	.0	210.0
15	REC 15	6.000	.000	.0	215.0
16	REC 16	7.000	.000	.0	220.0
17	REC 17	8.000	.000	.0	225.0
18	REC 18	9.000	.000	.0	230.0
19	REC 19	10.000	.000	.0	250.0
20	REC 20	13.000	.000	.0	300.0
21	REC 21	14.000	.000	.0	400.0
22	REC 22	15.000	.000	.0	500.0
23	REC 23	16.000	.000	.0	540.0
24	REC 24	20.000	.000	.0	600.0
25	REC 25	30.000	.000	.0	600.0
26	REC 26	40.000	.000	.0	600.0
27	REC 27	50.000	.000	.0	600.0

VALLEY METEOROLOGICAL INPUT DATA

PRESET BY MODEL:
MIXING HEIGHT (M) = 9999
STABILITY = 6
WIND SPEED (M/SEC) = 2.5

INPUT BY USER:
TEMPERATURE (K) = 293.0
WIND DIRECTIONS (DEG) = 270.0

VALLEY: FIVE HIGHEST 24-HOUR GENERIC POLLUTANT CONCENTRATIONS (WIND DIRECTION)
(MICROGRAMS/M**3)

RECEPTOR				1	2	3	4	5
1(	.50,	.00)		.00 (270.0)	*000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
2(	.64,	.00)		.00 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
3(	.76,	.00)		.00 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
4(	1.00,	.00)		.01 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
5(	1.50,	.00)		.07 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
6(	2.00,	.00)		.18 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
7(	2.50,	.00)		.25 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
8(	3.00,	.00)		.29 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
9(	3.81,	.00)		.29 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
10(	4.00,	.00)		.40 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
11(	4.18,	.00)		.43 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
12(	4.30,	.00)		.58 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
13(	4.39,	.00)	*	.66 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
14(	5.00,	.00)		.60 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
15(	6.00,	.00)		.49 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
16(	7.00,	.00)		.41 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
17(	8.00,	.00)		.35 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
18(	9.00,	.00)		.30 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
19(	10.00,	.00)		.27 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
20(	13.00,	.00)		.19 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
21(	14.00,	.00)		.16 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
22(	15.00,	.00)		.13 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
23(	16.00,	.00)		.11 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
24(	20.00,	.00)		.08 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
25(	30.00,	.00)		.05 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
26(	40.00,	.00)		.03 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)
27(	50.00,	.00)		.02 (270.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)	000000.00 (.0)

DETAILED SCREENING USING COMPLEX-I

(H.3)

```
                COMPLEX-1 (DATED 86064)
                AN AIR QUALITY DISPERSION MODEL IN
                SECTION 4. ADDITIONAL MODELS FOR REGULATORY USE
                IN UNAMAP (VERSION 6) JULY 86.
                SOURCE: FILE 31 ON UNAMAP MAGNETIC TAPE FORM NTIS.
                DATE & TIME OF THIS RUN - 06/28/89 12:18:26
                INPUT FILE - EDISON.DAT

                                    COMPLEX I  - VERSION 86064
EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY  MVM
GENERIC  1 GRAM/SECOND EMISSION RATE  / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

                              GENERAL INPUT INFORMATION

 THIS RUN OF COMPLEX I -VERSION 86064 IS FOR THE GENERIC POLLUTANT FOR 2  24-HOUR PERIODS.

 CONCENTRATION ESTIMATES BEGIN ON HOUR- 1,JULIAN DAY-  1, YEAR-1989.

 A FACTOR OF 1.0000000 HAS BEEN SPECIFIED TO CONVERT USER LENGTH UNITS TO KILOMETERS.

 0 SIGNIFICANT SOURCES ARE TO BE CONSIDERED.

 THIS RUN WILL NOT CONSIDER ANY POLLUTANT LOSS.

 HIGH-FIVE SUMMARY CONCENTRATION TABLES WILL BE OUTPUT FOR   4 AVERAGING PERIODS.

 AVG TIMES OF 1,3,8, AND 24 HOURS ARE AUTOMATICALLY DISPLAYED.

  A FACTOR OF       .3048000 HAS BEEN SPECIFIED TO CONVERT USER HEIGHT UNITS TO METERS.
 OPTION       OPTION LIST                  OPTION SPECIFICATION : 0= IGNORE OPTION
                                                                 1= USE OPTION
                        TECHNICAL OPTIONS
     1        TERRAIN ADJUSTMENTS                                 1
     2        DO NOT INCLUDE STACK DOWNWASH CALCULATIONS          1
     3        DO NOT INCLUDE GRADUAL PLUME RISE CALCULATIONS      0
     4        CALCULATE INITIAL PLUME SIZE                        1
                        INPUT OPTIONS
     5        READ MET DATA FROM CARDS                            1
     6        READ HOURLY EMISSIONS                               0
     7        SPECIFY SIGNIFICANT SOURCES                         0
     8        READ RADIAL DISTANCES TO GENERATE RECEPTORS         0
                        PRINTED OUTPUT OPTIONS
     9        DELETE EMISSIONS WITH HEIGHT TABLE                  1
    10        DELETE MET DATA SUMMARY FOR AVG PERIOD              1
    11        DELETE HOURLY CONTRIBUTIONS                         1
    12        DELETE MET DATA ON HOURLY CONTRIBUTIONS             1
    13        DELETE FINAL PLUME RISE CALC ON HRLY CONTRIBUTIONS  1
    14        DELETE HOURLY SUMMARY                               0
    15        DELETE MET DATA ON HRLY SUMMARY                     0
    16        DELETE FINAL PLUME RISE CALC ON HRLY SUMMARY        0
    17.       DELETE AVG-PERIOD CONTRIBUTIONS                     1
    18        DELETE AVERAGING PERIOD SUMMARY                     1
    19        DELETE AVG CONCENTRATIONS AND HI-5 TABLES           0
                        OTHER CONTROL AND OUTPUT OPTIONS
    20        RUN IS PART OF A SEGMENTED RUN                      0
    21        WRITE PARTIAL CONC TO DISK OR TAPE                  0
    22        WRITE HOURLY CONC TO DISK OR TAPE                   0
    23        WRITE AVG-PERIOD CONC TO DISK OR TAPE               0
    24        PUNCH AVG-PERIOD CONC ONTO CARDS                    0
    25        COMPLEX TERRAIN OPTION                              1
    26        CALM PROCESSING OPTION                              0
    27        VALLEY SCREENING OPTION                             0
ANEMOMETER HEIGHT IS:     10.00
EXPONENTS FOR POWER- LAW WIND INCREASE WITH HEIGHT ARE: .10, .15, .20, .25, .30, .30
TERRAIN ADJUSTMENTS ARE:  .500, .500, .500, .500, .000, .000 ZMIN IS  10.0
```

POINT SOURCE INFORMATION

SOURCE	EAST COORD (USER UNITS)	NORTH COORD	(G/SEC) EMISSIONS	PART(G/SEC) EMISSIONS	STACK HT(M)	STACK TEMP(K)	STACK DIAM(M)	STACK VEL(M/SEC)	POTEN. IMPACT (MICRO G/M**3)	EFF HT(M)	GRD-LVL ELEV USER HT UNITS	BUOY FLUX F M**4/S**3
1 EPA FACILITY	.00	.00	1.00	.00	44.2	352.0	.8	10.4	13.78	58.28	70.00	2.47

ADDITIONAL INFORMATION ON SOURCES.
EMISSION INFORMATION FOR 1 (NPT) POINT SOURCES HAS BEEN INPUT
0 SIGNIFICANT POINT SOURCES(NSIGP) ARE TO BE USED FOR THIS RUN
THE ORDER OF SIGNIFICANCE(IMPS) FOR 25 OR LESS POINT SOURCES USED IN THIS RUN AS LISTED BY POINT SOURCE NUMBER:

RECEPTOR INFORMATION

RECEPTOR	IDENTIFICATION	EAST COORD (USER UNITS)	NORTH COORD	RECEPTOR HT ABV LOCAL GRD LVL (METERS)	RECEPTOR GROUND LEVEL ELEVATION (USER HT UNITS)
1	REC 1	.500	.000	.0	70.0
2	REC 2	.640	.000	.0	80.0
3	REC 3	.762	.000	.0	100.0
4	REC 4	1.000	.000	.0	103.0
5	REC 5	1.500	.000	.0	105.0
6	REC 6	2.000	.000	.0	110.0
7	REC 7	2.500	.000	.0	115.0
8	REC 8	3.000	.000	.0	117.0
9	REC 9	3.810	.000	.0	120.0
10	REC 10	4.000	.000	.0	143.0
11	REC 11	4.180	.000	.0	150.0
12	REC 12	4.300	.000	.0	180.0
13	REC 13	4.390	.000	.0	200.0
14	REC 14	5.000	.000	.0	210.0
15	REC 15	6.000	.000	.0	215.0
16	REC 16	7.000	.000	.0	220.0
17	REC 17	8.000	.000	.0	225.0
18	REC 18	9.000	.000	.0	230.0
19	REC 19	10.000	.000	.0	250.0
20	REC 20	13.000	.000	.0	300.0
21	REC 21	14.000	.000	.0	400.0
22	REC 22	15.000	.000	.0	500.0
23	REC 23	16.000	.000	.0	540.0
24	REC 24	20.000	.000	.0	600.0
25	REC 25	30.000	.000	.0	600.0
26	REC 26	40.000	.000	.0	600.0
27	REC 27	50.000	.000	.0	600.0

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 1

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
1	270.00	.50	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	86.44									
DIST FIN HT (KM)	.086									

RECEPTOR NO. NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV	TOTAL FROM SIGNIF POINT	TOTAL FROM ALL SOURCES	CONCENTRATION RANK

					(USER HT UNITS)	SOURCES		
1	REC 1	.50	.00	.0	70.0	000000.0000	27.5487	1
2	REC 2	.64	.00	.0	80.0	000000.0000	15.9945	2
3	REC 3	.76	.00	.0	100.0	000000.0000	9.9106	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	4.4038	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.2615	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.5157	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.2574	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.1458	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.1066	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.1016	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0972	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0945	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0926	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0813	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0677	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0580	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0508	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0451	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0406	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0313	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0290	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0271	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0254	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0203	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0135	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0102	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0081	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 2

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
2	270.00	.80	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	86.44									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	27.5487	1
2	REC 2	.64	.00	.0	80.0	000000.0000	15.9945	2
3	REC 3	.76	.00	.0	100.0	000000.0000	9.9106	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	4.4038	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.2615	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.5157	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.2574	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.1458	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.1066	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.1016	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0972	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0945	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0926	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0813	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0677	15

16	REC 16	7.00	.00	.0	220.0	000000.0000	.0580	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0508	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0451	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0406	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0313	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0290	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0271	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0254	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0203	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0135	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0102	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0081	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 3

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
3	270.00	1.00	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	80.60									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	24.8271	1
2	REC 2	.64	.00	.0	80.0	000000.0000	14.0047	2
3	REC 3	.76	.00	.0	100.0	000000.0000	8.6047	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	3.8044	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.0877	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.4445	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.2219	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.1257	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.0919	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.0876	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0838	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0814	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0798	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0700	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0584	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0500	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0438	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0389	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0350	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0269	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0250	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0233	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0219	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0175	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0117	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0088	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0070	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 4

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
4	270.00	1.50	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	68.47									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	17.9899	1
2	REC 2	.64	.00	.0	80.0	000000.0000	9.6129	2
3	REC 3	.76	.00	.0	100.0	000000.0000	5.8140	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	2.5471	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	.7257	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.2964	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.1479	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.0838	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.0613	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.0584	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0559	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0543	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0532	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0467	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0389	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0334	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0292	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0259	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0233	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0180	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0167	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0156	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0146	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0117	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0078	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0058	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0047	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 5

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
5	270.00	2.00	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	62.40									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	13.9969	1
2	REC 2	.64	.00	.0	80.0	000000.0000	7.3020	2
3	REC 3	.76	.00	.0	100.0	000000.0000	4.3860	3

4	REC 4	1.00	.00	.0	103.0	000000.0000	1.9138	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	.5445	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.2223	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.1109	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.0629	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.0460	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.0438	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0419	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0407	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0399	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0350	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0292	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0250	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0219	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0195	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0175	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0135	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0125	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0117	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0109	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0088	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0058	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0044	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0035	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY NVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 6

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
6	270.00	2.50	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	58.76									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	11.4282	1
2	REC 2	.64	.00	.0	80.0	000000.0000	5.8829	2
3	REC 3	.76	.00	.0	100.0	000000.0000	3.5200	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.5326	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	.4356	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.1779	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.0888	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.0503	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.0368	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.0350	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0335	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0326	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0319	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0280	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0233	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0200	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0175	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0156	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0140	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0108	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0100	21

22	REC 22	15.00	.00	.0	500.0	000000.0000	.0093	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0088	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0070	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0047	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0035	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0028	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 7

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
7	270.00	3.00	5000.00	293.00	1

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	56.33									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	9.6472	1
2	REC 2	.64	.00	.0	80.0	000000.0000	4.9242	2
3	REC 3	.76	.00	.0	100.0	000000.0000	2.9392	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.2779	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	.3631	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.1482	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.0740	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.0419	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.0306	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.0292	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.0279	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.0271	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0266	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0233	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0195	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0167	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0146	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0130	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0117	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0090	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0083	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0078	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0073	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0058	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0039	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0029	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0023	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 8

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
8	270.00	.50	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10

FINAL HT (M) 86.44
DIST FIN HT (KM) .086

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	19.9582	2
2	REC 2	.64	.00	.0	80.0	000000.0000	21.4202	1
3	REC 3	.76	.00	.0	100.0	000000.0000	19.7551	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	14.0481	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	7.0798	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	4.0909	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	2.6242	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.8122	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.1088	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.0038	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.9165	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.8652	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.8293	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.6326	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.4324	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.3133	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.2369	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1852	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1485	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0857	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0734	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0635	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0555	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0347	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0148	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0102	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0081	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 9

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
9	270.00	.80	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10

FINAL HT (M) 86.44
DIST FIN HT (KM) .086

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	19.9582	2
2	REC 2	.64	.00	.0	80.0	000000.0000	21.4202	1
3	REC 3	.76	.00	.0	100.0	000000.0000	19.7551	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	14.0481	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	7.0798	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	4.0909	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	2.6242	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.8122	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.1088	9

10	REC 10	4.00	.00	.0	143.0	000000.0000	1.0038	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.9165	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.8652	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.8293	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.6326	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.4324	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.3133	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.2369	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1852	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1485	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0857	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0734	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0635	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0555	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0347	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0148	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0102	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0081	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 10

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
10	270.00	1.00	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	78.00									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	20.3014	1
2	REC 2	.64	.00	.0	80.0	000000.0000	19.8238	2
3	REC 3	.76	.00	.0	100.0	000000.0000	17.4386	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	11.8776	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	5.7966	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	3.3135	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	2.1154	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.4573	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.8898	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.8052	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.7350	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.6937	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.6648	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.5068	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.3463	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.2508	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1897	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1482	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1189	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0686	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0587	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0508	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0444	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0278	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0119	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0081	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0065	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 11

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
11	270.00	1.50	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	66.73									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	18.1801	1
2	REC 2	.64	.00	.0	80.0	000000.0000	15.7373	2
3	REC 3	.76	.00	.0	100.0	000000.0000	13.0566	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	8.4458	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	3.9688	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	2.2403	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.4224	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.9771	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.5952	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.5383	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.4913	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.4635	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.4441	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.3384	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.2311	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1673	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1265	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0988	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0793	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0457	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0392	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0339	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0296	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0185	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0079	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0054	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0043	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 12

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
12	270.00	2.00	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	61.10									
DIST FIN HT (KM)	.086									

.RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV	TOTAL FROM SIGNIF POINT	TOTAL FROM ALL SOURCES	CONCENTRATION RANK

						(USER HT UNITS)	SOURCES		
1	REC 1	.50	.00	.0		70.0	000000.0000	15.5955	1
2	REC 2	.64	.00	.0		80.0	000000.0000	12.7609	2
3	REC 3	.76	.00	.0		100.0	000000.0000	10.3068	3
4	REC 4	1.00	.00	.0		103.0	000000.0000	6.5157	4
5	REC 5	1.50	.00	.0		105.0	000000.0000	3.0113	5
6	REC 6	2.00	.00	.0		110.0	000000.0000	1.6905	6
7	REC 7	2.50	.00	.0		115.0	000000.0000	1.0707	7
8	REC 8	3.00	.00	.0		117.0	000000.0000	.7346	8
9	REC 9	3.81	.00	.0		120.0	000000.0000	.4471	9
10	REC 10	4.00	.00	.0		143.0	000000.0000	.4042	10
11	REC 11	4.18	.00	.0		150.0	000000.0000	.3688	11
12	REC 12	4.30	.00	.0		180.0	000000.0000	.3479	12
13	REC 13	4.39	.00	.0		200.0	000000.0000	.3333	13
14	REC 14	5.00	.00	.0		210.0	000000.0000	.2540	14
15	REC 15	6.00	.00	.0		215.0	000000.0000	.1734	15
16	REC 16	7.00	.00	.0		220.0	000000.0000	.1255	16
17	REC 17	8.00	.00	.0		225.0	000000.0000	.0949	17
18	REC 18	9.00	.00	.0		230.0	000000.0000	.0741	18
19	REC 19	10.00	.00	.0		250.0	000000.0000	.0595	19
20	REC 20	13.00	.00	.0		300.0	000000.0000	.0343	20
21	REC 21	14.00	.00	.0		400.0	000000.0000	.0294	21
22	REC 22	15.00	.00	.0		500.0	000000.0000	.0254	22
23	REC 23	16.00	.00	.0		540.0	000000.0000	.0222	23
24	REC 24	20.00	.00	.0		600.0	000000.0000	.0139	24
25	REC 25	30.00	.00	.0		600.0	000000.0000	.0059	25
26	REC 26	40.00	.00	.0		600.0	000000.0000	.0041	26
27	REC 27	50.00	.00	.0		600.0	000000.0000	.0033	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 13

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
13	270.00	3.00	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	55.47									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	11.7722	1
2	REC 2	.64	.00	.0	80.0	000000.0000	9.1368	2
3	REC 3	.76	.00	.0	100.0	000000.0000	7.1976	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	4.4559	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	2.0286	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.1332	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.7162	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.4908	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.2984	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.2698	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.2461	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.2321	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.2224	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.1694	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1156	15

16	REC 16	7.00	.00	.0	220.0	000000.0000	.0837	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0633	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0494	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0396	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0229	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0196	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0169	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0148	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0093	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0040	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0027	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0022	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 14

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
14	270.00	4.00	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	52.65									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	9.3568	1
2	REC 2	.64	.00	.0	80.0	000000.0000	7.0833	2
3	REC 3	.76	.00	.0	100.0	000000.0000	5.5148	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	3.3813	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.5288	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.8520	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.5380	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.3685	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.2240	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.2024	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.1847	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.1742	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.1668	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.1271	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0867	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0628	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0475	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0371	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0297	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0172	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0147	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0127	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0111	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0069	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0030	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0020	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0016	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 15

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
15	270.00	5.00	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	50.96									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	7.7401	1
2	REC 2	.64	.00	.0	80.0	000000.0000	5.7754	2
3	REC 3	.76	.00	.0	100.0	000000.0000	4.4661	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	2.7232	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.2264	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.6826	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.4307	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.2950	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.1792	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.1620	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.1478	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.1394	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.1335	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.1017	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0694	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0502	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0380	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0297	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0238	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0137	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0117	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0102	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0089	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0056	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0024	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0016	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0013	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 16

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
16	270.00	2.00	5000.00	293.00	3

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	59.89									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	8.6537	3
2	REC 2	.64	.00	.0	80.0	000000.0000	10.4144	2
3	REC 3	.76	.00	.0	100.0	000000.0000	10.6135	1

4	REC 4	1.00	.00	.0	103.0	000000.0000	8.2487	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	4.6945	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	2.9343	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.9896	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.4326	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.9233	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.8466	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.7805	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.7430	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.7162	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.5605	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.3966	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.2958	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.2294	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1833	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1499	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0908	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0788	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0691	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0610	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0398	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0183	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0106	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0069	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 17

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
17	270.00	2.50	5000.00	293.00	3

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	56.75									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	8.1557	3
2	REC 2	.64	.00	.0	80.0	000000.0000	9.2516	1
3	REC 3	.76	.00	.0	100.0	000000.0000	9.1359	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	6.9011	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	3.8370	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	2.3771	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.6048	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.1528	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.7414	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.6794	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.6262	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.5959	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.5742	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.4491	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.3177	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.2369	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1836	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1467	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1200	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0727	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0631	21

22	REC 22	15.00	.00	.0	500.0	000000.0000	.0553	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0488	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0319	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0147	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0085	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0055	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 18

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
18	270.00	3.00	5000.00	293.00	3

1 2 3 4 5 6 7 8 9 10

FINAL HT (M) . 54.66
DIST FIN HT (KM) .086

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	7.5570	3
2	REC 2	.64	.00	.0	80.0	000000.0000	8.2459	1
3	REC 3	.76	.00	.0	100.0	000000.0000	7.9771	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	5.9168	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	3.2412	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.9966	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.3443	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.9643	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.6193	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.5673	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.5228	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.4973	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.4792	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.3747	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.2649	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1975	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1531	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1223	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1000	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0606	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0525	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0460	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0407	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0266	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0122	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0070	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0046	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 19

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
19	270.00	4.00	5000.00	293.00	3

		1	2	3	4	5	6	7	8	9	10
FINAL HT (M)		52.04									
DIST FIN HT (KM)		.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	6.4457	2
2	REC 2	.64	.00	.0	80.0	000000.0000	6.7058	1
3	REC 3	.76	.00	.0	100.0	000000.0000	6.3267	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	4.5907	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	2.4705	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.5117	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.0145	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.7264	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.4658	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.4265	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.3929	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.3737	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.3600	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.2813	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1989	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1482	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1149	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0917	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0750	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0454	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0394	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0345	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0305	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0199	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0092	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0053	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0034	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 20

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
20	270.00	5.00	5000.00	293.00	3

		1	2	3	4	5	6	7	8	9	10
FINAL HT (M)		50.48									
DIST FIN HT (KM)		.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	5.5575	2
2	REC 2	.64	.00	.0	80.0	000000.0000	5.6218	1
3	REC 3	.76	.00	.0	100.0	000000.0000	5.2269	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	3.7448	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.9948	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.2159	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.8145	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.5826	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.3732	9

10	REC 10	4.00	.00	.0	143.0	000000.0000	.3417	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.3147	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.2992	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.2882	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.2252	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1592	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1186	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0919	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0734	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0600	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0363	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0315	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0276	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0244	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0159	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0073	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0042	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0028	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 21

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
21	270.00	7.00	5000.00	293.00	3

1 2 3 4 5 6 7 8 9 10

FINAL HT (M) 48.68

DIST FIN HT (KM) .086

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	4.3145	1
2	REC 2	.64	.00	.0	80.0	000000.0000	4.2294	2
3	REC 3	.76	.00	.0	100.0	000000.0000	3.8684	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	2.7329	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.4394	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.8736	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.5840	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.4173	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.2671	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.2444	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.2251	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.2140	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.2061	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.1610	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1137	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0848	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0657	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0524	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0429	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0260	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0225	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0197	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0174	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0114	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0052	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0030	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0020	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 22

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
22	270.00	10.00	5000.00	293.00	3

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	47.34									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	3.2096	1
2	REC 2	.64	.00	.0	80.0	000000.0000	3.0744	2
3	REC 3	.76	.00	.0	100.0	000000.0000	2.7784	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.9429	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.0150	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.6142	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.4099	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.2927	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.1872	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.1713	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.1577	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.1499	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.1444	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.1127	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0796	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0593	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0460	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0367	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0300	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0182	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0158	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0138	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0122	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0080	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0037	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0021	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0014	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 23

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
23	270.00	12.00	5000.00	293.00	3

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	46.81									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV	TOTAL FROM SIGNIF POINT	TOTAL FROM ALL SOURCES	CONCENTRATION RANK

					(USER HT UNITS)	SOURCES		
1	REC 1	.50	.00	.0	70.0	000000.0000	2.7376	1
2	REC 2	.64	.00	.0	80.0	000000.0000	2.5991	2
3	REC 3	.76	.00	.0	100.0	000000.0000	2.3381	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.6287	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	.8482	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.5126	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.3420	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.2441	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.1561	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.1428	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.1315	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.1250	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.1203	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0940	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0664	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.0495	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0383	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0306	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0250	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0151	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0131	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0115	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0102	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0066	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0031	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0018	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0011	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 1 : HOUR 24

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
24	270.00	15.00	5000.00	293.00	3

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	46.29									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	2.2411	1
2	REC 2	.64	.00	.0	80.0	000000.0000	2.1091	2
3	REC 3	.76	.00	.0	100.0	000000.0000	1.8886	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.3106	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	.6804	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	.4108	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.2739	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.1954	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.1249	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.1143	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.1052	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.1000	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.0963	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.0752	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.0531	15

16	REC 16	7.00	.00	.0	220.0	000000.0000	.0396	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0307	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0245	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0200	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0121	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0105	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0092	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0081	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0053	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0024	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0014	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0009	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 1

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
1	270.00	.50	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	86.44									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0778	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.4679	23
3	REC 3	.76	.00	.0	100.0	000000.0000	1.4864	16
4	REC 4	1.00	.00	.0	103.0	000000.0000	3.5370	10
5	REC 5	1.50	.00	.0	105.0	000000.0000	5.4393	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	5.8558	1
7	REC 7	2.50	.00	.0	115.0	000000.0000	5.5581	2
8	REC 8	3.00	.00	.0	117.0	000000.0000	4.9956	4
9	REC 9	3.81	.00	.0	120.0	000000.0000	4.0991	5
10	REC 10	4.00	.00	.0	143.0	000000.0000	4.0843	6
11	REC 11	4.18	.00	.0	150.0	000000.0000	3.9464	9
12	REC 12	4.30	.00	.0	180.0	000000.0000	4.0184	8
13	REC 13	4.39	.00	.0	200.0	000000.0000	4.0428	7
14	REC 14	5.00	.00	.0	210.0	000000.0000	3.4848	11
15	REC 15	6.00	.00	.0	215.0	000000.0000	2.7570	12
16	REC 16	7.00	.00	.0	220.0	000000.0000	2.2412	13
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.8627	14
18	REC 18	9.00	.00	.0	230.0	000000.0000	1.5764	15
19	REC 19	10.00	.00	.0	250.0	000000.0000	1.3645	17
20	REC 20	13.00	.00	.0	300.0	000000.0000	.9439	18
21	REC 21	14.00	.00	.0	400.0	000000.0000	.8566	19
22	REC 22	15.00	.00	.0	500.0	000000.0000	.7710	20
23	REC 23	16.00	.00	.0	540.0	000000.0000	.6986	21
24	REC 24	20.00	.00	.0	600.0	000000.0000	.4961	22
25	REC 25	30.00	.00	.0	600.0	000000.0000	.2654	24
26	REC 26	40.00	.00	.0	600.0	000000.0000	.1725	25
27	REC 27	50.00	.00	.0	600.0	000000.0000	.1234	26

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 2

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
2	270.00	.80	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	80.61									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.1087	26
2	REC 2	.64	.00	.0	80.0	000000.0000	.6466	21
3	REC 3	.76	.00	.0	100.0	000000.0000	1.9484	14
4	REC 4	1.00	.00	.0	103.0	000000.0000	4.2213	5
5	REC 5	1.50	.00	.0	105.0	000000.0000	5.8519	2
6	REC 6	2.00	.00	.0	110.0	000000.0000	5.9342	1
7	REC 7	2.50	.00	.0	115.0	000000.0000	5.4275	3
8	REC 8	3.00	.00	.0	117.0	000000.0000	4.7615	4
9	REC 9	3.81	.00	.0	120.0	000000.0000	3.8143	6
10	REC 10	4.00	.00	.0	143.0	000000.0000	3.7734	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	3.6304	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	3.6752	9
13	REC 13	4.39	.00	.0	200.0	000000.0000	3.6834	8
14	REC 14	5.00	.00	.0	210.0	000000.0000	3.1473	11
15	REC 15	6.00	.00	.0	215.0	000000.0000	2.4669	12
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.9923	13
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.6479	15
18	REC 18	9.00	.00	.0	230.0	000000.0000	1.3895	16
19	REC 19	10.00	.00	.0	250.0	000000.0000	1.1985	17
20	REC 20	13.00	.00	.0	300.0	000000.0000	.8237	18
21	REC 21	14.00	.00	.0	400.0	000000.0000	.7423	19
22	REC 22	15.00	.00	.0	500.0	000000.0000	.6679	20
23	REC 23	16.00	.00	.0	540.0	000000.0000	.6050	22
24	REC 24	20.00	.00	.0	600.0	000000.0000	.4292	23
25	REC 25	30.00	.00	.0	600.0	000000.0000	.2293	24
26	REC 26	40.00	.00	.0	600.0	000000.0000	.1489	25
27	REC 27	50.00	.00	.0	600.0	000000.0000	.1065	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 3

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
3	270.00	1.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	73.33									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.1797	25
2	REC 2	.64	.00	.0	80.0	000000.0000	.9875	17
3	REC 3	.76	.00	.0	100.0	000000.0000	2.6923	11

4	REC 4	1.00	.00	.0	103.0	000000.0000	5.0635	3
5	REC 5	1.50	.00	.0	105.0	000000.0000	6.1109	1
6	REC 6	2.00	.00	.0	110.0	000000.0000	5.7479	2
7	REC 7	2.50	.00	.0	115.0	000000.0000	5.0242	4
8	REC 8	3.00	.00	.0	117.0	000000.0000	4.2814	5
9	REC 9	3.81	.00	.0	120.0	000000.0000	3.3334	6
10	REC 10	4.00	.00	.0	143.0	000000.0000	3.2688	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	3.1289	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	3.1450	8
13	REC 13	4.39	.00	.0	200.0	000000.0000	3.1371	9
14	REC 14	5.00	.00	.0	210.0	000000.0000	2.6534	12
15	REC 15	6.00	.00	.0	215.0	000000.0000	2.0576	13
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.6495	14
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.3570	15
18	REC 18	9.00	.00	.0	230.0	000000.0000	1.1395	16
19	REC 19	10.00	.00	.0	250.0	000000.0000	.9788	18
20	REC 20	13.00	.00	.0	300.0	000000.0000	.6677	19
21	REC 21	14.00	.00	.0	400.0	000000.0000	.5974	20
22	REC 22	15.00	.00	.0	500.0	000000.0000	.5373	21
23	REC 23	16.00	.00	.0	540.0	000000.0000	.4864	22
24	REC 24	20.00	.00	.0	600.0	000000.0000	.3447	23
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1839	24
26	REC 26	40.00	.00	.0	600.0	000000.0000	.1194	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0853	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 4

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
4	270.00	1.50	5000.00	293.00	4

		1	2	3	4	5	6	7	8	9	10
FINAL HT (M)		63.62									
DIST FIN HT (KM)		.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.3853	21
2	REC 2	.64	.00	.0	80.0	000000.0000	1.6718	13
3	REC 3	.76	.00	.0	100.0	000000.0000	3.7708	5
4	REC 4	1.00	.00	.0	103.0	000000.0000	5.6870	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	5.6657	2
6	REC 6	2.00	.00	.0	110.0	000000.0000	4.8334	3
7	REC 7	2.50	.00	.0	115.0	000000.0000	3.9906	4
8	REC 8	3.00	.00	.0	117.0	000000.0000	3.2809	6
9	REC 9	3.81	.00	.0	120.0	000000.0000	2.4673	7
10	REC 10	4.00	.00	.0	143.0	000000.0000	2.3926	8
11	REC 11	4.18	.00	.0	150.0	000000.0000	2.2758	9
12	REC 12	4.30	.00	.0	180.0	000000.0000	2.2662	10
13	REC 13	4.39	.00	.0	200.0	000000.0000	2.2467	11
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.8775	12
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.4381	14
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.1430	15
17	REC 17	8.00	.00	.0	225.0	000000.0000	.9345	16
18	REC 18	9.00	.00	.0	230.0	000000.0000	.7810	17
19	REC 19	10.00	.00	.0	250.0	000000.0000	.6676	18
20	REC 20	13.00	.00	.0	300.0	000000.0000	.4496	19
21	REC 21	14.00	.00	.0	400.0	000000.0000	.4010	20

22	REC 22	15.00	.00	.0	500.0	000000.0000	.3605	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.3262	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.2309	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1230	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0798	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0570	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 5

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
5	270.00	2.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	58.76									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.5539	18
2	REC 2	.64	.00	.0	80.0	000000.0000	2.0234	7
3	REC 3	.76	.00	.0	100.0	000000.0000	4.0706	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	5.4545	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	4.9423	2
6	REC 6	2.00	.00	.0	110.0	000000.0000	4.0256	4
7	REC 7	2.50	.00	.0	115.0	000000.0000	3.2369	5
8	REC 8	3.00	.00	.0	117.0	000000.0000	2.6181	6
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.9383	8
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.8695	9
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.7731	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.7575	11
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.7373	12
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.4440	13
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.1002	14
16	REC 16	7.00	.00	.0	220.0	000000.0000	.8713	15
17	REC 17	8.00	.00	.0	225.0	000000.0000	.7104	16
18	REC 18	9.00	.00	.0	230.0	000000.0000	.5926	17
19	REC 19	10.00	.00	.0	250.0	000000.0000	.5054	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.3383	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.3017	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.2711	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.2453	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1735	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0923	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0599	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0428	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 6

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
6	270.00	3.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	53.91									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.7251	15
2	REC 2	.64	.00	.0	80.0	000000.0000	2.1668	6
3	REC 3	.76	.00	.0	100.0	000000.0000	3.8545	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	4.5853	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	3.7909	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	2.9556	4
7	REC 7	2.50	.00	.0	115.0	000000.0000	2.3185	5
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.8471	7
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.3478	8
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.2933	9
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.2233	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.2071	11
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.1898	12
14	REC 14	5.00	.00	.0	210.0	000000.0000	.9842	13
15	REC 15	6.00	.00	.0	215.0	000000.0000	.7463	14
16	REC 16	7.00	.00	.0	220.0	000000.0000	.5891	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.4792	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.3990	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.3394	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.2262	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.2017	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.1812	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.1639	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1159	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0616	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0400	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0285	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 7

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
7	270.00	4.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	51.48									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.7640	13
2	REC 2	.64	.00	.0	80.0	000000.0000	2.0490	5
3	REC 3	.76	.00	.0	100.0	000000.0000	3.4212	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	3.8379	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	3.0363	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	2.3187	4
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.7978	6
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.4221	7
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.0308	8

10	REC 10	4.00	.00	.0	143.0	000000.0000	.9866	9
11	REC 11	4.18	.00	.0	150.0	000000.0000	.9320	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	.9177	11
13	REC 13	4.39	.00	.0	200.0	000000.0000	.9032	12
14	REC 14	5.00	.00	.0	210.0	000000.0000	.7455	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.5641	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.4446	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.3613	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.3006	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.2550	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.1699	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.1514	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.1361	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.1231	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0870	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0462	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0300	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0214	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 8

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
8	270.00	5.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	50.03									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.7490	11
2	REC 2	.64	.00	.0	80.0	000000.0000	1.8791	5
3	REC 3	.76	.00	.0	100.0	000000.0000	3.0199	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	3.2722	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	2.5229	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.9036	4
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.4660	6
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.1550	7
9	REC 9	3.81	.00	.0	120.0	000000.0000	.8339	8
10	REC 10	4.00	.00	.0	143.0	000000.0000	.7970	9
11	REC 11	4.18	.00	.0	150.0	000000.0000	.7523	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	.7398	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.7275	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.5997	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.4532	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.3569	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.2899	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.2410	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.2042	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.1360	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.1212	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.1089	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0985	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0696	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0370	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0240	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0171	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 9

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
9	270.00	7.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	48.36									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.6738	8
2	REC 2	.64	.00	.0	80.0	000000.0000	1.5647	4
3	REC 3	.76	.00	.0	100.0	000000.0000	2.4070	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	2.5083	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.8793	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.3991	5
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.0695	6
8	REC 8	3.00	.00	.0	117.0	000000.0000	.8388	7
9	REC 9	3.81	.00	.0	120.0	000000.0000	.6030	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.5753	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.5427	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.5328	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.5235	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.4309	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.3252	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.2559	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.2077	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1726	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1460	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0972	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0867	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0779	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0704	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0498	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0264	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0171	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0122	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 10

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
10	270.00	10.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	47.11									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV	TOTAL FROM SIGNIF POINT	TOTAL FROM ALL SOURCES	CONCENTRATION RANK

(USER HT UNITS) SOURCES

1	REC 1	.50	.00	.0	70.0	000000.0000	.5597	8
2	REC 2	.64	.00	.0	80.0	000000.0000	1.2262	4
3	REC 3	.76	.00	.0	100.0	000000.0000	1.8256	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.8485	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.3562	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	.9999	5
7	REC 7	2.50	.00	.0	115.0	000000.0000	.7602	6
8	REC 8	3.00	.00	.0	117.0	000000.0000	.5942	7
9	REC 9	3.81	.00	.0	120.0	000000.0000	.4259	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.4058	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.3826	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.3752	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.3683	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.3029	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.2284	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1796	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1457	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1209	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.1023	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0681	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0607	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0545	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0493	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0348	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0185	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0120	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0086	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 11

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
11	270.00	12.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	46.63									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.4983	7
2	REC 2	.64	.00	.0	80.0	000000.0000	1.0671	4
3	REC 3	.76	.00	.0	100.0	000000.0000	1.5687	2
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.5710	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.1434	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	.8398	5
7	REC 7	2.50	.00	.0	115.0	000000.0000	.6372	6
8	REC 8	3.00	.00	.0	117.0	000000.0000	.4975	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.3561	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.3392	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.3196	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.3134	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.3076	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.2528	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1906	15

16	REC 16	7.00	.00	.0	220.0	000000.0000	.1498	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.1215	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.1008	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0853	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0568	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0506	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0454	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0411	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0290	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0154	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0100	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0071	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 12

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
12	270.00	15.00	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	46.14									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.4258	7
2	REC 2	.64	.00	.0	80.0	000000.0000	.8913	4
3	REC 3	.76	.00	.0	100.0	000000.0000	1.2937	1
4	REC 4	1.00	.00	.0	103.0	000000.0000	1.2815	2
5	REC 5	1.50	.00	.0	105.0	000000.0000	.9252	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	.6771	5
7	REC 7	2.50	.00	.0	115.0	000000.0000	.5127	6
8	REC 8	3.00	.00	.0	117.0	000000.0000	.3998	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.2858	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.2721	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.2564	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.2512	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.2465	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.2026	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1527	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1200	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0972	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0807	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0683	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0454	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0405	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0364	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0329	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0232	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0123	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0080	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0057	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 13

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
13	270.00	2.00	5000.00	293.00	5

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	71.69									
DIST FIN HT (KM)	.250									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0010	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0227	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.2295	21
4	REC 4	1.00	.00	.0	103.0	000000.0000	.7823	16
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.6367	10
6	REC 6	2.00	.00	.0	110.0	000000.0000	2.1180	4
7	REC 7	2.50	.00	.0	115.0	000000.0000	2.1991	3
8	REC 8	3.00	.00	.0	117.0	000000.0000	2.0688	5
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.7947	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.9942	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.9816	8
12	REC 12	4.30	.00	.0	180.0	000000.0000	2.2180	2
13	REC 13	4.39	.00	.0	200.0	000000.0000	2.3349	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	2.0243	6
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.5933	11
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.2948	12
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.0782	13
18	REC 18	9.00	.00	.0	230.0	000000.0000	.9154	14
19	REC 19	10.00	.00	.0	250.0	000000.0000	.8005	15
20	REC 20	13.00	.00	.0	300.0	000000.0000	.5542	17
21	REC 21	14.00	.00	.0	400.0	000000.0000	.4615	18
22	REC 22	15.00	.00	.0	500.0	000000.0000	.3831	19
23	REC 23	16.00	.00	.0	540.0	000000.0000	.3361	20
24	REC 24	20.00	.00	.0	600.0	000000.0000	.2292	22
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1314	23
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0885	24
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0663	25

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 14

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
14	270.00	2.50	5000.00	293.00	5

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	69.72									
DIST FIN HT (KM)	.313									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0010	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0231	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.2293	21

4	REC 4	1.00	.00	.0	103.0	000000.0000	.7484	14
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.4828	10
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.8556	3
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.8894	2
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.7551	5
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.5019	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.6568	6
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.6414	8
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.8242	4
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.9115	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.6497	7
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.2935	11
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.0483	12
17	REC 17	8.00	.00	.0	225.0	000000.0000	.8712	13
18	REC 18	9.00	.00	.0	230.0	000000.0000	.7384	15
19	REC 19	10.00	.00	.0	250.0	000000.0000	.6440	16
20	REC 20	13.00	.00	.0	300.0	000000.0000	.4432	17
21	REC 21	14.00	.00	.0	400.0	000000.0000	.3674	18
22	REC 22	15.00	.00	.0	500.0	000000.0000	.3048	19
23	REC 23	16.00	.00	.0	540.0	000000.0000	.2674	20
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1822	22
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1045	23
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0704	24
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0527	25

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 15

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
15	270.00	3.00	5000.00	293.00	5

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	68.22									
DIST FIN HT (KM)	.375									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0010	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0234	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.2275	20
4	REC 4	1.00	.00	.0	103.0	000000.0000	.7157	14
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.3579	9
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.6558	2
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.6609	1
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.5281	5
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.2942	10
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.4199	6
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.4034	7
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.5512	4
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.6197	3
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.3931	8
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.0894	11
16	REC 16	7.00	.00	.0	220.0	000000.0000	.8811	12
17	REC 17	8.00	.00	.0	225.0	000000.0000	.7311	13
18	REC 18	9.00	.00	.0	230.0	000000.0000	.6190	15
19	REC 19	10.00	.00	.0	250.0	000000.0000	.5387	16
20	REC 20	13.00	.00	.0	300.0	000000.0000	.3681	17
21	REC 21	14.00	.00	.0	400.0	000000.0000	.3050	18

22	REC 22	15.00	.00	.0	500.0	000000.0000	.2530	19
23	REC 23	16.00	.00	.0	540.0	000000.0000	.2219	21
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1512	22
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0867	23
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0584	24
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0437	25

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 16

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
16	270.00	4.00	5000.00	293.00	5

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	66.02									
DIST FIN HT (KM)	.500									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0010	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0238	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.2216	19
4	REC 4	1.00	.00	.0	103.0	000000.0000	.6570	13
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.1671	6
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.3697	1
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.3443	2
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.2198	4
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.0179	10
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.1077	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.0913	8
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.1966	5
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.2430	3
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.0640	9
15	REC 15	6.00	.00	.0	215.0	000000.0000	.8288	11
16	REC 16	7.00	.00	.0	220.0	000000.0000	.6685	12
17	REC 17	8.00	.00	.0	225.0	000000.0000	.5535	14
18	REC 18	9.00	.00	.0	230.0	000000.0000	.4679	15
19	REC 19	10.00	.00	.0	250.0	000000.0000	.4060	16
20	REC 20	13.00	.00	.0	300.0	000000.0000	.2747	17
21	REC 21	14.00	.00	.0	400.0	000000.0000	.2275	18
22	REC 22	15.00	.00	.0	500.0	000000.0000	.1886	20
23	REC 23	16.00	.00	.0	540.0	000000.0000	.1654	21
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1126	22
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0645	23
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0435	24
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0326	25

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 17

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
17	270.00	5.00	5000.00	293.00	5

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	64.46									
DIST FIN HT (KM)	.625									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0016	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0238	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.2145	18
4	REC 4	1.00	.00	.0	103.0	000000.0000	.6072	12
5	REC 5	1.50	.00	.0	105.0	000000.0000	1.0276	3
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.1733	1
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.1338	2
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.0188	4
9	REC 9	3.81	.00	.0	120.0	000000.0000	.8415	10
10	REC 10	4.00	.00	.0	143.0	000000.0000	.9105	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	.8949	8
12	REC 12	4.30	.00	.0	180.0	000000.0000	.9756	6
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.0097	5
14	REC 14	5.00	.00	.0	210.0	000000.0000	.8614	9
15	REC 15	6.00	.00	.0	215.0	000000.0000	.6692	11
16	REC 16	7.00	.00	.0	220.0	000000.0000	.5388	13
17	REC 17	8.00	.00	.0	225.0	000000.0000	.4455	14
18	REC 18	9.00	.00	.0	230.0	000000.0000	.3762	15
19	REC 19	10.00	.00	.0	250.0	000000.0000	.3256	16
20	REC 20	13.00	.00	.0	300.0	000000.0000	.2189	17
21	REC 21	14.00	.00	.0	400.0	000000.0000	.1813	19
22	REC 22	15.00	.00	.0	500.0	000000.0000	.1502	20
23	REC 23	16.00	.00	.0	540.0	000000.0000	.1317	21
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0896	22
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0514	23
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0346	24
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0259	25

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 18

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
18	270.00	2.00	5000.00	293.00	6

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	67.01									
DIST FIN HT (KM)	.189									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0000	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0001	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.0049	25
4	REC 4	1.00	.00	.0	103.0	000000.0000	.0453	24
5	REC 5	1.50	.00	.0	105.0	000000.0000	.3013	20
6	REC 6	2.00	.00	.0	110.0	000000.0000	.7573	16
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.1150	13
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.2887	12
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.3529	10

10	REC 10	4.00	.00	.0	143.0	000000.0000	1.8819	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	2.0091	5
12	REC 12	4.30	.00	.0	180.0	000000.0000	2.7377	3
13	REC 13	4.39	.00	.0	200.0	000000.0000	3.1861	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	2.9261	2
15	REC 15	6.00	.00	.0	215.0	000000.0000	2.3903	4
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.9972	6
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.7081	8
18	REC 18	9.00	.00	.0	230.0	000000.0000	1.4828	9
19	REC 19	10.00	.00	.0	250.0	000000.0000	1.3428	11
20	REC 20	13.00	.00	.0	300.0	000000.0000	.9350	14
21	REC 21	14.00	.00	.0	400.0	000000.0000	.7785	15
22	REC 22	15.00	.00	.0	500.0	000000.0000	.6483	17
23	REC 23	16.00	.00	.0	540.0	000000.0000	.5740	18
24	REC 24	20.00	.00	.0	600.0	000000.0000	.4040	19
25	REC 25	30.00	.00	.0	600.0	000000.0000	.2370	21
26	REC 26	40.00	.00	.0	600.0	000000.0000	.1646	22
27	REC 27	50.00	.00	.0	600.0	000000.0000	.1240	23

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 19

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
19	270.00	2.50	5000.00	293.00	6

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	65.38									
DIST FIN HT (KM)	.236									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0000	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0001	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.0050	25
4	REC 4	1.00	.00	.0	103.0	000000.0000	.0458	24
5	REC 5	1.50	.00	.0	105.0	000000.0000	.2911	20
6	REC 6	2.00	.00	.0	110.0	000000.0000	.7015	15
7	REC 7	2.50	.00	.0	115.0	000000.0000	1.0052	13
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.1404	11
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.1754	10
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.6143	7
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.7142	5
12	REC 12	4.30	.00	.0	180.0	000000.0000	2.3037	3
13	REC 13	4.39	.00	.0	200.0	000000.0000	2.6563	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	2.4197	2
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.9638	4
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.6329	6
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.3917	8
18	REC 18	9.00	.00	.0	230.0	000000.0000	1.2046	9
19	REC 19	10.00	.00	.0	250.0	000000.0000	1.0847	12
20	REC 20	13.00	.00	.0	300.0	000000.0000	.7457	14
21	REC 21	14.00	.00	.0	400.0	000000.0000	.6206	16
22	REC 22	15.00	.00	.0	500.0	000000.0000	.5166	17
23	REC 23	16.00	.00	.0	540.0	000000.0000	.4573	18
24	REC 24	20.00	.00	.0	600.0	000000.0000	.3217	19
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1887	21
26	REC 26	40.00	.00	.0	600.0	000000.0000	.1310	22
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0987	23

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 20

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
20	270.00	3.00	5000.00	293.00	6

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	64.13									
DIST FIN HT (KM)	.284									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0000	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0001	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.0051	25
4	REC 4	1.00	.00	.0	103.0	000000.0000	.0461	24
5	REC 5	1.50	.00	.0	105.0	000000.0000	.2808	19
6	REC 6	2.00	.00	.0	110.0	000000.0000	.6538	14
7	REC 7	2.50	.00	.0	115.0	000000.0000	.9172	12
8	REC 8	3.00	.00	.0	117.0	000000.0000	1.0256	10
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.0422	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.4171	6
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.4987	5
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.9926	3
13	REC 13	4.39	.00	.0	200.0	000000.0000	2.2812	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	2.0652	2
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.6681	4
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.3820	7
17	REC 17	8.00	.00	.0	225.0	000000.0000	1.1748	8
18	REC 18	9.00	.00	.0	230.0	000000.0000	1.0148	11
19	REC 19	10.00	.00	.0	250.0	000000.0000	.9069	13
20	REC 20	13.00	.00	.0	300.0	000000.0000	.6199	15
21	REC 21	14.00	.00	.0	400.0	000000.0000	.5158	16
22	REC 22	15.00	.00	.0	500.0	000000.0000	.4291	17
23	REC 23	16.00	.00	.0	540.0	000000.0000	.3798	18
24	REC 24	20.00	.00	.0	600.0	000000.0000	.2672	20
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1567	21
26	REC 26	40.00	.00	.0	600.0	000000.0000	.1088	22
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0820	23

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 21

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
21	270.00	4.00	5000.00	293.00	6

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	62.31									
DIST FIN HT (KM)	.378									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV	TOTAL FROM SIGNIF POINT	TOTAL FROM ALL SOURCES	CONCENTRATION RANK

(USER HT UNITS) SOURCES

1	REC 1	.50	.00	.0	70.0	000000.0000	.0000	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0001	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.0052	25
4	REC 4	1.00	.00	.0	103.0	000000.0000	.0460	24
5	REC 5	1.50	.00	.0	105.0	000000.0000	.2614	19
6	REC 6	2.00	.00	.0	110.0	000000.0000	.5771	14
7	REC 7	2.50	.00	.0	115.0	000000.0000	.7841	11
8	REC 8	3.00	.00	.0	117.0	000000.0000	.8583	9
9	REC 9	3.81	.00	.0	120.0	000000.0000	.8542	10
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.1446	6
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.2031	5
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.5744	3
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.7836	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.6005	2
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.2840	4
16	REC 16	7.00	.00	.0	220.0	000000.0000	1.0585	7
17	REC 17	8.00	.00	.0	225.0	000000.0000	.8966	8
18	REC 18	9.00	.00	.0	230.0	000000.0000	.7722	12
19	REC 19	10.00	.00	.0	250.0	000000.0000	.6810	13
20	REC 20	13.00	.00	.0	300.0	000000.0000	.4633	15
21	REC 21	14.00	.00	.0	400.0	000000.0000	.3853	16
22	REC 22	15.00	.00	.0	500.0	000000.0000	.3204	17
23	REC 23	16.00	.00	.0	540.0	000000.0000	.2835	18
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1993	20
25	REC 25	30.00	.00	.0	600.0	000000.0000	.1169	21
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0811	22
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0611	23

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 22

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
22	270.00	5.00	5000.00	293.00	6

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	61.01									
DIST FIN HT (KM)	.473									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.0000	27
2	REC 2	.64	.00	.0	80.0	000000.0000	.0001	26
3	REC 3	.76	.00	.0	100.0	000000.0000	.0053	25
4	REC 4	1.00	.00	.0	103.0	000000.0000	.0454	24
5	REC 5	1.50	.00	.0	105.0	000000.0000	.2442	18
6	REC 6	2.00	.00	.0	110.0	000000.0000	.5181	14
7	REC 7	2.50	.00	.0	115.0	000000.0000	.6878	11
8	REC 8	3.00	.00	.0	117.0	000000.0000	.7414	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.7270	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.9639	6
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.0088	5
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.3050	3
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.4672	1
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.3085	2
15	REC 15	6.00	.00	.0	215.0	000000.0000	1.0449	4

16	REC 16	7.00	.00	.0	220.0	000000.0000	.8585	7
17	REC 17	8.00	.00	.0	225.0	000000.0000	.7253	10
18	REC 18	9.00	.00	.0	230.0	000000.0000	.6235	12
19	REC 19	10.00	.00	.0	250.0	000000.0000	.5453	13
20	REC 20	13.00	.00	.0	300.0	000000.0000	.3696	15
21	REC 21	14.00	.00	.0	400.0	000000.0000	.3073	16
22	REC 22	15.00	.00	.0	500.0	000000.0000	.2555	17
23	REC 23	16.00	.00	.0	540.0	000000.0000	.2260	19
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1588	20
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0931	21
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0647	22
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0487	23

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 23

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
23	270.00	2.50	5000.00	293.00	2

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	57.72									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	13.4590	1
2	REC 2	.64	.00	.0	80.0	000000.0000	10.6642	2
3	REC 3	.76	.00	.0	100.0	000000.0000	8.4832	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	5.2946	4
5	REC 5	1.50	.00	.0	105.0	000000.0000	2.4246	5
6	REC 6	2.00	.00	.0	110.0	000000.0000	1.3570	6
7	REC 7	2.50	.00	.0	115.0	000000.0000	.8583	7
8	REC 8	3.00	.00	.0	117.0	000000.0000	.5885	8
9	REC 9	3.81	.00	.0	120.0	000000.0000	.3579	9
10	REC 10	4.00	.00	.0	143.0	000000.0000	.3236	10
11	REC 11	4.18	.00	.0	150.0	000000.0000	.2952	11
12	REC 12	4.30	.00	.0	180.0	000000.0000	.2785	12
13	REC 13	4.39	.00	.0	200.0	000000.0000	.2668	13
14	REC 14	5.00	.00	.0	210.0	000000.0000	.2032	14
15	REC 15	6.00	.00	.0	215.0	000000.0000	.1387	15
16	REC 16	7.00	.00	.0	220.0	000000.0000	.1004	16
17	REC 17	8.00	.00	.0	225.0	000000.0000	.0759	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.0593	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.0476	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.0274	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.0235	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.0203	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.0178	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.0111	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0048	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0033	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0026	27

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

SUMMARY CONCENTRATION TABLE(MICROGRAMS/M**3) 89/ 2 : HOUR 24

HOUR	THETA (DEG)	SPEED (M/S)	MIXING HEIGHT(M)	TEMP (K)	STABILITY CLASS
24	270.00	2.50	5000.00	293.00	4

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	55.85									
DIST FIN HT (KM)	.086									

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	000000.0000	.6632	16
2	REC 2	.64	.00	.0	80.0	000000.0000	2.1538	7
3	REC 3	.76	.00	.0	100.0	000000.0000	4.0277	3
4	REC 4	1.00	.00	.0	103.0	000000.0000	5.0244	1
5	REC 5	1.50	.00	.0	105.0	000000.0000	4.3068	2
6	REC 6	2.00	.00	.0	110.0	000000.0000	3.4160	4
7	REC 7	2.50	.00	.0	115.0	000000.0000	2.7057	5
8	REC 8	3.00	.00	.0	117.0	000000.0000	2.1683	6
9	REC 9	3.81	.00	.0	120.0	000000.0000	1.5911	8
10	REC 10	4.00	.00	.0	143.0	000000.0000	1.5299	9
11	REC 11	4.18	.00	.0	150.0	000000.0000	1.4487	10
12	REC 12	4.30	.00	.0	180.0	000000.0000	1.4320	11
13	REC 13	4.39	.00	.0	200.0	000000.0000	1.4131	12
14	REC 14	5.00	.00	.0	210.0	000000.0000	1.1711	13
15	REC 15	6.00	.00	.0	215.0	000000.0000	.8896	14
16	REC 16	7.00	.00	.0	220.0	000000.0000	.7031	15
17	REC 17	8.00	.00	.0	225.0	000000.0000	.5725	17
18	REC 18	9.00	.00	.0	230.0	000000.0000	.4770	18
19	REC 19	10.00	.00	.0	250.0	000000.0000	.4063	19
20	REC 20	13.00	.00	.0	300.0	000000.0000	.2711	20
21	REC 21	14.00	.00	.0	400.0	000000.0000	.2417	21
22	REC 22	15.00	.00	.0	500.0	000000.0000	.2172	22
23	REC 23	16.00	.00	.0	540.0	000000.0000	.1965	23
24	REC 24	20.00	.00	.0	600.0	000000.0000	.1390	24
25	REC 25	30.00	.00	.0	600.0	000000.0000	.0739	25
26	REC 26	40.00	.00	.0	600.0	000000.0000	.0479	26
27	REC 27	50.00	.00	.0	600.0	000000.0000	.0342	27

COMPLEX I - VERSION 86064

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM

GENERIC 1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN

SECOND RUN / WITH THE 48 WORST CASE METEOROLOGICAL CONDITIONS

RECEPTORS

RECEPTOR	IDENTIFICATION	EAST COORD (USER UNITS)	NORTH COORD (USER UNITS)	RECEPTOR HT ABV LOCAL GRD LVL (METERS)	RECEPTOR GROUND LEVEL ELEVATION (USER HT UNITS)	AVG CONC FOR PERIOD DAY 1.HR 1. TO DAY 2.HR24. (MICROGRAMS/M**3)
1	REC 1	.50	.00	.0	70.0	* 6.76
2	REC 2	.64	.00	.0	80.0	5.60
3	REC 3	.76	.00	.0	100.0	4.95
4	REC 4	1.00	.00	.0	103.0	3.74
5	REC 5	1.50	.00	.0	105.0	2.40
6	REC 6	2.00	.00	.0	110.0	1.80
7	REC 7	2.50	.00	.0	115.0	1.44
8	REC 8	3.00	.00	.0	117.0	1.18
9	REC 9	3.81	.00	.0	120.0	.90
10	REC 10	4.00	.00	.0	143.0	.93
11	REC 11	4.18	.00	.0	150.0	.90
12	REC 12	4.30	.00	.0	180.0	.96
13	REC 13	4.39	.00	.0	200.0	.99

14	REC 14	5.00	.00	.0	210.0	.84
15	REC 15	6.00	.00	.0	215.0	.65
16	REC 16	7.00	.00	.0	220.0	.52
17	REC 17	8.00	.00	.0	225.0	.43
18	REC 18	9.00	.00	.0	230.0	.36
19	REC 19	10.00	.00	.0	250.0	.31
20	REC 20	13.00	.00	.0	300.0	.21
21	REC 21	14.00	.00	.0	400.0	.18
22	REC 22	15.00	.00	.0	500.0	.16
23	REC 23	16.00	.00	.0	540.0	.14
24	REC 24	20.00	.00	.0	600.0	.10
25	REC 25	30.00	.00	.0	600.0	.05
26	REC 26	40.00	.00	.0	600.0	.04
27	REC 27	50.00	.00	.0	600.0	.03

FIVE HIGHEST 1-HOUR GENERIC POLLUTANT CONCENTRATIONS((ENDING ON JULIAN DAY, HOUR)
(MICROGRAMS/M**3)

RECEPTOR	1	2	3	4	5
1(.50, .00) *	27.55 (1, 1) *	27.55 (1, 2)	24.83 (1, 3)	20.30 (1,10)	19.96 (1, 8)
2(.64, .00)	21.42 (1, 8)	21.42 (1, 9)	19.82 (1,10)	15.99 (1, 1)	15.99 (1, 2)
3(.76, .00)	19.76 (1, 8)	19.76 (1, 9)	17.44 (1,10)	13.06 (1,11)	10.61 (1,16)
4(1.00, .00)	14.05 (1, 8)	14.05 (1, 9)	11.88 (1,10)	8.45 (1,11)	8.25 (1,16)
5(1.50, .00)	7.08 (1, 8)	7.08 (1, 9)	6.11 (2, 3)	5.85 (2, 2)	5.80 (1,10)
6(2.00, .00)	5.93 (2, 2)	5.86 (2, 1)	5.75 (2, 3)	4.83 (2, 4)	4.09 (1, 8)
7(2.50, .00)	5.56 (2, 1)	5.43 (2, 2)	5.02 (2, 3)	3.99 (2, 4)	3.24 (2, 5)
8(3.00, .00)	5.00 (2, 1)	4.76 (2, 2)	4.28 (2, 3)	3.28 (2, 4)	2.62 (2, 5)
9(3.81, .00)	4.10 (2, 1)	3.81 (2, 2)	3.33 (2, 3)	2.47 (2, 4)	1.94 (2, 5)
10(4.00, .00)	4.08 (2, 1)	3.77 (2, 2)	3.27 (2, 3)	2.39 (2, 4)	1.99 (2,13)
11(4.18, .00)	3.95 (2, 1)	3.63 (2, 2)	3.13 (2, 3)	2.28 (2, 4)	2.01 (2,18)
12(4.30, .00)	4.02 (2, 1)	3.68 (2, 2)	3.14 (2, 3)	2.74 (2,18)	2.30 (2,19)
13(4.39, .00)	4.04 (2, 1)	3.68 (2, 2)	3.19 (2,18)	3.14 (2, 3)	2.66 (2,19)
14(5.00, .00)	3.48 (2, 1)	3.15 (2, 2)	2.93 (2,18)	2.65 (2, 3)	2.42 (2,19)
15(6.00, .00)	2.76 (2, 1)	2.47 (2, 2)	2.39 (2,18)	2.06 (2, 3)	1.96 (2,19)
16(7.00, .00)	2.24 (2, 1)	2.00 (2,18)	1.99 (2, 2)	1.65 (2, 3)	1.63 (2,19)
17(8.00, .00)	1.86 (2, 1)	1.71 (2,18)	1.65 (2, 2)	1.39 (2,19)	1.36 (2, 3)
18(9.00, .00)	1.58 (2, 1)	1.48 (2,18)	1.39 (2, 2)	1.20 (2,19)	1.14 (2, 3)
19(10.00, .00)	1.36 (2, 1)	1.34 (2,18)	1.20 (2, 2)	1.08 (2,19)	.98 (2, 3)
20(13.00, .00)	.94 (2, 1)	.94 (2,18)	.82 (2, 2)	.75 (2,19)	.67 (2, 3)
21(14.00, .00)	.86 (2, 1)	.78 (2,18)	.74 (2, 2)	.62 (2,19)	.60 (2, 3)
22(15.00, .00)	.77 (2, 1)	.67 (2, 2)	.65 (2,18)	.54 (2, 3)	.52 (2,19)
23(16.00, .00)	.70 (2, 1)	.60 (2, 2)	.57 (2,18)	.49 (2, 3)	.46 (2,19)
24(20.00, .00)	.50 (2, 1)	.43 (2, 2)	.40 (2,18)	.34 (2, 3)	.32 (2,19)
25(30.00, .00)	.27 (2, 1)	.24 (2,18)	.23 (2, 2)	.19 (2,19)	.18 (2, 3)
26(40.00, .00)	.17 (2, 1)	.16 (2,18)	.15 (2, 2)	.13 (2,19)	.12 (2, 3)
27(50.00, .00)	.12 (2,18)	.12 (2, 1)	.11 (2, 2)	.10 (2,19)	.09 (2, 3)

REFINED MODELING USING ISCLT

(H.4)

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ISCLT (DATED 88167)
AN AIR QUALITY-DISPERSION MODEL IN
SECTION 1.  GUIDELINE MODELS
IN UNAMAP (VERSION 6) JUNE 88.
SOURCE:  UNAMAP FILE ON EPA'S UNIVAC AT RTP, NC
DATE & TIME OF THIS RUN - 06/26/89 12:45:18
INPUT FILE - EDISON.DAT
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                    - ISCLT INPUT DATA -

NUMBER OF SOURCES =   1
NUMBER OF X AXIS GRID SYSTEM POINTS =   20
NUMBER OF Y AXIS GRID SYSTEM POINTS =   36
NUMBER OF SPECIAL POINTS =    6
NUMBER OF SEASONS =   1
NUMBER OF WIND SPEED CLASSES =   6
NUMBER OF STABILITY CLASSES =   6
NUMBER OF WIND DIRECTION CLASSES =  16
FILE NUMBER OF DATA FILE USED FOR REPORTS =   1
THE PROGRAM IS RUN IN RURAL MODE
CONCENTRATION (DEPOSITION) UNITS CONVERSION FACTOR = .10000000E+07
ACCELERATION OF GRAVITY (METERS/SEC**2) =  9.800
HEIGHT OF MEASUREMENT OF WIND SPEED (METERS) =  10.000
CORRECTION ANGLE FOR GRID SYSTEM VERSUS DIRECTION DATA NORTH (DEGREES) =     .000
DECAY COEFFICIENT = .00000000E+00
PROGRAM OPTION SWITCHES = 1, 2, 1, 1, 0, 3, 2, 2, 3, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 1, 0,
ALL SOURCES ARE USED TO FORM SOURCE COMBINATION  1
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- GRID SYSTEM RECEPTOR TERRAIN ELEVATIONS (METERS) -

- GRID SYSTEM RECEPTORS -
- X AXIS (RANGE , METERS) -
- ELEVATIONS -

Y AXIS (AZIMUTH BEARING, DEGREES)	500.000	1500.000	2500.000	3500.000	4500.000	5500.000	6500.000	7500.000	8500.000
350.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
340.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
330.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
320.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
310.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
300.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
290.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
280.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
270.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
260.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
250.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
240.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
230.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
220.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
210.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
200.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
190.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
180.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
170.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
160.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
150.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
140.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
130.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
120.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
110.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
100.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
90.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
80.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
70.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
60.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
50.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
40.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
30.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
20.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
10.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070
.000	21.336040	24.384050	30.480060	31.394460	32.004060	33.528060	35.052070	35.661670	36.576070

- GRID SYSTEM RECEPTORS -
- X AXIS (RANGE , METERS) -
- ELEVATIONS -

Y AXIS (AZIMUTH BEARING, DEGREES)	9500.000	10500.000	11500.000	12500.000	13500.000	14500.000	15500.000	16500.000	17500.000
350.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090

- GRID SYSTEM RECEPTOR TERRAIN ELEVATIONS (METERS) (CONT.) -

- GRID SYSTEM RECEPTORS -
- X AXIS (RANGE , METERS) -

- ELEVATIONS -

Y AXIS (AZIMUTH BEARING, DEGREES)	9500.000	10500.000	11500.000	12500.000	13500.000	14500.000	15500.000	16500.000	17500.000
340.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
330.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
320.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
310.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
300.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
290.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
280.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
270.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
260.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
250.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
240.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
230.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
220.000	43.586490	44.196090	44.196090	34.747270	44.196090	44.196090	44.196090	44.196090	44.196090
210.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
200.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
190.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
180.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
170.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
160.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
150.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
140.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
130.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
120.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
110.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
100.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
90.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
80.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
70.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
60.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
50.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
40.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
30.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
20.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
10.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090
.000	43.586490	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090	44.196090

- GRID SYSTEM RECEPTORS -
- X AXIS (RANGE , METERS) -

- ELEVATIONS -

Y AXIS (AZIMUTH BEARING, DEGREES)	18500.000	19500.000
350.000	44.196090	44.196090
340.000	44.196090	44.196090

- GRID SYSTEM RECEPTOR TERRAIN ELEVATIONS (METERS) (CONT.) -

- GRID SYSTEM RECEPTORS -
- X AXIS (RANGE , METERS) -

- ELEVATIONS -

Y AXIS (AZIMUTH BEARING, DEGREES)	18500.000	19500.000
330.000	44.196090	44.196090
320.000	44.196090	44.196090
310.000	44.196090	44.196090
300.000	44.196090	44.196090
290.000	44.196090	44.196090
280.000	44.196090	44.196090
270.000	44.196090	44.196090
260.000	44.196090	44.196090
250.000	44.196090	44.196090
240.000	44.196090	44.196090
230.000	44.196090	44.196090
220.000	44.196090	44.196090
210.000	44.196090	44.196090
200.000	44.196090	44.196090
190.000	44.196090	44.196090
180.000	44.196090	44.196090
170.000	44.196090	44.196090
160.000	44.196090	44.196090
150.000	44.196090	44.196090
140.000	44.196090	44.196090
130.000	44.196090	44.196090
120.000	44.196090	44.196090
110.000	44.196090	44.196090
100.000	44.196090	44.196090
90.000	44.196090	44.196090
80.000	44.196090	44.196090
70.000	44.196090	44.196090
60.000	44.196090	44.196090
50.000	44.196090	44.196090
40.000	44.196090	44.196090
30.000	44.196090	44.196090
20.000	44.196090	44.196090
10.000	44.196090	44.196090
.000	44.196090	44.196090

- DISCRETE RECEPTOR TERRAIN ELEVATIONS (METERS) (CONT.) -

X DISTANCE (METERS)	Y DISTANCE (METERS)	ELEVATION	X DISTANCE (METERS)	Y DISTANCE (METERS)	ELEVATION	X DISTANCE (METERS)	Y DISTANCE (METERS)	ELEVATION
-270.0	-210.0	22.860040	-400.0	210.0	24.384050	-550.0	-150.0	30.480060
-850.0	-300.0	31.394460	-1000.0	1130.0	32.004060	1170.0	1740.0	33.528060

- ISCLT INPUT DATA (CONT.) -

- AMBIENT AIR TEMPERATURE (DEGREES KELVIN) -

	STABILITY CATEGORY 1	STABILITY CATEGORY 2	STABILITY CATEGORY 3	STABILITY CATEGORY 4	STABILITY CATEGORY 5	STABILITY CATEGORY 6
SEASON 1	293.0000	293.0000	293.0000	293.0000	293.0000	293.0000

- MIXING LAYER HEIGHT (METERS) -

SEASON 1

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04
STABILITY CATEGORY 2	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04
STABILITY CATEGORY 3	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04
STABILITY CATEGORY 4	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04	.500000E+04
STABILITY CATEGORY 5	.100000E+05	.100000E+05	.100000E+05	.100000E+05	.100000E+05	.100000E+05
STABILITY CATEGORY 6	.100000E+05	.100000E+05	.100000E+05	.100000E+05	.100000E+05	.100000E+05

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -

SEASON 1

STABILITY CATEGORY 1

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
.000	.00018001	.00011001	.00000000	.00000000	.00000000	.00000000
22.500	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000
45.000	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
67.500	.00010001	.00034002	.00000000	.00000000	.00000000	.00000000
90.000	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
112.500	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000
135.000	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000
157.500	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
180.000	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
202.500	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000
225.000	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
247.500	.00000000	.00000000	.00000000	.00000000	.00000000	.00000000
270.000	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
292.500	.00010001	.00034002	.00000000	.00000000	.00000000	.00000000
315.000	.00003000	.00011001	.00000000	.00000000	.00000000	.00000000
337.500	.00007000	.00023002	.00000000	.00000000	.00000000	.00000000

- ISCLT INPUT DATA (CONT.) -

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
SEASON 1
STABILITY CATEGORY 2

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
.000	.00057004	.00137010	.00126009	.00000000	.00000000	.00000000
22.500	.00029002	.00068005	.00114008	.00000000	.00000000	.00000000
45.000	.00016001	.00068005	.00023002	.00000000	.00000000	.00000000
67.500	.00019001	.00103007	.00046003	.00000000	.00000000	.00000000
90.000	.00007000	.00114008	.00080006	.00000000	.00000000	.00000000
112.500	.00020001	.00126009	.00057004	.00000000	.00000000	.00000000
135.000	.00006000	.00103007	.00171012	.00000000	.00000000	.00000000
157.500	.00041003	.00080006	.00068005	.00000000	.00000000	.00000000
180.000	.00019001	.00114008	.00057004	.00000000	.00000000	.00000000
202.500	.00019001	.00114008	.00126009	.00000000	.00000000	.00000000
225.000	.00056004	.00126009	.00160011	.00000000	.00000000	.00000000
247.500	.00067005	.00103007	.00148010	.00000000	.00000000	.00000000
270.000	.00110008	.00205014	.00126009	.00000000	.00000000	.00000000
292.500	.00032002	.00126009	.00171012	.00000000	.00000000	.00000000
315.000	.00053004	.00068005	.00103007	.00000000	.00000000	.00000000
337.500	.00006000	.00103007	.00034002	.00000000	.00000000	.00000000

SEASON 1
STABILITY CATEGORY 3

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
.000	.00053004	.00137010	.00537038	.00114008	.00000000	.00000000
22.500	.00030002	.00137010	.00571040	.00046003	.00000000	.00000000
45.000	.00005000	.00126009	.00308022	.00080006	.00000000	.00000000
67.500	.00002000	.00057004	.00126009	.00011001	.00000000	.00000000
90.000	.00003000	.00068005	.00114008	.00000000	.00000000	.00000000
112.500	.00002000	.00057004	.00285020	.00011001	.00000000	.00000000
135.000	.00030002	.00148010	.00559039	.00126009	.00000000	.00000000
157.500	.00040003	.00114008	.00422029	.00068005	.00000000	.00000000
180.000	.00090006	.00160011	.00422029	.00103007	.00000000	.00000000
202.500	.00018001	.00137010	.00240017	.00091006	.00000000	.00000000
225.000	.00005000	.00126009	.00434030	.00171012	.00000000	.00000000
247.500	.00031002	.00171012	.00662046	.00148010	.00000000	.00000000
270.000	.00055004	.00171012	.00651046	.00114008	.00000000	.00000000
292.500	.00028002	.00103007	.00400028	.00342024	.00011001	.00023002
315.000	.00003000	.00080006	.00331023	.00194014	.00011001	.00000000
337.500	.00014001	.00057004	.00263018	.00148010	.00011001	.00011001

- ISCLT INPUT DATA (CONT.) -

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
SEASON 1
STABILITY CATEGORY 4

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
.000	.00056004	.00502035	.01621113	.01963137	.00582041	.00126009
22.500	.00026002	.00651046	.02694188	.04258297	.00388027	.00023002
45.000	.00067005	.00502035	.01450101	.01473103	.00240017	.00011001
67.500	.00097007	.00354025	.00868061	.00765053	.00023002	.00000000
90.000	.00120008	.00628044	.00491034	.00422029	.00126009	.00011001
112.500	.00089006	.00753053	.00799056	.00525037	.00103007	.00023002
135.000	.00129009	.00856060	.01142080	.00354025	.00046003	.00000000
157.500	.00045003	.00537038	.00868061	.00445031	.00023002	.00000000
180.000	.00065005	.00731051	.01461102	.00776054	.00057004	.00000000
202.500	.00026002	.00354025	.00765053	.00479033	.00091006	.00000000
225.000	.00066005	.00457032	.01404098	.01553109	.00194014	.00057004
247.500	.00046003	.00263018	.01404098	.02021141	.00297021	.00057004
270.000	.00103007	.00502035	.02055144	.02637184	.00571040	.00148010
292.500	.00044003	.00205014	.00879061	.02295160	.00662046	.00377026
315.000	.00031002	.00194014	.00788055	.03219225	.01176082	.00400028
337.500	.00030002	.00148010	.00765053	.02123148	.00651046	.00114008

SEASON 1
STABILITY CATEGORY 5

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
.000	.00007000	.00297021	.00913064	.00034002	.00000000	.00000000
22.500	.00034002	.00468033	.01016071	.00000000	.00000000	.00000000
45.000	.00017001	.00217015	.00114008	.00000000	.00000000	.00000000
67.500	.00050003	.00126009	.00023002	.00000000	.00000000	.00000000
90.000	.00026002	.00114008	.00057004	.00000000	.00000000	.00000000
112.500	.00007000	.00308022	.00080006	.00000000	.00000000	.00000000
135.000	.00016001	.00171012	.00023002	.00000000	.00000000	.00000000
157.500	.00009001	.00388027	.00137010	.00000000	.00000000	.00000000
180.000	.00039003	.00674047	.00571040	.00000000	.00000000	.00000000
202.500	.00037003	.00605042	.00422029	.00000000	.00000000	.00000000
225.000	.00046003	.00479033	.01358095	.00000000	.00000000	.00000000
247.500	.00005000	.00228016	.01221085	.00000000	.00000000	.00000000
270.000	.00050003	.00651046	.01016071	.00000000	.00000000	.00000000
292.500	.00016001	.00183013	.00571040	.00023002	.00000000	.00000000
315.000	.00003000	.00137010	.00902063	.00000000	.00000000	.00000000
337.500	.00003000	.00126009	.00594041	.00000000	.00000000	.00000000

- ISCLT INPUT DATA (CONT.) -

- FREQUENCY OF OCCURRENCE OF WIND SPEED, DIRECTION AND STABILITY -
SEASON 1
STABILITY CATEGORY 6

DIRECTION (DEGREES)	WIND SPEED CATEGORY 1 (1.5000MPS)	WIND SPEED CATEGORY 2 (2.5000MPS)	WIND SPEED CATEGORY 3 (4.3000MPS)	WIND SPEED CATEGORY 4 (6.8000MPS)	WIND SPEED CATEGORY 5 (9.5000MPS)	WIND SPEED CATEGORY 6 (12.5000MPS)
.000	.00106007	.00377026	.00000000	.00000000	.00000000	.00000000
22.500	.00246017	.00719050	.00023002	.00000000	.00000000	.00000000
45.000	.00148010	.00400028	.00000000	.00000000	.00000000	.00000000
67.500	.00148010	.00126009	.00000000	.00000000	.00000000	.00000000
90.000	.00147010	.00114008	.00000000	.00000000	.00000000	.00000000
112.500	.00094007	.00114008	.00000000	.00000000	.00000000	.00000000
135.000	.00147010	.00114008	.00000000	.00000000	.00000000	.00000000
157.500	.00173012	.00388027	.00000000	.00000000	.00000000	.00000000
180.000	.00386027	.00970068	.00000000	.00000000	.00000000	.00000000
202.500	.00321022	.01062074	.00000000	.00000000	.00000000	.00000000
225.000	.00296021	.00982069	.00000000	.00000000	.00000000	.00000000
247.500	.00086006	.00514036	.00023002	.00000000	.00000000	.00000000
270.000	.00304021	.00765053	.00000000	.00000000	.00000000	.00000000
292.500	.00135009	.00491034	.00000000	.00000000	.00000000	.00000000
315.000	.00135009	.00400028	.00000000	.00000000	.00000000	.00000000
337.500	.00039003	.00274019	.00011001	.00000000	.00000000	.00000000

- VERTICAL POTENTIAL TEMPERATURE GRADIENT (DEGREES KELVIN/METER) -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00
STABILITY CATEGORY 2	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00
STABILITY CATEGORY 3	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00
STABILITY CATEGORY 4	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00	.000000E+00
STABILITY CATEGORY 5	.200000E-01	.200000E-01	.200000E-01	.200000E-01	.200000E-01	.200000E-01
STABILITY CATEGORY 6	.350000E-01	.350000E-01	.350000E-01	.350000E-01	.350000E-01	.350000E-01

- WIND PROFILE POWER LAW EXPONENTS -

	WIND SPEED CATEGORY 1	WIND SPEED CATEGORY 2	WIND SPEED CATEGORY 3	WIND SPEED CATEGORY 4	WIND SPEED CATEGORY 5	WIND SPEED CATEGORY 6
STABILITY CATEGORY 1	.100000E+00	.100000E+00	.100000E+00	.100000E+00	.100000E+00	.100000E+00
STABILITY CATEGORY 2	.150000E+00	.150000E+00	.150000E+00	.150000E+00	.150000E+00	.150000E+00
STABILITY CATEGORY 3	.200000E+00	.200000E+00	.200000E+00	.200000E+00	.200000E+00	.200000E+00
STABILITY CATEGORY 4	.250000E+00	.250000E+00	.250000E+00	.250000E+00	.250000E+00	.250000E+00
STABILITY CATEGORY 5	.300000E+00	.300000E+00	.300000E+00	.300000E+00	.300000E+00	.300000E+00
STABILITY CATEGORY 6	.300000E+00	.300000E+00	.300000E+00	.300000E+00	.300000E+00	.300000E+00

- SOURCE INPUT DATA -

C A R D	T A P E	SOURCE NUMBER	SOURCE TYPE	X COORDINATE (M)	Y COORDINATE (M)	EMISSION HEIGHT (M)	BASE / ELEV- / ATION / (M) /	- SOURCE DETAILS DEPENDING ON TYPE -
X		1	STACK	.00	.00	44.20	21.34	GAS EX.T TEMP (DEG K)= 352.00, GAS EXIT VEL. (M/SEC)= 10.36, STACK DIAMETER (M)= .762, HEIGHT OF ASSO. BLDG. (M)= .00, WIDTH OF ASSO. BLDG. (M)= .00, WAKE EFFECTS FLAG = 0

- SOURCE STRENGTHS (GRAMS PER SEC) -

SEASON 1	SEASON 2	SEASON 3	SEASON 4
1.00000E+00			

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) FROM ALL SOURCES COMBINED **

- GRID SYSTEM RECEPTORS -

- X AXIS (RANGE , METERS) -

- CONCENTRATION -

Y AXIS (AZIMUTH BEARING, DEGREES)	500.000	1500.000	2500.000	3500.000	4500.000	5500.000	6500.000	7500.000	8500.000
350.000	.087767	.105444	.079235	.058020	.045062	.037119	.031408	.026731	.023222
340.000	.081743	.086752	.062177	.044390	.033920	.027574	.023099	.019529	.016870
330.000	.085322	.090655	.062128	.042905	.032033	.025528	.021054	.017612	.015076
320.000	.095524	.102149	.067276	.045104	.032956	.025766	.020926	.017319	.014687
310.000	.091930	.102591	.067418	.044836	.032522	.025237	.020361	.016771	.014160
300.000	.074024	.092132	.062416	.041980	.030640	.023874	.019313	.015936	.013474
290.000	.061948	.082331	.056994	.038701	.028406	.022224	.018031	.014908	.012625
280.000	.054376	.073716	.051440	.035120	.025907	.020375	.016609	.013780	.011707
270.000	.050321	.065665	.045657	.031285	.023177	.018320	.015004	.012490	.010645
260.000	.050517	.066542	.046320	.031773	.023566	.018649	.015289	.012738	.010864
250.000	.053637	.067864	.046800	.032064	.023778	.018818	.015429	.012856	.010966
240.000	.058931	.082525	.056803	.038894	.028847	.022842	.018740	.015623	.013331
230.000	.069129	.102064	.069738	.047667	.035327	.027966	.022941	.019121	.016316
220.000	.083495	.135317	.093614	.064258	.047723	.037822	.031045	.025885	.022092
210.000	.108695	.183278	.128177	.088334	.065708	.052107	.042773	.035660	.030429
200.000	.129708	.211786	.148289	.102250	.076046	.060270	.049438	.041192	.035130
190.000	.125553	.180450	.125717	.086369	.064041	.050608	.041410	.034445	.029329
180.000	.131549	.150412	.102662	.069930	.051517	.040471	.032951	.027308	.023178
170.000	.103216	.126096	.086307	.058764	.043284	.033997	.027677	.022937	.019467
160.000	.081001	.102364	.069590	.047229	.034721	.027231	.022143	.018336	.015551
150.000	.082095	.109239	.074540	.050724	.037386	.029401	.023966	.019882	.016891
140.000	.095391	.126702	.086467	.058989	.043583	.034361	.028072	.023326	.019846
130.000	.105435	.132327	.090049	.061559	.045587	.036037	.029513	.024567	.020936
120.000	.113643	.126028	.085255	.058420	.043389	.034414	.028271	.023584	.020139
110.000	.126766	.128917	.087357	.060221	.044941	.035806	.029524	.024693	.021134
100.000	.142289	.158596	.111078	.077653	.058417	.046814	.038762	.032509	.027886
90.000	.165743	.188914	.134489	.094738	.071567	.057517	.047713	.040061	.034398
80.000	.144998	.164524	.116558	.081725	.061515	.049277	.040770	.034171	.029291
70.000	.132814	.140965	.098361	.068354	.051110	.040700	.033509	.027988	.023918
60.000	.121765	.133111	.096380	.068504	.052021	.041982	.034933	.029391	.025277
50.000	.114629	.131207	.100044	.073208	.056671	.046470	.039146	.033206	.028761
40.000	.103122	.117514	.092846	.069586	.054742	.045505	.038741	.033098	.028841
30.000	.083914	.092090	.075460	.058150	.046616	.039372	.033931	.029222	.025637
20.000	.074846	.079193	.066297	.052018	.042211	.036016	.031278	.027068	.023847
10.000	.084565	.101552	.081090	.061700	.049118	.041282	.035461	.030480	.026698
.000	.098896	.124795	.096324	.071558	.056075	.046516	.039558	.033772	.029419

- GRID SYSTEM RECEPTORS -

- X AXIS (RANGE , METERS) -

- CONCENTRATION -

Y AXIS (AZIMUTH BEARING, DEGREES)	9500.000	10500.000	11500.000	12500.000	13500.000	14500.000	15500.000	16500.000	17500.000
350.000	.021942	.019381	.017212	.015426	.013934	.012673	.011596	.010675	.009874
340.000	.015779	.013896	.012313	.011015	.009933	.009021	.008244	.007579	.007002

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) FROM ALL SOURCES COMBINED (CONT.) **

- GRID SYSTEM RECEPTORS -

- X AXIS (RANGE , METERS) -

Y AXIS (AZIMUTH BEARING, DEGREES)	9500.000	10500.000	11500.000	12500.000	13500.000	14500.000	15500.000	16500.000	17500.000
	- CONCENTRATION -								
330.000	.013864	.012143	.010722	.009560	.008597	.007787	.007100	.006513	.006005
320.000	.013268	.011559	.010166	.009034	.008099	.007315	.006653	.006088	.005600
310.000	.012673	.011009	.009663	.008572	.007673	.006921	.006286	.005745	.005278
300.000	.012071	.010492	.009215	.008178	.007323	.006608	.006003	.005488	.005043
290.000	.011334	.009863	.008669	.007699	.006898	.006228	.005661	.005177	.004759
280.000	.010585	.009228	.008123	.007224	.006480	.005857	.005329	.004878	.004489
270.000	.009695	.008475	.007472	.006654	.005976	.005408	.004926	.004514	.004158
260.000	.009908	.008661	.007638	.006803	.006112	.005532	.005039	.004619	.004255
250.000	.010002	.008746	.007714	.006872	.006174	.005588	.005092	.004667	.004300
240.000	.012176	.010647	.009391	.008367	.007518	.006805	.006200	.005684	.005237
230.000	.014905	.013035	.011497	.010243	.009203	.008330	.007590	.006959	.006412
220.000	.020177	.017642	.015560	.012946	.012455	.011273	.010271	.009416	.008675
210.000	.027754	.024264	.021399	.019062	.017126	.015500	.014120	.012943	.011924
200.000	.031990	.027962	.024653	.021956	.019721	.017845	.016256	.014898	.013722
190.000	.026625	.023239	.020474	.018221	.016356	.014792	.013465	.012333	.011354
180.000	.020903	.018216	.016024	.014242	.012770	.011536	.010493	.009603	.008833
170.000	.017557	.015292	.013452	.011956	.010719	.009684	.008807	.008059	.007412
160.000	.014007	.012199	.010728	.009533	.008545	.007718	.007019	.006422	.005907
150.000	.015269	.013309	.011714	.010416	.009344	.008444	.007805	.007033	.006471
140.000	.017996	.015705	.013833	.012309	.011048	.009990	.009094	.008329	.007667
130.000	.019055	.016647	.014673	.013064	.011732	.010614	.009667	.008858	.008158
120.000	.018417	.016107	.014208	.012659	.011376	.010297	.009383	.008602	.007927
110.000	.019418	.017009	.015017	.013391	.012042	.010907	.009946	.009124	.008412
100.000	.025707	.022541	.019919	.017775	.015995	.014497	.013224	.012136	.011194
90.000	.031740	.027856	.024626	.021983	.019787	.017938	.016370	.015027	.013863
80.000	.026948	.023615	.020860	.018608	.016739	.015167	.013831	.012690	.011701
70.000	.021874	.019136	.016880	.015040	.013515	.012234	.011148	.010219	.009416
60.000	.023400	.020544	.018170	.016226	.014611	.013250	.012092	.011103	.010245
50.000	.026978	.023784	.021096	.018886	.017043	.015486	.014161	.013026	.012039
40.000	.027370	.024214	.021527	.019312	.017458	.015889	.014550	.013402	.012403
30.000	.024655	.021890	.019508	.017538	.015885	.014482	.013281	.012252	.011354
20.000	.023119	.020576	.018364	.016531	.014990	.013679	.012560	.011597	.010756
10.000	.025615	.022727	.020244	.018191	.016471	.015010	.013761	.012691	.011758
.000	.027924	.024709	.021966	.019705	.017814	.016212	.014849	.013679	.012660

- GRID SYSTEM RECEPTORS -

- X AXIS (RANGE , METERS) -

Y AXIS (AZIMUTH BEARING, DEGREES)	18500.000	19500.000
	- CONCENTRATION -	
350.000	.009171	.008551
340.000	.006497	.006051
330.000	.005561	.005170
320.000	.005174	.004801

** ANNUAL GROUND LEVEL CONCENTRATION (MICROGRAMS PER CUBIC METER) FROM ALL SOURCES COMBINED (CONT.) **

- GRID SYSTEM RECEPTORS -

- X AXIS (RANGE , METERS) -

Y AXIS (AZIMUTH BEARING, DEGREES)	18500.000	19500.000
	- CONCENTRATION -	
310.000	.004872	.004516
300.000	.004656	.004316
290.000	.004395	.004076
280.000	.004149	.003851
270.000	.003847	.003574
260.000	.003937	.003658
250.000	.003979	.003697
240.000	.004847	.004504
230.000	.005934	.005515
220.000	.008029	.007461
210.000	.011034	.010252
200.000	.012696	.011795
190.000	.010501	.009750
180.000	.008162	.007573
170.000	.006849	.006355
160.000	.005457	.005063
150.000	.005982	.005552
140.000	.007090	.006584
130.000	.007547	.007011
120.000	.007337	.006818
110.000	.007790	.007243
100.000	.010370	.009645
90.000	.012845	.011949
80.000	.010837	.010077
70.000	.008714	.008098
60.000	.009495	.008835
50.000	.011175	.010412
40.000	.011526	.010751
30.000	.010565	.009866
20.000	.010017	.009362
10.000	.010938	.010213
.000	.011766	.010976

- DISCRETE RECEPTORS -

X DISTANCE (METERS)	Y DISTANCE (METERS)	CONCENTRATION	X DISTANCE (METERS)	Y DISTANCE (METERS)	CONCENTRATION	X DISTANCE (METERS)	Y DISTANCE (METERS)	CONCENTRATION
-270.0	-210.0	.041701	-400.0	210.0	.077780	-550.0	-150.0	.106193
-850.0	-300.0	.119272	-1000.0	1130.0	.123796	1170.0	1740.0	.103703

CATASTROPHIC RELEASE MODELING

(H.5)

SCREENING USING VALLEY OPTION OF COMPLEX-1

(H.5.1)

```
                    COMPLEX-1 (DATED 86064)
                   AN AIR QUALITY DISPERSION MODEL IN
                   SECTION 4. ADDITIONAL MODELS FOR REGULATORY USE
                   IN UNAMAP (VERSION 6) JULY 86.
                   SOURCE: FILE 31 ON UNAMAP MAGNETIC TAPE FORM NTIS.
                   DATE & TIME OF THIS RUN - 12/20/89 15:00:44
                   INPUT FILE - CAT4.DAT

                                      COMPLEX I  - VERSION 86064
EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY  MVM
1 GRAM/SECOND EMISSION RATE  / COMPLEX-I RUN
CATASTROPHIC RELEASE SCENARIO  WORST-CASE METEOROLOGICAL CONDITIONS

                              GENERAL INPUT INFORMATION

 THIS RUN OF COMPLEX I/VALLEY OPTION IS FOR THE GENERIC POLLUTANT  FOR   1 WIND DIRECTIONS.
 A FACTOR OF  1.0000000 HAS BEEN SPECIFIED TO CONVERT USER LENGTH UNITS TO KILOMETERS.
 4 SIGNIFICANT SOURCES ARE TO BE CONSIDERED.
 THIS RUN WILL NOT CONSIDER ANY POLLUTANT LOSS.
 A FACTOR OF  3048000 HAS BEEN SPECIFIED TO CONVERT USER HEIGHT UNITS TO METERS.

 OPTION      OPTION LIST                   OPTION SPECIFICATION : 0= IGNORE OPTION
                                                                  1= USE OPTION
                      TECHNICAL OPTIONS
    1        TERRAIN ADJUSTMENTS                                  1
    2        DO NOT INCLUDE STACK DOWNWASH CALCULATIONS           0
    3        DO NOT INCLUDE GRADUAL PLUME RISE CALCULATIONS       1
    4        CALCULATE INITIAL PLUME SIZE                         1
                      INPUT OPTIONS
    5        READ MET DATA FROM CARDS                             1
    6        READ HOURLY EMISSIONS                                0
    7        SPECIFY SIGNIFICANT SOURCES                          0
    8        READ RADIAL DISTANCES TO GENERATE RECEPTORS          0
                      PRINTED OUTPUT OPTIONS
    9        DELETE EMISSIONS WITH HEIGHT TABLE                   1
   10        DELETE MET DATA SUMMARY FOR AVG PERIOD               1
   11        DELETE HOURLY CONTRIBUTIONS                          1
   12        DELETE MET DATA ON HOURLY CONTRIBUTIONS              1
   13        DELETE FINAL PLUME RISE CALC ON HRLY CONTRIBUTIONS   1
   14        DELETE HOURLY SUMMARY                                0
   15        DELETE MET DATA ON HRLY SUMMARY                      1
   16        DELETE FINAL PLUME RISE CALC ON HRLY SUMMARY         0
   17        DELETE AVG-PERIOD CONTRIBUTIONS                      1
   18        DELETE AVERAGING PERIOD SUMMARY                      1
   19        DELETE AVG CONCENTRATIONS AND HI-5 TABLES            1
                      OTHER CONTROL AND OUTPUT OPTIONS
   20        RUN IS PART OF A SEGMENTED RUN                       0
   21        WRITE PARTIAL CONC TO DISK OR TAPE                   0
   22        WRITE HOURLY CONC TO DISK OR TAPE                    0
   23        WRITE AVG-PERIOD CONC TO DISK OR TAPE                0
   24        PUNCH AVG-PERIOD CONC ONTO CARDS                     0
   25        COMPLEX TERRAIN OPTION                               0
   26        CALM PROCESSING OPTION                               0
   27        VALLEY SCREENING OPTION                              1
ANEMOMETER HEIGHT IS:     10.00
EXPONENTS FOR POWER- LAW WIND INCREASE WITH HEIGHT ARE: .10, .15, .20, .25, .30, .30
TERRAIN ADJUSTMENTS ARE:  .500, .500, .500, .500, .000, .000 ZMIN IS  10.0


 BECAUSE THE VALLEY OPTION HAS BEEN SELECTED, THE FOLLOWING
 OPTIONS AND PARAMETERS HAVE BEEN SET BY THE MODEL, OVERRIDING VALUES
 PROVIDED BY THE USER:

      IOPT(5), IOPT(10), IOPT(12), IOPT(15), IOPT(17), IOPT(18) = 1
      IOPT(6), IOPT(20) THRU IOPT(26) = 0
      NAVG = 1              NAV5 = 0
      IHSTRT = 1            CONTER(6) = 0.
      ZMIN = 10.            IKST = 6
      QU = 2.5              QHL = 9999.

                                       POINT SOURCE INFORMATION

  SOURCE              EAST    NORTH   SO2(G/SEC) PART(G/SEC) STACK  STACK   STACK   STACK       GRD-LVL BUOY FLUX
                      COORD   COORD   EMISSIONS  EMISSIONS   HT(M) TEMP(K) DIAM(M) VEL(M/SEC)    ELEV       F
                      (USER UNITS)                                                            USER HT M**4/S**3
```

UNITS

1	NUMBER ONE V	.02	.00	.25	.00	9.1	1000.0	.9	16.5	70.00	23.88
2	NUMBER TWO V	.01	.00	.25	.00	9.1	1000.0	.9	16.5	70.00	23.88
3	NUMBER THREE	-.01	.00	.25	.00	9.1	1000.0	.9	16.5	70.00	23.88
4	NUMBER FOUR	-.02	.00	.25	.00	9.1	1000.0	.9	16.5	70.00	23.88

ADDITIONAL INFORMATION ON SOURCES.

EMISSION INFORMATION FOR 4 (NPT) POINT SOURCES HAS BEEN INPUT
4 SIGNIFICANT POINT SOURCES(NSIGP) ARE TO BE USED FOR THIS RUN
THE ORDER OF SIGNIFICANCE(IMPS) FOR 25 OR LESS POINT SOURCES USED IN THIS RUN AS LISTED BY POINT SOURCE NUMBER:
1 2 3 4

RECEPTOR INFORMATION

RECEPTOR	IDENTIFICATION	EAST COORD (USER UNITS)	NORTH COORD (USER UNITS)	RECEPTOR HT ABV LOCAL GRD LVL (METERS)	RECEPTOR GROUND LEVEL ELEVATION (USER HT UNITS)
1	REC 1	.500	.000	.0	70.0
2	REC 2	.640	.000	.0	80.0
3	REC 3	.762	.000	.0	100.0
4	REC 4	1.000	.000	.0	103.0
5	REC 5	1.500	.000	.0	105.0
6	REC 6	2.000	.000	.0	110.0
7	REC 7	2.500	.000	.0	115.0
8	REC 8	3.000	.000	.0	117.0
9	REC 9	3.810	.000	.0	120.0
10	REC 10	4.000	.000	.0	143.0
11	REC 11	4.180	.000	.0	150.0
12	REC 12	4.300	.000	.0	180.0
13	REC 13	4.390	.000	.0	200.0
14	REC 14	5.000	.000	.0	210.0
15	REC 15	6.000	.000	.0	215.0
16	REC 16	7.000	.000	.0	220.0
17	REC 17	8.000	.000	.0	225.0
18	REC 18	9.000	.000	.0	230.0
19	REC 19	10.000	.000	.0	250.0
20	REC 20	13.000	.000	.0	300.0
21	REC 21	14.000	.000	.0	400.0
22	REC 22	15.000	.000	.0	500.0
23	REC 23	16.000	.000	.0	540.0
24	REC 24	20.000	.000	.0	600.0
25	REC 25	30.000	.000	.0	600.0
26	REC 26	40.000	.000	.0	600.0
27	REC 27	50.000	.000	.0	600.0

VALLEY METEOROLOGICAL INPUT DATA

PRESET BY MODEL:
MIXING HEIGHT (M) = 9999
STABILITY = 6
WIND SPEED (M/SEC) = 2.5

INPUT BY USER:
TEMPERATURE (K) = 293.0
WIND DIRECTIONS (DEG) = 270.0

EDISON NEW JERSEY / ENVIRONMENTAL IMPACT STATEMENT / AIR QUALITY MVM
1 GRAM/SECOND EMISSION RATE / COMPLEX-I RUN
CATASTROPHIC RELEASE SCENARIO WORST-CASE METEOROLOGICAL CONDITIONS

VALLEY: SO2 24-HR AVERAGE SUMMARY CONCENTRATION TABLE (MICROGRAMS/M**3) (WIND DIRECTION (DEG) = 270.0)

	1	2	3	4	5	6	7	8	9	10
FINAL HT (M)	61.95	61.95	61.95	61.95						
DIST FIN HT (KM)	.147	.147	.147	.147						

RECEPTOR NO.	NAME	EAST COORD	NORTH COORD	RECEPTOR HT ABV GRD (M)	RECEPTOR GRD-LVL ELEV (USER HT UNITS)	TOTAL FROM SIGNIF POINT SOURCES	TOTAL FROM ALL SOURCES	CONCENTRATION RANK
1	REC 1	.50	.00	.0	70.0	.0388	.0388	26
2	REC 2	.64	.00	.0	80.0	.0956	.0956	23
3	REC 3	.76	.00	.0	100.0	.3056	.3056	17
4	REC 4	1.00	.00	.0	103.0	.4187	.4187	16
5	REC 5	1.50	.00	.0	105.0	.5485	.5485	13
6	REC 6	2.00	.00	.0	110.0	.6670	.6670	9
7	REC 7	2.50	.00	.0	115.0	.7092	.7092	7

8	REC 8	3.00	.00	.0	117.0	.6868	.6868	8
9	REC 9	3.81	.00	.0	120.0	.6224	.6224	11
10	REC 10	4.00	.00	.0	143.0	.7790	.7790	6
11	REC 11	4.18	.00	.0	150.0	.8018	.8018	4
12	REC 12	4.30	.00	.0	180.0	.9947	.9947	2
13	REC 13	4.39	.00	.0	200.0	1.0980	1.0980	1
14	REC 14	5.00	.00	.0	210.0	.9777	.9777	3
15	REC 15	6.00	.00	.0	215.0	.7854	.7854	5
16	REC 16	7.00	.00	.0	220.0	.6491	.6491	10
17	REC 17	8.00	.00	.0	225.0	.5509	.5509	12
18	REC 18	9.00	.00	.0	230.0	.4754	.4754	14
19	REC 19	10.00	.00	.0	250.0	.4190	.4190	15
20	REC 20	13.00	.00	.0	300.0	.2870	.2870	18
21	REC 21	14.00	.00	.0	400.0	.2391	.2391	19
22	REC 22	15.00	.00	.0	500.0	.1991	.1991	20
23	REC 23	16.00	.00	.0	540.0	.1764	.1764	21
24	REC 24	20.00	.00	.0	600.0	.1245	.1245	22
25	REC 25	30.00	.00	.0	600.0	.0734	.0734	24
26	REC 26	40.00	.00	.0	600.0	.0511	.0511	25
27	REC 27	50.00	.00	.0	600.0	.0386	.0386	27

SCREENING USING ISCST WITH CLOSEST RECEPTORS

(H.5.2)

```
 ISCST - VERSION 3.4 (DATED 88348)
DATE & TIME OF THIS RUN - 12/20/89 14:45:32
INPUT FILE - CATASTRO.DAT

         *** CATASTROPHIC RELEASE SCENARIO /  11/89 /  MVM            ***

CALCULATE (CONCENTRATION=1,DEPOSITION=2)                              ISW(1) =   1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)               ISW(2) =   2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                      ISW(3) =   2
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                              ISW(4) =   1
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                         ISW(5) =   0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                      ISW(6) =   2

COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
WITH THE FOLLOWING TIME PERIODS:
  HOURLY (YES=1,NO=0)                                                 ISW(7) =   1
  2-HOUR (YES=1,NO=0)                                                 ISW(8) =   0
  3-HOUR (YES=1,NO=0)                                                 ISW(9) =   0
  4-HOUR (YES=1,NO=0)                                                ISW(10) =   0
  6-HOUR (YES=1,NO=0)                                                ISW(11) =   0
  8-HOUR (YES=1,NO=0)                                                ISW(12) =   0
  12-HOUR (YES=1,NO=0)                                               ISW(13) =   0
  24-HOUR (YES=1,NO=0)                                               ISW(14) =   0
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                  ISW(15) =   0

PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
SPECIFIED BY ISW(7) THROUGH ISW(14):
  DAILY TABLES (YES=1,NO=0)                                          ISW(16) =   1
  HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                       ISW(17) =   0
  MAXIMUM 50 TABLES (YES=1,NO=0)                                     ISW(18) =   0
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)            ISW(19) =   2
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)    ISW(20) =   0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)            ISW(21) =   1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)     ISW(22) =   1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                    ISW(23) =   0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)                ISW(24) =   1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)          ISW(25) =   2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)                ISW(26) =   1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)              ISW(27) =   2
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                              ISW(28) =   2
TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                     ISW(29) =   2
DEBUG OPTION CHOSEN (YES=1,NO=2)                                     ISW(30) =   2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                  ISW(31) =   0
USE RUNNING AVERAGES (0=NO,1=YES)                                    ISW(40) =   0

NUMBER OF INPUT SOURCES                                               NSOURC =   4
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                              NGROUP =   1
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)                  IPERD =   0
NUMBER OF X (RANGE) GRID VALUES                                       NXPNTS =   3
NUMBER OF Y (THETA) GRID VALUES                                       NYPNTS =  36
NUMBER OF DISCRETE RECEPTORS                                          NXWYPT =   0
NUMBER OF HOURS PER DAY IN METEOROLOGICAL DATA                        NHOURS =  16
NUMBER OF DAYS OF METEOROLOGICAL DATA                                  NDAYS =   1
SOURCE EMISSION RATE UNITS CONVERSION FACTOR                              TK =.10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                      ZR =  10.00  METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                              IMET =   1
ALLOCATED DATA STORAGE                                                 LIMIT = 55000 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                             MIMIT =  1620 WORDS

         *** CATASTROPHIC RELEASE SCENARIO /  11/89 /  MVM            ***

             *** NUMBER OF SOURCE NUMBERS REQUIRED TO DEFINE SOURCE GROUPS ***
                                          (NSOGRP)

4,
                          *** SOURCE NUMBERS DEFINING SOURCE GROUPS ***
                                          (IDSOR)

  1,     2,     3,     4,

             *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                        (METERS/SEC)

                             1.54,    3.09,    5.14,    8.23,   10.80,


                            *** RANGES OF POLAR GRID SYSTEM ***
```

(METERS)

500.0, 640.0, 750.0,

*** RADIAL ANGLES OF POLAR GRID SYSTEM ***

(DEGREES)

10.0,	20.0,	30.0,	40.0,	50.0,	60.0,	70.0,	80.0,	90.0,	100.0,
110.0,	120.0,	130.0,	140.0,	150.0,	160.0,	170.0,	180.0,	190.0,	200.0,
210.0,	220.0,	230.0,	240.0,	250.0,	260.0,	270.0,	280.0,	290.0,	300.0,
310.0,	320.0,	330.0,	340.0,	350.0,	360.0,				

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* ELEVATION HEIGHTS IN METERS *
* FOR THE RECEPTOR GRID *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0
360.0 /	21.33604	24.38405	30.48006
350.0 /	21.33604	24.38405	30.48006
340.0 /	21.33604	24.38405	30.48006
330.0 /	21.33604	24.38405	30.48006
320.0 /	21.33604	24.38405	30.48006
310.0 /	21.33604	24.38405	30.48006
300.0 /	21.33604	24.38405	30.48006
290.0 /	21.33604	24.38405	30.48006
280.0 /	21.33604	24.38405	30.48006
270.0 /	21.33604	24.38405	30.48006
260.0 /	21.33604	24.38405	30.48006
250.0 /	21.33604	24.38405	30.48006
240.0 /	21.33604	24.38405	30.48006
230.0 /	21.33604	24.38405	30.48006
220.0 /	21.33604	24.38405	30.48006
210.0 /	21.33604	24.38405	30.48006
200.0 /	21.33604	24.38405	30.48006
190.0 /	21.33604	24.38405	30.48006
180.0 /	21.33604	24.38405	30.48006
170.0 /	21.33604	24.38405	30.48006
160.0 /	21.33604	24.38405	30.48006
150.0 /	21.33604	24.38405	30.48006
140.0 /	21.33604	24.38405	30.48006
130.0 /	21.33604	24.38405	30.48006
120.0 /	21.33604	24.38405	30.48006
110.0 /	21.33604	24.38405	30.48006
100.0 /	21.33604	24.38405	30.48006
90.0 /	21.33604	24.38405	30.48006
80.0 /	21.33604	24.38405	30.48006
70.0 /	21.33604	24.38405	30.48006
60.0 /	21.33604	24.38405	30.48006
50.0 /	21.33604	24.38405	30.48006
40.0 /	21.33604	24.38405	30.48006
30.0 /	21.33604	24.38405	30.48006
20.0 /	21.33604	24.38405	30.48006
10.0 /	21.33604	24.38405	30.48006

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

*** SOURCE DATA ***

SOURCE NUMBER	TYPE	WAKE	NUMBER PART. CATS.	EMISSION RATE TYPE=0,1 (GRAMS/SEC) TYPE=2 (GRAMS/SEC) *PER METER**2	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	HEIGHT (METERS)	TEMP. TYPE=0 (DEG.K); VERT.DIM TYPE=1 (METERS)	EXIT VEL. TYPE=0 (M/SEC); HORZ.DIM TYPE=1,2 (METERS)	DIAMETER TYPE=0 (METERS)	BLDG. HEIGHT TYPE=0 (METERS)	BLDG. LENGTH TYPE=0 (METERS)	BLDG. WIDTH TYPE=0 (METERS)
1	0	0	0	.25000E+00	22.9	.0	21.3	9.10	1000.00	16.48	.91	8.20	54.10	54.10
2	0	0	0	.25000E+00	7.6	.0	21.3	9.10	1000.00	16.48	.91	8.20	54.10	54.10

3	0 0	0	.25000E+00	-7.6	.0	21.3	9.10	1000.00	16.48	.91	8.20	54.10	54.10
4	0 0	0	.25000E+00	-22.9	.0	21.3	9.10	1000.00	16.48	.91	8.20	54.10	54.10

MET. DATA
DAY 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* METEOROLOGICAL DATA FOR DAY 1 *

HOUR	FLOW VECTOR (DEGREES)	WIND SPEED (MPS)	MIXING HEIGHT (METERS)	TEMP. (DEG. K)	POT. TEMP. GRADIENT (DEG. K PER METER)	STABILITY CATEGORY	WIND PROFILE EXPONENT	DECAY COEFFICIENT (PER SEC)
1	.0	2.50	10000.0	298.0	.0350	6	.5500	.000000E+00
2	22.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
3	45.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
4	67.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
5	90.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
6	112.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
7	135.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
8	157.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
9	180.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
10	202.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
11	225.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
12	247.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
13	270.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
14	292.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
15	315.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
16	337.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00

DAILY: 1
1-HR/PD 1
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 1 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 9.47194 AND OCCURRED AT (750.0, 360.0) *

- -

1-HR/PD 2
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 2 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.23961 AND OCCURRED AT (750.0, 20.0) *

- -

1-HR/PD 3
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 3 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 1.36803 AND OCCURRED AT (750.0, 40.0) *

- -

1-HR/PD 4
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *

* ENDING WITH HOUR 4 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.19573 AND OCCURRED AT (750.0, 70.0) *

- -

1-HR/PD 5
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 5 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 11.16520 AND OCCURRED AT (750.0, 90.0) *

- -

1-HR/PD 6
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 6 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.19572 AND OCCURRED AT (750.0, 110.0) *

- -

1-HR/PD 7
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 7 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 1.36801 AND OCCURRED AT (750.0, 140.0) *

- -

1-HR/PD 8
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 8 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.23961 AND OCCURRED AT (750.0, 160.0) *

- -

1-HR/PD 9
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 9 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 9.58714 AND OCCURRED AT (750.0, 180.0) *

- -

1-HR/PD10
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *

* ENDING WITH HOUR 10 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.23962 AND OCCURRED AT (750.0, 200.0) *

- -

1-HR/PD11
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 11 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 1.36801 AND OCCURRED AT (750.0, 220.0) *

- -

1-HR/PD12
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 12 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.19579 AND OCCURRED AT (750.0, 250.0) *

- -

1-HR/PD13
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 13 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 11.16520 AND OCCURRED AT (750.0, 270.0) *

- -

1-HR/PD14
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 14 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.19582 AND OCCURRED AT (750.0, 290.0) *

- -

1-HR/PD15
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 15 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 1.36801 AND OCCURRED AT (750.0, 320.0) *

- -

1-HR/PD16
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *

* ENDING WITH HOUR 16 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 6.23960 AND OCCURRED AT (750.0, 340.0) *

- -

CATASTROPHIC RELEASE MODELING USING ISCST

(H.5.3)

```
ISCST - VERSION 3.4 (DATED 88348)
DATE & TIME OF THIS RUN - 12/20/89 14:10:36
INPUT FILE - CATASTRO.DAT


          *** CATASTROPHIC RELEASE SCENARIO /  11/89 /  MVM              ***

CALCULATE (CONCENTRATION=1,DEPOSITION=2)                               ISW(1) =   1
RECEPTOR GRID SYSTEM (RECTANGULAR=1 OR 3, POLAR=2 OR 4)                ISW(2) =   2
DISCRETE RECEPTOR SYSTEM (RECTANGULAR=1,POLAR=2)                       ISW(3) =   2
TERRAIN ELEVATIONS ARE READ (YES=1,NO=0)                               ISW(4) =   1
CALCULATIONS ARE WRITTEN TO TAPE (YES=1,NO=0)                          ISW(5) =   0
LIST ALL INPUT DATA (NO=0,YES=1,MET DATA ALSO=2)                       ISW(6) =   2

COMPUTE AVERAGE CONCENTRATION (OR TOTAL DEPOSITION)
WITH THE FOLLOWING TIME PERIODS:
  HOURLY (YES=1,NO=0)                                                  ISW(7) =   1
  2-HOUR (YES=1,NO=0)                                                  ISW(8) =   0
  3-HOUR (YES=1,NO=0)                                                  ISW(9) =   0
  4-HOUR (YES=1,NO=0)                                                 ISW(10) =   0
  6-HOUR (YES=1,NO=0)                                                 ISW(11) =   0
  8-HOUR (YES=1,NO=0)                                                 ISW(12) =   0
  12-HOUR (YES=1,NO=0)                                                ISW(13) =   0
  24-HOUR (YES=1,NO=0)                                                ISW(14) =   0
PRINT 'N'-DAY TABLE(S) (YES=1,NO=0)                                   ISW(15) =   0

PRINT THE FOLLOWING TYPES OF TABLES WHOSE TIME PERIODS ARE
SPECIFIED BY ISW(7) THROUGH ISW(14):
  DAILY TABLES (YES=1,NO=0)                                           ISW(16) =   1
  HIGHEST & SECOND HIGHEST TABLES (YES=1,NO=0)                        ISW(17) =   0
  MAXIMUM 50 TABLES (YES=1,NO=0)                                      ISW(18) =   0
METEOROLOGICAL DATA INPUT METHOD (PRE-PROCESSED=1,CARD=2)             ISW(19) =   2
RURAL-URBAN OPTION (RU.=0,UR. MODE 1=1,UR. MODE 2=2,UR. MODE 3=3)     ISW(20) =   0
WIND PROFILE EXPONENT VALUES (DEFAULTS=1,USER ENTERS=2,3)             ISW(21) =   1
VERTICAL POT. TEMP. GRADIENT VALUES (DEFAULTS=1,USER ENTERS=2,3)      ISW(22) =   1
SCALE EMISSION RATES FOR ALL SOURCES (NO=0,YES>0)                     ISW(23) =   0
PROGRAM CALCULATES FINAL PLUME RISE ONLY (YES=1,NO=2)                 ISW(24) =   1
PROGRAM ADJUSTS ALL STACK HEIGHTS FOR DOWNWASH (YES=2,NO=1)           ISW(25) =   2
PROGRAM USES BUOYANCY INDUCED DISPERSION (YES=1,NO=2)                 ISW(26) =   1
CONCENTRATIONS DURING CALM PERIODS SET = 0 (YES=1,NO=2)               ISW(27) =   2
REG. DEFAULT OPTION CHOSEN (YES=1,NO=2)                               ISW(28) =   2
TYPE OF POLLUTANT TO BE MODELLED (1=SO2,2=OTHER)                      ISW(29) =   2
DEBUG OPTION CHOSEN (YES=1,NO=2)                                      ISW(30) =   2
ABOVE GROUND (FLAGPOLE) RECEPTORS USED (YES=1,NO=0)                   ISW(31) =   0
USE RUNNING AVERAGES (0=NO,1=YES)                                     ISW(40) =   0

NUMBER OF INPUT SOURCES                                                NSOURC =   4
NUMBER OF SOURCE GROUPS (=0,ALL SOURCES)                               NGROUP =   1
TIME PERIOD INTERVAL TO BE PRINTED (=0,ALL INTERVALS)                   IPERD =   0
NUMBER OF X (RANGE) GRID VALUES                                        NXPNTS =  27
NUMBER OF Y (THETA) GRID VALUES                                        NYPNTS =  36
NUMBER OF DISCRETE RECEPTORS                                           NXWYPT =   0
NUMBER OF HOURS PER DAY IN METEOROLOGICAL DATA                         NHOURS =  16
NUMBER OF DAYS OF METEOROLOGICAL DATA                                   NDAYS =   1
SOURCE EMISSION RATE UNITS CONVERSION FACTOR                               TK =.10000E+07
HEIGHT ABOVE GROUND AT WHICH WIND SPEED WAS MEASURED                       ZR =  10.00  METERS
LOGICAL UNIT NUMBER OF METEOROLOGICAL DATA                               IMET =   1
ALLOCATED DATA STORAGE                                                  LIMIT = 55000 WORDS
REQUIRED DATA STORAGE FOR THIS PROBLEM RUN                              MIMIT =  5100 WORDS

          *** CATASTROPHIC RELEASE SCENARIO /  11/89 /  MVM              ***

            *** NUMBER OF SOURCE NUMBERS REQUIRED TO DEFINE SOURCE GROUPS ***
                                       (NSOGRP)

4,
                       *** SOURCE NUMBERS DEFINING SOURCE GROUPS ***
                                       (IDSOR)

  1,     2,     3,     4,

            *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                     (METERS/SEC)

                            1.54,   3.09,   5.14,   8.23,  10.80,


                             *** RANGES OF POLAR GRID SYSTEM ***
```

(METERS)

500.0,	640.0,	750.0,	1000.0,	1500.0,	2000.0,	2500.0,	3000.0,	3810.0,	4000.0,
4180.0,	4300.0,	4390.0,	5000.0,	6000.0,	7000.0,	8000.0,	9000.0,	10000.0,	13000.0,
14000.0,	15000.0,	16000.0,	20000.0,	30000.0,	40000.0,	50000.0,			

*** RADIAL ANGLES OF POLAR GRID SYSTEM ***

(DEGREES)

10.0,	20.0,	30.0,	40.0,	50.0,	60.0,	70.0,	80.0,	90.0,	100.0,
110.0,	120.0,	130.0,	140.0,	150.0,	160.0,	170.0,	180.0,	190.0,	200.0,
210.0,	220.0,	230.0,	240.0,	250.0,	260.0,	270.0,	280.0,	290.0,	300.0,
310.0,	320.0,	330.0,	340.0,	350.0,	360.0,				

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* ELEVATION HEIGHTS IN METERS *
* FOR THE RECEPTOR GRID *

DIRECTION /				RANGE (METERS)					
(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
350.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
340.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
330.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
320.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
310.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
300.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
290.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
280.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
270.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
260.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
250.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
240.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
230.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
220.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
210.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
200.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
190.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
180.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
170.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
160.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
150.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
140.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
130.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
120.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
110.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
100.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
90.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
80.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
70.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
60.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
50.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
40.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
30.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
20.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607
10.0 /	21.33604	24.38405	30.48006	31.39446	32.00406	33.52806	35.05207	35.66167	36.57607

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* ELEVATION HEIGHTS IN METERS *
* FOR THE RECEPTOR GRID *

DIRECTION /				RANGE (METERS)					
(DEGREES) /	4000.0	4180.0	4300.0	4390.0	5000.0	6000.0	7000.0	8000.0	9000.0

360.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
350.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
340.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
330.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
320.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
310.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
300.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
290.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
280.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
270.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
260.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
250.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
240.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
230.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
220.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
210.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
200.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
190.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
180.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
170.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
160.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
150.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
140.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
130.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
120.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
110.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
100.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
90.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
80.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
70.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
60.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
50.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
40.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
30.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
20.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414
10.0 /	43.58649	45.72009	54.86411	60.96012	64.00813	65.53213	67.05613	68.58013	70.10414

* ELEVATION HEIGHTS IN METERS *
* FOR THE RECEPTOR GRID *

DIRECTION /				RANGE (METERS)					
(DEGREES) /	10000.0	13000.0	14000.0	15000.0	16000.0	20000.0	30000.0	40000.0	50000.0
360.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
350.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
340.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
330.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
320.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
310.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
300.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
290.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
280.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
270.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
260.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
250.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
240.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
230.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
220.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
210.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
200.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
190.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
180.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
170.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
160.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
150.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
140.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
130.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
120.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
110.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
100.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040

90.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
80.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
70.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
60.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
50.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
40.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
30.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
20.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040
10.0 /	76.20015	91.44018	121.92020	152.40030	164.59230	182.88040	182.88040	182.88040	182.88040

*** SOURCE DATA ***

SOURCE NUMBER	TYPE	WAKE	NUMBER PART. CATS.	EMISSION RATE TYPE=0,1 (GRAMS/SEC) TYPE=2 (GRAMS/SEC) *PER METER**2	X (METERS)	Y (METERS)	BASE ELEV. (METERS)	HEIGHT (METERS)	TEMP. TYPE=0 (DEG.K); VERT.DIM TYPE=1 (METERS)	EXIT VEL. TYPE=0 (M/SEC); HORZ.DIM TYPE=1,2 (METERS)	DIAMETER TYPE=0 (METERS)	BLDG. HEIGHT TYPE=0 (METERS)	BLDG. LENGTH TYPE=0 (METERS)	BLDG. WIDTH TYPE=0 (METERS)
1	0	0	0	.25000E+00	22.9	.0	21.3	9.10	1000.00	16.48	.91	-8.20	54.10	54.10
2	0	0	0	.25000E+00	7.6	.0	21.3	9.10	1000.00	16.48	.91	-8.20	54.10	54.10
3	0	0	0	.25000E+00	-7.6	.0	21.3	9.10	1000.00	16.48	.91	-8.20	54.10	54.10
4	0	0	0	.25000E+00	-22.9	.0	21.3	9.10	1000.00	16.48	.91	-8.20	54.10	54.10

*** DIRECTION SPECIFIC BUILDING DIMENSIONS ***

SOURCE 1

IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW
1	8.2,	61.9,	2	8.2,	64.9,	3	8.2,	70.4,	4	8.2,	79.6,	5	8.2,	79.6,	6	8.2,	70.4,
7	8.2,	64.9,	8	8.2,	61.9,	9	8.2,	61.0,	10	8.2,	61.9,	11	8.2,	64.9,	12	8.2,	70.4,
13	8.2,	79.6,	14	8.2,	79.6,	15	8.2,	70.4,	16	8.2,	64.9,	17	8.2,	61.9,	18	8.2,	61.0,
19	8.2,	61.9,	20	8.2,	64.9,	21	8.2,	70.4,	22	8.2,	79.6,	23	8.2,	79.6,	24	8.2,	70.4,
25	8.2,	64.9,	26	8.2,	61.9,	27	8.2,	61.0,	28	8.2,	61.9,	29	8.2,	64.9,	30	8.2,	70.4,
31	8.2,	79.6,	32	8.2,	79.6,	33	8.2,	70.4,	34	8.2,	64.9,	35	8.2,	61.9,	36	8.2,	61.0,

SOURCE 2

IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW
1	8.2,	61.9,	2	8.2,	64.9,	3	8.2,	70.4,	4	8.2,	79.6,	5	8.2,	79.6,	6	8.2,	70.4,
7	8.2,	64.9,	8	8.2,	61.9,	9	8.2,	61.0,	10	8.2,	61.9,	11	8.2,	64.9,	12	8.2,	70.4,
13	8.2,	79.6,	14	8.2,	79.6,	15	8.2,	70.4,	16	8.2,	64.9,	17	8.2,	61.9,	18	8.2,	61.0,
19	8.2,	61.9,	20	8.2,	64.9,	21	8.2,	70.4,	22	8.2,	79.6,	23	8.2,	79.6,	24	8.2,	70.4,
25	8.2,	64.9,	26	8.2,	61.9,	27	8.2,	61.0,	28	8.2,	61.9,	29	8.2,	64.9,	30	8.2,	70.4,
31	8.2,	79.6,	32	8.2,	79.6,	33	8.2,	70.4,	34	8.2,	64.9,	35	8.2,	61.9,	36	8.2,	61.0,

SOURCE 3

IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW
1	8.2,	61.9,	2	8.2,	64.9,	3	8.2,	70.4,	4	8.2,	79.6,	5	8.2,	79.6,	6	8.2,	70.4,
7	8.2,	64.9,	8	8.2,	61.9,	9	8.2,	61.0,	10	8.2,	61.9,	11	8.2,	64.9,	12	8.2,	70.4,
13	8.2,	79.6,	14	8.2,	79.6,	15	8.2,	70.4,	16	8.2,	64.9,	17	8.2,	61.9,	18	8.2,	61.0,
19	8.2,	61.9,	20	8.2,	64.9,	21	8.2,	70.4,	22	8.2,	79.6,	23	8.2,	79.6,	24	8.2,	70.4,
25	8.2,	64.9,	26	8.2,	61.9,	27	8.2,	61.0,	28	8.2,	61.9,	29	8.2,	64.9,	30	8.2,	70.4,
31	8.2,	79.6,	32	8.2,	79.6,	33	8.2,	70.4,	34	8.2,	64.9,	35	8.2,	61.9,	36	8.2,	61.0,

SOURCE 4

IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW	IFV	BH	BW
1	8.2,	61.9,	2	8.2,	64.9,	3	8.2,	70.4,	4	8.2,	79.6,	5	8.2,	79.6,	6	8.2,	70.4,
7	8.2,	64.9,	8	8.2,	61.9,	9	8.2,	61.0,	10	8.2,	61.9,	11	8.2,	64.9,	12	8.2,	70.4,
13	8.2,	79.6,	14	8.2,	79.6,	15	8.2,	70.4,	16	8.2,	64.9,	17	8.2,	61.9,	18	8.2,	61.0,
19	8.2,	61.9,	20	8.2,	64.9,	21	8.2,	70.4,	22	8.2,	79.6,	23	8.2,	79.6,	24	8.2,	70.4,
25	8.2,	64.9,	26	8.2,	61.9,	27	8.2,	61.0,	28	8.2,	61.9,	29	8.2,	64.9,	30	8.2,	70.4,
31	8.2,	79.6,	32	8.2,	79.6,	33	8.2,	70.4,	34	8.2,	64.9,	35	8.2,	61.9,	36	8.2,	61.0,

MET. DATA
DAY 1

* METEOROLOGICAL DATA FOR DAY 1 *

HOUR	FLOW VECTOR (DEGREES)	WIND SPEED (MPS)	MIXING HEIGHT (METERS)	TEMP. (DEG. K)	POT. TEMP. GRADIENT (DEG. K PER METER)	STABILITY CATEGORY	WIND PROFILE EXPONENT	DECAY COEFFICIENT (PER SEC)
1	.0	2.50	10000.0	298.0	.0350	6	.5500	.000000E+00
2	22.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
3	45.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
4	67.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
5	90.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
6	112.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
7	135.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
8	157.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
9	180.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
10	202.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
11	225.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
12	247.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
13	270.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
14	292.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
15	315.0	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00
16	337.5	2.50	10000.0	293.0	.0350	6	.5500	.000000E+00

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 1 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 12.07261 AND OCCURRED AT (3000.0, 360.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00021	.01243	.40424	1.74365	6.50163	9.85063	11.55022	12.07261	11.64788
350.0 /	.00000	.00000	.00002	.00002	.00001	.00001	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00002	.00002	.00001	.00001	.00000	.00000	.00000

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 2 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.59551 AND OCCURRED AT (2500.0, 20.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00008	.00157	.00292	.00386	.00303	.00218	.00155	.00089
20.0 /	.00022	.00959	.26681	.96634	3.02665	4.17477	4.59551	4.57444	4.15354
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 3 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS .27180 AND OCCURRED AT (2000.0, 40.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00003	.00111	.03043	.09309	.22719	.26279	.25162	.22375	.17322
40.0 /	.00006	.00178	.03978	.10742	.24160	.27180	.25730	.22693	.17506
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD 4
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 4 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.52215 AND OCCURRED AT (2500.0, 70.0) *

DIRECTION /				RANGE (METERS)					
(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00017	.00803	.23737	.89993	2.91883	4.08169	4.52215	4.51790	4.11794
60.0 /	.00000	.00004	.00077	.00164	.00264	.00232	.00180	.00133	.00080
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD 5
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 5 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 12.43516 AND OCCURRED AT (3000.0, 90.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00043	.01863	.53651	2.07586	7.10963	10.42042	12.02019	12.43516	11.90036
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD 5
1-HR/PD 6
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 6 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.52213 AND OCCURRED AT (2500.0, 110.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00004	.00077	.00164	.00264	.00232	.00180	.00133	.00080
110.0 /	.00017	.00803	.23737	.89993	2.91882	4.08168	4.52213	4.51789	4.11792
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD 7
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 7 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS .27179 AND OCCURRED AT (2000.0, 140.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00006	.00178	.03978	.10742	.24160	.27179	.25729	.22692	.17506
130.0 /	.00003	.00111	.03043	.09309	.22719	.26280	.25162	.22375	.17323
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD 7
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 8 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.59552 AND OCCURRED AT (2500.0, 160.0) *

DIRECTION /	RANGE (METERS)								
(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00022	.00959	.26681	.96634	3.02666	4.17477	4.59552	4.57445	4.15355
150.0 /	.00000	.00008	.00157	.00292	.00386	.00303	.00218	.00155	.00089
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD 8
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 9 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 12.22959 AND OCCURRED AT (3000.0, 180.0) *

DIRECTION /	RANGE (METERS)								
(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00002	.00002	.00001	.00001	.00000	.00000	.00000
180.0 /	.00026	.01393	.43668	1.83711	6.70215	10.05944	11.73950	12.22959	11.76901
170.0 /	.00000	.00000	.00002	.00002	.00001	.00001	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD10
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 10 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.59553 AND OCCURRED AT (2500.0, 200.0) *

DIRECTION /				RANGE (METERS)					
(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00008	.00157	.00292	.00386	.00303	.00218	.00155	.00089
200.0 /	.00022	.00959	.26681	.96634	3.02666	4.17479	4.59553	4.57446	4.15356
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD10
1-HR/PD11
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 11 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS .27179 AND OCCURRED AT (2000.0, 220.0) *

DIRECTION /	RANGE (METERS)								
(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00003	.00111	.03043	.09309	.22719	.26279	.25162	.22375	.17322
220.0 /	.00006	.00178	.03978	.10742	.24160	.27179	.25730	.22692	.17506
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD11
1-HR/PD12
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 12 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.52222 AND OCCURRED AT (2500.0, 250.0) *

DIRECTION / RANGE (METERS)

(DEGREES) /	500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00017	.00803	.23738	.89994	2.91887	4.08175	4.52222	4.51798	4.11801
240.0 /	.00000	.00004	.00077	.00164	.00264	.00232	.00180	.00133	.00080
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD12
1-HR/PD13
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 13 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 12.43516 AND OCCURRED AT (3000.0, 270.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00043	.01863	.53651	2.07586	7.10963	10.42042	12.02019	12.43516	11.90036
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD14
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 14 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.52226 AND OCCURRED AT (2500.0, 290.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00004	.00077	.00164	.00264	.00232	.00180	.00133	.00080
290.0 /	.00017	.00803	.23738	.89995	2.91889	4.08179	4.52226	4.51802	4.11805
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD14
1-HR/PD15
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 15 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,

* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS .27179 AND OCCURRED AT (2000.0, 320.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
330.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
320.0 /	.00006	.00178	.03978	.10937	.24160	.27179	.25729	.22692	.17506
310.0 /	.00003	.00111	.03043	.09309	.22719	.26280	.25162	.22375	.17323
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

DAILY: 1
1-HR/PD16
SGROUP# 1

*** CATASTROPHIC RELEASE SCENARIO / 11/89 / MVM ***

* DAILY 1-HOUR AVERAGE CONCENTRATION (MICROGRAMS PER CUBIC METER) *
* ENDING WITH HOUR 16 FOR DAY 1 *
* FROM SOURCES: 1, 2, 3, 4,
* FOR THE RECEPTOR GRID *

* MAXIMUM VALUE EQUALS 4.59550 AND OCCURRED AT (2500.0, 340.0) *

DIRECTION / (DEGREES) /	RANGE (METERS) 500.0	640.0	750.0	1000.0	1500.0	2000.0	2500.0	3000.0	3810.0
360.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
350.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
340.0 /	.00022	.00959	.26681	.96634	3.02664	4.17475	4.59550	4.57442	4.15352
330.0 /	.00000	.00008	.00157	.00292	.00386	.00303	.00218	.00155	.00089
320.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
310.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
300.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
290.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
280.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
270.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
260.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
250.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
240.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
230.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
220.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
210.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
200.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

190.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
180.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
170.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
160.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
150.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
140.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
130.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
120.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
110.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
100.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
90.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
80.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
70.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
60.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
50.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
40.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
30.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
20.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000
10.0 /	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000	.00000

1-HR/PD16