Washington Military Department
Emergency Management Division

Radiological Emergency Information for Farmers, Food Processors and Distributors

Affected Counties

Six counties in Washington State are involved with preparing for a possible emergency at either WNP-2 or the Hanford Nuclear Reservation. The state of Washington represents the interests of two other counties — Kittitas and Klickitat — in the preparation process because they have very small areas and populations that would be affected by an emergency at Energy Northwest's WNP-2 reactor or the Hanford Nuclear Reservation. For more information about emergency preparedness activities in your community, or additional copies of this booklet, contact the emergency management or emergency services office in your county. The booklet also can be found at the Washington Emergency Management Website at <www.wa.gov/wsem/>.

Adams County Emergency Management
(509) 488-3704

Benton County Emergency Management
(509) 628-2600

Franklin County Emergency Management
(509) 545-3546

Grant County Emergency Management
(509) 762-1462

Kittitas County Emergency Services
(509) 962-7525

Klickitat County Emergency Services
(509) 773-4036

Walla Walla County Emergency Services
(509) 527-3223

Yakima County Emergency Management
(509) 574-1900

Washington Military Department
Emergency Management Division

Major General Timothy J. Lowenberg, *The Adjutant General*
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This booklet also can be found at the Washington Emergency Management Website at <www.wa.gov/wsem/>

Average Annual Background Radiation in Washington State

Source	*Millirem/Year*
Natural radioactivity (cosmic and terrestrial)	55
From inside human body	40
Radon (air contamination from terrestrial sources)	200
Medical uses and nuclear medicine	53
Consumer products	10
Other sources (fallout, occupational exposure, nuclear energy)	<4
Total Millerem/Year	**360**

How exposure to radiation will affect a person's health depends on:

- The amount and time of exposure.
- How much of the body or particular organ is exposed.
- How much radioactive material stays in the body.
- The general health and age of the exposed person.

The effects of radiation can be reduced by reducing exposure time, by increasing the distance from the source of radiation, or by placing shielding material between the source of radiation and the individual.

General Information on Radiation

Radiation is a natural part of our environment. Radiation is in the air we breathe, the food we eat, the soil, our homes, sunshine, and even our bodies. The radiation naturally occurring or existing in our environment is called background radiation. The amount of background radiation varies from one location to another.

People are also exposed to radiation through medical and dental x-rays, and appliances such as color television sets. Commercial nuclear power stations and other facilities such as hospitals and universities are permitted to release controlled non-harmful amounts of radioactivity to the environment during routine operations.

Health Effects of Radiation Exposure
The health effects of radiation exposure to people are measured in units called millirems. In the United States, each person is exposed to about 200 to 400 millirems of background radiation per year. In Washington State, the average annual exposure is about 360 millirem.

It is difficult to observe any immediate effects to human health for exposures below 25,000 millirem. In comparison, Washington State initiates protective actions based on the trigger levels recommended by the Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA):

Evacuate or shelter in place (from passage of radioactive plume)	1000 millirem
Relocate residents over the next 12 months	2000 millirem
Interdict contaminated food whole body or 5000 millirem to any organ	500 millirem

Introduction

This booklet contains information to help food producers and home gardeners take effective action during and after a radiological emergency. This booklet is intended to address only those areas where contamination levels are such that the only health risk they pose is from the ingestion of significant quantities of contaminated food and water, not from direct exposure. Contaminated areas where there is a risk of direct exposure will have their access restricted.

A radiological emergency at the WNP-2 commercial power plant or the U.S. Department of Energy facilities on the Hanford Site near Richland could effect Washington State residents in the surrounding counties. While it is unlikely that an emergency will occur, it is important to be prepared because of the potential impact to public health and safety, and the agricultural community.

In an emergency, radioactive materials may be released to the environment. You may be advised of actions that you can take to provide additional protection for your family and workers, your animals, and farm products. State and local emergency response agencies will provide specific information on actions that you should take at the time of the emergency. This booklet contains information to help you plan for the recommended actions.

The information in this booklet may also be useful in helping you deal with other kinds of emergencies. During any emergency, your first concern should be the safety of your family, your employees, and yourself.

Please read this booklet thoroughly.

Why Protective Measures May Be Needed

A release of radioactive materials into the environment can pose a threat to the agricultural community and to the safety of the food supply. The deposition of radioactive materials could contaminate crops, livestock, uncovered water supplies, and land, above established safety levels. When this level is exceeded, the food is considered to be "adulterated." Eating adulterated foods and drinking adulterated milk or water could have a harmful, long-term effect on your health.

Emergency Response Agencies

State and local emergency response agencies are prepared to notify the agricultural community quickly during a radiological emergency by distributing emergency information through contact points such as granges and food processing plants. The government agencies will recommend actions to reduce contamination and public consumption of adulterated food, milk and water. Decisions or recommended actions will be based on a variety of factors. These factors include:

- The possible health effects.
- Emergency conditions at the nuclear facility.
- The amount and type of radioactive material.
- Weather conditions.

Reimbursement for Damages, Losses and Expenses

A radiological emergency may lead to additional living expenses, loss of farm or business income, or physical or property damages.

Claims for Damage or Loss
Utilities operating nuclear power facilities are required to have insurance to cover damages suffered by the public. Claims centers will be opened by American Nuclear Insurers within 48 hours of an emergency at the WNP-2 power plant. The claims centers may provide reimbursement for reasonable additional claims, including living expenses, to persons affected by an ordered evacuation. Staff at the claims centers also will handle claims for personal injury, property damage and loss of income.

Claims for damage or loss resulting from an emergency occurring at a facility operated by the U.S. Department of Energy (DOE) or its contractors could be filed at a claims center which would be established at the Federal Building in Richland, Washington. USDOE would promptly provide information to the public on when and how to file a claim.

Temporary Housing
The Federal Emergency Management Agency may provide funds for temporary housing, as well as other types of assistance.

Announcements will be made on the location of claims centers, types of assistance programs available, and procedures for obtaining assistance.

Protecting Food Products

Food and Milk Processors, Warehouses and Commodity Terminals
Windows and vents to the outdoors should be closed. Vacuum systems should be shut down as should compressed air systems. Any system that draws air from outdoors to the inside should be shut down. Your facility will be notified directly by the Washington State Department of Agriculture, Food Safety and Animal Health Division, if the food products in your facility are affected. Samples will be collected and Department of Agriculture officials will notify you which products can be released for sale.

Protection of Packaged Food Products
Food in finished packaging should not be harmful to eat as long as the outer wrappings are discarded. Radioactivity will travel as fine particles that may coat the outside of the food product container. The Washington State Departments of Health and Agriculture will provide further advice to avoid any adulteration from exterior packaging.

Emergency Alert System Stations

The Emergency Alert System (EAS) (formerly the Emergency Broadcast System, or EBS) is one of the primary means local officials have to communicate with the public in times of emergency.

The broadcast stations listed below are likely to carry EAS messages to the counties in South Central Washington within 50 miles of WNP-2 and the Hanford site. Listeners should keep in mind that KONA AM and FM are the primary EAS stations in this area.

Adams County
KXLY 920 AM and 100 FM, KAQQ 590 AM or KRSC 98.1 FM

Benton and Franklin Counties
KONA 610 AM, KONA 105.3 FM or KALE 960 AM; and KNDU-TV Ch. 25, KEPR-TV Ch. 29, or KVEW-TV Ch. 42

Grant County
KONA 610 AM, KONA 105.3 FM or KALE 960 AM

Kittitas County
KXLE 1240 AM

Klickitat County
KIHR 1340 AM, KCBG 105.5 FM, KYYT 102.3 FM, or KLCK 1400 AM

Walla Walla County
KONA 610 AM or KONA 105.3 FM

Yakima County
KMWX 1460 AM or KFFM 107 FM

Sources of Emergency Information

Your best source of information during an emergency depends on where you live or work. For example, people near the nuclear facility experiencing an emergency will receive initial information over the Emergency Alert System. People in adjacent areas will receive information from the media or other means. Major food processors and distributors will receive information directly from the Washington State Department of Agriculture.

Emergency Alert System (EAS)
Local emergency response officials will provide instructions and emergency-related information over designated radio and television stations.

News Media
Local and state emergency response officials will be providing information to the news media. These reports will appear on radio and television as well as in newspapers.

Personal Contact
The Washington State Department of Agriculture or the local office of the Washington State University Cooperative Extension will provide information directly to food producers.

Toll-Free Phone
Additionally, the state of Washington may provide information through toll-free phone numbers established at the time of the emergency.

Poultry and Poultry Products
Poultry raised outdoors, especially those kept for egg production, should be monitored by taking samples and performing lab tests to determine the presence of radioactive contamination. Poultry raised indoors and given protected food and water are not likely to be contaminated. If adulteration is verified, officials of the Washington State Departments of Health and Agriculture will advise that poultry and eggs not be eaten.

Grains
If grains are permitted to grow to maturity, most contamination will probably be removed by the wind and rain. Milling or polishing will probably remove any remaining contamination. Sampling and laboratory analysis will determine if the grain is safe to use. When harvested, adulterated and unadulterated grains should be stored separately.

Bees
Honey and beehives will need to be sampled and analyzed by the Washington State Departments of Health and Agriculture or the Federal Radiological Monitoring and Assessment Center if radioactive contamination is detected in the area. You will be instructed by Washington State Department of Agriculture officials on how to handle the hives and honey.

Fish
Fish may continue to be harvested unless Washington State Department of Health officials determine through laboratory analysis of samples that they are adulterated. Dilution of the radioactive material in large bodies of water should make adulteration of fish highly unlikely. Samples of water and fish from open bodies of water will be analyzed to ensure they are safe.

Protecting Your Crops

The following specific actions may be advised to reduce the danger of ingesting adulterated food products.

Milk
Remove all dairy animals from pasture and shelter them if possible, and provide them with protected food and water. Sampling teams from the Washington State Departments of Health and Agriculture, or the Federal Radiological Monitoring and Assessment Center will come to your farm to take milk, feed and water samples for laboratory analysis to determine whether any of these products are adulterated.

If dairy products are found to be contaminated, it will be recommended that milk and milk products be withheld from the market. It is possible, however, for milk products contaminated with very low levels of radioactive materials to be safe for human consumption.

You will be advised by officials from the Washington State Departments of Health and Agriculture as to which protective actions are appropriate.

Vegetables and Fruits, Including Grapes
Wash, scrub, peel, or shell locally grown fruits and vegetables, including roots, tubers and grapes to remove surface contamination.

Meat and Meat Products
If there is a release of radioactive materials into the environment, you may 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.

Purpose of Protective Actions

Three types of hazards may result from a release of radioactive material from a nuclear facility. Different actions are taken to protect against the risks presented by each. Radioactive particles emit energy which can disrupt normal cell functions. By reducing the amount of exposure to radioactive material, risk can be minimized.

Direct exposure to radioactive material is most significant during the emergency phase of the event, while the radioactive material is being released. Access will be restricted to areas where exposure to radioactive materials exceeds acceptable levels. These levels are well below those that can cause any observable health effects.

Ingestion of radioactive material by drinking or eating can also pose a hazard. If food or water that contains radioactive material is consumed, it poses an increased risk to the organs of the body. Large or prolonged exposure of organs to radiation can damage them, eventually resulting in dysfunction or even cancer.

Inhalation of radioactive particles is another hazard. Inhalation allows energy emitting particles to come in direct contact with the lining of the lungs. The lining of the lungs is sensitive to, and easily damaged by, the energy being emitted by radioactive particles. Inhaled radioactive particles can be expelled by normal biological processes. Some particles are more difficult to expel and stay in the lungs longer resulting in a greater risk of damage. Care should be taken to minimize the inhalation of radioactive particles.

Protective Actions

Protective actions are intended to prevent or minimize the possibility of consuming adulterated food, or minimize the contamination of food products as they are consumed. An example is washing, scrubbing, peeling or shelling fruits and vegetables to remove surface contamination. Another example is to restrict or withhold agricultural or dairy products from the market place by prohibiting their transportation out of affected areas.

Protecting Water Sources
Open sources of water, such as rain barrels and tanks should be covered to prevent contamination. State and local health experts will check open sources of water and tell you whether they are safe.

Filler pipes should be disconnected from storage containers supplied by runoff from roofs or other surface drain fields. This will help prevent contamination from entering the storage containers.

Intake valves on water systems should be closed when you suspect the water source may be contaminated. This will prevent distribution or irrigation until the water source is tested and found to be safe.

Protection from Contaminated Soil
If state officials find that the soil is contaminated above established safety levels, proper soil management procedures can reduce contamination to safe levels. Idling — the non-use of land for a specific period of time — may be necessary. In situations involving highly contaminated soil, removal and disposal of the soil may be more appropriate.

Growing alternative non-food crops may also be recommended in some situations.

Deep-plowing the soil can move 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.

Protecting Your Farm

You may be asked to shelter your farm animals and give them protected feed and water. This will help prevent contamination from harming your animals, and from later entering the human food supply.

Sheltering Animals
If you are advised to shelter animals, remove them from pasture and house them in a farm building. You may not have enough shelter available for all your animals, so priority should be given to your most valuable livestock. State and local emergency response agencies will have more advice for decontaminating farm animals.

Giving Animals Protected Feed
You may be advised to place animals on protected feed and water that have not been stored in the open or exposed to radioactive contamination. Types of protected feed include:

- Grain stored in covered bins.
- Hay stored in a barn or covered shed.
- Ensilage stored in a covered silo.
- Hay bales covered by a tarp or barrier plastic or bales with the outer layers discarded.

Giving Animals Protected Water
Even if you have no protected feed during a radiological emergency, animals can live for several days on water alone. Water from enclosed wells or other covered or underground sources will normally be safe for livestock. It is unlikely these water supplies will be affected.

Open water troughs should be drained, rinsed and refilled after notification that radioactive materials have settled to the ground. The same procedure should be followed after windy weather spreads dust in the area.

Food Control Area

Initially, state radiation health experts will determine which areas may be contaminated by radiation. They will do this by using information from field measurements and computer projections. The area which includes potentially adulterated food is called the Food Control Area.

The purpose of the Food Control Area is to:

- Prevent consumption of potentially adulterated fresh food and milk products from the area; and
- Prevent potentially adulterated food products from being moved to the market place.

As an emergency protective action to prevent the consumption of adulterated food, the transport of all food from the Food Control Area will be stopped. Cargo en route to processors is to be returned to its point of origin.

Early field monitoring and laboratory testing will focus on two segments of the agricultural community within the Food Control Area:

1. Commercial dairies and milk processing plants, and feed and dairy animals will be checked first, because contamination can appear in fresh whole milk within 72 hours of a release of radioactive materials. Early monitoring and testing will help protect people living or working within the potentially affected area. Children are the primary consumers of milk products and the segment of the population most sensitive to radiation.
2. Fresh foods at farms and food processors cannot be moved from within the Food Control Area until testing is completed. The timing and order of testing will be determined by the harvest times for crops.

Fresh food and milk products will be condemned if lab testing shows they are adulterated. The state of Washington will direct the disposition of condemned food and milk products.

Food and milk products shown by lab testing to be safe for consumption by the public can be moved to market.

Check points will be set up at the boundary of the Food Control Area to ensure that adulterated fresh food and milk products do not leave the area,

Home gardeners and small-scale farms
Checking for contamination at home gardens and small-scale farms may not begin for weeks after the emergency. Home grown produce should be tested for radioactive contamination before it is consumed. Home gardeners and small-scale farmers should wait for a field monitoring team to help them, or for further instructions from local and state agriculture and health agencies.

Lifting Food Controls
The boundary of the Food Control Area will be revised as data becomes available on the extent of radioactive contamination. The Washington State Department of Agriculture will provide information when normal farming activities can be resumed in areas where food controls have been lifted.

Relocation Area
Field monitoring teams may find an area too contaminated for people to live in or for normal farming activities to continue. Such an area is called a Relocation Area. Access will be limited to emergency workers, monitoring teams, and others who must enter under controlled conditions.

If people are living in a designated Relocation Area, they will be asked to leave the area. The length of time they will be away from their homes and farms will depend on the level of contamination. Farmers will be allowed to return to care for animals and to perform other necessary functions in these areas under controlled conditions designed to minimize radiation exposure. Assistance will be provided for the relocation of animals.

Emergency Worker/Assistance Centers
Information for farmers who must care for animals and other necessities in a Relocation Area will be provided at Emergency Worker/Assistance Centers opened during the emergency. Locations of the centers will be announced during the emergency.

Protecting Farm Workers

People who continue to work their farms or gardens may be advised how they can further reduce the possibility of being contaminated by radioactive materials. To minimize the inhalation or ingestion of radioactive materials deposited on vegetation or in the soil, and to avoid bringing contamination into living spaces, you might be asked to take the following steps:

- Wash your hands thoroughly before eating.
- Wear clothing such as coveralls, gloves and hats while working outside. The clothing should cover all portions of your body. Remove outer clothing before going inside.
- As much as possible, avoid activities that can re-suspend contamination, such as plowing, digging, burning, or mowing. Wear a dust mask or a folded, dampened cloth over your nose and mouth to reduce the quantity of radioactive materials inhaled when such activities can not be avoided.
- Shower after completing outside activities.
- Wash outer clothing.