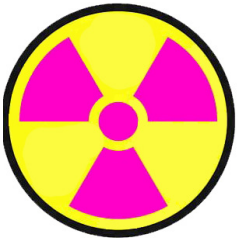
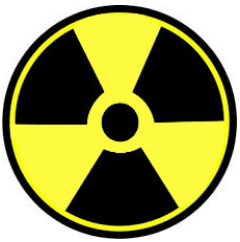


U.S. Radiation Symbol



International Radiation Symbol

Radiological Emergency Preparedness

For Farmers, Food Processors and Distributors

NEBRASKA

EMERGENCY MANAGEMENT AGENCY

Good Life. Great Strength.

June 2019

Please read and save this brochure for future reference

Radiological Emergency Information

for

Farmers, Food Processors and Distributors

Issued by the

Nebraska Emergency Management Agency

Farmers, food processors and food distributors located within 50 miles of a nuclear power facility would have special needs if there were an accident at the plant that caused a release of radiation. This booklet gives information about actions for the protection of your family, your animals and your crops in the event of such an accident.

In case of a radiological accident, you will receive instructions from local, state and federal authorities, via the Emergency Alert System (EAS).

Please read this book carefully, and fill in the emergency information on the next page.

Save this booklet for future reference.

Emergency Information for this Area

County Agricultural Extension Service

(See Pages 6 through 9 for information)

Agent: _____

Telephone: _____

County Emergency Management Director

(See Pages 7 and 10 for information)

Name: _____

Telephone: _____

Local Emergency Alert System (EAS)

This information can be obtained from your County Emergency Management Director.

EAS Radio Frequency: _____

EAS Television Channel: _____

Other

_____

_____

_____

_____

In any public emergency, important news and instructions for your safety will be given over the Emergency Alert System. Keep your radio tuned to the EAS station and follow the emergency recommendations.

Shadow Windmill by Merle Henkenius

Radiological Emergency Information

Table of Contents

Cooper Nuclear Station
Emergency Planning Zone (EPZ)

County Agricultural Extension Service Offices

Cass County
8400 144th St., Suite 100
Weeping Water, NE 68463-1932
402-267-2205
Cass-County@unl.edu

Douglas/Sarpy Counties
8015 W. Center Road
Omaha, NE 68124-3175
402-444-7804
Douglas-Sarpy@unl.edu

Gage County
1115 W. Scott
Beatrice, NE 68310-3514
402-223-1384
Gage-County@unl.edu

Johnson County
Third and Broadway Streets
(Courthouse) P.O. Box 779
Tecumseh, NE 68450-0779
402-335-3669
Johnson-County@unl.edu

Lancaster County
444 Cherrycreek Road, Suite A
Lincoln, NE 68528-1507
402-441-7180
Lancaster@unl.edu

Nemaha County
1824 N St., Suite 102
Auburn, NE 68305-2395
402-274-4755
Nemaha-County@unl.edu

Otoe County
620 First St., P.O. Box 160
Syracuse, NE 68446-0160
402-269-2301
Otoe-County@unl.edu

Pawnee County	625 Sixth St., P.O. Box 391 Pawnee City, NE 68420-0391 402-852-2970 Pawnee-County@unl.edu
Richardson County	1700 Stone St. (Courthouse) Falls City, NE 68355-2033 402-245-4324 Richardson-County@unl.edu

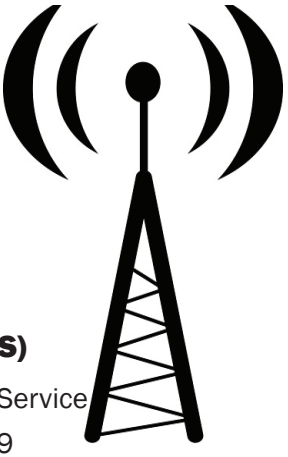
County Sheriffs' Departments

Cass	402-296-9370
Gage	402-223-5221
Johnson	402-335-3307
Lancaster	402-441-6500
Nemaha	402-274-3139
Otoe	402-873-9560
Pawnee	402-852-2969
Richardson	402-245-2479
Sarpy	402-593-2288

County Emergency Management Agencies

Cass	402-267-6765
Gage	402-223-1305
Johnson	402-335-3411
Lancaster	402-441-7441
Nemaha	402-274-2552
Otoe	402-873-9588
Pawnee	402-335-3411
Richardson	402-245-3054
Sarpy	402-593-5785

Commercial Nuclear Licensee
Cooper Nuclear Power Station
Nebraska Public Power District
P.O. Box 98, 72676,
648 Avenue
Brownville, NE 68321-0098
402-825-3811



Local Emergency Alert System (EAS)

EAS Radio Frequency: National Weather Service
and KGOR-FM 99.9

State Agencies

University of Nebraska Extension Service

211 Agricultural Hall
University of Nebraska-Lincoln
Lincoln, NE 68583-0703
402-472-2966/3972
ltempel1@unl.edu

Nebraska Department of Agriculture

301 Centennial Mall South, Fourth Floor
P.O. Box 94947
Lincoln, NE 68509-4947
402-471-2341

Nebraska Emergency Management Agency

2433 N.W. 24th St.
Lincoln, NE 68524-1801
402-471-7421
Toll Free: 877-297-2368

NEBRASKA
EMERGENCY MANAGEMENT AGENCY

Good Life. Great Strength.

Introduction

This brochure provides emergency information for the agricultural community within approximately a 50-mile radius of a commercial nuclear power station. It contains information concerning how you will be notified and what procedures you should follow in the event of a radiological emergency at the power station.

If the emergency results in a release of radioactive material to the environment, you may be advised to take actions to protect your family, farm animals and agricultural products. This information, along with specific instructions you will receive over the Emergency Alert System (EAS), NOAA Weather Radio or through other official news releases, will help you to prevent or minimize the effects of a radiological emergency on food and agriculture.

The instructions in this brochure may also be used in response to other kinds of radiological emergencies. General information on radiation and post-emergency activities are also provided in this booklet.

Please read this brochure thoroughly to be prepared should an emergency occur.

What is Nuclear Energy?

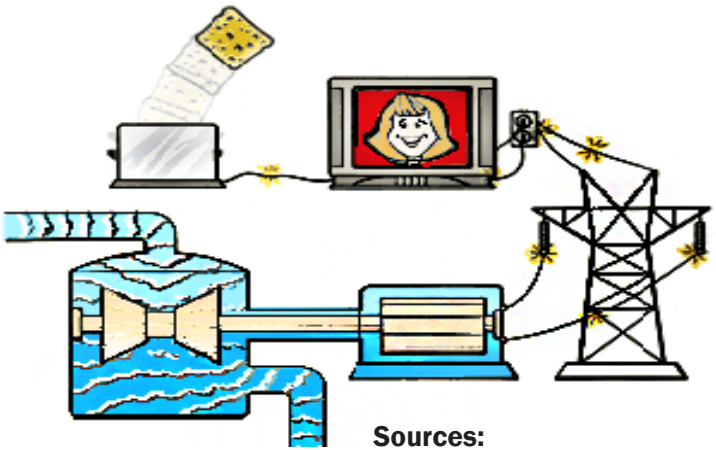
Nuclear power plants use the heat generated from nuclear fission in a contained environment to convert water to steam, which powers generators to produce electricity.

The heat from fission boils water and creates steam to turn a turbine. As the turbine spins, the generator turns and its magnetic field produces electricity. The electricity can then be carried to your home, so you can work on the computer, watch television, play video games, or make toast.

Nuclear power plants operate in most states in the country and produce about 20 percent of the nation's power. Nearly 3 million Americans live within 10 miles of an operating nuclear power plant.

Although the construction and operation of these facilities are closely monitored and regulated accidents are possible. An accident could result in dangerous levels of radiation that could affect the health and safety of the public living near the nuclear power plant.

Local and state governments, federal agencies, and the electric utilities have emergency response plans in the event of a nuclear power plant incident. The potential danger from an accident at a nuclear power plant is exposure to radiation. Radioactive materials are composed of atoms that are unstable.



Sources:
www.ready.gov, www.nrc.gov.

EAS
Emergency Alert System

Sources of Emergency Information

In the event of an emergency at the nuclear power station near you, specific protective action recommendations will be issued by appropriate state or local government officials. Information to prevent or minimize radiation contamination of food products will be provided to you through at least one of the following sources:

The Emergency Alert System (EAS) will provide you with emergency information over designated radio and television stations. These stations will also provide additional emergency-related information.

- Your local extension or farm services office may provide you with information on the protection of agricultural products through local radio or television alerts, newspaper articles or by telephone.

- Broadcasts over weather band radios will provide you with up-to-date weather information. The broadcasts may also provide you with emergency instructions on protective measures.

- Additional emergency agricultural information may be available to you through federal, state or local government emergency organizations.

Emergency Planning Zones (EPZ) and Protective Actions

Two types of emergency planning zones (EPZ) may be referred to in an emergency:

The Plume Exposure Pathway EPZ

This is the area generally within a 10-mile radius around a commercial nuclear power generating facility, where emergency planning is required for members of the general public, and in place to deal with the potential of direct exposure to radiation.

To view the **Cooper Plume Exposure Pathway EPZ** map see **page 28**.

The Ingestion Exposure Pathway EPZ

This is the area within a 50-mile radius around a commercial nuclear power generating facility, where emergency planning is required, and in place to deal with the potential of indirect exposure to radiation due to eating contaminated food or drinking contaminated water, milk or other liquids.

The safety of the food supply within the 50-mile ingestion exposure pathway EPZ could be a concern to members of the agricultural community if a radiological release to the atmosphere occurred. During such a release, both water and land could become contaminated. Eating contaminated foods, and drinking contaminated milk and water, could have a harmful, long-term effect on your health.

To view the **Cooper Ingestion Exposure Pathway EPZ** map see **page 30**.

Protective Action Decision Notifications

Federal, state and local government emergency response organizations will notify and advise the agricultural community on what actions to take in the event of a radiological emergency. The decision to recommend protective actions will be based on:

- Emergency conditions at the power station
- Available information on the amount of radioactive material that may be or has been released to the environment
- Meteorological considerations, and
- Consideration of the health, economic and the social impact of the proposed actions.

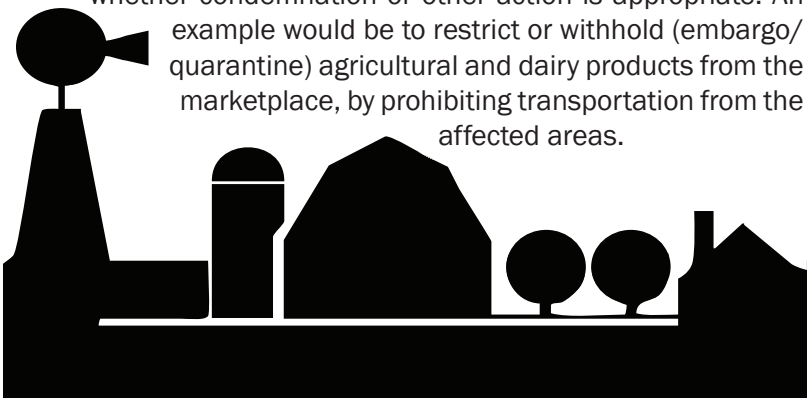
There are two types of protective actions that will help to prevent or lessen the possibility of persons eating or drinking contaminated food or water: These are **Preventive Protective Actions** and **Emergency Protective Actions**.

Preventive Protective Actions

Preventive protective actions are those which prevent or minimize contamination of milk and food products. Examples are:

- Placing dairy animals on stored feed and protected water
- Washing, scrubbing, peeling or shelling fruits and vegetables to remove surface contamination

Other preventive protective actions are those which isolate or contain food, prevent its introduction into commerce and determine whether condemnation or other action is appropriate. An example would be to restrict or withhold (embargo/quarantine) agricultural and dairy products from the marketplace, by prohibiting transportation from the affected areas.



Emergency Protective Actions

The following are examples of protective actions that may be recommended if a release of radioactive materials occurs, and contamination of agricultural products is verified by appropriate state or local government officials.

- When outside, wear clothing that covers all portions of the body, similar to what you would wear when applying pesticides; for example: coveralls or long-sleeved shirt, long pants, boots and gloves.
- Wear a respirator, protective mask or place a folded (preferably dampened) cloth over your mouth and nose when working outside to prevent inhalation of radioactive materials.
- Remove outer clothing before going indoors.
- Wash hands thoroughly before preparing or eating food.
- Remove diary animals from pastures, shelter them if possible and provide them with protected feed and water.
- Delay the slaughter of any animals until advised it is safe to do so by appropriate health officials.
- Protect feed and water.

- Do not use fresh milk from dairy animals, fresh garden vegetables or eggs from within the Plume Exposure Pathway Emergency Planning Zone surrounding the nuclear facility, until appropriate health officials indicate these are safe.
- If you must eat fresh fruit and vegetables, wash, scrub, peel or shell them before eating.
- Cover outside feed supplies with a tarpaulin or other appropriate material.
- Do not engage in dust-producing activities such as cultivating, disking, baling or harvesting.
- Do not process or distribute agricultural products until they have been sampled by appropriate government officials and found to be free of contamination.
- Do not transport or market food products from the Plume or Ingestion Exposure Pathway Emergency Planning Zone until advised it is safe to do so by appropriate health officials. Follow the advice of health officials heard in emergency alert messages regarding the area within the Ingestion Exposure Pathway.
- Restrict fishing to catch and release. Fish and game should not be taken for food until further notice.

Protective Actions for the Food Supply

- **Specific instructions will depend on the distance of a farm or facility from the commercial nuclear power station and the existing weather conditions.**
- **State and local officials will assist you with appropriate protective actions and specific methods to deal with contamination problems.**

The following are examples of preventive and emergency protective actions and related information that may be recommended to the agricultural community by appropriate state or local government officials. Location-specific protective action recommendations will be issued by these officials in the event of an actual emergency.

Milk

Remove all dairy animals from pastures, shelter if possible, and provide them with protected feed and water. State or local government officials may come to your farm to take milk, feed and water samples for laboratory analysis to determine whether any of these products are contaminated.

If dairy products are found to be contaminated, it may be recommended that milk and milk products be withheld from the market. It is possible, however, for milk products contaminated with certain radioactive materials to be safe for human consumption after proper storage over a period of time. This will allow for the radioactive materials to decay away. Radioactive decay may be achieved by freezing and storing fresh milk, concentrated milk or concentrated milk products. Storage of milk for prolonged periods of time at reduced temperature is also possible, provided ultrahigh temperature pasteurization techniques are used during processing. Using fluid milk for the production of butter, cheese, dry milk or evaporated milk may also be possible.

Fruits and Vegetables

Wash, scrub, peel or shell locally grown fruits and vegetables, including roots and tubers, to remove surface contamination.

If fruits or vegetables are contaminated by short-lived (rapidly decaying) radionuclides, they can be preserved by canning, freezing or dehydration, and stored to allow time for decay of the radioactivity.

Meat and Meat Products

If there is a release of radioactive material to the environment, you will be advised to place meat animals on protected feed and water and, if possible, provide them with shelter. If livestock consume feed and water contaminated with radioactive materials, some of the contamination will be absorbed into their bodies and could then enter the human food supply through meat and meat products.

Poultry and Poultry Products

Poultry raised outdoors, especially those kept for egg production, should be monitored by federal, state or local officials taking samples and performing laboratory tests to determine the presence of radioactive contamination. Poultry raised indoors and given protected feed and water are not likely to be contaminated. If contamination is verified, state or local government officials may advise that poultry and eggs should not be eaten.

Fish and Aquatic Life

Fish and other aquatics raised in ponds should not be harvested unless appropriate state or local government officials have determined, through laboratory analysis of samples, that they are safe. Samples of water, fish and aquatic life from other bodies of water should be analyzed to ensure that they are safe.

Soils

If state or local government officials find that the soil is contaminated, proper soil management procedures can be implemented to reduce contamination to safe levels. “Idling” (the non use of the land for a specific period of time) may be necessary in some cases. However, in situations involving small spots of highly contaminated soil, removal and disposal of the soil may be more appropriate.

Planting alternative crops may be recommended in some situations. Crops such as cotton and flax could be substituted for food crops because they contribute little or no radioactive material to the human diet.

Deep plowing of the soil will remove radioactive substances below the plant root level, prevent plants from taking up contaminated nutrients and allow the level of radioactivity to decrease with the passage of time.

State or local government officials will let you know what actions are appropriate.

Grains

If grains are permitted to grow to maturity, most contamination will probably be removed by the wind and rain. Sampling and laboratory analysis will determine if the grain is safe to use. When harvested, contaminated and uncontaminated grains should be stored separately to prevent cross contamination.

Water

Open sources of water should be protected. Cover open rain barrels and tanks to prevent contamination. Covered wells and other covered or underground sources of water will probably not become contaminated. It is unlikely that underground water supplies will be affected. Radiation contaminants deposited on the ground will travel very slowly unless soils are sandy.

Filler pipes should be disconnected from storage containers that are supplied by runoff from roofs or other surface drain fields. This will prevent contaminants from entering the storage containers. Close water intake valves from any contaminated water sources to prevent distribution (e.g., irrigation) of contaminated water.

Honey

Honey and beehives will need to be sampled and analyzed by appropriate state or local government officials if radioactive contamination is detected in the area. You will be instructed by these officials on how to handle the hives and honey.

Food Processors and Distributors

Radioactive contamination of milk or food products in an affected area can occur **during processing or during transportation**. This can result from exposure to radioactive materials on the ground or in the air and from contact with contaminated products.

Following a radiological emergency, government officials may restrict the movement of food products, and withhold them from the marketplace, if they are found to be contaminated. These products should not be released until they are safe for consumption or until a decision is made to dispose of them. You will be instructed how to safely handle and dispose of contaminated food products.

Post Emergency Actions

After evacuation has occurred, and radioactive contamination has been verified, the following post-emergency actions—relocation, reentry, return and recovery—may be initiated based on air and ground monitoring surveys.

Relocation

Relocation refers to a post-emergency protective action that is taken to avoid chronic exposure from deposited contamination found in a given area. Relocation is a mandatory movement of people from their homes and farms to a location that does not present a danger from contamination. Unlike an evacation area where people are instructed to immediately leave a given area, relocation is allowed to take place over a period of time, normally two-to-three days. This allows people time to pack up personal property that was sheltered during the emergency, and move out of the area. Federal, state and local officials will be present to assist with the relocation efforts.

Reentry

Reentry is only necessary if an area has previously been evacuated. Reentry is the temporary entry, under controlled conditions, into a restricted, contaminated area or areas. In all probability, reentry would only occur within the 10-mile radius of the commercial nuclear power station. If you have been evacuated from your area, you may be allowed to return temporarily to your home, farm or property, when conditions permit.

State and local government officials will determine when it is safe for temporary entry and under what circumstances a return to the restricted area will be allowed. Public announcements will be made regarding when and where access to the restricted area will be authorized. Local government officials will have a list of allowable reasons for returning to the area.

Upon acceptable application, you willl be provided allowable stay time limits withing the restricted area and the number of allowable reentires you may make over a given period of time.

Return

Return referes to reoccupation of areas that have been sampled and analyzed and found to be be clear of contamination for unrestricted residence, or use by previously evacuated or relocated populations. People will only be allowed to return once areas have been monitored and determined not to have been significantly contaminated.

Recovery

Recovery is the process of reducing radiation in the environment to acceptable levels for normal daily living. Following the emergency, federal, state and local government officials will identify the types and levels of contamination. They may need to take samples of air, water, soil, crops and animal prooducts from your farm or business. They will provide you with instructions to assist you in decontaminationg your animals, food and property if such actions are necessary. Contaminated food will be isolated to prevent its introduction to the market places. Federal, state and local government officials will determine whether condemnation and disposal are appropriate. Services such as medical, utilities, roads, schools, business and housing will be identified, and procedures for restoration will be initiated prior to allowing people to return.

General Information on Radiation

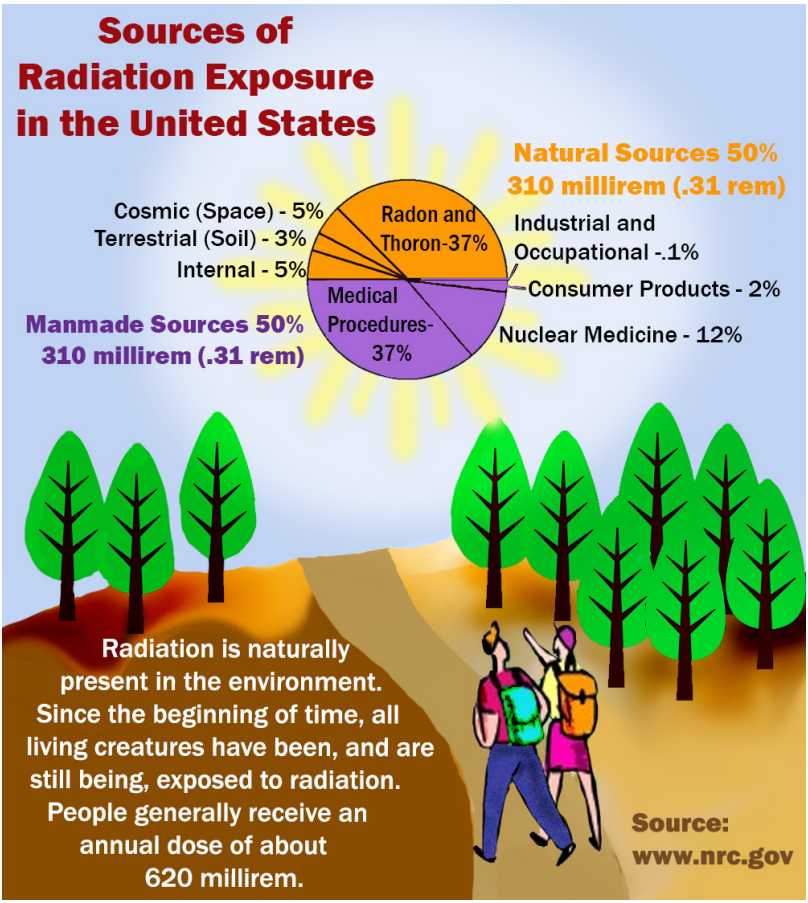
Radiation, and some radioactive materials, is a natural part of our environment. It is in the air we breathe, the food we eat, the soil, our homes and even in our bodies. The level of radiation naturally existing in our environment is called **background radiation.** It may vary greatly from one location to another, depending on related factors such as solar radiation, geographic elevation, soil composition and the presence of radon gases from the soil and building materials. We are also exposed to sources of man-made radiation, such as X-ray machines and televisions.

The health effects to people from radiation exposure is measured in units of millirems. People are constantly exposed to radiation. In the United States the average background radiation exposure received by each person is about 310 millirems per year. An approximate 310 millirems is received from consumer products and occupational and other environmental sources. The total average exposure per person per year, is about 620 millirems from all sources.

Commercial nuclear power stations may release small, non-harmful amounts of radioactive materials to the environment during routine operations, and under controlled conditions. Persons living adjacent to a commercial nuclear power station receive less than one additional millirem per year.

The effects of radiation on people depend on the amount and length of time of exposure, how much of the body is exposed, how much radioactive material stays in the body and the general health and age of the person. The effects of radiation can be decreased by reducing the time a person is exposed and increasing the distance from the source of radiation.

Over time, all radioactive material will become less radioactive through a process called **decay**. Some radioactive materials will decay to acceptable levels in a matter of hours or days. Others might require months or, in extreme cases, years. The amount of time necessary for radioactive materials to decay to acceptable levels depends upon the materials involved and can only be determined by laboratory analysis of samples.



Summary: Effects of Radioactive Deposits on Human Food and Water Supplies

Depending on the amount of radioactive materials released into the atmosphere, the duration of the release and the prevailing weather conditions, people, animals, crops, land and water near the site of the nuclear power plant could be affected.

Of initial concern would be the condition of fresh milk from diary animals grazing on pastures and drinking from open sources of water. Sampling for contamination could be performed at the farm, the transfer station or the processing plant. If contamination of fresh milk and processed milk products is verified, state or local government officials will determine whether to dispose of these products or to hold them until safe for consumption.

Another concern would be the contamination of vegetables, grains, fruits and nuts. The severity of the impact of the contamination would depend on the time of the year the emergency occurred. The time immediately prior to or during harvest is the most critical period. Crops will be sampled and analyzed by the appropriate government officials to ensure that they are safe to eat.

An additional concern would be the impact of contamination on livestock and poultry. Pasture, feed and water sources, as well as meat and poultry products will be sampled and analyzed to ensure that the meat and poultry products are safe to eat.

Contamination of drinking water supplies is not considered to present a significant problem. If it occurs, it will probably affect only surface water supplies and not ground wells or underground water sources. The safety of water would be determined by sampling public and private sources. If land becomes contaminated, proper soil management techniques can be implemented to reduce contamination of crops grown on the land. The procedures recommended would depend on the severity of contamination and the specific crops to be grown.

Remember, while a serious radiological emergency is unlikely, it is important to be prepared for such an event.

The point of contact with reference to information contained within this publication is:

Nebraska Emergency Management Agency
2433 N.W. 24th St.
Lincoln, NE 68524
Telephone:
402-471-7420
Attn:
Technical Hazards Section Manager

Additional information about radiological emergency preparedness (REP) is available on the Nebraska Emergency Management Agency website at: **www.nema.nebraska.gov**

Summary of Recommendations

If a radiological emergency occurs in your immediate area, you will be alerted by the sounding of a siren, an emergency vehicle equipped with a loudspeaker or other appropriate means. You should take the following actions:

- Turn on your radio or television and tune to a station or channel that carries Emergency Alert System (EAS) information.
- Follow the recommendations of the state or local emergency response officials.

You may be advised to take protective actions such as:

- Protect feed and water — cover outside feed and open water source supplies with a tarpaulin or other appropriate material.
- Remove dairy animals from pastures by sheltering them, if possible,and providing them with protected feed and water.
- Protect other livestock and poultry by sheltering them, if possible, and providing them with protected feed and water.

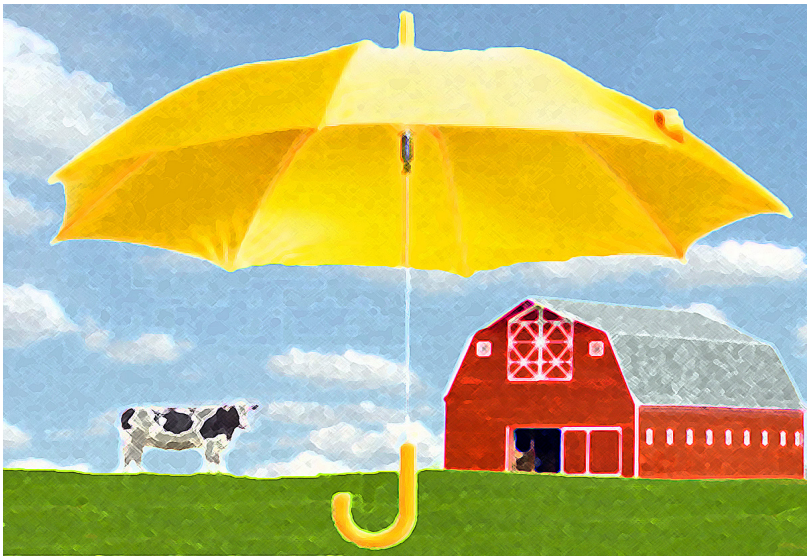
If you live within the Plume Exposure Pathway EPZ of the nuclear power plant, you may be advised to take shelter (go inside) or evacuate. This would help protect you and your family from potentially harmful levels of radiation.

Insurance

An accident at one of the nation's commercial nuclear power stations could result in human health and environmental damages. To ensure that funds would be available to settle liability claims in such cases, the Price-Anderson Act requires licensees for these nuclear power stations to have primary insurance—currently $300 million per site. The act also requires secondary coverage in the form of retrospective premiums to be contributed by all licensees to cover claims that exceed the primary insurance.

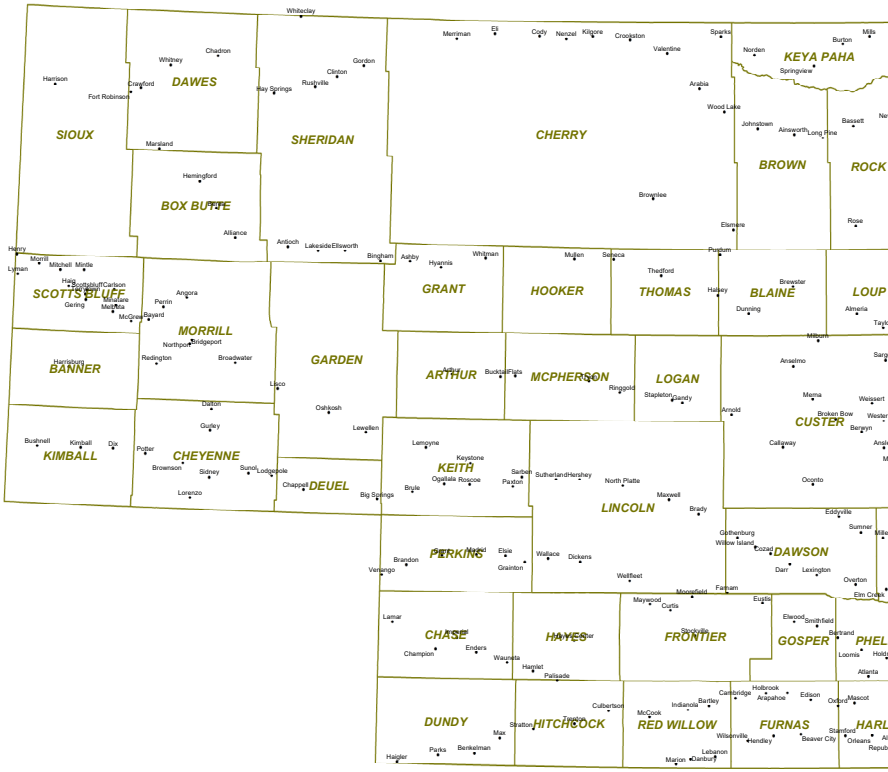
American Nuclear Insurers is the joint underwriting association whose purpose is to pool the financial assets of some of the largest stock insurance companies in the United States to provide the significant amount of property and liability insurance required by nuclear power stations.

Should there be a radiological emergency at one of the nuclear power stations, ANI will process damage and liability claims from off-site claimants.



This brochure is available by calling (402) 471-7421 or online at http://www.nema.ne.gov/pdf/rep-ingest.pdf

Curious Cow by Merle Henkenius



NEBRASKA
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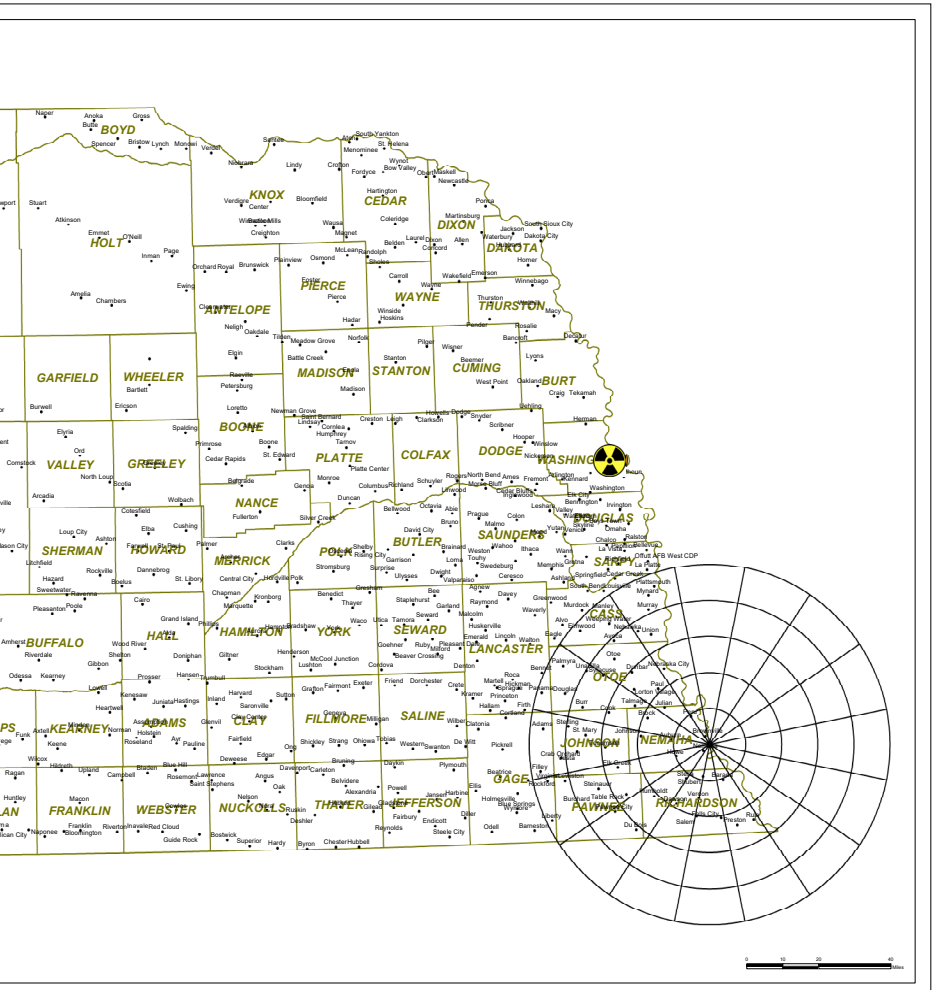
Radiological Emergency Information



Nuclear Plant
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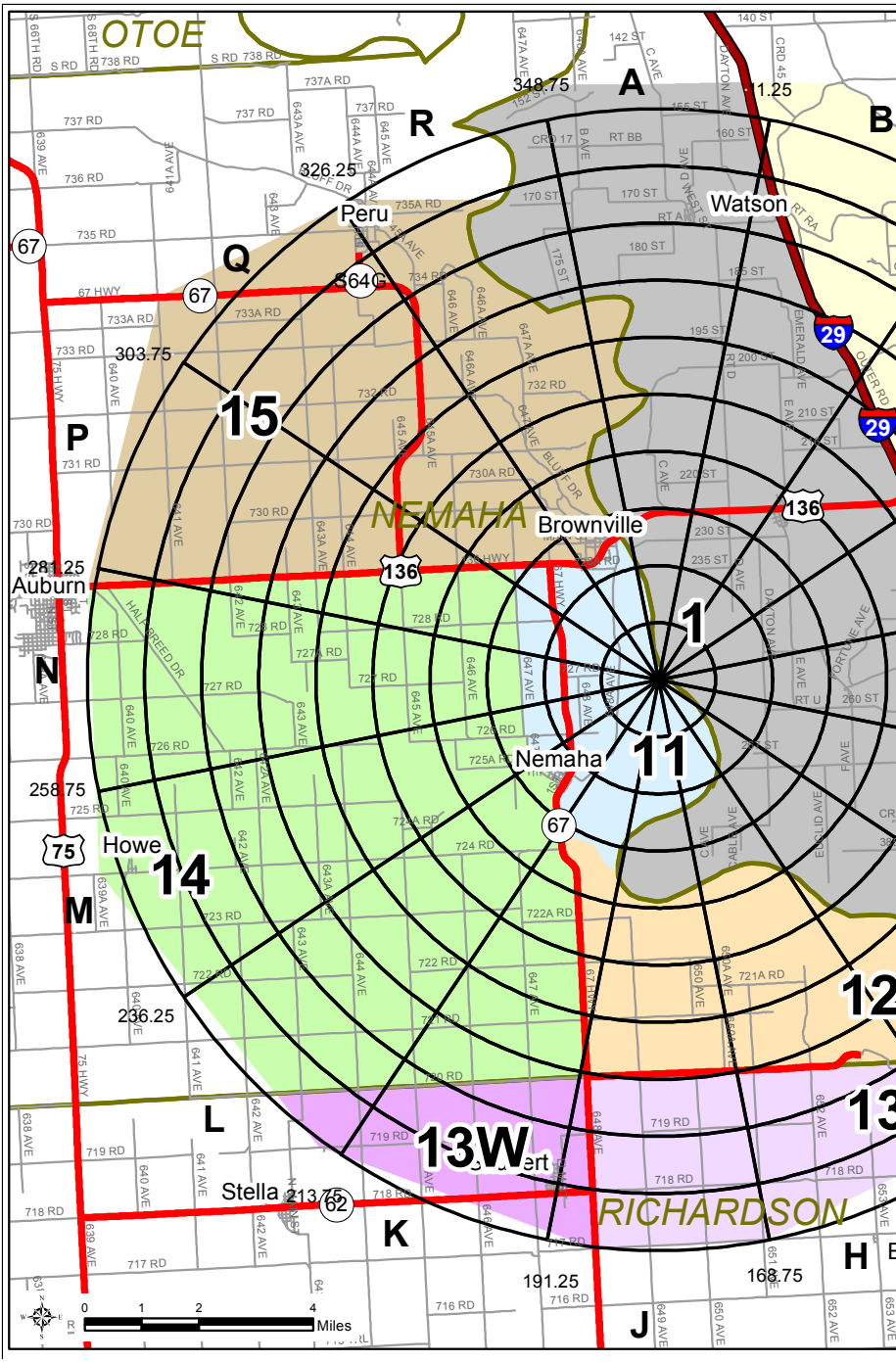
N

- City
- 50-Mile EPZ
- County
- Decommissioned Site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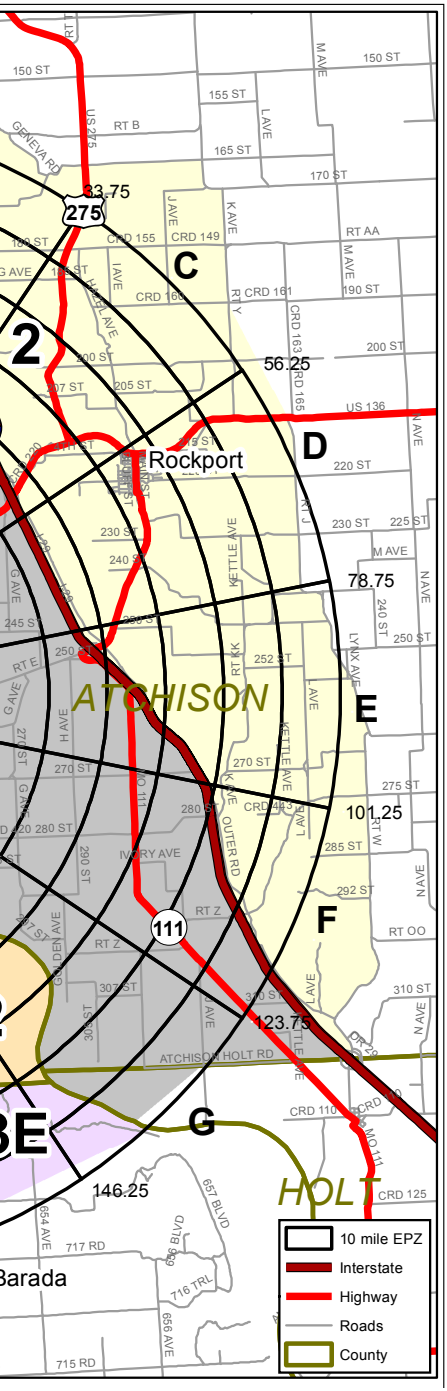
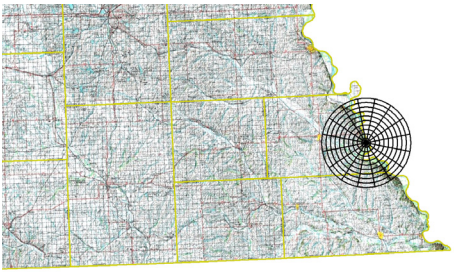
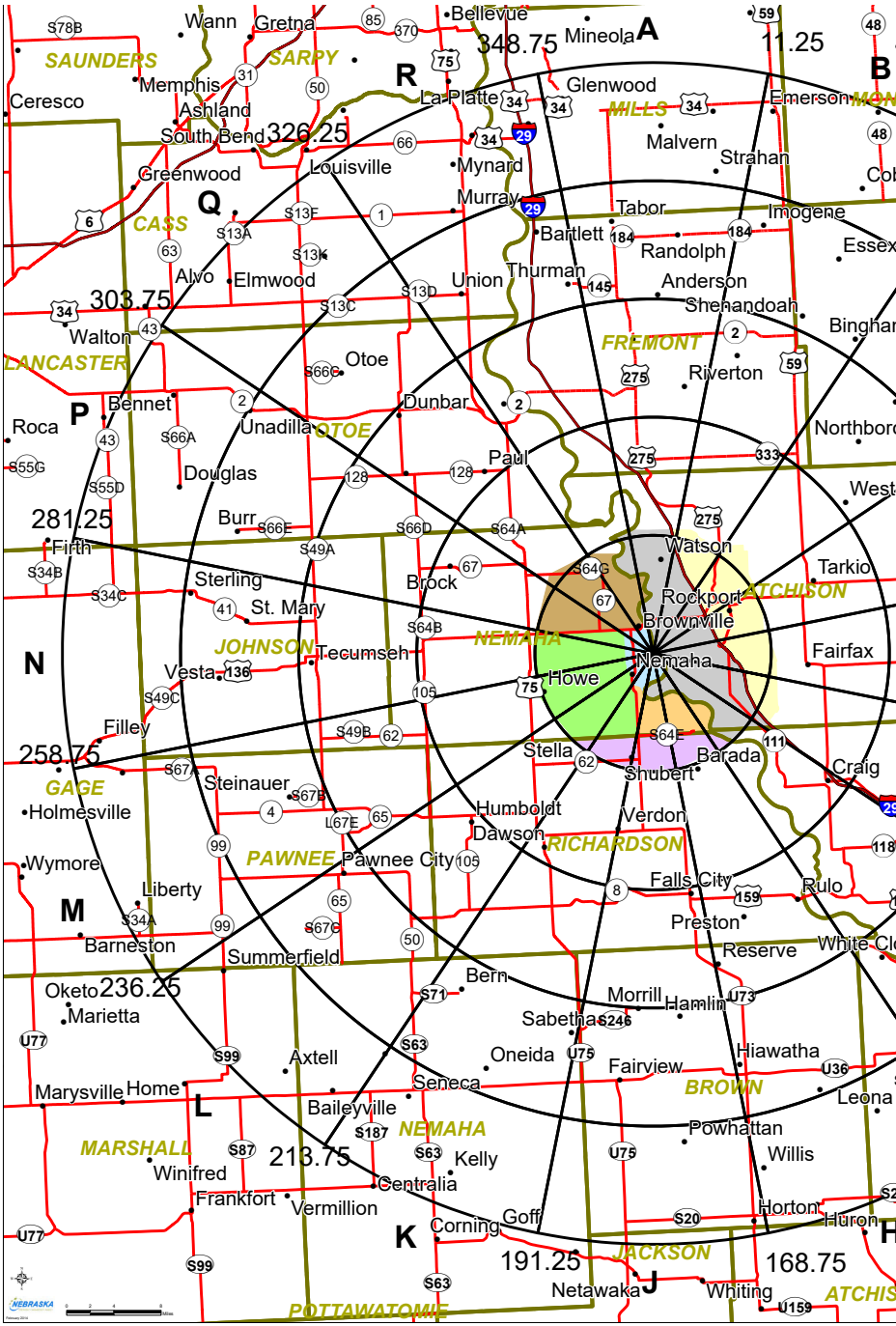
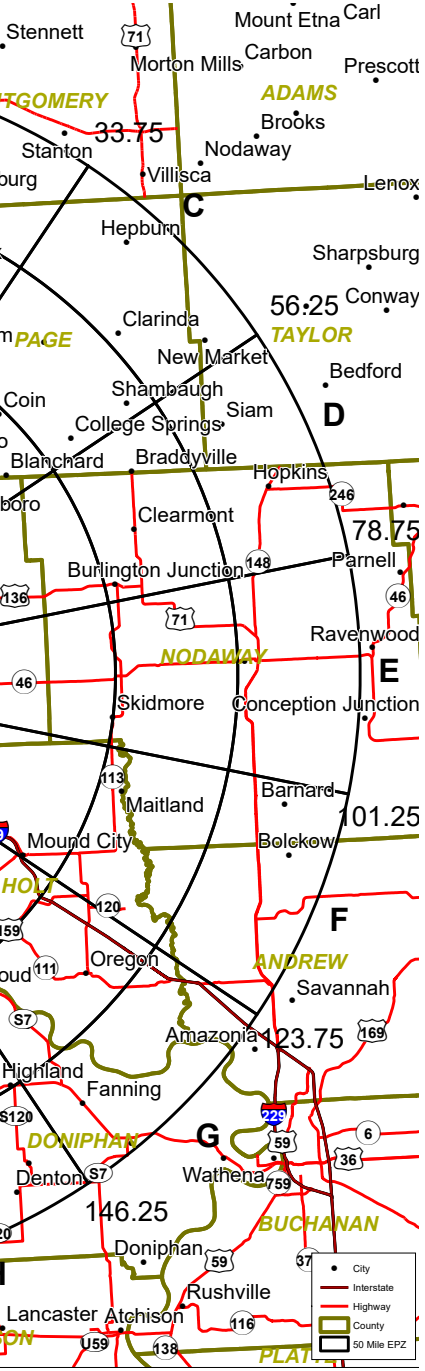
Cooper Nuclear 10-Mile Emergency Protective Zone (EPZ)





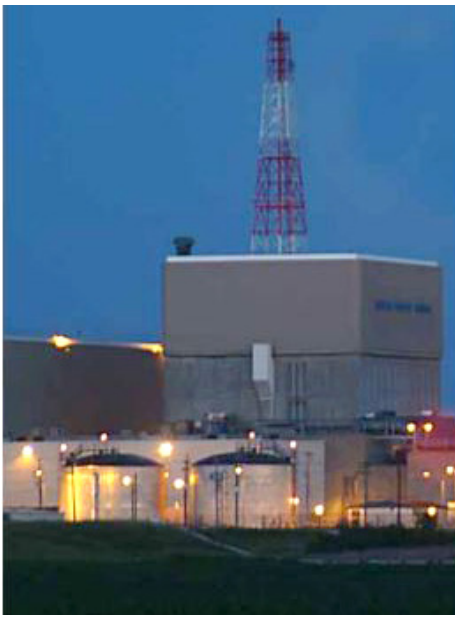


Radiological Emergency Information



Cooper Nuclear 50-Mile Emergency Protective Zone (EPZ)

Cooper Nuclear Station is located in southeast Nebraska on the west bank of the Missouri River near the towns of Nemaha and Brownville. With a generating capacity of 810 megawatts. Cooper is the largest single unit generating facility in the state. Commercial operation of the station began, July 1, 1974 .



The point of contact with reference to information contained within this publication is:

Nebraska Emergency Management Agency
2433 N.W. 24th St.
Lincoln, NE 68524-1801

NEBRASKA

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