FOREWORD

The Illinois Technological Hazards Mitigation Plan (ITHMP) is part of the Illinois Multi-Hazard Mitigation Plan (IMHMP), which also includes the Illinois Multi-Hazard Mitigation Strategy (IMHMS), the Illinois Human-Caused Hazard Mitigation Plan (IHCHMP) and the Illinois Natural Hazard Mitigation Plan (INHMP). The overall mitigation plan and strategy was developed as a cooperative effort of state agencies under the coordination of the Illinois Emergency Management Agency (IEMA). It discusses the process used to identify, profile and assess technological hazards in Illinois and the actions that should be taken to mitigate those hazards.

The ITHMP will continue to be reviewed and enhanced as new mitigation opportunities become available. Comments and suggestions are welcome and should be forwarded to my attention at the address below.

Andrew Velasquez III, Director
Illinois Emergency Management Agency
2200 S. Dirksen Pkwy
Springfield, Illinois 62703

ACRONYMS

ARC	American Red Cross
CFR	Code of Federal Regulation
CMS	(Illinois Department of) Central Management Services
CRBNE	Chemical, Radiological, Biological, Nuclear, and Explosives
CSEPP	Chemical Stockpile Emergency Preparedness Program
DHS	Department of Homeland Security
DMA2k	Disaster Mitigation Act of 2000
DRC	Disaster Resistant Community
EMA	Emergency Management Agency
EMAP	Emergency Management Accreditation Program
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
ESDA	Emergency Services and Disaster Agency (local)
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FHMO	Federal Hazard Mitigation Officer
FY	Fiscal Year
GAR	Governor's Authorized Representative
GDN	Gamma Detector Network
GEMS	Gaseous Effluent Monitoring System
HM	Hazard Mitigation
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team (for non-flood disasters)
HUD	Housing and Urban Development
IAW	"In Accordance With"
IDNR	Illinois Department of Natural Resources
IDoA	Illinois Department of Agriculture
IDOT	Illinois Department of Transportation
IDPH	Illinois Department of Public Health
IEMA	Illinois Emergency Management Agency
IEMA-DNS	Illinois Emergency Management Agency - IEMA
IEPA	Illinois Environmental Protection Agency
IHCHMP	Illinois Human-Caused Hazard Mitigation Plan
IHMT	Interagency Hazard Mitigation Team

Acronyms (cont.)

IHPA	Illinois Historic Preservation Agency
IMAG	Interagency Mitigation Advisory Group
IMHMP	Illinois Multi-Hazard Mitigation Plan
IMHMS	Illinois Multi-Hazard Mitigation Strategy
INHMP	Illinois Natural Hazard Mitigation Plan
INHMPC	Illinois Technological Hazard Mitigation Planning Committee
IPRA	Illinois Plan for Radiological Accidents
I-REACH	Illinois Radio Emergency Assistance Channel
ISP	Illinois State Police
ITECS	Illinois Transportable Emergency Communications Systems
ITHMP	Illinois Technological Hazard Mitigation Plan
ITTF	Illinois Terrorism Task Force
JPIC	Joint Public Information Center
LEPC	Local Emergency Planning Committee
NARS	Nuclear Accident Reporting System
NIMS	National Incident Management System
NEMA	National Emergency Management Association
NEPA	National Environmental Policy Act
NRC	U. S. Nuclear Regulatory Commission
NTH	Natural and Technological Hazards (part of FEMA)
NWS	National Weather Service
OMB	Office of Management and Budget
PDM	Pre-Disaster Mitigation
PL	Public Law
POC	Point of Contact
RACER	Radiological/Chemical Emergency Response
RAFT	Radiological Assessment Field Team
REAC	Radiological Emergency Assessment Center
RERO	Radiological Emergency Response Operations
RMS	Remote Monitoring System
RX	Reactor
SARA	Superfund Amendments and Reauthorization Act
SCO	State Coordinating Officer
SEOC	State Emergency Operations Center
SERC	State Emergency Response Commission
SHMO	State Hazard Mitigation Officer

SOP Standard Operating Procedures

Acronyms (cont.)

SWMDT State Weapons of Mass Destruction Team

TBD To Be Determined
TSC Technical Support Center

USEPA U. S. Environmental Protection Agency

WMD Weapons of Mass Destruction

TABLE OF CONTENTS

I. INTRODUCTION

Purpose

The contents of this Illinois Technological Hazard Mitigation Plan (ITHMP) are intended to provide the framework for technological hazard mitigation not only during the recovery and reconstruction process, but also on a year-round basis to identify current and proposed mitigation projects that will reduce the potential for future losses and decrease the costs to the taxpayers. The overall goals of this plan, and of the four documents comprising the Illinois Multi-Hazard Mitigation Plan (IMHMP), are universal in that they center on the need to protect lives and property, reduce the costs of disaster response, and minimize disruption to the state following a disaster. The IMHMP is comprised of four documents: three planning documents addressing natural hazards, technological hazards and human-caused hazards, respectively, along with the Illinois Multi-Hazard Mitigation Strategy (IMHMS) document. The Illinois Natural Hazard Mitigation Plan (INHMP) is the original mitigation plan for the State of Illinois, and is the comprehensive expression of the mitigation processes, programs, projects and strategies employed in the State of Illinois for hazard mitigation planning and plan implementations.

As previously stated, this plan will be referred to in this document and in general as the Illinois Technological Hazard Mitigation Plan (ITHMP) to be consistent with the naming convention established by the Illinois Natural Hazard Mitigation Plan (INHMP), the central planning document in the Illinois Multi-Hazard Mitigation Plan. Throughout this plan, the processes, methods and strategies described are within the same general framework as the processes, methods and strategies described in detail within the Illinois Multi-Hazard Mitigation Strategy (IMHMS). This plan does not contain detailed restatements of the processes, methods, strategies and overall approach to hazard mitigation planning in Illinois. Rather, the ITHMP contains additional information specific to the hazards identified in this ITHMP.

The Illinois Multi-Hazard Mitigation Plan will be used to increase awareness and initiate development of long-range, interagency, multi-hazard mitigation activities to be administered by the Illinois Emergency Management Agency (IEMA) and the Interagency Mitigation Advisory Group (IMAG) for the State of Illinois.

Scope

The ITHMP shall address those technological hazards that have the potential to rise to the level of a regional or a statewide disaster. In other words, those hazards presenting substantial risk to human life and private and public property that have potential to have a more widespread effect than a localized problem. This plan focuses on technological hazards. Separate efforts are in place for natural and human-caused hazards, and for hazards that are not otherwise specified (N.O.S.), such as pandemic disease and animal disease epidemics.

The ITHMP presents mitigation plans for hazards themselves, rather than presenting mitigation plans for "events". Emergency planning aimed at dealing with events is generally categorized as "response" planning. Thus, the mitigation plans for natural, technological, human-caused and N.O.S. hazards, involve mitigation efforts that occur outside of a disaster or hazard event, either prior to or after an event has occurred.

Authority

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended by (PL) 106-390 (Pre-Disaster Mitigation Program, Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program - 44 CFR Part 78) addresses state mitigation planning, identifies new local mitigation planning requirements, authorizes Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to states that develop a comprehensive, enhanced mitigation plan. The Disaster Mitigation Act of 2000 (DMA 2000) emphasizes the importance of strong state and local planning processes and comprehensive program management at the state level with a link in the planning process between the state and local mitigation programs. The Federal Emergency Management Agency (FEMA) has promulgated rules for implementation in 44 CFR Parts 201 and 206.

The Illinois Emergency Management Agency Act created IEMA and its authority to develop, plan, analyze, conduct, provide, implement and maintain programs for disaster mitigation, preparedness, response and recovery. (20 ILCS 3305/5) Further, the Illinois Administrative

Code restates the IEMA mandate to prepare the State of Illinois to deal with disasters, to preserve the lives and property of the people of the State and to protect the public peace, health and safety in the event of a disaster. (29 Ill. Adm. Code 301.110)

(430 ILCS 45/1) The Illinois Chemical Safety Act (Source: P.A. 84-852.)

(430 ILCS 50/0.01) Sec. 0.01. Short title. This Act may be cited as the Hazardous Materials Emergency Act. (Source: P.A. 86-1324.) Implementing Rule: AUTHORITY: Implementing "AN ACT to require labeling of equipment and facilities for the use, transportation, storage and manufacture of hazardous materials and to provide for a uniform response system to hazardous materials emergencies" (Ill. Rev. Stat. 1987, ch. 127, pars. 1251 et seq.) and Section 304 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 11004) and authorized by Section 6(c)(1) of the Illinois Emergency Services and Disaster Agency Act of 1988 (P.A. 85-1027, effective June 30, 1988).

On October 17, 1986, the President signed into law the Superfund Amendments and Reauthorization Act of 1986 (SARA). Included under Title III of SARA, was a free standing law, the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), commonly known as SARA Title III. Its purpose is to encourage and support emergency planning efforts at the State and local levels and provide the public and local governments with information concerning potential chemical hazards present in their communities.

Title III of the Superfund Amendments Reauthorization Act (SARA) entitled the Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 11001 et seq.).

TITLE 29: EMERGENCY SERVICES, DISASTERS, AND CIVIL DEFENSE
CHAPTER I: EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER f: CHEMICAL SAFETY
PART 620 EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW

Listed below are the names of the Radioactive Materials Rules And Regulations, along with a synopsis of the rulemaking requirements, by which the IEMA implements its statutory powers, duties and responsibilities.

The texts of rules and regulations provided on this system are unofficial and provided for the information of readers interested in the responsibilities of the IEMA. Statutes and rules are frequently amended. Consequently, the texts of statutes and rules provided on this system may at times not be current. For matters affecting legal rights or requiring legal interpretation, readers should consult a lawyer.

FINANCIAL ASSURANCE REQUIREMENTS

(32 Ill. Adm. Code 326)

This Part prescribes financial assurance requirements to ensure that specific and general licensees will have sufficient funds to reclaim properties. This Part identifies which licensees must file financial assurance arrangements and describes arrangements acceptable to the Agency. This Part is not applicable to licensees subject to 32 Ill. Adm. Code 332 that have financial assurance arrangements on file with the Agency.

LICENSING OF RADIOACTIVE MATERIAL

(32 Ill. Adm. Code 330)

This Part establishes licensing requirements for persons who receive, possess, utilize, manufacture, distribute, transfer, own or acquire radioactive material or devices or equipment utilizing or producing such materials.

FEES FOR RADIOACTIVE MATERIAL LICENSEES AND REGISTRANTS

(32 Ill. Adm. Code 331)

This Part establishes fees to cover the costs of licensure and inspection of radioactive material

licenses, registration of certain types of generally licensed devices, recovery and remediation of radioactive material and evaluation and maintenance of sealed source and device evaluations conducted in support of radioactive material licenses issued by the Illinois Emergency Management Agency, Division of Nuclear Safety.

LICENSING REQUIREMENTS FOR SOURCE MATERIAL MILLING FACILITIES

(32 Ill. Adm. Code 332)

This Part establishes procedures, criteria, and conditions upon which the IEMA issues specific licenses for source material milling and disposal of the byproduct material. The regulations in this Part do not establish procedures and criteria for the issuance of licenses for materials covered under Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (42 U.S.C. 7901).

FEES FOR BY-PRODUCT MATERIAL LICENSES

(32 Ill. Adm. Code 334)

This Part establishes an annual fee to be paid by the owner or operator of any property that has been used in whole or in part for the milling of source material and is being used for the storage or disposal of by-product material, equal to $2 per cubic foot of by-product material being stored or disposed of by the facility. However, no fees shall be collected from any State, county, municipal, or local governmental agency.

TRANSPORTATION OF RADIOACTIVE MATERIAL

(32 Ill. Adm. Code 341)

This Part establishes requirements for packaging, preparation for shipment and transportation of radioactive material and applies to any person who transports radioactive material or delivers radioactive material to a carrier for transport.

Characteristics of Illinois

Environment and Climate

The Illinois Environmental Protection Agency (IEPA) is the regulatory agency responsible for providing a unified, statewide program of environmental protection that is consistent with the social and economic needs of the citizens of Illinois.

The IEPA administers a wide range of programs designed to ensure clean air, water and land. Because the agency is sensitive to the needs of business and industry, it administers a coordinated review of permit applications to minimize delays in industrial permit issuance. The procedure brings together the agency's various programs to provide the convenience of "one stop" service.

The IEPA also maintains complete environmental data for all areas of the state. For example, businesses may access information about quality and quantity of water resources from streams and lakes for both treated and untreated water. The database also includes information on reserve capacity, type of treatment for public water supplies and waste treatment facilities, and air quality information from a large network of air monitoring equipment.

Illinois is serious about planning for the waste disposal needs of the 21st century. Although approximately 13 years of capacity exists at 54 active solid-waste landfills, statewide solid-waste planning efforts are well underway. Currently, two hazardous waste landfills are active in Illinois, one with eight years capacity and the other with five years.

The IEPA also undertakes efforts aimed at pollution prevention. Efforts undertaken by the IEPA center on reducing the disposal and release of toxic substances; integrating existing regulatory programs to promote toxic pollution prevention; and stimulating prevention strategies. The first program of this type began in 1991 with the cooperation of The Illinois Chamber. The Industrial Material Exchange Service (IMES), the third largest in the nation and largest in the Midwest, functions as an information clearinghouse; directory and marketing facilitator for materials that otherwise might be placed in landfills. To date, IMES has helped industries save or avoid

disposal costs of more than $112.5 million and has diverted the equivalent of 278.8 million gallons of waste from landfills.

The IEPA employs a large professional staff that is experienced in balancing the needs of the various constituencies to be served in the diverse economic climate that is Illinois.

In addition, the Illinois Department of Commerce and Economic Opportunity administers the **Small Business Environmental Assistance Program.** This program helps small businesses understand and comply with state and federal air pollution regulations. Section 507 of the 1990 Clean Air Act Amendments requires each state to operate a small business assistance program, and this program was deliberately established at the state's non-regulatory commerce agency to alleviate small businesses fear of seeking assistance in answering environmental compliance questions.

The program serves as a free, confidential and non-regulatory resource to small business owners around the state. Through the program, professional staffs work as a liaison between small businesses and state (IEPA) and federal (USEPA) regulators. The staffs create "plain language" publications, answer compliance questions, respond to written and verbal regulatory inquiries, coordinate environmental compliance workshops, and direct businesses to other pertinent technical assistance providers. Services include a toll-free help-line (800-252-3998), on-site consultation, and permit applications on the DCEO website. Free business assistance tools include easy-to-read regulatory fact sheets and guides, a Directory of Environmental Consultants, and a quarterly newsletter called *Clean Air Clips*. All client information is confidential and remains anonymous to the Illinois EPA.

Over 109,000 businesses have benefited from the program services since its inception in 1994.

The Illinois Climate

Illinois residents enjoy the variety of four distinct seasons. January high temperatures average near 30 degrees Fahrenheit in the north and the low 40s in Southern Illinois. In July, average highs vary from the mid-80s in Northern Illinois to near 90 degrees in Southern Illinois. April

and October highs average in the low-60s in Northern Illinois and near 70 degrees in Southern Illinois. Northern Illinois experiences approximately ten days a year with temperatures below zero; Southern Illinois typically records only one day below zero. Northern Illinois averages 18 days each year with temperatures greater than 90 degrees, while Southern Illinois averages 45 days in the 90-plus range.

The wettest seasons are typically spring and summer, with about four inches of precipitation monthly; during fall and winter, only about one to two inches of precipitation are recorded. Average annual snowfall varies from near 38 inches in Northern Illinois to about 10 inches in Southern Illinois. Southern Illinois generally records only about three days per winter with snowfalls topping one inch; Northern Illinois typically averages about 12 such days each winter.

Illinois generally records about 220 sunny days each year and about 50 days with fog. Ground frost generally is found from late December until early April, reaching depths of nearly 30 inches in Northern Illinois, while Southern Illinois often records no significant ground frost. On average, the state experiences five snowstorms each winter during which at least 10 percent of the state is impacted with six or more inches of snow.

In spring and summer, thunderstorms are the major source of precipitation, with five to seven thunderstorm days recorded during each of those months.
- Updated February 2004

Illinois Infrastructure

Transportation & Telecommunication

Illinois' modern transportation system utilizes air, ground transportation, rail, waterways and telecommunications technologies to provide direct routes to every U.S. market and also international ports.

Illinois Interstate Highways

Illinois lies at the heart of the nation's interstate highway system. Three coast-to-coast interstates (I-70, I-80, and I-90) pass through Illinois. These are joined by major north-south interstates, including I-39, I-55, and I-57; major east-west interstates that include I-24, I-64, and I-74; as well as I-72, I-94, I-88 and I-155. In all, 2,164 miles of interstate highway serve Illinois. Only two states have more interstate miles. Illinois also benefits from major east/west/north/south interchanges located in more than a dozen communities around the state. Augmenting the interstates are over 35,000 miles of state highways, making the interstate routes accessible from every region of Illinois. It's no wonder that Illinois is home to more than 5,700 trucking companies.

Illinois Railroads

Illinois is the center of the nation's rail network. Chicago is the largest U.S. rail gateway, and another major rail center is located in East St. Louis. In all 56 railroads are able to provide service from Illinois to every part of the United States.

The Illinois Air Transport System

Illinois' central location makes it a natural hub for air travel. Home to Chicago's O'Hare International Airport (the world's busiest airport), as well as a major commuter hub at Midway Airport and with more than 118 public use airports, 273 heliports and over 1,000 aviation facilities, Illinois is a convenient location for those needing air transport. In fact, an airport with commercial airline service or the capability to handle business jets serves virtually every Illinois city with a population exceeding 30,000. With over 1.6 million tons of cargo and approximately 69 million travelers passing through O'Hare each year and more than one arrival or departure every minute, it's obvious that travelers have maximum scheduling flexibility in Illinois.

Illinois Waterways

Illinois has 1,118 miles of navigable waterways bordering or passing through the state. These waterways provide Illinois with a link between the Atlantic Ocean (through the St. Lawrence Seaway and Great Lakes) and the Gulf of Mexico. The Port of Chicago offers terminals that handle ocean and lake vessels, as well as barges. Owned by the Illinois International Port

District, the Lake Michigan port is served by seven railroads and has direct access to Interstates 90 and 94. There are also 12 other port districts in Illinois. Both the Illinois International Port District and the Tri-City Regional Port District near St. Louis are Foreign Trade Zones, providing low-cost production and warehousing facilities for imported and export-bound products. (Foreign trade zones also are located in Peoria, Lawrenceville, Rockford and the Quad Cities.)

II. ILLINOIS TECHNOLOGICAL HAZARD MITIGATION PLAN PROCESS

Public and private sector involvement in the Illinois' hazard mitigation activities is wide-ranging. At the local government level both sector representatives are active members of the Local Emergency Planning Commissions. In addition, many local governments enjoy the active participation of the sectors in Emergency Operations Centers, response structures and public education outreach programs. Coupled with the local government partnerships with public and private sector representatives is the active involvement of a variety of representatives to the Illinois Terrorism Task Force (ITTF). Meeting on a monthly basis, the ITTF has sector representatives that actively participate in sub-committees and efforts structured around the base principle for emergency management in Illinois – "Protecting the citizens through an active, in-place system to mitigate, prepare, respond, and recovery to/from disasters.

The Illinois Emergency Management Agency (IEMA), Bureau of Disaster Assistance and Preparedness (DA&P) prepared the Illinois Technological Hazard Mitigation Plan (ITHMP). IEMA is responsible for leading and coordinating technological mitigation and long-term redevelopment efforts. The IEMA DA&P organized the Illinois Technological Hazard Mitigation Planning Committee (ITHMPC), composed of representatives from State government, to assist the DA&P division in preparing the Plan. Members of this committee are also members of the larger Interagency Mitigation Advisory Group (IMAG). This committee met to formulate the planning process, to provide knowledge and expertise, to discuss issues and concerns, to identify resources and mitigation measures, to interact and implement mitigation

decisions and to review planning documents and the Plan. Later in the planning process the committee members met on an as needed basis at the direction of the IEMA DA&P. The Plan was completed over a three-month period.

During this three-month process the committee coordinated the development of the Plan, recognized and incorporated other sources of expertise and resources and established a mitigation strategy to protect the citizens of Illinois including life, property, environment and economic interests. Each participating agency was able to introduce it's programs, name, classify and pinpoint mitigation opportunities and subsequently comment on the preliminary and draft versions of the Plan. Appropriate comments were incorporated into the final version of the Plan and the final version was distributed to the participating agencies.

The Illinois Technological Hazard Mitigation Planning Committee (ITHMPC) members were drawn from the Interagency Mitigation Advisory Group (IMAG). The IMAG concept brings together those agencies that can and do contribute staff, expertise and funding to mitigation efforts in Illinois. IMAG is composed of members from, but not limited to, agencies involved in emergency management, natural resources, environmental regulations, historic preservation, planning and zoning, community development, construction regulation, public information and insurance, Federal, State and local levels of government, private non-profit organizations and academic fields who have expertise in mitigation and who can offer technical assistance. This group meets annually and has the following responsibilities:

1) Establishing policies consistent with the State's mitigation goals.
2) Developing a comprehensive strategy for the development, integration and implementation of the State's mitigation programs.

III. HAZARD IDENTIFICATION and RISK ASSESSMENT (HIRA)

Illinois HIRA Process

The Illinois Technological Hazard Mitigation Planning Committee performed a technical review

and evaluated all of the technological hazards shown in the Federal Emergency Management Agency "State and Local Mitigation Planning how-to guide" entitled "Integrating Manmade Hazards Into Mitigation Planning". The committee decided to divide the potential technological hazards into three categories: those extremely unlikely to occur in Illinois, those with low probability and minimal impact, or technological hazards that have in the past and in all probability will continue to impact Illinois at various levels of severity and frequency. The following pages extensively discuss the hazards with an impact: Hazardous Materials – Chemicals, Hazardous Materials – Radiological, and Dam Failures.

Technological Hazards Identified

Technological hazards are those that are caused by tools, machines and substances that we use in our everyday life. The major technological hazards that will be discussed in this section are Hazardous Materials – Chemicals and Hazardous Materials - Radiological. "Hazardous Materials" refers generally to hazardous substances, petroleum, natural gas, synthetic gas, and acutely toxic chemicals. The term Extremely Hazards Substance (EHS) is used in Title III of the Superfund Amendments and Reauthorization Act of 1986 to refer to those chemicals that could cause serious health effects following short-term exposure from accidental releases. Illinois has more than 7000 fixed facility locations that report the presence of an EHS in Federally mandated threshold amounts.

Nuclear power generating facilities have the greatest concentration of radioactive materials of any private source. Illinois has 6 functioning nuclear power plants: Braidwood (Kankakee County), Byron (Ogle County), Clinton (DeWitt County), Dresden (Will County), LaSalle (LaSalle County) and Quad Cities (Rock Island County). In order to be in compliance with federal regulations, there must be a demonstrated ability to respond to any event that could occur at a site. The Illinois Plan for Radiological Accidents (IPRA) has been a proactive Radiological Emergency Preparedness program since the early 1980's. There have been many training courses and instruction given both to those counties within the immediate area of the plants (within 10 miles), and those who are in the ingestion pathway of the plant (within 50 miles). IPRA brings together local, state and Federal agencies for three federally evaluated exercises

each year. Although extensive safeguards are required, accidents can occur. These could affect large population through the accidental release of radiation. Other sources of radiological accidents can occur through transportation of radioactive materials. Illinois licenses, inspects, and regulates approximately 11,000 users of machines that produce ionizing radiation and 730 users of radioactive materials. IEMA's Bureau of Radiation Safety is charged with carrying out both State and Federal laws, rules, and regulations that pertain to radiation safety and mitigation programs for the licensees. IEMA's Bureau of Environmental Safety also conducts and maintains an active mitigation and response program that centers on the environmental impacts of radiation/radioactive materials. The IEMA is a unique and tremendous resource for the State of Illinois, comprehensively addressing radiological safety for the citizens of Illinois.

Operational Experience and Likelihood of Occurrence

The State of Illinois experiences events that require reporting and/or response on a routine basis. Operationally the experience gained from these activities allows Illinois the unique opportunity to use both historical perspective and hypothesis to develop and implement a comprehensive mitigation strategy against all identified threats. Provided below are reporting data for specific incidents.

2004 Oil & HazMat Emergency Incidents	
Total Incidents	**1777**
Incidents Involving Evacuations	9 Incidents 1,578 Individuals
Incidents Involving Fatalities	11 Incidents 20 Individuals
Incidents Involving Injuries	37 Incidents 83 Individuals
Release Type	33 Fire/Explosion 120 Gas or Vapor Cloud 1563 Leak or Spill 56 Water Involvement
Incident Location	226 Highway 91 Railroad 1049 Fixed Facility 125 Waterway 81 Air 19 Oil Fields 26 Agriculture
Leaking Underground Storage Tank Incidents	654
Abandoned Material Incidents	75
Complaints	222

IEPA - Emergency Operations Unit 2005 Oil & HazMat Emergency Incidents	
Total Incidents	**1696 (Down 4.5%)**
Incidents Involving Evacuations	57 Incidents **(Up 533%)** 1099 Individuals **(Down 30%)**
Incidents Involving Fatalities	12 Incidents **(Up 9%)** 16 Individuals **(Down 20%)**
Incidents Involving Injuries	82 Incidents **(Up 121%)** 185 Individuals **(Up 123%)**
Release type	49 fire/explosion **(Up 48%)** 129 gas or vapor cloud **(Up 7.5%)** 1487 leak or spill **(Down 4.8%)** 66 water involvement **(Up 17%)**
Incident Locations	257 highway **(Up 13%)** 106 railroad **(Up 16%)** 1057 fixed facility **(Up .76%)** 117 waterway **(Down 6 %)** 76 air **(Down 6%)** 62 oil fields **(Up 226%)** 43 agriculture **(Up 65%)**
Leaking Underground Storage Tank Incidents	516 **(Down 21%)**
Abandoned Material Incidents	65 **(Down 13%)**
Complaints	*undetermined*

*This data is continuously updated, as the Illinois Environmental Protection Agency completes the report database. 2005 is the most current completed survey.

Detailed information regarding the type, number, and event details for radioactive materials/radiation, and Nuclear Power Station incidents can be obtained through IEMA.

Hazardous Materials - Chemical Hazards

Description/Profile

Hazardous materials hazards are technological (meaning non-natural hazards created or influenced by humans) events that involve large-scale accidental or intentional releases of chemical, biological, or radiological (nuclear) materials. Hazardous materials events generally involve incidents at fixed-site facilities that manufacture, store, process, or otherwise handle hazardous materials or along transportation routes like major highways, railways, navigable waterways, and pipelines.

The severity of a hazardous materials release depends upon the type of material released, the amount of the release, and the proximity to populations or sensitive areas like wetlands or waterways and environmental factors such as wind velocity and direction and sunlight. The release of materials can lead to injuries or evacuation of thousands of nearby residents.

Primary State Agencies

Illinois Environmental Protection Agency

The primary role of the Illinois Environmental Protection Agency is to protect the State water, air and land from the effects of pollution, control solid waste disposal, direct the States technical response to non-radiological hazardous materials emergencies, collect meteorological and atmospheric contaminant data, and make long range studies of environmental conditions.

Additionally, the EPA requires Risk Management Programs (RMP) for companies of all sizes that use certain flammable and toxic substances. The RMPs must consist of risk management plans that include hazard assessments that detail the potential effects of accidental releases including the numbers of affected households, accident histories of the last five years, and evaluations of worst-case and alternative accidental releases. The information helps local fire, police, and emergency hazardous materials response personnel respond effectively to

emergencies.

Illinois Emergency Management Agency

The IEMA is responsible for coordinating the overall emergency management program of the State. IEMA is dedicated to the safeguarding of the people and property of Illinois through emergency preparedness, training and coordinated response to disasters.

Designated the State Emergency Response Commission (SERC) by the Governor, IEMA performs functions in accordance with the Superfund Amendment Reauthorization Act (SARA) Title III.

Emergency Planning and Community Right-to-Know Act

With the passage of the Federal Emergency Planning and Community Right-To-Know Act (EPCRA) in 1986, IEMA began implementation of a statewide Hazardous Materials Emergency Planning Program. For the first time, passage of EPCRA allowed emergency planners, responders and the public access to facility specific information regarding the identification, location and quantity of hazardous materials at fixed sites. The law requires facilities with threshold quantities of federally mandated substances to report annually to state and local emergency officials. In addition, facilities must immediately notify officials of any releases of harmful chemicals that have the potential to result in off-site consequences. This information is utilized to prepare emergency plans for hazardous materials incidents; to allow responders to receive training based on specific known threats; and to inform and educate the public regarding the chemical present in their communities.

The EPCRA Reporting Program implements three different sections of EPCRA:

Section 302: Notification of Extremely Hazardous Substances (EHS). Facilities usually submit by letter - there is no required form. The letter contains the facility name, telephone number and types of EHS chemicals used/stored. This is a one-time report unless there are acquisitions or revisions in a facility's chemical inventory. Notification is due within 60 days of acquisition/revision.

Section 311: List of physical and health hazards and names of products used/stored, but only products listed on the Tier2 forms. Facilities usually submit a material Safety Data Sheet (MSDS) - there is no required form. This is a one-time report unless there are acquisitions or revisions in a facility's chemical inventory. Notification is due within 90 days of acquisition/revision.

Section 312: Emergency and Hazardous Chemical Inventory (Tier) forms. Regulated facilities are required to complete and submit forms to IEMA, as the State Emergency Response Commission (SERC), their respective Local Emergency Planning Committees (LEPCs) and jurisdictional fire departments. Submissions are due between January 1st and March 1st for the previous calendar year.

CHEMICAL STOCKPILE EMERGENCY PREPAREDNESS

Newport Chemical Depot (NECD), Newport, Indiana

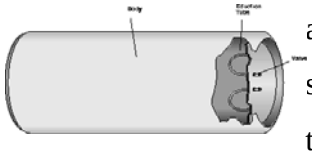
Newport Chemical Depot (NECD or the Depot) is located in west central Indiana, approximately 2 miles south of Newport and 70 miles west of Indianapolis. NECD has a multi-faceted mission. NECD was transferred from the U.S. Army Industrial Operations Command to the U.S. Army Chemical and Biological Defense Command in 1995. Both of these are subordinate organizations of the U.S. Army Material Command, which continues to have major command responsibilities. NECD is a government-owned, contractor operated facility. There are 11 civil service employees and one military commander that comprise the Contracting Officer's Representative (COR) staff. Mason & Hanger Corporation, with headquarters in Lexington, Kentucky, is the Operating Contractor. Approximately 222 full-time contractor employees work at NECD. The total acreage of NECD is 7,098, with easement rights in effect for an additional 1,400 acres. In 2005, DoD recommended to close Newport Chemical Depot as part of its BRAC Recommendations (see below for details).

Workers began chemically neutralizing 1,269 tons of VX nerve-agent late in the summer of 2004. Neutralizing all the VX should take about 2 ½ years. In 1959, the U.S. Army announced the award of a contract to the FMC Corporation of New York City, New York, for the design and construction of a facility to manufacture Chemical Agent VX. The facility was located in

the area formerly used for the production of heavy water. The new facility, completed in 1961 operated under US Army contract by FMC, remained in production until 1968 when it was placed in standby. The completion of the new VX nerve agent production plant at the Newport Chemical Plant in 1961 created a need for disposal specialists at the site. A detachment of Technical Escort Unit personnel was assigned to the plant the same year.

The Army produced its entire stockpile of VX, a rapid-acting, lethal nerve agent, at Newport. Munitions such as land mines, spray tanks and rockets were shipped to Newport by rail, filled with chemical agent, and then shipped to U.S. Defense sites worldwide. President Richard Nixon halted production of all chemical weapons, including VX, in 1968 and declared a moratorium on shipment in 1969, leaving the final two batches of 1,269 tons in storage on the depot. The manufacturing plant was decontaminated as much as was possible without disassembly, then fenced off and left to rust.

The nerve agent VX stockpiled at the Newport Chemical Depot in Indiana is stored in 1,690 steel ton containers commonly known as "TCs". These containers are designed specifically for the maintenance, storage, and transportation of bulk chemical agent. The Newport Chemical Depot (NECD) stores bulk nerve agent VX in ton containers that are over six and one-half feet long, and almost three feet in diameter. The solid steel sidewalls are roughly a half inch thick, and each end is about one inch thick. When empty, the containers weigh 1,600 pounds. When filled to capacity, the containers can hold up to 170 gallons of liquid, though the TCs stored at Newport have a layer of nitrogen gas that occupies a 10 percent void within the TC. Ton containers are designed to withstand pressures up to 25 times greater than the pressure of our atmosphere, and internal pressures up to 500 pounds per square inch. The ton containers at Newport are stacked in rows three containers high, and are clamped together for stability on top of wooden concave cradles inside a single warehouse of corrugated steel sheet metal supported by steel beams. In order to provide maximum protection to facility personnel and the environment, storage personnel are trained in handling ton containers storing chemical agent and monitoring the containers for signs of leakage.



The Newport Chemical Depot employs numerous security measures to ensure the safety of the stockpile. The depot entrances are guarded 24-hours per day and the outer perimeter is secured by a single chain link barbed wire fence. The storage area is surrounded by double fences and equipped with intrusion detection devices and television monitors. In addition, personnel entering the area must follow strict safety and security procedures.

The chemical agent storage area has alarms and detection systems that monitor the air 24-hours per day for signs of chemical agent release. In addition, four Automatic Continuous Air Monitoring Systems (ACAMS) monitor the storage building. Should the ACAMS detect chemical agent vapor, it would activate a series of alarms, both visual and audible, and alert emergency response teams. Certified personnel also conduct visual monitoring regularly to inspect the condition of the ton containers housed in the storage building. If a ton container shows evidence of leaking, detailed emergency response procedures are in place to rectify the problem and to protect the health of site personnel and the community.

The Newport Chemical Depot will continue to store bulk chemical agent in ton containers until the Chemical Stockpile Disposal Program safely disposes of it. Once the agent has been removed, the containers will be cleaned and decontaminated in accordance with federal, state and local laws, and then shipped off-site for recycling.

Under the terms of the Chemical Weapons Convention treaty ratified in April 1997, the U.S. must destroy its entire inventory of chemical weapons and production facilities by 2007. The Army plans to break ground in late 1999 for a pilot neutralization plant at the Newport depot to destroy the VX stockpile. The facility will destroy 4.1% of the nation's original chemical stockpile including nerve agent in ton containers.

VX stored in bulk containers will be pilot tested at NECD using the chemical neutralization process followed by supercritical water oxidation (SCWO) as a potential disposal technology for the bulk agent VX stored at Newport Chemical Depot (NECD). The proposed facility will be used to demonstrate, as part of a research and development program, the neutralization process followed by SCWO, to destroy VX agent currently stored in ton containers at NECD. At one time, the option of sending the neutralization hydrolysate to an off-site bio-treatment facility was

under consideration by the Army. However, technical and programmatic evaluations have concluded that off-site bio-treatment is not suitable at this time.

On February 18, 1999, the Army awarded the $295 million contract to Parsons Infrastructure and Technology Group, Inc., and its partnership team headed by AlliedSignal to complete the facility design; build, operate and close the disposal facility. Construction was scheduled to begin on this new facility to destroy 1,269 tons of liquid VX stored in carbon steel ton containers. The Parsons-Allied Signal Team disposes of the Newport stockpile using a low-pressure, low-temperature neutralization process, followed by a post-treatment process called supercritical water oxidation (SCWO), which reduces the neutralized by-product to distilled water and salt.

BRAC 2005

In its 2005 BRAC Recommendations, DoD recommended to close Newport Chemical Depot. There was no additional chemical demilitarization workload slated to go to Newport Chemical Depot. The projected date for completion of existing workload was 2nd quarter of 2008. There would be no further use for Newport Chemical Depot.

Obtained through the Global Security website at - http://www.globalsecurity.org/wmd/facility/newport.htm

The State of Illinois along with two impacted counties, actively participates in the exercise and evaluation of Chemical Stockpile Emergency Preparedness Plan exercises. Exercises are conducted on an established schedule that is overseen by the Federal Government. Detailed information regarding thereof exercising, evaluation criteria, and the State of Illinois plans and procedures, may be requested through the IEMA.

Technological Hazards

Hazardous Materials – CHEMICAL

IDENTIFICATION – DEFINITION

The term "Hazardous Materials" refers generally to hazardous substances, petroleum, natural gas, synthetic gas, and acutely toxic chemicals. The term Extremely Hazardous Substance (EHS) is used in Title III of the Superfund Amendments and Reauthorization Act of 1986 to refer to those chemicals that could cause serious health effects following short-term exposure from accidental releases. Our hazard identification of "Hazardous Materials – Chemical" is generally focused on accidental releases of EHS – extremely hazardous substances, from both fixed facility and mobile transport sources.

Mitigation Efforts

Emergency Planning and Community Right-to-Know Act of 1986

On October 17, 1986, Congress passed the Superfund Amendments and Reauthorization Act of 1986 (SARA). Title III of this act, also known as the Emergency Planning and Community Right-to-Know Act, was a response to releases of methyl isocyanate gas from Union Carbide plants in Bhopol, India and Institute, West Virginia. SARA Title III established the community's right to information about the chemicals that are stored or used at, or released from, local facilities. It also established a framework for developing emergency plans for responding to releases of these materials.

Many of these materials are things we use every day. A few examples are gasoline, fertilizer, pesticides, chlorine, anhydrous ammonia, and propane. While their presence is common and accepted, the transportation of these materials over our highways, and their presence in our communities, does cause some risk. SARA Title III provides a framework to address this risk.

Each state is required to establish a state emergency response commission, determine planning districts, and establish a local emergency planning committee in each district. In Illinois, all 102 counties have been designated SARA Title III planning districts. In addition, the City of

Chicago has been designated a SARA Title III planning district. The Illinois State Emergency Response Commission allows counties to consolidate to form multi-county districts. There is currently one consolidated planning district in Illinois, comprised of the Jersey County and Calhoun County planning districts. The local committees must be composed of representatives from many groups including emergency management, transportation, and law enforcement personnel, firefighters, elected or appointed local officials, hospital and emergency medical personnel, and community groups.

Local emergency planning committees must develop emergency response plans. These plans address the chemical hazards in the community within the scope of the local resources available to respond to releases. The plans are based in part on information provided by facilities that use, store, or release hazardous materials. Businesses must report this information to their local emergency planning committee, the fire department, and the state emergency response commission. In turn, the state commission and the local committees must provide this information to the public upon request.

Several sections of Title III impose reporting requirements on facilities. Section 302 of SARA establishes a list of Extremely Hazardous Substances and Threshold Planning Quantities (TPQs), which can be downloaded from the EPA web site. Business facilities, that have one or more of those substances on site in amounts that exceed the TPQ, must notify local planners and designate a facility coordinator to work with the local emergency planning committee. This notification must say that the facility stores an extremely hazardous substance and is therefore subject to the emergency planning requirements.

Section 304 deals with releases rather than storage. It includes not only releases from fixed facilities, but also transportation incidents. Vehicles, vessels, and rolling stock are considered facilities for the purposes of Section 304.

A chemical on either the Extremely Hazardous Substances List, or on the Comprehensive Emergency Response, Compensation, and Liability Act list, has a reportable quantity. This amount is as little as one pound for some substances but may be much higher. You should refer to either the Extremely Hazardous Substances List, or the Consolidate Chemical List, for the

reportable quantity for a specific substance. **[Documents available online at http://yosemite.epa.gov/oswer/ceppoweb.nsf/content/chemicalinfo.htm .** If the amount of a release exceeds the reportable quantity, the release must be reported as soon as the responsible party becomes aware of it.

Sections 311 and 312 have similar reporting thresholds and provide similar information. The information is sent to three locations - the local committee, the fire department, and the state emergency response commission.

Section 311 requires facilities to report the presence of certain materials within 90 days of beginning to store them. This report may consist of either:

> 1. Copies of the material safety data sheets for all substances stored in an amount which: A.) exceeds the threshold planning quantity for extremely hazardous substances; or B.) exceeds 10,000 pounds for hazardous substances designated by the Occupational Safety and Health Administration; or
>
> 2. A list of these materials classified by hazard. [The South Dakota State Emergency Response Commission prefers a list rather than individual material safety data sheets.]

Section 312 requires facilities to submit an Emergency and Hazardous Chemical Inventory Form by March 1 of each year. This report, known as a Tier II Form, must be provided to the three groups listed above. The completed form contains information about chemicals stored during the preceding calendar year.

*Portions of the preceding EPCRA description were taken from the South Dakota Department of Environment and Natural Resources, at the following link: http://www.state.sd.us/denr/DES/Ground/SARATitleIII/emergenc.htm

Additional Information

Anhydrous Ammonia Tank Regulation – Illinois Department of Agriculture

The Department of Agriculture's Division of Ag Industry Regulation, Bureau of Ag Products

Inspection is responsible for regulating seed, feed, fertilizer and anhydrous ammonia facilities in the state.

The Bureau's ten inspectors conduct nearly 900 inspections of anhydrous ammonia facilities annually. Inspections are carried out as required by the Rules and Regulations Relating to the Handling of Anhydrous Ammonia and Low Pressure Nitrogen Solutions, Equipment, Containers and Storage Facilities. Anhydrous ammonia is the most dangerous material handled by farmers and dealers. Inspectors provide an important consumer protection function by verifying storage tanks, applicators and nurse tank wagons are in safe operating condition. Inspectors also confirm storage tanks have the proper safety relief valves, excess flow valves and break away couplings on load out platforms. Inspectors also verify the hoses on the applicators are in good condition. In addition to the 900 facilities inspected, IDOA also examines 27,600 nurse tank wagons annually to guarantee valves on the tanks are not leaking. Since nurse wagon tanks are pulled on public roads, wagons are also checked to guarantee they are safe to travel on the roads and are equipped with slow moving vehicle signs.

During 2004 the Bureau of Ag Products Inspection launched a new program conducting Risk Management Plan (RMP) audits at anhydrous ammonia facilities in Illinois for the US Environmental Protection Agency (EPA). The USEPA is paying IDOA $136,400 to conduct the 500 RMP audits in Illinois. The RMP audits verify the preparedness of anhydrous ammonia facilities in the event an accidental release of anhydrous ammonia occurs at a facility.

Illinois Environmental Protection Agency – Response and Mitigation

The Illinois Environmental Protection Agency maintains experienced managers on call around the clock as Emergency Duty Officers to evaluate reports of oil and chemical releases to the environment. Response personnel are on standby status in the north, central and southern parts of the state, and are dispatched by the Duty Officer if necessary to respond to the incident location. Responders provide expert advice to local responders, conduct a technical evaluation of public health and environmental impacts, if necessary conduct sampling and/or real-time monitoring as well as directing initial remedial activities.

1. Emergency Management/Response - Assurance that spillers respond appropriately to environmental emergencies by conducting document reviews, phone interviews and field visits. Oversee remediation of such spills.

2. Sample Analysis for Div. of Public Water Supplies - Analysis of drinking water samples from public water supplies participating in the Community Water Supply Testing Fee Program to monitor and assure compliance with chemical and bacteriological standards for safe drinking water.

3. Abandoned Hazardous Substance Disposition - The Emergency Response Unit responds to reports of potentially abandoned hazardous substances and assesses the veracity and nature of reported hazards. The State contracts for services to evaluate, package, transport and dispose or treat those, which are then determined to be abandoned hazardous substances.

4. Ambient Air Monitoring Program - The Ambient Air Monitoring Program has two purposes. The first is to provide a real time measure of the level of pollutants in the atmosphere that citizens are exposed to. This allows the public to be notified when pollutant concentrations reach levels that could create adverse health effects. The second purpose is to collect long-term records of pollutant levels so that strategies can be developed to reduce the level of pollution and monitor the progress as the strategies are implemented.

5. Significant Chemical Release Determination - The Illinois EPA is to investigate and to designate certain chemical or oil releases as "significant releases" and notify a business which had a significant release that it must submit its Chemical Safety Contingency Plan (CSCP) (its response plan for chemical or oil releases) to the Illinois EPA within 30 days for review; Illinois EPA is to review the CSCP and provide comments for improvement of the CSCP to the Illinois Emergency Management Agency (IEMA) within 60 days of the Illinois EPAs receipt of the CSCP.

6. Accreditation of Environmental Laboratories - Accreditation of environmental laboratories as authorized by Section 4(n) and (o) of the Illinois Environmental Protection Act (415 ILCS 5/4(n) and (o)), and implemented by "Accreditation of Environmental Laboratories for Drinking Water, Wastewater and Hazardous Waste Analysis"(35 Ill. Adm. Code Part 186).

7. Administrative Support - Provides the fiscal and financial services, data processing, and administrative support for Illinois EPA activities.

8. Air Compliance and Inspection Program - The purpose of the Compliance and Inspection Program is to insure that the facilities regulated by the Illinois EPA Bureau of Air operate in compliance with all of the appropriate rules and regulations. This involves the review and evaluation of data collected by, and submitted to, the Illinois EPA. It also involves the physical inspection of facilities to insure compliance.

9. Air Emission Inventory Program - The purpose of the Emission Inventory Program is to insure that an accurate inventory of air pollution sources in Illinois is maintained. This inventory is used to support the monitoring and analysis of the Air Pollution Modeling and Compliance and Inspection Programs.

10. Air Permit Fee Program - The purpose of the Air Permit Fee Program is to issue bills and track the payment of fees required of permit holders covered by the Illinois EPA Bureau of Air. These fees fund a substantial portion of the Air Pollution Program.

11. Air Permitting Program - The Air Permitting Program is responsible for evaluating and issuing permits to facilities in Illinois that potentially release pollutants into the atmosphere. These permits are designed to identify and document the requirements and limits that a specific facility is subject to.

12. Air Pollution Modeling Program - The Air Pollution Modeling Program provides the technical analysis and support for developing strategies to reduce and control the level of

pollutants in the atmosphere. This program also supports the evaluation of existing programs and the development of alternatives.

13. Asbestos Control Program - The Asbestos Control Program covers the monitoring and reporting of asbestos renovation and demolition projects within Illinois.

14. Cleanup of Contaminated Sites - Protects public health, welfare or safety through clean up of contaminated sites.

15. Drinking Water Quality Compliance Monitoring - The Illinois EPA records and reviews the results of tests on CWS drinking water to determine compliance with established drinking water standards. The Illinois EPA also conducts operational visits and detailed engineering evaluations of CWS facilities and operations. The Illinois EPA certifies operators of the facilities and reviews all operational and managerial aspects of the facility to determine compliance. Appropriate enforcement action is taken when non-compliance occurs.

16. Emissions Reduction Marketing System - Under the Clean Air Act Amendments of 1990 (CAAA), states may use market-based approaches to achieve the required reductions in volatile organic material (VOM) emissions. The Illinois EPA has taken this approach and developed the Emissions Reduction Market System (ERMS) to take advantage of cost savings that come from allowing emissions trading among sources. The ERMS is for stationary sources emitting VOMs in the Chicago ozone non-attainment area located in Northeastern Illinois. The ERMS will be fully operational in May 2000. The Illinois EPA will operate an ERMS database that participating sources must use for processing trading transactions.

17. Employee Medical Monitoring - To implement medical monitoring requirements specified by 40 CFR 312 and 29 CFR 1910.120 which comprise initial, annual, termination, and exposure-based medical monitoring evaluations.

18. Enforcement Programs - Provides activities prior to and after the initial of formal enforcement proceedings to obtain compliance commitments and appropriate penalties.

19. Environmental Education - The environmental education coordinator focuses programs on youth education, which include the Air, Land & Water education program for fifth and sixth grade students and the Envirofun web site. The Environmental Education Coordinator, arranges IEPA speakers for classroom presentations (K-12 and college level). Exhibits are designed for the state fair, teacher workshops, and conferences. Permanent exhibits have been designed for the Brookfield Zoo, Shedd Aquarium and the Museum of Science and Industry.

20. Freedom of Information Act - The Illinois EPA must respond to all requests for information within seven working days of the request unless the request requires special treatment as described in the rules.

21. Industrial Hygiene Licensure - The program administers the licensing of Industrial Hygienists.

22. Land Data Collection and Analysis - Supports administrative functions.

23. Land Fees - Provides for parallel construction revenue streams to the State for environmental program support.

24. Legislative, Regulatory, and Enforcement - Supports administrative functions.

25. Noise Pollution Control - Protects public health, welfare and safety through limitations on excessive noise levels.

26. Office of Pollution Prevention - Conduct on-site P2 technical assessments at businesses and other entities; educate businesses about P2 opportunities through workshops, conference and electronic systems; promote voluntary P2 efforts through environmental

recognition programs; integrate P2 into routine agency functions through training and special projects.

27. Office of Small Business - The Office of Small Business provides Clean Break, an environmental assessment and amnesty program for small business; an environmental toll-free help line for small business; plain-language environmental facts sheets and compliance guides; and, mediation in resolving complaints or disputes with Illinois EPA.

28. Permitting Of Drinking Water and Wastewater Facilities. - The program has three primary components. First, under the National Pollutant Discharge Elimination System (NPDES), limits are established by permit for all municipal and industrial facilities that discharge waste into waters of the State. Second, engineering reviews are performed on the plans and specifications for construction of wastewater conveyance and treatment facilities and permits are issued as appropriate. Third, engineering reviews are performed on the plans and specifications for construction of drinking water facilities and permits are issued as appropriate.

29. Permitting of Waste Handling Facilities - Protects public health, welfare or safety through permit conditions.

30. Protection of Drinking Water Sources - The program identifies the ground and surface waters that serve as drinking water sources in the State, identifies existing and potential pollutant sources that could impact those waters, analyzes the susceptibility of the water to contaminants and defines a process to make information available to the public. Specific groundwater protection activities mandated by State law include establishing water well protection zones, developing groundwater quality standards, developing technology control regulations, and authority for recharge area protection.

31. Regulatory and Administrative Proceedings - Prepares and justifies regulatory proposals. Advocates courses of action to the Illinois PCB with regard to such matters as regulatory, permit appeal and variance proceedings.

32. Sample Analysis - Div. of Water Pollution Control - Analysis of samples from the waters of the State to monitor and assure compliance with chemical and bacteriological goals for water quality.

33. Sample Analysis for the Bureau of Air - Analysis of air samples to monitor and assure compliance with air quality standards.

34. Sample Analysis for the Bureau of Land - Sample Analysis for the Bureau of Land

35. Total Quality Management - Same as #1 above.

36. Toxic Chemical Reporting - Requires submission of toxic chemical reports to the Illinois EPA. Requires the Illinois EPA to maintain the reported information in a computer database and publish an annual toxic chemical report summarizing the reported information by chemical, industrial category and geographic area. Illinois EPA must provide copies of toxic chemical reports to any Illinois citizens on request with no charge.

37. Vehicle Inspection and Maintenance Program - The Vehicle Inspection and Maintenance Program supports the reduction of pollutant levels from motor vehicles in Illinois by requiring periodic inspections of those vehicles to insure their operation in an acceptable manner.

38. Waste Management Grants and Reimbursement Payments - Provides revenue streams to the State for waste management purposes.

39. Waste Management Inspections - Protects public health, welfare or safety through pursuit of environmental compliance.

40. Waste Material Recovery - Protects public health, welfare and safety through waste reduction.

41. Wastewater Discharge Compliance Monitoring - The Illinois EPA records and reviews the monitoring reports submitted by dischargers of wastewater in the State to determine compliance with permitted limits. The Illinois EPA also conducts sampling visits and detailed engineering inspections of discharge facilities. The Illinois EPA certifies operators of the facilities, monitors operations, and responds to emergencies. Field staff also make every attempt to identify un-permitted discharges and respond to citizens complaints. Appropriate enforcement action is taken when non-compliance occurs.

42. Water Quality Monitoring of Rivers, Lakes and GW - Provides ongoing monitoring of water and sediment chemistry, macro-invertebrates, fisheries, bioassay, and stream discharge data for support and direction of other program activities. Water quality monitoring activities consist of a combination of fixed station networks and intensive surveys of specific water resources.

Office of State Fire Marshall - Petroleum & Chemical Safety

The following list of highlights from 2004 provides examples of petroleum and chemical hazard mitigation actions performed regularly by the Office of the State Fire Marshall (OSFM):

- Issued a total of 1,939 permits for all tank installation, removals, upgrades/repairs, relines and abandonment's in-place.
- Reviewed and processed 556 eligibility and deductibility applications.
- There were 2,471 initial facility audits performed.
- Division personnel managed more than 18,484 phone inquiries.
- The division processed 5,587 Freedom of Information Act requests.
- Under the supervision of the DPCS, the Chicago Fire Department and Environmental Department conducted 521 permitted underground storage tank inspections and responded to 19 emergencies.

- The Chicago Environmental Department issued 500 permits for tank installations, removals, upgrades/repairs, relines and abandonment's in-place.
- Chicago also responded to 76 field investigations and conducted 199 initial certification audits.

The Division of Petroleum and Chemical Safety (DPCS) regulates Underground Storage Tanks (USTs) containing petroleum and hazardous substances to protect public health and safety. The division works under a comprehensive program combining new and existing federal and state rules and legislation to handle tank management, emergency response and financial responsibility requirements. The mission of the DPCS is … to protect against threats to human safety and contamination of the environment that can occur by the underground storage of petroleum products and other hazardous substances through prevention, education and enforcement.

Experiences

At the end of calendar year 2004, the division maintained registration on a total of 21,464 active petroleum and hazardous substance tanks. The division also maintains more than 38,000 facility files regarding USTs in Illinois. During the year, DPCS issued 1,939 permits and conducted 4,621 UST inspections. These inspections include permitted activity, multiple certification audit and re-inspection of Notice of Violation (NOV) issues. The division conducted 1,032 field investigations, issued 1,331 NOVs and responded to 47 emergency responses, while personnel processed 7,553 multiple forms. As the result of the Timely Compliance Opportunity program initiated in 2001, the division Red Tagged more than 528 tanks in 2004. The Red Tags were applied to USTs that did not meet the legal requirements. Red Tagging prohibits the deposit of product into the UST until all deficiencies are corrected.

Hazardous Materials - Radiological Hazards

Nuclear power generating facilities have the greatest concentration of radioactive materials of any private source. Illinois has 6 functioning nuclear power plants: Braidwood (Kankakee County), Byron (Ogle County), Clinton (DeWitt County), Dresden (Will County), LaSalle

(LaSalle County) and Quad Cities (Rock Island County). In order to be in compliance with federal regulations, there must be a demonstrated ability to respond to any event that could occur at a site. The Illinois Plan for Radiological Accidents (IPRA) has been a proactive Radiological Emergency Preparedness program since the early 1980's. There have been many training courses and instruction given both to those counties within the immediate area of the plants (within 10 miles), and those who are in the ingestion pathway of the plant (within 50 miles). IPRA brings together local, state and Federal agencies for three federally evaluated exercises each year. Although extensive safeguards are required, accidents can occur. These could affect large population through the accidental release of radiation. Other sources of radiological accidents can occur through transportation of radioactive materials. Illinois licenses, inspects, and regulates approximately 11,000 users of machines that produce ionizing radiation and 730 users of radioactive materials. IEMA's Bureau of Radiation Safety is charged with carrying out both State and Federal laws, rules, and regulations that pertain to radiation safety and mitigation programs for the licensees. IEMA's Bureau of Environmental Safety also conducts and maintains an active mitigation and response program that centers on the environmental impacts of radiation/radioactive materials. The IEMA is a unique and tremendous resource for the State of Illinois, comprehensively addressing radiological safety for the citizens of Illinois.

Description/Profile

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
IDENTIFICATION - DEFINITION
A radiological hazard can be defined as the uncontrolled release of radioactive material that can harm people or damage the environment. Hazards can be sub-categorized into three classifications: • Criticality accidents involving nuclear assemblies, research, production, or power reactors, and chemical operators. • Loss-of-coolant accidents as a result of significant breaks in the reactor coolant system. • Loss-of-containment accidents involving the release of radioactivity through breaches in containment vessels at fixed facilities or damage to packages in transportation accidents.

The IEMA is responsible for protecting Illinois residents from the potentially harmful effects of ionizing radiation. The department is recognized across the nation and around the world as a leader in radiation safety. The IEMA administers over two dozen programs to protect citizens and the environment, including:

- The nation's most comprehensive monitoring system for the 11 operating nuclear power reactors in Illinois
- Inspection and escort of spent nuclear fuel shipments
- Inspection and regulation of 800 radioactive materials licensees and 25,000 x-ray machines
- Accreditation of radiation technologists
- Licensing of radon measurement and mitigation professionals

- Oversight of cleanup efforts at sites contaminated with radioactive material

2A. Nuclear Power Plants

Nuclear power plants are designed to be safe and are operated without significant effect on public heath and safety and the environment. No industrial activity, however, is risk-free. To prevent the release of radioactive material to the environment, nuclear power plants are constructed with several barriers between the radioactive material and the environment surrounding the plant. The first barrier is the fuel cladding, sealed metal tubes in which ceramic pellets of uranium fuel are encased. The second barrier is the heavy steel reactor vessel, in the range of nine inches to a foot thick, and the primary cooling water system piping. The third barrier is the containment building, a heavily reinforced structure of concrete and steel up to several feet thick that surrounds the reactor and is designed to contain radioactivity that might be released from the reactor system in the unlikely event of a serious accident. An incident resulting in the release of radioactive material outside the plant boundaries may be caused by operator error, a failure of the redundant safety systems, or an act of sabotage or terrorism. As these plants are very robust structures with redundant safety systems the likelihood of releasing radioactive material offsite has a very low probability.

There are eleven operating nuclear power reactors located at six sites throughout the northern half of the state of Illinois. (Figure 1). They are licensed to operate by the U.S. Nuclear Regulatory Commission. In addition there are three permanently shutdown reactors located at two sites.

Figure 1

Nuclear Power Reactors In Illinois				
Location	**Type**	**Number of units**	**Status**	**Location**
Braidwood	Pressurized Water reactor	Two	Operating	Will County
Byron	Pressurized Water reactor	Two	Operating	Ogle County
Clinton	Boiling Water Reactor	One	Operating	De Witt County
Dresden	Boiling Water Reactor	Two	Operating	Grundy County
		One	Permanently shutdown	
LaSalle	Boiling Water Reactor	Two	Operating	La Salle County
Quad Cities	Boiling Water Reactor	Two	Operating	Rock Island County
Zion	Pressurized Water reactor	Two	Permanently shutdown	Lake County

The US Nuclear Regulatory Commission (NRC) has conducted and evaluated extensive studies of nuclear power stations for operational vulnerabilities and offsite impacts prior to licensing the plant. The risks of an accident occurring at a commercial nuclear power reactor, the resultant radiological release and the economic impacts have been well documented by the NRC and industry studies (WASH 1400, *Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants*; NUREG 1150, *Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants;* NUREG 1228, *Source Term Estimation During Response to Severe Nuclear Power Plant Accidents*; NUREG1465, *Accident Source Terms for Light-Water Nuclear Power Plants*, NUREG/CR 3673, *Economic Risks of Nuclear Power Reactors*, among others). Individual Plant Evaluations (IPEs) to determine plant-specific vulnerabilities have been performed by the utility for each site in compliance with NRC regulations and guidance. Evaluations of the vulnerability of people, property and governmental operations are performed

before sighting such a facility and are updated regularly (Update Final Safety Analysis Report, IPE and Estimated Time for Evacuation (ETS), etc.) per NRC guidance.

As a condition of their operating license, the licensee must have an Emergency Plan (10 CFR 50 Appendix E) in place prior to operating. The plan contains details on organization, assessment, activation and notification in the case of an incident at the plant. These plans categorize events into four categories covering the spectrum of postulated emergencies and increasing off-site impact: Unusual Event, Alert, Site Area, and General Emergency. These plans are established in accordance with such documents as EPA 400, Manual *of Protective Action Guides and Protective Actions For Nuclear Incidents*, NUREG 0654, *Criteria For Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants* and NUREG-0396, *Planning Basis for the Development of State and Local Government Radiological Emergency Response Plans in Support of Light Water Nuclear Power Plants*.

A wide-range of possible events that can occur during reactor operations have been analyzed. The impacts on the off-site public range from benign to severe. *A nuclear power plant accident can be expected, in the worst-case analysis, to result in a large release of radioactive isotopes into the environment and this release will have significant impact.*

Mitigation Efforts

Nuclear Power Plants

The State's efforts to mitigate the hazards associated with a nuclear power plant consist of programs to monitor activities at each nuclear power plant, and in the surrounding environment.

The mitigation effort involved IEMA establishing a Resident Inspector Program. This Program has IEMA inspectors assigned to each nuclear power plant to work in concert with the U.S. NRC inspecting the overall operations at each reactor site. (State/NRC Memorandum Of

Understanding Sub-agreement 3, dated 27 April 1989; 420 ILCS 5: Illinois Nuclear Safety Preparedness Act). They also work in concert with staff in Springfield to monitor and make comments on safety issues for impacts that could lesson the safety margins built into each facility. A second group of IEMA inspectors monitor utility compliance with the ASME Code for Boiler and Pressure Vessels and In-service Inspection Activities (Illinois Administrative Code Title 32: Energy, Part 505 and State/NRC Memorandum Of Understanding Sub-agreement 2, dated April 1984; 20 ILCS 3310 Nuclear Safety Act of 2004; 430 ILCS 75, Boiler and Pressure Vessel Safety Act). These inspection efforts have the ultimate goal of ensuring the plants are operated safely and that the probability of an accident with a release does not increase but can in-fact be reduced.

The State, Utility and local responders (fire, police, county officials) are part of a comprehensive emergency plan specific to nuclear power plant emergencies. The goal of this effort is to have in place a mechanism by which the impact of a radiological release on the public health and safety is minimized (420 ILCS 5: Illinois Nuclear Safety Preparedness Act). In order to mitigate (reduce or avoid) dose to the public, procedures are in place that specify at what *projected dose* protective actions should be taken. These protective actions consider evacuation, sheltering, food inspection and relocation of the general public as well as emergency workers exposure limits to mitigating the effects of exposure to radiation. (BNFS 4-SOP-6).

Finally, IEMA has established a one-of-a-kind Remote Monitoring System that monitors nuclear power plant and environmental data to look for warnings of potential problems. The Reactor Data Link (RDL) monitors reactor operational parameters (Illinois Administrative Code Title 32: Energy, Part 504: Status Signals For Nuclear Power Reactors; 420 ILCS 5: Illinois Nuclear Safety Preparedness Act). The Gaseous Effluent Monitoring System (GEMS) has radiation detectors to sample and analyze gaseous effluent from each plant vent stack, and the Gamma Detector Network (GDN) is a ring of detectors in the environment approximately 2-miles from each plant (420 ILCS 5: Illinois Nuclear Safety Preparedness Act). These detectors provide independent verification that no radioactive material has been released from the plant. Should there be a release of radioactive material from a nuclear power plant, these detectors can quantify that release, and provide immediate notification to IEMA should a release be undetected or

unreported by the plant. The goal of this effort is the earliest possible issuance of protective actions for the public, thus mitigating the effects of exposure to radiation.

Transportation of Spent Nuclear Fuel

Description/Profile:

The transportation of highway route control quantity (HRCQ) radioactive material such as spent nuclear fuel, and transuranic waste poses a potential hazard to traffic and communities on the transportation route if the shipment is involved in an accident or is targeted by terrorists. Shipments are met at the borders of Illinois and inspected against USDOT standards to ensure casks meet specifications before entering the state.

Mitigation Efforts

The Nuclear Safety Preparedness Act gives IEMA the authority to inspect and escort these shipments. The purpose of the program is to lessen the probability of the shipment being involved in an accident and to ensure that the cargo does not cause any contamination problems. IEMA works cooperatively with the Illinois State Police and the Illinois Commerce Commission to conduct these inspections and escorts. Shipments are stopped when they enter the state. For highway shipments, ISP conducts a standard Commercial Vehicle Safety Alliance inspection of the vehicle. Vehicles are tagged “Out of Service” for worn tires, brakes and hoses. IEMA conducts a radiation survey of the cargo to determine compliance with USDOT radioactive cargo regulations. For train shipments, IEMA inspects the cargo, while ICC inspects the train and the track. For both types of shipments, the inspectors follow the shipment through the state and drop off when the shipment exits the state.

Should there be an incident involving a shipment, the escort team will be the first response unit. Local responders will be second on the scene.

IEMA employee inspecting a transportation shipment

Dam Failure

Description/Profile

Illinois rules define dams as "all obstructions, walls, embankments, or barriers, together with their abutments and appurtenant works, if any, constructed for the purpose of storing or diverting water or creating a pool. Not included are underground or elevated tanks to store water."

Dam height is defined by regulation as the measurement in feet from the natural bed of the stream or watercourse at the downstream dam slope toe of the barrier to the top of the embankment or barrier.

Dams are categorized according to the degree of threat to life and property in case of failure. Class I dams are those for which failure has a high probability of causing loss of life or substantial economic loss, similar to that of US Army Corps of Engineers High Hazard Potential or USDA Natural Resources Conservation Service Class (c) dams. Class II dams are those for which failure has a moderate probability for causing loss of life or substantial economic loss, similar to USCOE Significant Hazard Potential or USDA/NRCS Class (b) dams. Class III dams are those for which failure has a low probability for causing loss of life or substantial economic loss, similar to the USCOE Low Hazard Potential or USDA/NRCS Class (a) dams. In addition, dams in Illinois are categorized according to size in the following manner:

Category	**Capacity (acre-feet)**	**Height (feet)**
Small	less than 1000	less than 40
Intermediate	1000 to 50,000	40 to 100
Large	more than 50,000	more than 100

Illinois rules identify those dams that are under the jurisdiction of the state. All Class I and II dams are regulated. Class III dams are regulated if they meet the following criteria:

• The drainage area of the dam is 6400 acres or more in a rural area, or 640 acres in an urban area, or

• The dam is 25 feet or more in height provided that the impounding capacity is greater than 15 acre-feet, or

• The dam has an impounding capacity of 50 acre-feet or more provided that the dam height is greater than 6 feet.

In Illinois there are 1,226 dams included in the U.S. Army Corp of Engineers (USACE) National Inventory of Dams. Map 4-12 shows dam locations per the USACE's inventory.

2003 Statistics:

Number of state-regulated dams: 1,311

Number of dams in National Inventory of Dams: 1,226

The USACE National Inventory of Dams records dams as "High hazard potential", "Significant hazard potential" and "Low hazard potential":

- High hazard potential dams are dams where failure or improper operation will probably cause loss of human life.

- Significant hazard potential dams are those where failure or improper operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Dams classified as having "significant hazard potential" are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

- Low hazard potential dams are those where failure or improper operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property. Low hazard potential class dams are listed as those that exceed 25 feet in height and 15-acre-feet of storage, and low hazard potential class dams that exceed 50-acre-feet of storage and 6 feet in height.

Technological Hazards

DAM FAILURE

IDENTIFICATION – DEFINITION

Dam failure is an accidental or unintentional collapse or other failure of an impoundment structure that results in downstream flooding. Dams are man-made structures and dam failures are usually considered technological hazards, however, these failures are usually caused by prolonged periods of rainfall and flooding. We have a dam safety program. (For reference, we comply with the requirements of the national model dam safety program) We classify dams into 3 categories - Class I, Class II, and Class III. These are roughly equal to the federal - High, Significant and Low Categories.

Class I dams are dams where failure is likely to cause loss of life. Class II dams cause significant loss of property or damage to significant infrastructure (Interstates, railroads, power plants, etc.) Class III dams cause limited property damage.

Nature of the Hazard

Dams are water storage, control, or diversion barriers that impound water upstream in reservoirs. Dam failure is a collapse or breach in the structure. While most dams have storage volumes small enough that failures have little or no repercussions, dams with large storage volumes can cause significant flooding downstream.

Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which cause most failures;
- Inadequate spillway capacity, resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage or piping;
- Improper maintenance, including failure to remove trees, repair internal seepage problems, replace lost material from the cross-section of the dam and abutments, or maintain gates, valves, and other operational components;
- Improper design, including the use of improper construction materials and construction practices;

Technological Hazards **DAM FAILURE**
IDENTIFICATION – DEFINITION
• Negligent operation, including the failure to remove or open gates or valves during high flow periods; • Failure of upstream dams on the same waterway; • Landslides into reservoirs, which cause surges that result in overtopping; • High winds, which can cause significant wave action and result in substantial erosion; and Earthquakes, which typically cause longitudinal cracks at the tops of the embankments that, can weaken entire structures.

Mitigation Efforts

Illinois' permit program (Admin Rules, Part 3702 - on IDNR web site) requires all Class I and II dams to have operation permits. As part of that permit they are required to have an Emergency Action Plan for the dam. Permits issued since 1998 required the EAP to be consistent with the ICODS format (basically the format in FEMA 64). The permits issued prior have a mix of good to poor plans. We are doing a PR campaign using owner liability as the lever to get them upgraded. Our rules do not allow us to demand the format update. We are in good shape with the major dams. The nuclear generating structures were upgraded a couple years ago.
The Corps dams are not up to speed at this time.

In the event of a dam emergency, our staff is a support element to IEMA. If an event does not elevate to IEMA, we support the local emergency management agency. We do not operate in an adversarial environmental, but we work for the citizens of the state, not the dam owner. The format requires a direct tie into the local response community. We work with the owners through that group.

As a program, we do not see human-caused hazards as an issue. The EAP's we require assume an instantaneous failure scenario. The plans should be equally effective for natural and man-made breaches.

We screened all Illinois dams using the RAM-D procedure prior to its release. There are no dams in Illinois, which rate as critical. (our highest score was 80 out of 800) This means that we are prepared to handle the effect, even though we are not requiring owners to take specific security measures.

Most of the information we have can be queried and downloaded from the National Dam Inventory, which is kept by the Corps. There is about a 1-year lag, but the data does not change much.

Illinois Hazard Rating Process

The overall objective of this process is to devise a method to compare and evaluate technological hazards in Illinois. In order to accomplish this task, a period of time was selected, data was collected on the technological hazards and categories for evaluation were identified. These categories were sub-divided into three divisions and scores for each division were given. The exact procedure is discussed in the next several pages and this section is concluded with a table revealing the results of this process.

There are four categories (Historical/Probability, Vulnerability, Severity of Impact and Population) that will identify and define the ratings of each hazard, noted in the five tables on the next three pages. The first table will identify what has occurred in the past as a guide to projecting the probability for future occurrences. The second table will identify the number of citizens who might be impacted based on individual criteria identified in the methodology. The third table will estimate the severity by considering health and safety, continuity of operations, property, facilities, infrastructure, environment, economic and financial situation. The fourth category is population with two tables: table 4A is based on the 2000 census population and table 4B is based on the projected population growth for the next ten years.

The first three tables are weighted three times as much as the last two tables combined. Each hazard (for example flood) will have a score from each of the five tables. These tables are displayed and the score to be used is identified on the following pages by table. This last column under each hazard will be the total overall score of the five tables. This overall score will be evaluated, as shown below:

Low – 0 to 12 (green)
Guarded – 13 to 24 (blue)
Elevated – 25 to 36 (yellow)
High – 37 to 48 (orange)
Severe – 49 to 60 (red)

For example, under flood there will be a number from each of the five tables. These five numbers will be totaled to arrive at the overall risk for floods. Illinois uses the referenced rating process by county for all major natural hazards in Illinois. As ratings and numbers become available/revised they will be transferred onto a separate spreadsheet by county and colored coded as indicated above to readily indicate the hazard ratings.

1) HISTORICAL/PROBABILITY (frequency)

-The number of times that a disaster has occurred in a jurisdiction in the past 50 years
-The information is being used to determine and evaluate the likelihood for future disasters

Low (6)	0 to 10 occurrences in the last 50 years
Medium (12)	11 to 50 occurrences in the last 50 years
High (18)	More than 50 occurrences in the last 50 years

2) VULNERABILITY (percentage of people)

-The relationship of where people live in or near the hazard area

-The percentage of people that will be adversely affected should the hazard occur

Low (6)	Less than 10% of the total population of the jurisdiction
Medium (12)	10% to 25% of the total population of the jurisdiction
High (18)	More than 25% of the total population of the jurisdiction

This section required an individual analysis by hazard, as indicated below:

- Hazardous Materials – Chemicals - All counties are susceptible to chemical accidents.

- Hazardous Materials – Radiological - Illinois is nearly 56,000 square miles in size, with the average county around 545 square miles.

- Dam Failures - Illinois has between 1200 and 1300 manmade Dams that are inspected and regulated by the State of Illinois. Although the hazard is a by-product of a natural hazard, that of flooding, the manmade structures are a technological hazard that we plan for and mitigate against.

3) SEVERITY OF IMPACT (injuries, fatalities, personal property & infrastructure)

-The worst conceivable impact to human life and property which could result from a hazard

-The essential facilities are defined for this purpose as PUBLIC SAFETY (fire, police & local government) and UTILITIES (electric, gas, telephone water & sewer)

Low (6)	Minor injuries (under 50) & property damage (under $1,000,000), or less than 24 hour shutdown of essential facilities
Medium (12)	Serious injury (more than 50), major property damage (structural stability) ($1,000,001 to $15,000,000), or 24 to 72 hour shutdown of essential facilities
High (18)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (More than $15,000,000), or more than 3 days of shutdown for essential facilities

POPULATION–COMBINED FOURTH CRITERIA based on 1/3 the value of the above tables. The committee was instructed to include growth as a factor for the risk assessment. After a review of the data the committee concluded that giving the future growth equal weight with the other factors skewed the risk assessment. Counties range in population from approximately 5,000 to 5,000,000. To say a population growth of 25% in a smaller county (1, 250) would have more of an impact than a larger county with 10% growth (500,000) was not acceptable to the committee.

The committee also determined that because of the large population disparity between counties the Vulnerability and Severity of Impact didn't fully distinguish the quantity of people that would be exposed to risk. The committee decided to give the population of the counties equal weight with the growth factor. The planning committee discussed the impact of population on the risk assessment at length. While population is an important factor to be considered, it is of lesser significance than the first three criteria and has been assigned 1/3 the value. On a scale of 100 the first three tables would receive 30 each and the remaining 10 was allocated to

population.

4A) POPULATION (number in jurisdiction)

-The actual 2000 population census figure per jurisdiction

-The quantity will be used to identify a slight increase in risk

Low (1)	0 to 100,000 population in the jurisdiction
Medium (2)	100,001 to 500,000 population in the jurisdiction
High (3)	More than 500,000 population in the jurisdiction

4B) POPULATION GROWTH (percentage of increase)

-The projected population growth in a jurisdiction over the next 10 years

-The population growth estimates will be used to identify a potential increase to risk

Low (1)	% of decrease to 10% projected population increase in the jurisdiction
Medium (2)	11% to 25% projected population increase in the jurisdiction
High (3)	More than 25% projected population increase in the jurisdiction

1 Likelihood of Occurrence

2. Vulnerability of people, property, environment, and the entity itself

Ratings of Hazards & Categorization of Threats

Rating Technological Hazards

The Illinois Technological Hazard Mitigation Planning Committee used the process described in the previous section to develop hazard ratings, by county, for technological hazards in Illinois. Please see the Appendix A – Ratings of Technological Hazards By County for the results of the assessment.

Hazard Ratings Methodology

Using the tables in this rating process, the information has been extracted and analyzed in the following manner:

Historical/probability – The actual number of events that occurred in the previous calendar year, in this case, 2004.

Vulnerability – This section required an individual analysis by hazard, as indicated below:

- Hazardous Materials – Chemicals - All counties are susceptible to chemical accidents.

- Hazardous Materials – Radiological - Counties with nuclear reactors, or in proximity to nuclear reactors.

- Dam Failures - the number and hazard rating classification of dams within a county.

Severity of Impact – In general, severity of impact for the technological hazards identified, is

largely related to population. Thus, population was the distinguishing factor in the severity of impact factor for these analyses.

Population – The Illinois Department of Commerce and Economic Opportunity provided the 2000 census population and the projected population growth by county through 2010. This information was used in supplying information for the fourth and fifth tables.

IV. MITIGATION STRATEGY CONSIDERATIONS

Hazardous Materials – Chemical

Technological Hazards **Hazardous Materials – CHEMICAL**
MITIGATION STRATEGY CONSIDERATIONS
(a) The use of appropriate building construction standards
Generally not applicable, with the possible exception of OSHA requirements, and any storage requirements under the purview of Environmental Protection Agencies, Illinois Department of Agriculture (note that they have storage containment rules for Agrichemicals such as herbicides and insecticides) and the Office of the State Fire Marshall's under-ground and aboveground storage tanks regulatory programs. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(b) Hazard avoidance through appropriate land-use practices
Generally not applicable, with the possible exception of OSHA requirements, and any storage requirements under the purview of Environmental Protection Agencies, Illinois Department of Agriculture (note that they have storage containment rules for Agrichemicals such as herbicides and

Technological Hazards **Hazardous Materials – CHEMICAL**
MITIGATION STRATEGY CONSIDERATIONS
insecticides) and the Office of the State Fire Marshall's under-ground and aboveground storage tanks. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(c) Relocation, retrofitting, or removal of structures at risk
This consideration is applicable to the Office of State Fire Marshall's (OSFM) regulation of storage tanks containing petroleum and hazardous substances. The OSFM Division of Petroleum and Chemical Safety (DPCS) regulates Underground Storage Tanks (USTs) containing petroleum and hazardous substances to protect public health and safety. The division works under a comprehensive program combining new and existing federal and state rules and legislation to handle tank management, emergency response and financial responsibility requirements. The mission of the DPCS is … to protect against threats to human safety and contamination of the environment that can occur by the underground storage of petroleum products and other hazardous substances through prevention, education and enforcement. In 2004, The OSFM issued a total of 1,939 permits for all tank installation, removals, upgrades/repairs, relines and abandonments in-place. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(d) Removal or elimination of the hazard
In mitigation terms, our considerations of this criteria center on what we can do before or after an event, not during an event, which is "response". The OSFM program for regulation of storage tanks

Technological Hazards

Hazardous Materials – CHEMICAL

MITIGATION STRATEGY CONSIDERATIONS

containing petroleum and hazardous substances is an example of a mitigation effort in this regard. Generally, the following government entities all have a role in the removal or elimination of chemical hazardous materials before, during and after a hazard event has occurred: Local Fire Departments and local government divisions of EMA/ESDA, along with local law enforcement, local transportation departments and any local departments dedicated to protection of the environment. State and Federal government entities with roles in this process include: IEMA, the IEPA, the OSFM, the US EPA, IDOT, and US DOT.

Although Hazardous Materials Response is not "mitigation", the training and establishment of hazardous materials response teams, and the planning to establish teams strategically around the state, has produced extremely valuable resources that continue to grow in number, and deserve mention within this strategy:

Hazardous Materials Response Teams (ITTF)

Through the statewide plans development, a first ever inventory of locally based Hazardous Materials Teams was completed statewide. As a result, 36 response teams were designated for statewide response. Currently, 27 of the teams are rated at Level "A" or the most qualified while the remainder are rated Level "B" but currently upgrading to Level "A" capability.

The teams have held two statewide meetings where representatives created standardized operating protocols, minimum equipment and training performance standards and modeled response packages to domestic terrorism incidents.

Through ITTF grants ($1,358,467.00) each of the 36 teams have received standardized, WMD Detection and analysis equipment for nuclear, biological and chemical incidents. The equipment

Technological Hazards **Hazardous Materials – CHEMICAL**
MITIGATION STRATEGY CONSIDERATIONS
received represents contemporary technology available to non-military resources. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(e) Reduction or limitation of the amount or size of the hazard
Please see the information listed in criteria (d) of this section, which is generally applicable to this criterion also. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(f) Segregation of the hazard from that which is to be protected
Please see the information listed in criteria (d) of this section, which is generally applicable to this criterion also. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(g) Modification of the basic characteristics of the hazard
Please see the information listed in criteria (d) of this section, which is generally applicable to this criterion also. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois'

Technological Hazards **Hazardous Materials – CHEMICAL**
MITIGATION STRATEGY CONSIDERATIONS
jurisdiction.
(h) Control of the rate of release of the hazard
Please see the information listed in criteria (d) of this section, which is generally applicable to this criterion also. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(i) Provision of protective systems or equipment
Please see the information listed in criteria (d) of this section, which is generally applicable to this criterion also. Local responders and some of the government entities (as in (d), are generally equipped with and trained in the use of Personal Protective Equipment (PPE) for response to hazardous materials events. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction.
(j) Establishment of hazard warning and communication procedures
Hazard warning and communication procedures are established for a hazardous materials – chemical hazard. For transportation-related incidents and incidents at fixed facilities, an emergency release notification process is established as follows: A. Immediate telephone notification shall be given by the owner or operator of a facility when a

Technological Hazards

Hazardous Materials – CHEMICAL

MITIGATION STRATEGY CONSIDERATIONS

release equal to or exceeding the reportable quantity of an extremely hazardous substance[1] or a CERCLA hazardous substance[2] occurs at the facility.

In such incidents, notifications are to be made to the following:

1. Illinois Emergency Management Agency (IEMA)/State Emergency Response Commission (SERC) at 1-800-782-7860 (within state) or (217) 782-7860 (when calling from out-of-state);
2. Local Emergency Planning Committee (LEPC) that is likely to be affected by the release. The telephone number(s) can be obtained from IEMA;
3. National Response Center (NRC) at 1-800-424-8802 (if the substance is a CERCLA hazardous substance).

B. Immediate telephone notification is also required if an incident or accident involving a hazardous material[3] occurs which results in:

1) a member of the general public is killed;

2) a member of the general public receives injuries requiring hospitalization;

3) an authorized official of an emergency agency recommends an evacuation of an area by the general public;

4) a motor vehicle has overturned on a public highway;

5) Fire, breakage, release or suspected contamination occurs involving an etiologic agent;

6) Any release of oil that produces a sheen on water and/or threatens navigable waters. (This includes ditches)

In such incidents, notification shall be made as noted in Paragraph A, above, except no notification is required to the NRC, except item 6 (oil that impacts water).

At a minimum, notification shall include:

1) the chemical name or identity of any substance involved in the release;

Technological Hazards

Hazardous Materials – CHEMICAL

MITIGATION STRATEGY CONSIDERATIONS

2) an indication of whether the substance is an extremely hazardous substance;

3) an estimate of the quantity in pounds of any such substance that was released into the environment;

4) the time and duration of the release;

5) the specific location of the release;

6) the medium or media (air, land, water) into which the release occurred;

7) any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals;

8) proper precautions to take as a result of the release, including evacuations;

9) the name and telephone number of the person or persons to be contacted for further information.

WRITTEN FOLLOW-UP NOTICE IS REQUIRED WITH RESPECT TO INCIDENTS AS DESCRIBED IN PARAGRAPH A, ABOVE. As soon as practicable after such release, the owner or operator shall provide a written follow-up emergency notice (or notices, as more information becomes available) to the SERC and the LEPC, updating the information provided in the immediate notification and including additional information with respect to:

1) Actions taken to respond to and contain the release;

2) Any known or anticipated acute or chronic health risks associated with the release;

3) Where appropriate, advice regarding medical attention necessary for exposed individuals.

[1] See 40 CFR 355 for a listing of extremely hazardous substances (EHS)

[2] See 40 CFR 302.4 for a listing of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) hazardous substances

[3] See 49 CFR 172.101 for a list of hazardous materials

(These rules are compiled in 29 IAC 430 and 29 IAC 620) **2/04**

Guidance specific to the notification of events at the Newport Army Chemical Depot can be found in

Technological Hazards **Hazardous Materials – CHEMICAL**
MITIGATION STRATEGY CONSIDERATIONS
the CSEPP plan maintained by the State of Illinois.
(k) Redundancy or duplication of critical systems, equipment, information, operations, or materials
The State of Illinois enforces federal regulation regarding the redundancy or duplication of critical systems, equipment, information, operations, or materials. Concurrently, the State of Illinois utilizes a redundant system of notifications, inspection, and regulation to enact effective mitigation activities/strategies. Through the activities of the LEPC's and State inspection programs Illinois' provides mitigation techniques consistent with national standards. In addition, the State of Illinois utilizes reporting and response notification protocols that allow for a 24/7/365 capability to respond to and recover from potential releases. It should be noted that standards for the Newport Army Chemical Depot are outside of Illinois' jurisdiction. However, Illinois maintains a robust network of notification, facilities, and equipment necessary for response and recovery to CSEPP events.

Hazardous Materials – Radiological

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
MITIGATION STRATEGY CONSIDERATIONS

Technological Hazards

Hazardous Materials – RADIOLOGICAL

MITIGATION STRATEGY CONSIDERATIONS

(a) The use of appropriate building construction standards

Nuclear Power Plants (6) in Illinois and the United States are subject to meeting standards established by the Nuclear Regulatory Commission (NRC) *and the State. These building and construction standards are delineated in each plant's Updated Safety Analysis Report. Examples of standards used are the Institute of Electrical and Electronic Engineers (IEEE), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), American Society for Testing Materials (ASTM), and the American Society of Civil Engineers (ASCI). In addition, US NRC Regulatory Guides are used for all aspects of the design and construction.*

Title 10 Code of Federal Regulations Part 50, " Domestic Licensing of Production and Utilization Facilities," Section 55a delineates specific ASME and IEEE standards to be used. 10CFR 50 Appendix J, "Primary Reactor Containment Leakage Testing for Water-cooled Power Reactors", contains the leakage testing requirements for the primary containment (one of three release barriers).

(b) Hazard avoidance through appropriate land-use practices

There are no specific land-use practices in place for areas surrounding a nuclear power plant. However, for the area surrounding each nuclear power plant, a 10-mile Emergency Planning Zone has been established. Detailed plans are established, implemented and trained against to ensure that offsite response organizations can effectively manage an accident at a nuclear power plant.

This criteria is generally not applicable to this hazard.

(c) Relocation, retrofitting, or removal of structures at risk

If this pertains to the nuclear facility structures, then:

Technological Hazards

Hazardous Materials – RADIOLOGICAL

MITIGATION STRATEGY CONSIDERATIONS

Relocation/removal are-not possible for nuclear facilities

Retrofitting:

For existing nuclear power plants the Bureau of Nuclear Facility Safety (BNFS) monitors and reviews all changes to the existing plant's operating license to ensure that all changes maintain adequate margins of safety. For new nuclear power plants, the BNFS actively follows and comments upon the design, operation and emergency response characteristics of proposed designs. The US NRC licensing process governs the licensing of new nuclear power plants.

Removal of a nuclear facility and the return of the land to a "green" condition will be addressed at that time such activities take place.

If, not then relocation, removal and retrofitting of offsite structures "at risk" is not in IEMA's mandate.

.

(d) Removal or elimination of the hazard

N/A for existing nuclear power plants. The IEMA has implemented a new program for removal of orphan radiation sources from workplaces and the environment. IEMA arranges for proper disposal of radiation sources that are not secured.

(e) Reduction or limitation of the amount or size of the hazard

The IEMA limits the quantities of radioactive materials a facility can have on hand at any one time. A licensing and enforcement program accomplishes this limitation.

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
MITIGATION STRATEGY CONSIDERATIONS
(f) Segregation of the hazard from that which is to be protected
For existing nuclear power plants, Utility access controls are in place to prevent unauthorized access to the facility. The IEMA works with shippers of high hazard radioactive material to improve the performance of shipping containers.
(g) Modification of the basic characteristics of the hazard
The basic characteristics of radiation are fixed by the Laws of Physics and are immutable. IEMA is working with manufacturers of high hazard radioactive materials to improve their basic structural integrity and reduce the probability of release during normal use and accident conditions.
(h) Control of the rate of release of the hazard
The control of any radiological release from a nuclear power plant is outside IEMA's control.
(i) Provision of protective systems or equipment
The BNFS reviews all licensing issues to ensure the requirements for nuclear power plant protective systems and equipment are maintained. Additionally IEMA's Resident Inspectors routinely inspect these systems for operability and maintenance activities. IEMA Response personnel are equipped with appropriate radiological detection and monitoring instrumentation, personal protective equipment, dosimetry, training and procedures to handle a radiological emergency.
(j) Establishment of hazard warning and communication procedures

Technological Hazards

Hazardous Materials – RADIOLOGICAL

MITIGATION STRATEGY CONSIDERATIONS

The Nuclear Accident Reporting System (NARS) is in place for the purpose of hazard warnings and establishment of communication procedures in a nuclear accident situation. *The NARS relies upon pre-established (and agreed to by the State and NRC) plant conditions that are used to classify the accident into one of four categories: Unusual Event, Alert, Site Area Emergency and General Emergency. Each category has detailed procedures on the response required and the points of contact. Each classification is tied to a specific US EPA Protective Action Guideline (PAGS). These PAGs refer to the dose received to an individual at which protective actions are warranted. (see* ***Manual of Protective Action Guidelines and Protective Actions for Nuclear Power Incidents,*** *US EPA 400-R-92-001, May 1992) Additionally, activation of the IPRA would establish liaisons at key Utility, State, and Local offsite response organizations to ensure the timely flow of information and the co-ordination of response activities. Offsite notification is required to be made within 15 minutes after the event is classified.*

Radiological accidents during transport would be reported through the emergency notification "911" system and would prompt the implementation of plans for response in accordance with procedures specific to hazardous materials response to a radiological accident.

(k) Redundancy or duplication of critical systems, equipment, information, operations, or materials

Nuclear power plants are designed, built and operated with redundant and diverse critical systems and equipment. There are also three engineered barriers to prevent an accidental release of radioactivity to the environment. See "Hazard Definition" above for more details.

IEMA's technical response to a nuclear power-plant event is centered in the Radiological Emergency Assessment Center (REAC) The REAC has backup power, multiple communications paths: phones

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
MITIGATION STRATEGY CONSIDERATIONS
and cellular, e mail, etc., and is supplied by backup power. Nuclear power plant and IEMA environmental data arrives at separate two computer centers also with backup power. A backup REAC exists. Liaisons can be contacted by land phone, cell phone or e-mail. Key response documents are stored in both REAC and the alternate REAC. Identical analysis software is available on both computers.

Dam Failure

Technological Hazards **DAM FAILURE**
MITIGATION STRATEGY CONSIDERATIONS
(a) The use of appropriate building construction standards
The Illinois Department of Natural Resources, Office of Water Resources, monitors, categorizes and handles permitting processes for man-made dams in Illinois. Their purview includes, generally, building construction standards for dams.
(b) Hazard avoidance through appropriate land-use practices
The Illinois Department of Natural Resources, Office of Water Resources, monitors, categorizes and handles permitting processes for man-made dams in Illinois. The state has no authority to regulate land use to reflect the hazard created by a dam. Since most dams create a riverine flood wave, the State's floodplain regulations help to minimize new development at risk from dam failure.

Technological Hazards **DAM FAILURE**
MITIGATION STRATEGY CONSIDERATIONS
(c) Relocation, retrofitting, or removal of structures at risk
The Illinois Department of Natural Resources, Office of Water Resources, monitors, categorizes and handles permitting processes for man-made dams in Illinois. There is no direct mitigation program for structures at risk due to dam failure. Federal, State and local floodplain mitigation programs exist and will often remove structures at risk from both riverine flooding and dam failure.
(d) Removal or elimination of the hazard
The Illinois Department of Natural Resources, Office of Water Resources, monitors, categorizes and handles permitting processes for man-made dams in Illinois. The state has the authority to require the removal or repair of dams that are in imminent danger of failure.
(e) Reduction or limitation of the amount or size of the hazard
The Illinois Department of Natural Resources, Office of Water Resources, monitors, categorizes and handles permitting processes for man-made dams in Illinois. Class I and II dams are required to have operation and maintenance plans which include inspection and emergency repair criteria intended to locate and repair potential failure modes before they progress to a dam breach.
(f) Segregation of the hazard from that which is to be protected
Not practical. Local land use controls for areas downstream of a dam may provide some segregation.

Technological Hazards **DAM FAILURE**
MITIGATION STRATEGY CONSIDERATIONS
(g) Modification of the basic characteristics of the hazard
Not feasible.
(h) Control of the rate of release of the hazard
See (e) above.
(i) Provision of protective systems or equipment
Not practical.
(j) Establishment of hazard warning and communication procedures
Hazard warning and communication procedures are established in the emergency action plan for the dam.
(k) Redundancy or duplication of critical systems, equipment, information, operations, or materials
Redundant communications systems are typically identified in the emergency action plan.

V. IMPACTS AND HAZARD CONSEQUENCES ANALYSIS

Hazardous Materials - Chemical Hazards – Fixed and Mobile (Rail and Roadways)

Technological Hazards **Hazardous Materials – CHEMICAL**
IMPACTS ANALYSIS
(a) Health and safety of persons in the affected area at the time of the incident (injury and death)
The persons in the impact area(s) may be affected with consequences ranging from no effects, to slight or severe effects, and even death, derived from chemical exposures (from both fixed – industrial, or mobile – transportation) sources. Rail Mass evacuation would be required, depending on the type & amount of toxic chemicals released. Local residents would be displaced from their homes until the toxic chemicals were cleaned up and the vapor cloud has dissipated. Roadways Regarding traffic accidents, IDOT has nine Districts throughout the State. Each District facility has a person appointed as a Safety Manager. This office has documentation on what steps are taken to prevent and respond to each incident. Each District has their internal documents. IDOT has a Bureau of Traffic Safety and a Division of Employee Services that instruct Safety Classes throughout the Districts.
(b) Health and safety of personnel responding to the incident

Technological Hazards

Hazardous Materials – CHEMICAL

IMPACTS ANALYSIS

IEMA and other State Agency Personnel responding to the incident shall observe life safety/health standards and practices. Persons responding to the incident could be exposed to the same chemical hazard sources as the general public, but would probably not be as highly exposed because of their training and use of personal protective equipment. Personnel responding will utilize intelligence gathered from local responders to properly address any hazards that may pose a threat. Chemical exposures pose a risk to responders and can be addressed through victim symptomology, and monitoring/sampling. This type of exposure will be minimized through personal protective equipment measures.

Rail

Should be minimal if trained in proper techniques to handle release of toxic chemicals.

Roadways

IDOT in association with IEMA provides HazMat first responder training annually throughout all the Districts in the State.

Response handbook training designated as Response Handbook for Incidents, Disasters and Emergencies (RHIDE) also is given throughout the Districts.

IDOT has a Bureau of Traffic Safety and a Division of Employee Services that instruct Safety Classes throughout the Districts.

(c) Continuity of operations

State Agencies in Illinois recently participated in a Continuity of Operations planning effort resulting in an overall state plan and individual plans for the agencies. The State of Illinois has developed plans to continue government operations in the event that designated building and/or building systems fail

Technological Hazards

Hazardous Materials – CHEMICAL

IMPACTS ANALYSIS

or become uninhabitable. In addition, the State of Illinois has mobile command vehicles capable of providing independent power, communication, and telephone lines in the event that facilities in the affected area(s) should lose power and other means of communication.

(d) Property, facilities, and infrastructure

Chemical events may render the building/property contaminated and uninhabitable for use, structurally unsound, or prohibit the transportation to and from the critical facilities.

(e) Delivery of services

A large-scale chemical accident could conceivably delay non-critical services provided by the State of Illinois, which would result in a minimal effect on public service, and in the case of multiple large scale events occurring concurrently there could conceivably be significant effect on the State of Illinois to provide critical services. Under provisions in place for the concept of operations and government it is assumed that the State of Illinois will begin the resumption of essential services with in a 24-72 hour timeframe.

Rail

Rail operations would be disrupted until the derailed cars were moved, the track was rebuilt, and environmental conditions were safe to operate trains. Short-term, all utility services would be shut down until the derailment was cleaned up and the chemical vapors dissipated. Long-term, services would be phased back in.

Technological Hazards

Hazardous Materials – CHEMICAL

IMPACTS ANALYSIS

Roadways

IDOT maintenance facilities throughout the State will assist each other in times of crises and needs. It is an understanding between IDOT Districts to assist one another.

(f) The environment

Like most categories of impact/consequences, the impact on the environment would be case specific, but could rise to a significant level in certain situations, if containment of the hazard did not occur when and where necessary.

Rail

Would require provisions for temporary food, water, and shelter for displaced residents; Homes would have to be inspected by EPA and/or Health officials to determine when levels of toxic chemical vapors are low enough for residents to return; Water and Sewer systems operability and safety would need to be verified before residents could utilize them;

Roadways

Regarding traffic accidents, IDOT's Security Contingency Plan in the Emergency Operations Manual has designated measures to be put in place during current threat levels and when the threat levels are increased. Also, IDOT trains through its RHIDE documentation how to secure the work area and what to do in response to suspicious items that are found.

(g) Economic and financial condition

Technological Hazards

Hazardous Materials – CHEMICAL

IMPACTS ANALYSIS

The range of economic and financial impacts from a chemical hazard event is highly variable. Illinois is home to a large chemical industry and transportation of extremely hazardous chemicals occurs every day on the roads and railroads within the State of Illinois. Specific data regarding economic impact can be found through IEMA – Economic Impact Multi-Hazards Estimates binder.

(h) Regulatory and contractual obligations

The regulatory climate for extremely hazardous substances (EHS) revolves around Title III of the Superfund Amendments Reauthorization Act (SARA) entitled the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 USC 11001 et seq.). Additional legislation addressing this hazard includes the Illinois Emergency Planning and Community Right To Know Act [430 ILCS 100] and authorized by Section 5(c) of the Illinois Emergency Management Agency Act [20 ILCS 3305/5c], The Illinois Chemical Safety Act, (430 ILCS 45/1) (Source: P.A. 84-852.), and the Hazardous Materials Emergency Act. (Source: P.A. 86-1324.) (430 ILCS 50/0.01) Sec. 0.01.

The occurrence of a large-scale chemical/EHS incident would not have much of an effect on the regulatory climate, with the exception of, adding to the number filing for Tier II reporting facilities.

(i) Reputation of the entity

Our statewide commitment to comprehensively address hazardous materials accidents in all phases of emergency management in Illinois puts us in a good position to perform at a high level when hazardous materials accidents involving chemicals/EHS occur. However, as in any emergency response situation, if response and associated recovery, preparedness and mitigation activities are not perceived as having been adequate to protect lives and property in the State of Illinois, the reputation of State government would suffer.

Technological Hazards **Hazardous Materials – CHEMICAL**
IMPACTS ANALYSIS
Rail The reputation of the government will be proportional to the degree that governmental agencies are prepared for, and subsequently responsive to, the needs of citizens affected by the evacuation. Roadways The reputation of the government will be proportional to the degree that governmental agencies are prepared for, and subsequently responsive to, the needs of citizens affected by the evacuation.

Hazardous Materials - Radiological Hazards

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
IMPACTS ANALYSIS
(a) Health and safety of persons in the affected area at the time of the incident (injury and death)
As stated in the identification and definition section, the transportation of spent nuclear fuel, transuranic waste and highway route control quantity (HRCQ) radioactive material poses a potential hazard to traffic and communities on the transportation route if the shipment is involved in an accident

Technological Hazards

Hazardous Materials – RADIOLOGICAL

IMPACTS ANALYSIS

or is targeted by terrorists.

Persons in the immediate vicinity of a transportation incident could suffer high radiation exposures. Such exposures are not likely to be immediately fatal, but could result in significant life shortening through cancer incident.

An accident or terrorist activities at a nuclear power station leading to a radiological release poses both short and long-term health affects depending upon the quantity of radioisotopes released to the environment. Health effects from exposure to radiation range from no effects to death, and include such diseases as bone, breast and lung cancer. The public and emergency workers' radiation dose from an exposure to radioactivity can be caused by "external" or "internal" pathways. External exposure is from radiation that originates outside the body. Internal exposure is from radioactive material that has been taken into the body. Radioactive material may be taken into the body through breathing, eating, drinking, open wounds, or may be absorbed through the skin.

The effects of exposure can be classified into three categories:

Somatic effects: Physical effects occurring after a large (acute) dose (e.g., 100 rem whole body in a few hours) or cancer that occurs years after small exposures (chronic dose).

Genetic effects: Abnormalities that may occur in the future children of exposed individuals

Teratogenic effects: effects that are observed in children who have been exposed during the fetal and embryonic stages of development (generally observed in high acute exposures).

(b) Health and safety of personnel responding to the incident

Persons responding to the incident could be exposed to the same radiation sources as the general

Technological Hazards

Hazardous Materials – RADIOLOGICAL

IMPACTS ANALYSIS

public, but would probably not be as highly exposed because of their training and instrumentation.

For nuclear power plant accidents, response personnel will have appropriate PPE to protect themselves. Dose limits are in place at which time response personnel will be "turned around" and not allowed to enter a contaminated area.

(c) Continuity of operations

State Agencies in Illinois recently participated in a Continuity of Operations planning effort resulting in an overall state plan and individual plans for the agencies. Recipients of HRCQ materials would have significant COOP issues. These materials naturally decay over time and the failure to deliver replacement materials could force irradiation facilities to close temporarily.

If there is a major event at a nuclear power plant that requires full activation of the state's response team, the initial response may need to be sustained for several days. Local fire and law enforcement professionals can request mutual aid assistance from their counterparts in the state (such as the Mutual Aid Box Alarm System (MABAS) for fire). If the incident lasts a long time, mutual aid could be used to bring in other response professionals to help cover shifts, or handle local calls while staff is responding to the incident. IEMA staff responding to the incident will also have to work in shifts to perform environmental sampling and determine the extent of the spread of radioactive material. During this time, the routine IEMA duties of these responders will have to be prioritized, deferred or possibly performed by staff between response shifts. Federal assistance through the National

Technological Hazards

Hazardous Materials – RADIOLOGICAL

IMPACTS ANALYSIS

Response Plan is also available to supplement Agency efforts. Long term response could last years.

(d) Property, facilities, and infrastructure

Any highway or rail line on which such an incident occurs will be temporarily closed and traffic re-routed. Previous experience indicates a 24 to 36 hour closure.

Radioactive releases associated with nuclear power plant accidents may render buildings and property contaminated and uninhabitable for use, or prohibit the transportation to and from critical facilities. The duration of the impact is dependant upon the severity of the radiological release. The immediate impact (shelter, evacuation, access control) can be minimal to a few days. Subsequent protective actions (establishment of food control zones, reentry, etc.) can last from weeks to many months. Long-term actions to restore environmental radiation levels to acceptable levels for unconditional occupancy or use (population relocation, decontamination of land and structures) may extend from months to years. The infrastructure will be affected by:

Loss of electrical generating capacity

Temporary Loss of Utilities

Contamination of Public Water supplies

Loss of Agricultural land usage

Loss of Dairy land usage

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
IMPACTS ANALYSIS
Loss of Business land usage *Potential inability of law enforcement/fire/emergency medical services to communicate* *Potential civil unrest*
(e) Delivery of services
Only as related to "d" above.
(f) The environment
The threat to the environment is secondary to the threat to human health and safety. If the incident occurs in a park or forest preserve area, the spill may render the area temporarily inaccessible. A nuclear power plant accident with a large release of radionuclides will impact the surrounding environment. The affected area during a release is dependant upon meteorological factors. Wind and rain can deposit contamination far beyond the area of the power plant, or they can cause the release to deposit near the plant. Animal and plants may become contaminated. Crops can also be contaminated. Crop and livestock loss is possible. Exterior building surfaces and streets, pastures, etc. may be contaminated. Radionuclides can contaminate bodies of water by direct deposition, effluent discharge or from washout in the surrounding area. This contamination tends to accumulate in the bottom sediment, aquatic plants and fish. Potential human exposure is from drinking water and indirectly from irrigation and eating contaminated fish. The release of radioactivity into the environment may not directly affect the ecosystem but may affect the surrounding population. For example, contamination of groundwater may not directly affect the surrounding area but could be transported to a human population via public water systems. Depending upon the magnitude of the release, short or long-term remedial actions may be necessary to restore the affected region around a nuclear power

Technological Hazards

Hazardous Materials – RADIOLOGICAL

IMPACTS ANALYSIS

plant to full use. Remedial actions are dependant upon the contamination levels. Methods might be as simple as restricting access for a short time to allow the radioactive material to decay away, washing the surface of a parking lot to remove small amounts of surface contamination, or washing foods before processing them for consumption. More complex decontamination processes include removing top soil and disposing of it as radioactive waste or applying chemical agents to react with the radioactive material like soap reacts with oil to allow it to be more easily removed. Some areas, in the unlikely worst-case scenario, may never be restored to a "green" condition. It is extremely important that the actual isotopic mixture of a radioactive release be determined for analysis, as different isotopes pose different levels or hazard depending on the pathway by which they enter the human body. For example, some isotopes undergo radioactive decay very quickly, so by the type the isotope passes from the grass to the cow to the milk to the human, there is no hazard remaining, while other isotopes with longer decay rates might still remain in the milk and pose an exposure threat. Likewise, metabolic processes within plants or animals might enhance or even prevent exposure, making the exact isotopic mix of the release critical. See picture "Environmental Exposure Pathways", below

Such methods might be as simple as restricting access for a short time to allow the radioactive material to decay away, washing the surface of a parking lot to remove small amounts of surface contamination, or washing foods before processing them for consumption. More complex decontamination processes include removing top soil and disposing of it as radioactive waste or applying chemical agents to react with the radioactive material like soap reacts with oil to allow it to be more easily removed.

Technological Hazards **Hazardous Materials – RADIOLOGICAL**
IMPACTS ANALYSIS
The threat to the environment is secondary to the threat to human health and safety. If the incident occurs in a park or forest preserve area, the spill may render the area temporarily inaccessible.
(g) Economic and financial condition
No widespread economic issues. However, in the case of a nuclear power plant radiological accident involving the extended evacuation of an area, their would be an economic impact to the evacuated area, and possibly beyond, including a food control zone, depending on a number of factors including: agriculture production in the affected area, general goods production in the area and distribution area, employers located in the affected area, etc. *See "d" above.* Specific data regarding economic impact can be found through IEMA – Economic Impact Multi-Hazards Estimates binder.
(h) Regulatory and contractual obligations
Current federal regulations specify the safety and security arrangements for these shipments. A serious incident involving these materials will call these arrangements into question and will have significant impact on the regulations of the U. S. Nuclear Regulatory Commission as well as IEMA. 420 ILCS 5/," Illinois Nuclear Safety Preparedness Act", Section 5/8 delineates the Agency's duties and responsibilities for "Illinois Nuclear Safety Preparedness Program" which includes emergency response to nuclear power plant accidents.
(i) Reputation of the entity

Technological Hazards

Hazardous Materials – RADIOLOGICAL

IMPACTS ANALYSIS

Although we hope we never have to respond to a serious incident, we look at such an incident as an opportunity to show the public how well the State of Illinois can respond to effectively limit any problems associated with the incident.

Responding to a release of radioactive material in the environment will be an administrative and political challenge for this Agency. Public confidence in the ability of the Agency to combat the event must be clearly established and maintained in light of conflicting information and rumors that will be available to the general public. The inherent public fear of radiation and its effects is perhaps the biggest hurdle the Agency faces in ensuring that the public health and safety is protected. Although there has never been a nuclear power plant accident, IEMA has demonstrated repeatedly the professionalism and capabilities to meet the requirements of an emergency response organization dealing with nuclear power-related accidents.

Nuclear Power Plants

2) Additional Impact / Consequence Analysis:

In 1986 the NRC issued a policy statement that established safety goals that specify the Commission's expectations with respect to an acceptable level of risk to public health and safety from the operation of nuclear power plants. The policy statement states:

1) the risk of an immediate fatality to an average individual in the vicinity of a nuclear power plant that might result from reactor accidents should not exceed 0.1% of the sum of the immediate fatality risks that result from other accidents to which the U.S. population is generally exposed and

2) the risk of cancer fatalities to the population near a nuclear power plant should not exceed 0.1% of the sum of cancer fatality risks from all other causes.

A large release of radioactive isotopes to the environment from a nuclear power plant could result in significant health, infrastructure and economic impacts. From an economic perspective, there will be costs associated with the public protective actions taken during and after the release.

During the release, there will be costs for:

Evacuation of the affected population

Sheltering of the affected population

Temporary Relocation Centers

Public medical services

Personal Decontamination

IEMA/State response activities

After the release has been terminated, there will be costs associated with:

Long-term IEMA/State response activities

Federal government support

Land Interdiction

Agricultural Products Disposal

Decontamination

Permanent Relocation of the affected population

Public Health Effects

Offsite Litigation

Public relations

Long-term environmental monitoring

Environmental mitigation activities

The infrastructure will be affected by:

Loss of electrical generating capacity

Temporary Loss of Utilities

Contamination of Public Water supplies

Loss of Agricultural land usage

Loss of Dairy land usage

Loss of Business land usage

Potential inability of law enforcement/fire/emergency medical services to communicate

Potential civil unrest

Health effects from exposure to radiation range from no effects to death, and include such diseases as bone, breast and lung cancer. The public and emergency workers' radiation dose from an exposure to radioactivity can be caused by "external" or "internal" pathways. External exposure is from radiation that originates outside the body. Internal exposure is from radioactive material that has been taken into the body. Radioactive material may be taken into the body through breathing, eating, drinking, open wounds, or may be absorbed through the skin. The summed dose from both external and internal exposures is called the Total Effective Dose Equivalent (TEDE).

The effects of exposure can be classified into three categories:

Somatic effects: Physical effects occurring after a large (acute) dose (e.g., 100 rem whole body in a few hours) or cancer that occurs years after small exposures (chronic dose).

Genetic effects: Abnormalities that may occur in the future children of exposed individuals

Teratogenic effects: Effects that are observed in children who have been exposed during the fetal and embryonic stages of development (generally observed in high acute exposures).

Acute Biological Effects of Radiation*	
Exposure	**Effects**
0 Rem to 20 Rem	No measurable effects
20 Rem to 50 Rem	Clinically detectable blood changes, cellular damage almost completely repaired
50 Rem to 100 Rem	Significant blood changes, loss of appetite, fatigue, no disability
100 Rem to 300 Rem	Illness occurs: nausea, vomiting, diarrhea, skin reddening, loss of hair, complete recovery in most cases, although a few fatalities
300 Rem to 400 Rem	Severe illness
450 Rem	About 50% fatalities in 30 days without medical treatment
600 Rem	All exposed individuals will die without medical treatment

* The effects shown above are based upon:

1. An acute exposure to the entire body.
2. An exposure to an entire population.
3. No medical treatment for the individuals exposed.

Approximate Cancer Risk to Average Individuals from 25 Rem Effective Dose Equivalent Delivered Promptly		
Age at exposure (years)	**Appropriate risk of premature death (deaths per 1,000 persons exposed)**	**Average years of life lost is premature death occurs (years)**
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

BEIR V (*Health Effects of Exposure to Low Levels of Ionizing Radiation* (1990)) estimates that the lifetime risk of cancer death from an acute exposure to 10 rad of gamma radiation is about 0.8% (80 in 10,000). This lifetime risk varies with the age at the time of exposure. If the same dose is accumulated over a longer period of time (weeks or months), the lifetime risk is reduced appreciably, possibly by a factor of 2 or more.

The following table summarizes the risk factors used to determine the additional risk associated with exposure to ionizing radiation. Using this risk the additional detriment can be calculated.

Risk Factors*		
Effect	**Risk To Worker**	**Risk to Public**
Fatal Cancer	4×10^{-4} per rem	5×10^{-4} per rem
Nonfatal Cancer Detriment	0.8×10^{-4} per rem	1.0×10^{-4} per rem
Severe Genetic Effects	0.8×10^{-4} per rem	1.3×10^{-4} per rem
Total Detriment	5.6×10^{-4} per rem	7.3×10^{-4} per rem

* From National Council on Radiation Protection and Measurement, NCRP 116.

For example, a worker receiving an average dose of 210 mrem/yr would have a risk of about 1 x 10^{-4} /yr (5.6 x 10^{-4} rem^{-1} x 0.210 rem/yr = 1.2 x 10^{-4} /yr) or about a 1 in 10,000 chance of excess detriment (damage) due to the radiation exposure. This is approximately the same as the risk of fatal accidents in all industries.

If there is a major event at a nuclear power plant that requires full activation of the state's response team, the response may need to be sustained for several days. Local fire and law enforcement professionals can request mutual aid assistance from their counterparts in the state (such as the Mutual Aid Box Alarm System (MABAS) for fire). If the incident lasts a long time, mutual aid could be used to bring in other response professionals to help cover shifts, or handle local calls while staff is responding to the incident. IEMA staff responding to the incident will also have to work in shifts to perform environmental sampling and determine the extent of the spread of radioactive material. During this time, the routine IEMA duties of these responders will have to be prioritized, deferred or possibly performed by staff between response shifts. Federal assistance through the National Response Plan is also available to supplement Agency efforts.

Responding to a release of radioactive material in the environment will be an administrative and political challenge for this Agency. Public confidence in the ability of the Agency to combat the event must be clearly established and maintained in light of conflicting information and rumors that will be available to the general public. The inherent public fear of radiation and its effects is perhaps the biggest hurdle the Agency faces in ensuring that the public health and safety is protected.

Dam Failure

Technological Hazards **DAM FAILURE**
IMPACTS ANALYSIS
(a) Health and safety of persons in the affected area at the time of the incident (injury and death)
The affected area for dam failure includes the dam and the area impacted by the release of the water in the reservoir. For the most part, there are few people on the dam and the health and safety impacts are negligible. The threat in the area below the dam can be significant. Dams are categorized according to the degree of threat to life and property in the breach wave inundation area. Class I dams are those for which failure has a high probability of causing loss of life or substantial economic loss, similar to that of US Army Corps of Engineers High Hazard Potential or USDA Natural Resources Conservation Service Class (c) dams. Class II dams are those for which failure has a moderate probability for causing loss of life or substantial economic loss, similar to USCOE Significant Hazard Potential or USDA/NRCS Class (b) dams. Class III dams are those for which failure has a low probability for causing loss of life or substantial economic loss, similar to the USCOE Low Hazard Potential or USDA/NRCS Class (a) dams. The health and safety concerns are similar to flooding, but the nature of the breach wave flood creates a higher level of damage to structures and a higher velocity of flow in open areas.

Technological Hazards

DAM FAILURE

IMPACTS ANALYSIS

(b) Health and safety of personnel responding to the incident

Responders will experience the same hazards as in other flood response situations. IEMA and other State Agency Personnel responding to the incident shall observe life safety/health standards and practices. Personnel responding will utilize intelligence gathered from Federal, State, local responders, and the public to properly address any situations that may pose a threat. The potential for responding personnel to be affected by the event will be event specific.

Responders shall be trained to the identified levels in accordance with established guidelines and regulations before commencing field operations.

The lead time for implementation of damage reduction measures is small and persons involved in these efforts may be at risk from rapidly rising water levels.

(c) Continuity of operations

The State of Illinois has developed plans to continue government operations in the event that designated building and/or building systems fail or become uninhabitable due to a hazard of any type, including a dam failure(s). In addition, the State of Illinois has mobile command vehicles capable of providing independent power, communication, and telephone lines in the event that facilities in the affected area(s) should lose power and other means of communication.

Technological Hazards **DAM FAILURE**
IMPACTS ANALYSIS
(d) Property, facilities, and infrastructure
Damages are similar to flooding with increased structural damages due to the higher velocities of flow.
(e) Delivery of services
Disruption of services is comparable to flooding.
(f) The environment
Damages to the environment are typically less than flooding. Duration of inundation due to dam failure is short.
(g) Economic and financial condition
Similar to flooding. Specific data regarding economic impact can be found through IEMA – Economic Impact Multi-Hazards Estimates binder.

(h) Regulatory and contractual obligations
An incident of dam failure would likely not affect/impact regulatory and contractual obligations on a wide scale.
(i) Reputation of the entity
Our statewide commitment to comprehensively address the dam failure hazard, ties in with our statewide commitment to comprehensively address the flood hazard, through planning, training and resource management in Illinois. These efforts put us in a good position to perform at a high level to handle floods and dam failures when they occur. However, as in any emergency response situation, if response and associated recovery, preparedness and mitigation activities are not perceived as having been adequate to protect lives and property in the State of Illinois, the reputation of the our State government would suffer.

VI. PLAN MAINTENANCE PROCESS

Monitoring, Evaluating and Updating the Plan

The Illinois Emergency Management Agency and the Illinois Mitigation Advisory Group - Illinois Technological Hazard Mitigation Planning Committee (ITHMPC) will meet and be responsible for reviewing and evaluating the Mitigation Plan. These committees have previously been identified in the planning process section. These combined committees will meet once a year in January, and all members will be asked to analyze the overall success and progress in implementing the Plan.

The combined committees will review each goal and objective to determine their appropriateness with respect to changing situations in the State as well as changes in policy and to ensure they are addressing current and expected conditions. The combined committees will also review the risk assessment and capabilities portion of the Plan to determine if this information needs to be updated or modified. Each strategy (goal and objective) and the associated actions will be reported on by the party responsible for its implementation, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding and which strategies or processes need to be revised or strengthened.

The committee will then create a list of recommendations that suggests ways to bring the Plan up to date, and any enhancements that can be made. The Illinois Emergency Management Agency, Bureau of Disaster Assistance and Preparedness will be responsible for making the necessary changes to the Plan, and the revised Plan must be submitted for approval to the Illinois Technological Hazard Mitigation Planning Committee no later than three months after the conclusion of the committee meeting.

B. Monitoring Progress of Mitigation Activities

The Illinois Emergency Management Agency, Disaster Assistance and Preparedness, is responsible for the monitoring and tracking of progress of mitigation actions. The Illinois Technological Hazards Mitigation Committee (ITHMP) of the Illinois Mitigation Advisory Group (IMAG) has been identified in the planning process section as the committee who will monitor the progress of mitigation actions and will meet on an as need basis, but not less than once annually, to monitor progress.

Goals, objectives and projects will be reviewed in the event of a technological hazards disaster to determine whether they need to be modified to reflect the new conditions and the findings appended to the existing Plan.

APPENDIX A. Technological Hazard Ratings - By County

TECHNOLOGICAL HAZARD RATINGS

KEY

- SEVERE = 49 - 60
- HIGH = 37 - 48
- ELEVATED = 25 - 36
- GUARDED = 13 - 24
- LOW = 0 - 12

TECHNOLOGICAL HAZARD RATINGS BY COUNTY

County Name	Population	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	CHEMICAL HAZARD	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	RADIOLOGICAL HAZARD	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	DAM FAILURE
Adams	68,277	6	6	6	1	2	21	6	6	6	1	2	21	6	12	6	1	2	27
Alexander	9,590	6	6	6	1	2	21	6	6	6	1	2	21	6	6	0	1	2	15
Bond	17,633	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Boone	41,786	6	6	6	1	3	22	6	6	6	1	3	22	6	6	6	1	3	22
Brown	6,950	6	6	6	1	3	22	6	6	6	1	3	22	6	6	6	1	3	22
Bureau	35,503	6	6	6	1	2	21	6	6	6	1	2	21	6	6	12	1	2	27
Calhoun	5,084	6	6	6	1	2	21	6	6	6	1	2	21	6	6	0	1	2	15
Carroll	16,674	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Cass	13,695	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Champaign	179,669	6	12	6	2	3	29	6	12	6	2	3	29	6	6	6	2	3	23
Christian	35,372	12	6	6	1	3	28	6	6	6	1	3	22	6	12	6	1	3	28
Clark	17,008	6	6	6	1	2	21	6	6	6	1	2	21	6	12	6	1	2	27
Clay	14,560	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Clinton	35,535	6	6	6	1	3	22	6	6	6	1	3	22	6	6	6	1	3	22
Coles	53,196	6	6	6	1	3	22	6	6	6	1	3	22	6	6	6	1	3	22
Cook (excl. Chicago)	2,480,725	18	18	6	3	2	47	6	6	6	3	2	23	6	18	18	3	2	47
Chicago	2,896,016	18	18	6	3	2	47	6	6	6	3	2	23	6	0	0	3	2	11
Crawford	20,452	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Cumberland	11,253	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
DeKalb	88,969	6	6	6	1	3	22	6	6	6	1	3	22	6	6	6	1	3	22
De Witt	16,798	6	6	6	1	2	21	6	12	6	1	2	27	6	6	6	1	2	21
Douglas	19,922	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
DuPage	904,161	18	18	6	3	2	47	6	6	6	3	2	23	6	12	6	3	2	29
Edgar	19,704	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Edwards	6,971	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Effingham	34,264	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Fayette	21,802	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Ford	14,241	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Franklin	39,018	6	6	6	1	2	21	6	6	6	1	2	21	6	18	18	1	2	45
Fulton	38,250	6	6	6	1	2	21	6	6	6	1	2	21	6	18	6	1	2	33
Gallatin	6,445	6	6	6	1	1	20	6	6	6	1	1	20	6	12	6	1	1	26
Greene	14,761	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Grundy	37,535	6	18	6	1	3	34	6	6	6	1	3	22	6	6	6	1	3	22
Hamilton	8,621	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Hancock	20,121	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21

KEY	
	SEVERE = 49 - 60
	HIGH = 37 - 48
	ELEVATED = 25 - 36
	GUARDED = 13 - 24
	LOW = 0 - 12

TECHNOLOGICAL HAZARD RATINGS BY COUNTY

County Name	Population	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	CHEMICAL HAZARD	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	RADIOLOGICAL HAZARD	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	DAM FAILURE
Hardin	4,800	6	6	6	1	3	22	6	6	6	1	3	22	6	6	6	1	3	22
Henderson	8,213	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Henry	51,020	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Iroquois	31,334	6	6	6	1	1	20	6	6	6	1	1	20	6	6	0	1	1	14
Jackson	59,612	6	6	6	1	2	21	6	6	6	1	2	21	6	12	12	1	2	33
Jasper	10,117	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Jefferson	40,045	6	6	6	1	1	20	6	6	6	1	1	20	6	18	18	1	1	44
Jersey	21,668	6	6	6	1	2	21	6	6	6	1	2	21	6	12	6	1	2	27
Jo Daviess	22,289	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21
Johnson	12,878	6	6	6	1	2	21	6	6	6	1	2	21	6	12	6	1	2	27
Kane	404,119	12	18	6	2	2	40	6	6	6	2	2	22	6	12	6	2	2	28
Kankakee	103,833	6	6	6	2	1	21	6	6	6	2	1	21	6	6	6	2	1	21
Kendall	54,544	6	6	6	1	2	21	6	12	6	1	2	27	6	6	0	1	2	15
Knox	55,836	6	6	6	1	1	20	6	6	6	1	1	20	6	12	6	1	1	26
Lake	644,356	18	18	6	3	2	47	6	12	6	3	2	29	6	12	12	3	2	35
La Salle	111,509	12	12	6	2	1	33	6	12	6	2	1	27	6	6	12	2	1	27
Lawrence	15,452	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Lee	36,062	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Livingston	39,678	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Logan	31,183	6	6	6	1	1	20	6	12	6	1	1	26	6	6	6	1	1	20
McDonough	32,913	6	6	6	1	2	21	6	6	6	1	2	21	6	18	6	1	2	33
McHenry	260,077	12	12	6	2	2	34	6	6	6	2	2	22	6	12	12	2	2	34
McLean	150,433	6	6	6	2	3	23	6	12	6	2	3	29	6	6	6	2	3	23
Macon	114,706	12	6	6	2	1	27	6	12	6	2	1	27	6	6	6	2	1	21
Macoupin	49,019	6	6	6	1	1	20	6	6	6	1	1	20	6	18	12	1	1	38
Madison	258,941	18	12	6	2	1	39	6	6	6	2	1	21	6	18	18	2	1	45
Marion	41,691	6	12	6	1	1	26	6	6	6	1	1	20	6	12	6	1	1	26
Marshall	13,180	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Mason	16,038	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Massac	15,161	6	6	6	1	2	21	6	6	6	1	2	21	6	6	0	1	2	15
Menard	12,486	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Mercer	16,957	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Monroe	27,619	6	6	6	1	2	21	6	6	6	1	2	21	6	12	12	1	2	33
Montgomery	30,652	6	6	6	1	1	20	6	6	6	1	1	20	6	12	12	1	1	32
Morgan	36,616	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20

KEY

- SEVERE = 49 - 60
- HIGH = 37 - 48
- ELEVATED = 25 - 36
- GUARDED = 13 - 24
- LOW = 0 - 12

TECHNOLOGICAL HAZARD RATINGS BY COUNTY

County Name	Population	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	CHEMICAL HAZARD	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	RADIOLOGICAL HAZARD	1) HISTORICAL/PROBABILITY	2) VULNERABILITY	3) SEVERITY OF IMPACT	4A) POPULATION	4B) POPULATION GROWTH	DAM FAILURE
Moultrie	14,287	6	6	6	1	1	20	6	6	6	1	1	20	6	6	0	1	1	14
Ogle	51,032	6	6	6	1	1	20	6	12	6	1	1	26	6	6	6	1	1	20
Peoria	183,433	6	12	6	2	1	27	6	6	6	2	1	21	6	18	12	2	1	39
Perry	23,094	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Piatt	16,365	6	6	6	1	1	20	6	12	6	1	1	26	6	6	0	1	1	14
Pike	17,384	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Pope	4,413	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Pulaski	7,348	6	6	6	1	1	20	6	6	6	1	1	20	6	6	0	1	1	14
Putnam	6,086	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Randolph	33,893	6	6	6	1	1	20	6	6	6	1	1	20	6	18	12	1	1	38
Richland	16,149	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Rock Island	149,374	6	6	6	2	1	21	6	12	6	2	1	27	6	6	6	2	1	21
St. Clair	256,082	12	12	6	2	1	33	6	6	6	2	1	21	6	18	18	2	1	45
Saline	26,733	6	6	6	1	1	20	6	6	6	1	1	20	6	12	12	1	1	32
Sangamon	188,951	12	12	6	2	1	33	6	6	6	2	1	21	6	6	6	2	1	21
Schuyler	7,189	6	6	6	1	1	20	6	6	6	1	1	20	6	12	6	1	1	26
Scott	5,537	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Shelby	22,893	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Stark	6,332	6	6	6	1	1	20	6	6	6	1	1	20	6	6	0	1	1	14
Stephenson	48,979	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Tazewell	128,485	6	6	6	2	1	21	6	6	6	2	1	21	6	18	18	2	1	45
Union	18,293	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Vermilion	83,919	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Wabash	12,937	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Warren	18,735	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Washington	15,148	6	6	6	1	1	20	6	6	6	1	1	20	6	6	6	1	1	20
Wayne	17,151	6	12	6	1	1	26	6	6	6	1	1	20	6	6	6	1	1	20
White	15,371	6	12	6	1	1	26	6	6	6	1	1	20	6	6	6	1	1	20
Whiteside	60,653	6	6	6	1	1	20	6	12	6	1	1	26	6	6	6	1	1	20
Will	502,266	18	18	6	3	3	48	6	6	6	3	3	24	6	12	12	3	3	36
Williamson	61,296	6	6	6	1	1	20	6	6	6	1	1	20	6	18	18	1	1	44
Winnebago	278,418	12	12	6	2	1	33	6	12	6	2	1	27	6	6	12	2	1	27
Woodford	35,469	6	6	6	1	2	21	6	6	6	1	2	21	6	6	6	1	2	21