



OAK RIDGE

DOE/ORO/2185

Reservation

Annual Site Environmental Report Summary

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Protecting Our Legacy



Message from the Students

Dear Department of Energy Stakeholder:

We, the 2005 Communications for Life Class at Karns High School, are proud to have participated in creating such an important DOE document. When first meeting the project leaders we saw a man from DOE walk into our classroom with a Dr. Seuss hat on. We all thought he was outrageous and goofy. The message he gave to us to kick off the project was to think “outside the box.” He told us to use our imaginations and be creative and different. Tim told us he wore the Seuss hat specifically to get us to put on our own creative hats, and that’s what we did.

We learned that there are many DOE activities that the local community can get involved in. We used to think that the Oak Ridge facilities only built bombs, but after our research, site visits, and scientists coming to our class, realized Oak Ridge is a spectacular place, with lots of research, and wasn’t filled with bombs. Working on the project has been very interesting and different to say the least. The most important thing we have learned is that people will amaze you if you give them a chance.

The class would like to thank Dr. Tim Joseph of the Department of Energy, Joan Hughes from the Oak Ridge National Laboratory, and Evelyn Hammonds our own Karns High School Communications for Life teacher. And we thank DOE for choosing us to help with this project, for we learned so much. We hope you, the public, find our document informative and of value to you.

Sincerely,

Shanda Smith
Sam Walker
Shannah Hall
Jennifer Carmichael
Haley Holts
Janae
Robert Millington
Jessica Baldwin
Nick Anderson
Drew Horner
Vanessa McElroy
Matthew Henderson
Brittany Rock
Pamela Jears

About the cover

Protecting Our Legacy: Standing at a precipice, gazing out over the Tennessee Valley, taking in the wonders of the environment around us, it becomes clear how fortunate we are to have been given such a gift. Too, it becomes clear that this gift must be protected. Nestled in a quiet valley is the Oak Ridge Reservation, prosperous yet fragile, a sanctuary where wildlife and research coexist in harmony. All of us, the public, private industry, and the government, must never forget the value of this endowment, and work together to maintain and improve the health of this beautiful place.
— Timothy Joseph, Ph.D.

Cover Artwork: Chelsea Brown, Karns High School student artist.

Layout/Design: LeJean Hardin, Communications and Community Outreach, UT-Battelle.

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Message from the Oak Ridge Operations Office Manager:

It is with great pride DOE provides you, our public, with this Annual Site Environmental Report Summary. My special thanks go out to the hard working students at Karns High School; Evelyn Hammonds, their teacher; and Clifford Davis, Jr., Principal. Without their skills, enthusiasm, and support, this document would not be possible. DOE appreciates the dedicated teaming from Karns High School and we look forward to our close continuing partnership.

Gerald G. Boyd, Manager





Credits



Front row left to right: xxx, xxx, xxx, xxx, xxx, xxx, Chelsea Brown,

Second row left to right: Joan Hughes, xxx xxx, xxx xxx, xxx xxx, xxx xxx, Mrs. Evelyn Hammonds, Timothy Joseph

Oak Ridge Reservation Annual Site Environmental Report Summary for 2003

on the World Wide Web: <http://www.ornl.gov/asr>

Contributors

Fall 2004 Applied Communications Class
and **Spring 2004 Art Class Students**
Karns High School

Mrs. Evelyn Hammonds, Instructor and
Project Manager
English Department Chairperson
Karns High School

Andrea Haury and Bill Shinn, Art Teachers
Karns High School

Joan Hughes
Project Director
Oak Ridge National Laboratory

Timothy W. Joseph, Ph.D., Proj-

Department of Energy
Oak Ridge Operations Office

LeJean Hardin, Judy Neeley, Tina Curry,
Graphics, Creative Media
Oak Ridge National Laboratory



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Preface

Annual Site Environmental Report Summary-2003

A mission of foremost importance to the Department of Energy and our contractors is to provide our stakeholders with a complete understanding of the consequences of our operations, both past and present. To do this, an extensive annual multimillion-dollar monitoring and surveillance program collects and analyzes tens of thousands of samples from air, surface and groundwater, soil, mud, plants, and animals. The results are published in a detailed Annual Site Environmental Report available to all. We also publish a separate Data Volume for those who wish to see the raw data.

Though these documents present all the facts and figures, they are long, technical, and not always easy to read. Thus, I team with a local high school each year and ask students to write an Annual Site Environmental Report Summary specifically for the public. These documents are perhaps the most important reports the Department of Energy produces. Why? First, they lay out the environmental monitoring programs and the consequences of Department of Energy operations in great detail to our legislatures, stakeholders, and the public; second, they represent the efforts of many dedicated environmental scientists who carry out these extensive programs and work hard to protect and enhance the environment; and third, the summary is written for you, the public, our most important stakeholder, with the hope that you find it understandable and of value in gaining an accurate understanding of the Oak Ridge Reservation. All three documents can be found on the web, along with previous years, at <http://www.ornl.gov/aser>.

Working with a new class each year brings new faces, new personalities, and new creative ideas. The students always amaze me with their interest and desire to produce a document the public will utilize and find of value. I personally thank the Karns High School students and their teacher, Ms Evelyn Hammonds, for accepting my challenge in writing this public document and for thinking out of the box as I asked. Thanks also to each contributing art student and Principal Clifford Davis for his support. This class was an especially enjoyable group to work with, and took off at full speed when I threw them the ball. I hope you, our public, find their efforts of value. I believe you will.

As the Annual Site Environmental Report program manager it is my sincere hope you find this summary useful and easy to read. I am always interested in stakeholder feedback on how we can improve the report and this summary document, for they are written for you. I invite your comments, and can be reached by phone at 865-576-1582, or by email at: joseph.t@oro.doe.gov Additional printed reports are available at the Department of Energy Information Center, or by calling 574-6649.

Genuine Regards

Timothy Joseph, Ph.D.

Senior Scientist

U.S. Department of Energy



Oak Ridge Reservation History

The history of the Oak Ridge Reservation is very important to the world because of its contributions to the making of the atomic age. We hope that after reading our brief synopsis the history of the Oak Ridge Reservation is better understood

The reason for war

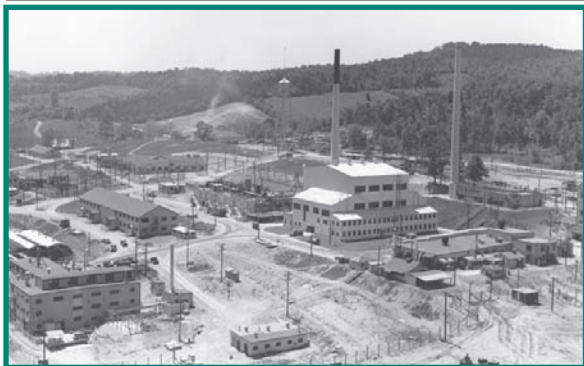
On December 7, 1941, the Japanese attacked Pearl Harbor. In 1942 while the world was at war, the United States government purchased an area in east Tennessee to build a plant to be a part of a secret project to create the atomic bomb. The plant site and community was originally called the Clinton Engineer Works, and later was called Oak Ridge.

Oak Ridge was chosen because of the temperate climate and also because it was isolated by the surrounding mountains and ridges, and had access to large labor pools from the nearby city of Knoxville. The site today has more than 33,749 acres of land in the Oak Ridge area.

During war time, the population in Oak Ridge grew to more than 75,000. Fred Strohl, from the Oak Ridge National Laboratory, said in an interview with our class, the city was so secret that the men and women were not allowed to play golf because there was a feeling that people might talk too much while playing. One worker on the reservation at that time, Dr. Al Brooks, said it was “very clear” that you did not talk about the mission. This worker also said that all of the secrecy and the project itself were worth it when a soldier thanked him for “saving his life.”

In addition to the work going on in Oak Ridge, a team of scientists were also working on secret projects at many closely guarded sites including a remote mesa at Los Alamos, New Mexico, and the stark, remote valley of the upper Columbia River at Hanford, Washington.





X-10

The X-10 plant, built in November 1943, housed the first full-scale nuclear reactor, and support buildings for the production and chemical separation of plutonium. The Graphite Reactor was decommissioned in 1963. Today the reactor is a national landmark and public tours are regularly scheduled.

Y-12

The Y-12 Electromagnetic Separation Plant, completed in 1945, was designed to produce enough enriched uranium to make fissionable material for an atomic bomb. At its peak, more than 22,000 employees worked at the plant. The Y-12 National Security Complex is currently operated by BWXT. The plant stretches over 811 acres with more than 600 buildings. The primary missions of Y-12 Security Complex today are producing and refurbishing nuclear weapons components, safeguarding special nuclear material, providing the United States Navy with nuclear material for safe, effective nuclear propulsion systems, and providing support for other national security needs as required. One of the more recent projects at the plant is the development of a “hospital in a box”. The neatly packaged box, when opened, is actually a fully contained surgical facility. These boxes are designed for use in military situations where soldiers do not have immediate access to hospitals.

K-25

The K-25 site was developed to separate uranium by use of the gaseous diffusion process. The plant became operating in 1945, but it only produced half of the enriched uranium initially intended. Though 1964 the plant was primarily used for production of high-grade uranium for nuclear weapons, and later production shifted to commercial-grade uranium to support the nuclear power industry. In 1987 K-25 was shut down permanently. K-25 now called the East Tennessee Technology Park, focuses primarily on environmental management and ways to reindustrialize and reuse site assets through leasing of vacated facilities.



Future of the Oak Ridge Reservation

The reservation's role has evolved over the years, and it continues to adapt to meet the changing defense, energy, and research needs of the United States. Both the work carried out for the war effort and subsequent research, development, and production activities have involved, and continue to involve, the use of radiological and hazardous materials. Therefore environmental sampling and monitoring to ensure that environmental and public health is protected as these activities are conducted will remain high priority activities. The site will continue to be a leading research area for the entire world.



Environmental Compliance

- **Clean Air Act** - This Act protects and improves air quality in the United States. It establishes a dose limit of 10 millirem per year for air emissions. The total 2003 dose from radionuclides emitted to the air from all Oak Ridge Reservation sources was 0.2 millirem.
- **Clean Water Act** - This Act helps regulate the discharge of pollutants into the waters of the United States. The 2003 compliance rate for all three Oak Ridge sites was greater than 99.9%.
- **Safe Drinking Water Act** – This act establishes drinking water regulations.
- **Endangered Species Act** – This act protects plant and animal species when projects could alter their habitats.
- **Comprehensive Environmental Response, Compensation, And Liability Act** (also known as Superfund) - This law ensures that the environmental impacts of past and present activities on the reservation are investigated and that measures are taken to protect the public and the environment. There were no reportable releases of hazardous chemicals from the reservation in 2003.
- **Resource Conservation And Recovery Act** – This act gives the Environmental Protection Agency the authority to control hazardous waste from “cradle to grave.”
- **Federal Facilities Compliance Act** – This act was passed to bring federal facilities into compliance with Resource Conservation and Recovery Act.
- **Federal Insecticide, Fungicide, And Rodenticide Act** – This act provides federal control of pesticide usage, sale, and distribution. No restricted- use pesticides are used on the Oak Ridge Reservation.
- **National Environmental Policy Act** – This act requires an evaluation of environmental impacts of proposed projects, and the examination of alternatives.
- **National Historic Preservation Act** – This act provides for the preservation of historic properties all over the nation.
- **Toxic Substances Control Act** – This law keeps up with the production, use, and disposal of chemicals substances.

Image underconstruction



Basic Overview of Radiation

What is Radiation?

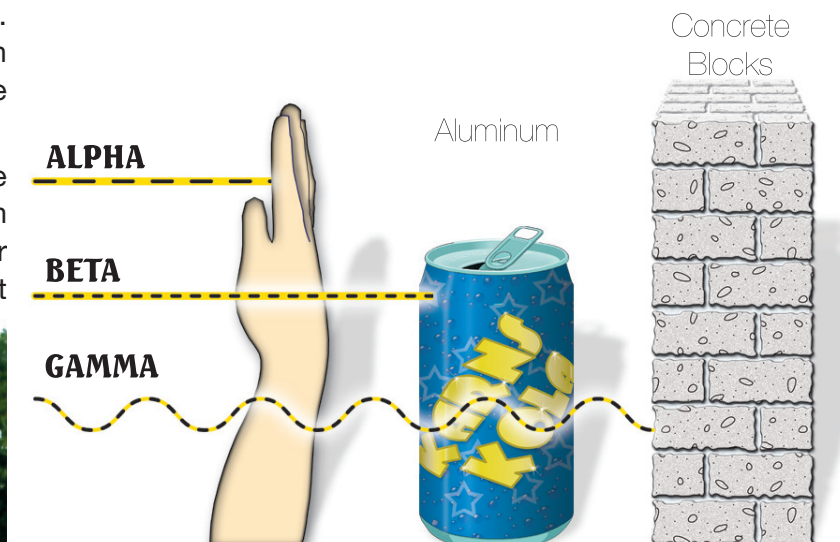
Radiation is energy in the form of waves or particles moving through space. Radiation is either natural or human made. There are several different forms of radiation. The heat that you feel from the sun is actually the most common form of radiant energy. Visible light, heat, and radio waves, are also examples of radiation. Radiation is characterized as ionizing or non-ionizing depending on the way in which it interacts with matter. Ionizing radiation has enough energy to eject electrons from electrically neutral atoms, and exposure can be dangerous as it damages the internal structure of living cells. Examples of ionizing radiation are X-rays and gamma rays. Non-ionizing radiation bounces off or passes through matter without displacing electrons. Exposure to non-ionizing radiation is generally not dangerous, but there are some exceptions such as intense ultraviolet exposure which can cause blindness and burns to the skin.

Matter is composed of chemical elements such as carbon, oxygen, or hydrogen. All elements that make up matter consist of atoms. An atom is the smallest particle of an element that can exist. Atoms are composed of three basic particles: protons, neutrons, and electrons. The protons have a positive charge, the electrons have a negative charge, and the neutrons have no charge. The number of protons and neutrons, forming the nucleus, determines the chemical and physical properties of an atom. Some atoms can become unstable due to an imbalance in the forces among the particles that make up the nucleus and are characterized as being radioactive. To get stable, a radioactive atom (radionuclide) releases energy from its nucleus and forms an atom of a different element. Some kinds of radiation are electromagnetic (like light) and particulate. Gamma radiation and X-rays are examples of electromagnetic radiation. Alpha and beta radiation are examples of particulate radiation.

Alpha particles are composed of two protons and two neutrons. These particles do not travel very far from their radioactive source. They cannot travel through a piece of paper, clothes, or even the layer of dead cells that normally protects the skin. Since alpha particles cannot travel through human skin, they are not considered an “external exposure hazard” (this means if the particles stay outside the body they cannot harm it). However, alpha materials can be harmful to the human body if the materials are inhaled, swallowed, or absorbed through open wounds. This means alpha particles are considered to be “internal exposure hazard.”

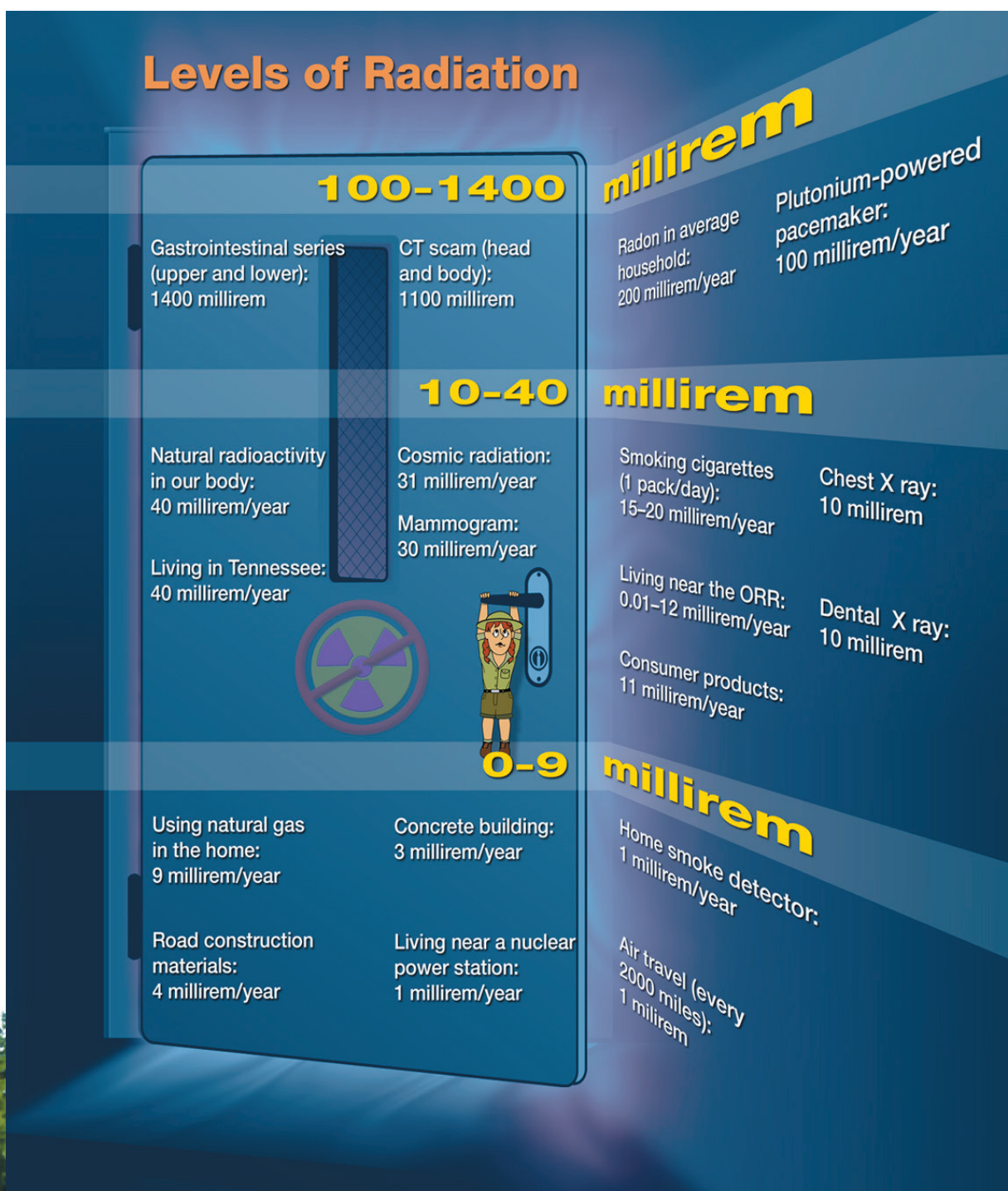
Beta particles do not travel far from their radioactive source. These particles are only moderately penetrating. They may travel a few yards in the air and about half an inch in human tissue. They are not able to travel through a book or a pad of notebook paper. Clothing may be helpful in preventing skin exposure to the beta particles. However, particles that remain on the skin for a long time may cause skin injury.

Gamma radiation comes from the nucleus of an atom. This radiation can travel many meters in the air and may pass through the body. It



is often referred to as the penetrating radiation. Radioactive materials that emit gamma radiation and X-rays can cause both external and internal hazards to the human body. Dense materials such as lead and concrete are needed for shielding from gamma radiation. Clothing can protect the skin from radioactive materials but does not protect the body from penetrating radiation.

In our daily lives we are exposed to various types of radiation. We are exposed to natural radiation by cosmic rays, radioactive substances in the earth, and naturally occurring radiation in the body. Human-made sources of radiation are X-rays, building masonry, gas stoves, computer monitors, and televisions. On the average, natural radiation sources contribute about four to five times as much to an individual's exposure as human-made sources. A lot of natural exposure is due to radon, a gas that seeps from the earth's crust and is present in the air we breathe.





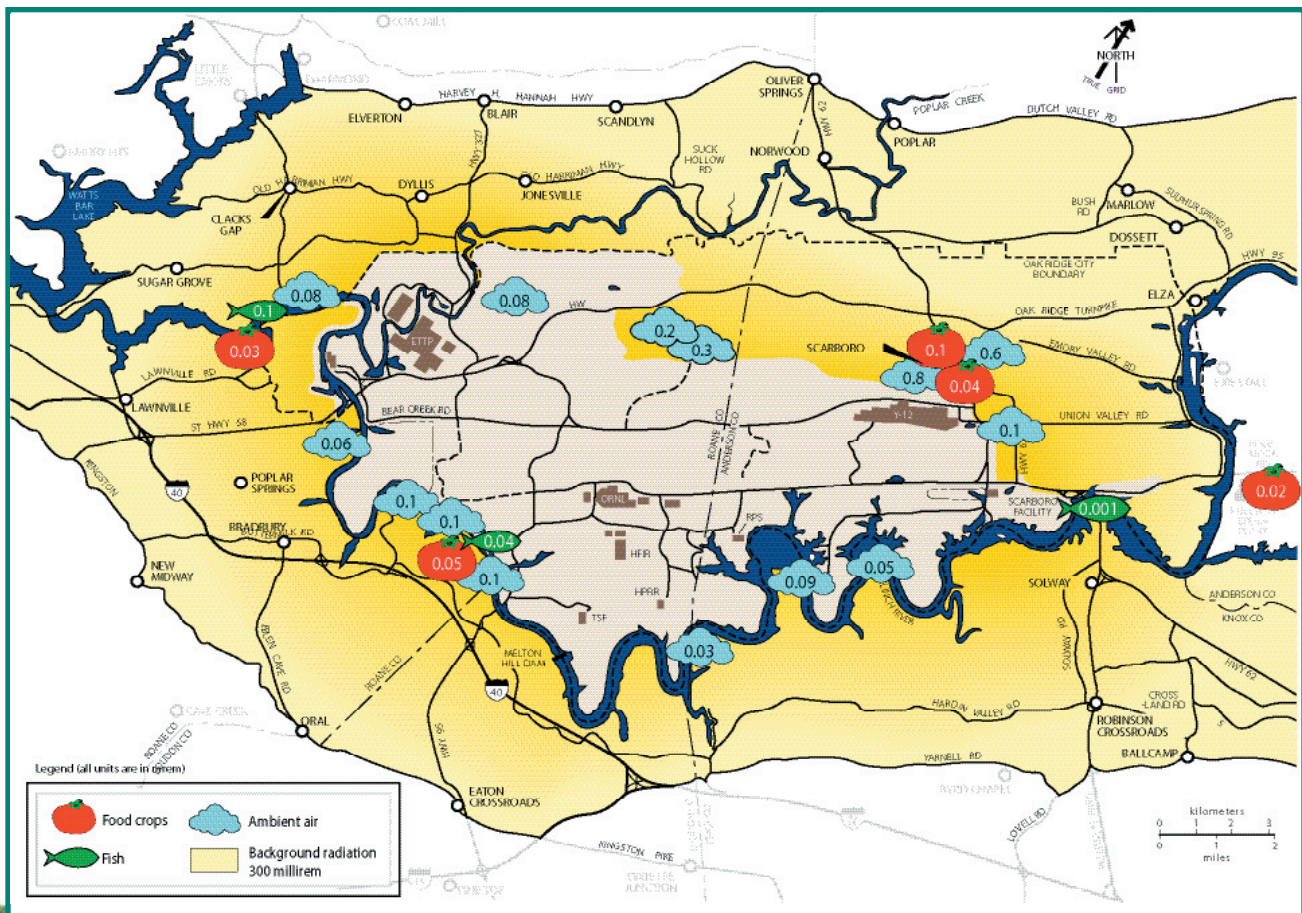
What is a Dose?

Determining a potential dose consists of combining all possible types of exposure including direct radiation and the ingestion of food and water containing radioactive materials. Dose is general term denoting the quantity of radiation or energy absorbed by the body. It is a measure of the effect of exposure and the potential for damage rather than just the amount of the exposure. A specific dose of radiation has the same effect on people. Usually radiation dose is expressed in a unit called rem. There are 1000 millirem in a rem. An average person in the United States receives 360 millirem of radiation dose per year. Dose is measured by the potential types of radiation. If someone received a dose of 100,000 to 200,000 millirem, he or she will have signs of sickness but will most likely recover completely. A dose of 800,000 millirem or more can be fatal without treatment.

Dose Map

Everyone is exposed to radiation through everyday normal activities. An average person in the United States can received up to 300 millirem per year from radiation that is natural. For example cosmic rays from outer space and radioactive elements found in the soil, water, and food. Monitoring the air, water, and the wildlife around the reservation provides data that are used to confirm that doses from radiation releases from the Department of Energy activities are low and in compliance with all laws. The radiation dose varies depending on location.

Radiation Doses on or near the Oak Ridge Reservation



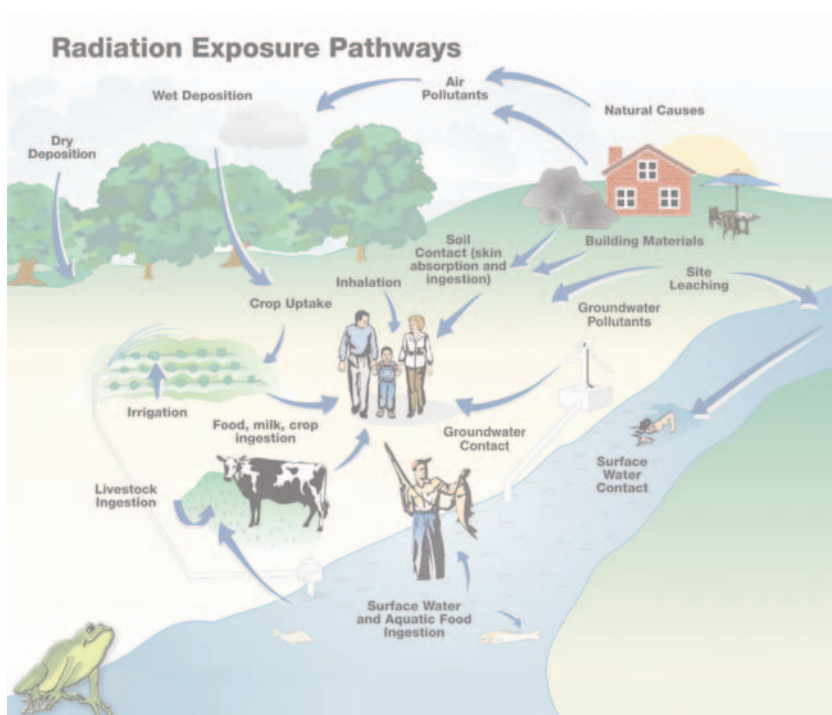
Are we at Risk?

Near the Department of Energy's Oak Ridge facilities the annual amount of radiation dose to individuals living near it is between XX and XX millirem per year. This amount is less than schools, stores, buildings, or homes made of concrete. Smokers who smoke cigarettes can be exposed to 15 to 50 millirems per year. Radon, natural in the earth, can lead to dose up to 200 millirem per year in some areas.

How are we exposed?

There are many ways that we are exposed to radiation. Simply breathing the air where particles are suspended can result in some exposure. Anytime we consume food or water we receive radiation. We are exposed directly to radiation from cosmic rays, and airborne contaminants that can settle on grass in pastures that cows eat. This means our milk and meat is also exposed to natural sources of radiation. X-rays and CAT scans give an average amount of approximately 1200 millirems. Radiation is everywhere on the earth. Some forms of radiation can be dangerous if it is not controlled, but radiation has improved our quality of life.

[insert Radiation Exposure Pathways figure] (NEW VERSION IN DEVELOPMENT)





Environmental Monitoring

In addition to environmental monitoring conducted at the three major Oak Ridge Department of Energy installations, reservation-wide surveillance monitoring is performed to measure radiological parameters directly in the area adjacent to the facilities. Data from the Reservation surveillance programs are analyzed to assess the environmental impact of Department of Energy operations on the entire reservation and the surrounding area.

Air

Both effluent and ambient air are sampled on or near the Oak Ridge Reservation. Effluent air flows into the environment from a source, such as an exhaust stack, and ambient air is the air that exists in the surrounding area. Radiological and nonradiological air emissions at the three sites and on the reservation as a whole are monitored. The 2003 results show that Oak Ridge Reservation operations have an insignificant effect on local air quality.



External Gamma Radiation

External gamma radiation monitoring is conducted to determine whether radioactive effluents from the Reservation are increasing the external radiation levels significantly above background levels. The testing showed that the Reservation's measured exposure rate was within the range of normal background levels in Tennessee. This indicates that in 2003 activities at the Reservation did not increase external gamma levels above normal background levels.

Surface Water

Water that is discharged from the Department of Energy's Oak Ridge facilities directly into lakes and streams is called effluent discharge.

Each of the three major sites has a permit for water discharges, and effluent surface water is monitored according to the permit requirements. The compliance rate for all three sites was greater than 99.9% in 2003. In addition to the permit required monitoring, surface water from approximately 35 other locations at the three sites and around the reservation is routinely monitored to detect any contaminant releases. Comparisons of surface water sample results from locations upstream of DOE inputs with surface water results from samples obtained downstream of DOE inputs show that there were no statistically significant differences in any of the parameters of

TABLE ???



interest. None of the locations had radionuclides detected above the reference limits established by the Department of Energy derived concentration guide.

Ground Water

Most Oak Ridge area residents do not rely on groundwater for drinking water. However, local groundwater provides for some domestic, municipal, and farm irrigation and is used for industrial purposes. It is therefore viewed as a potential pathway for exposure to hazardous wastes and as a means of transporting contaminants off the Oak Ridge Reservation. Groundwater is monitored for organic compounds, metals, and radionuclides. Contamination is found mainly in former waste sites, and there are no users of the groundwater in these locations. Groundwater monitoring programs at the Oak Ridge National Laboratory and at the East Tennessee Technology Park have not detected groundwater contamination migrating off

DOE property. At the Y-12 National Security Complex, chlorinated volatile organic compounds have migrated off the Oak Ridge Reservation east of the plant into Union Valley at depths between 200 and 500 feet. Remediation is being conducted to mitigate plume migration. Meanwhile, there are no users of the groundwater, and restrictions have been established to prevent future use.

Canada Geese

Open hunts for Canada geese are held in counties adjacent to the Oak Ridge Reservation each year. Therefore, the consumption of Canada geese is a potential exposure pathway to members of the public to radionuclides released from Oak Ridge operations. Geese from on and around the reservation are rounded up each summer for live whole-body gamma screenings. The 2003 roundup was held June 24 and 25, and 95 geese were screened for radiological activity. None of these geese had radiation levels exceeding release limits.

Eastern Wild Turkeys

No wild turkey hunts were held on the Reservation in 2003 due to security concerns.

Fish

Sunfish and catfish are collected from three locations on the Clinch River, annually. These locations include an upstream sampling point that is not affected by Oak Ridge Reservation activities and a location downstream from all Reservation inputs. In 2003, mercury, PCBs and radionuclides were detected in both species of fish at all locations. In addition, gamma chloradane, a pesticide was also





detected in the catfish samples collected at all three locations. Two other pesticides (Endosulfan sulfate and Heptachlor expoxide) were detected in one catfish sample at the downstream location.

Vegetables

Tomatoes, lettuce, and turnips were purchased from farmers near the Oak Ridge facilities to evaluate potential radiation doses to people consuming local produce. The locations were chosen based on availability and the likelihood of the produce being affected by routine releases from the Oak Ridge facilities. Uranium 233/234 and Uranium 238 were detected in three of the six lettuce samples and in two of the six tomato samples. These radionuclides are found in the natural environment and in commercial fertilizers, and are also emitted from the Oak Ridge Reservation. Potassium-40, which is naturally occurring and found in commercial fertilizers, was detected in all but one vegetable sample. Consumers of garden vegetables in the vicinity of the reservation could have received a dose of between 0.02 and 0.1 mrem.

Deer

The annual deer hunts on the reservation were held during the final quarter of 2003. Shotgun/muzzle loader and archery hunts were held on October 18-19, November 8-9, and December 6-7. There were about 550 shotgun/muzzleloader permitted hunters and 450 archery permitted hunters participated in each hunt. This year's total harvest was 256 deer (89 bucks, 167 does). Of the deer harvested, two exceeded the radiological release limits and were retained for additional testing. The dose from consuming all edible meat from a white-tailed deer with average radionuclide concentrations was estimated to be 0.7 millirem.

Hay

Hay is gathered from six different locations on or adjacent to the Oak Ridge Reservation and is checked for radionuclide concentrations. None of the locations had gamma-emitting radionuclides above the minimum detectable activity except naturally occurring ⁷Be and ⁴⁰K. Uranium isotopes were detected at very low levels.

Milk

The 2003 milk-sampling program consisted of samples collected every other month from three locations. One is from a commercial dairy in Powell that processes milk from all over east Tennessee. The second dairy location is in Claxton, and the third is in Maryville. The Maryville location is used as a background location for comparison purposes and is not in an area that would be affected by Oak Ridge releases. Milk is analyzed for gamma-emitting radionuclides, tritium and total radioactive strontium. The total radioactive strontium was detected once each at Claxton and Maryville.

Environmental Management

This section will show you how you can be a part of decision making for the Oak Ridge Reservation and how you can stay informed about activities carried out by the Department of Energy.

Public Involvement

The Department of Energy Oak Ridge Operations Office encourages stakeholders to participate in decisions and to exchange information regarding remediation of contaminated areas on the Oak Ridge Reservation. Stakeholders include individual groups, host communities, and other entities in the public and private sectors that are interested in or affected by Department of Energy activities and decisions. The following sources of information are available to stakeholders and the general public.

- The Oak Ridge Site Specific Advisory Board, a federally appointed citizen panel, provides advice and recommendations to Department of Energy on environmental activities (<http://www.oro.doe.gov/em/ssab>). During June 2003, the board issued the Oak Ridge Reservation Educational Resource Guide to introduce the concepts of radiological and chemical contamination, environmental management, and stewardship to middle and high school students.
- The Oak Ridge Reservation Health Effects Subcommittee, funded by the Department of Energy and administered through the Agency for Toxic Substances and Disease Registry, performs public health assessments for contaminants by looking at present and historical releases from the Oak Ridge Reservation and their potential impact on the health of nearby residents. Subcommittee meetings and technical work group meetings are open to the public.
- The Tennessee Department of Environment and Conservation Department of Energy Oversight Office provide independent state oversight of the Department of Energy's Oak Ridge activities (<http://www.state.tn.us/environment>).
- The Local Oversight Committee provides public oversight of the environmental management activities of the Department of Energy Oak Ridge Operations Office (<http://www.local-oversight.org>).
- The Department of Energy Information Center provides newsletters, reports, and tapes and transcripts of public meetings and Department of Energy activities (phone: 865-241-4582).
- The City of Oak Ridge Environmental Quality Advisory Board, appointed by the Oak Ridge City Council, provides counsel to the city government on environmental matters (<http://www.ci.oak-ridge.tn.us/ComDev-html/EQAB.htm>).



Other means for the public to get information on Oak Ridge activities and public meetings include the following.

- A new DOE Information Center Web site was established to make information more accessible to the public (http://www.oakridge.doe.gov/info_cntr/).
- During July 2003, the Oak Ridge Site Specific Advisory Board launched its video lending library at the DOE Information Center, providing the community with a valuable educational resource regarding environmental management program issues.
- The TSCA Incinerator Burn Plan for 2004 to 2006 was made available. The incinerator is tentatively scheduled to be closed in 2006.
- Fact sheets describing various Oak Ridge environmental management projects are available (http://www.bechteljacobs.com/ettp_factsheets.shtml).
- Department of Energy websites offer information on public involvement opportunities (http://www.oro.doe.gov/public_activ.html).
- Newsletters, reports, tapes, and transcripts of public meetings are available online (<http://www.oakridge.doe.gov>).
- The schedule for upcoming public meetings is available online (<http://www.oakridge.doe.gov/meetings.html>).
- The DOE Public Involvement Plan for CERCLA Activities at the U.S. Department of Energy Oak Ridge Reservation and the monthly DOE publication Public Involvement News are also available (865-576-0885).
-

In addition to the various ways to obtain information concerning the Reservation's activities, there are several opportunities for the community to enjoy the land maintained on the Reservation. Some of these opportunities are outlined below.

- In 1996 ORNL began sponsoring guided community nature walks to allow participants to enjoy nature at its best.
- Deer hunts are held each fall. There were about 550 shotgun/muzzleloader permitted hunters and 450 archery-permitted hunters who participated in these hunts in 2003.
- The Oak Ridge Public Tour Program, featuring visits to all three DOE facilities in Oak Ridge, resumed in 2003.
- In 1999, DOE partnered with the State of Tennessee to set aside 3,000 acres of the Oak Ridge Reservation as a conservation and wildlife management area. The area provides an important habitat and home for numerous threatened, endangered, and rare animal species. Within the 3,000 acres there is an 80-acre recreational area known Clark Center Park. In addition, the area contains the historic Freels Cabin. This cabin was built in the 1820s and was one of the earliest settlements in the area.

On the Oak Ridge Reservation, every effort is made to conduct operations in compliance with federal, state, and local environmental protection laws to ensure the protection of environmental and public health. Except for the few instances of noncompliance discussed in this section, all Oak Ridge sites were in compliance with environmental laws and regulations in 2003.

- Each site achieved a National Pollutant Discharge Elimination System permit compliance rate greater than 99.9 percent in 2003.
- In 2003, all three Oak Ridge Reservation facilities operated in compliance with State of Tennessee regulatory dose limits for air emissions and met its emission and test procedures.
- No releases of reportable quantities of hazardous chemicals or asbestos were reported under the Comprehensive Environmental Response, Compensation, and Liability Act by any of the sites.

Summary of National Pollutant Discharge Elimination System Permit Exceedances in 2003

Y-12

Description/Cause

On January 22, 2003, a water sample showed an elevated chlorine level. Additional data analysis for January showed the monthly average for total residual chlorine exceeded permit limits. Cause was determined to be failure of the dechlorination system. No observed adverse effects on aquatic life.

Corrective Action

Installed a new sodium bisulfite feed line for the raw water basin

Two water samples taken on February 17 and 18, 2003, showed elevated mercury levels. This occurred because of heavy rains in the area. Both samples were from the same location.

No action was taken because problem was due to excessive rainfall and the system functioned as designed.

On April 15, 2003, a water sample showed an elevated oil and grease reading above the

In the future additional lab analysis on samples with elevated oil and



permitted limit. Could not find the source of the oil. No observed adverse affects on aquatic life.

grease readings will be performed on residue to find source of problem

On November 18, 2003, three water samples an at outfall showed elevated chlorine levels. An investigation revealed that one of the tablet dechlorination units was not working properly.

Replaced the malfunctioning Dechlorination unit.

East Tennessee Technology Park

Description/Cause

On January 21, 2003, diesel fuel leaked from a causing an oil sheen in a pond. repaired and removed from site.

Corrective Action

The spilled fuel did not enter vehicle at ETPP Poplar Creek and the vehicle was

On July 29, 2003, a sanitary sewer line outside break room overflowed because of blockage in the line. The water was discharged into Mitchell Branch.

The blocked line was excavated building and replaced.

Oak Ridge National Laboratory

Description/Cause

On January 14, 2003, there was a pH excursion. underground pipe containing sodium hydroxide is believed to have contributed to the excursion

Corrective Action

The leaking portion of the pipe was A leaking bypassed.

On December 16, 2003, there was a total solid excursion. A combination of low flow and foam accumulation to be the cause of the accumulated residue in the incident.

Sampler intake tube was relocated suspended so the foam would not be taken into the compositor during low-flow is believed conditions.

Class Participation at the Department of Energy's Annual Site Environmental Report Workshop

Our class had a unique opportunity to share our experiences with writing the summary document and our new found knowledge about the Oak Ridge Reservation with a nationwide audience. Each year officials from the Department of Energy in Washington, D.C. conduct a workshop to evaluate the most recent Annual Site Environmental Reports from all Department of Energy sites across the country, and to provide guidance for the preparation of the next report. This year's workshop was hosted by UT-Battelle and was held at the National Transportation Research Center, just a few minutes away from Karns High School. UT-Battelle and the Department of Energy invited us to participate, and our teacher, Evelyn Hammonds, and classmate Jenna Scalf addressed the conference attendees on our behalf. Mrs. Hammonds talked about teaming with the Department of Energy from the perspective of the school and the teacher. She talked about we have been given the opportunity to apply our writing skills in a very meaningful way – not just for a grade but for a real public document. Jenna spoke from the students' point of view and explained how much more knowledgeable we are about community history and industry and local environmental issues. As a result of Ms. Hammond and Jenna sharing our experiences and successes with this project, other Department of Energy facilities around the country are making plans to team with high schools in their communities.





ORR ASER 2003