



Wildlife and plants are evaluated as part of ecological risk assessments

LOS ALAMOS NATIONAL LABORATORY

Los Alamos National Laboratory (the Laboratory) is a multidisciplinary research facility owned by the Department of Energy (DOE) and managed by the University of California. The Laboratory is located in north-central New Mexico approximately 20 miles northwest of Santa Fe. The Laboratory covers 43 square miles of the Pajarito Plateau; the Plateau consists of a series of finger-like mesas that are separated by deep canyons containing perennial and intermittent streams running from west to east.

RISK REDUCTION AND ENVIRONMENTAL STEWARDSHIP

ENVIRONMENTAL RESTORATION PROJECT

The Laboratory's Environmental Restoration (ER) Project (implemented by the Risk Reduction and Environmental Stewardship [RRES] Division) is a part of a DOE nationwide program. DOE's environmental restoration efforts began in 1989. The ER Project investigates whether hazardous chemicals and/or radioactive wastes are present as a result of past Laboratory operations and cleans up and restores such sites as needed.

ECOLOGICAL RISK ASSESSMENT DESCRIPTION

The RCRA corrective action process requires the protection of human health and the environment. Ecological risk assessments evaluate the potential for adverse impacts on the environment. Ecological risk assessments can be used to predict the likelihood of future adverse effects or evaluate the likelihood that effects are caused by past exposure to contaminants. The guidance for conducting an ecological risk assessment is provided by the U.S. Environmental Protection Agency (EPA) under the Comprehensive Environmental Recovery, Compensation, and Liability Act (CERCLA) also known as Superfund. The EPA guidance presents a technically valid and defensible approach for conducting ecological risk assessments at contaminated sites, the ER Project follows this EPA guidance.

ECOLOGICAL RISK ASSESSMENT APPROACH

The ecological risk assessment process is a phased approach that progresses from a generic screening assessment to a site-specific assessment. Ecological screening methods were developed in conjunction with the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) and are described in *Screening Level Ecological Risk Assessment Methods*. This methodology uses ecological screening levels (ESLs) for a variety of plants and animals. The ESLs are derived from values for no observed adverse effect concentrations and conservative intake parameters for each receptor. The origin of the ESLs is documented in the ECORISK Database, which was developed and is maintained by the ER Project, and updated annually. The screening assessment is designed to identify chemicals of potential ecological concern (COPECs), not to indicate or predict actual risk.

- 1940s** The Laboratory was founded in 1943 as part of the Manhattan Project. Processes used to carry out the Laboratory's past and present missions involve the use of hazardous and radioactive materials.
- 1950s** During and after World War II, materials were disposed of on the Laboratory site or otherwise released into the environment.
- 1960s** Congress enacted basic legislation to protect the environment. The Department of Energy's predecessor, the Atomic Energy Commission, and the Laboratory began to conduct surveys and to clean up areas where spills and disposal had occurred.
- 1970s** Congress enacted the Resource Conservation and Recovery Act (RCRA) that governs the day-to-day operations of hazardous waste generation, treatment, storage, and disposal facilities (sites).
- 1980s** Congress amended RCRA by passing the Hazardous and Solid Waste Amendments (HSWA). HSWA prescribes a corrective action process that focuses primarily on the investigation and cleanup, if required, of inactive sites.
- 1989** Environmental restoration began at the Laboratory to clean up sites that were formerly involved in weapons research and production.
- 1990s** The ER Project investigates
- Present** and cleans up sites that have the potential to affect human health or the environment, in accordance with the Laboratory's RCRA permit.

INFORMATION SHEET: ECOLOGICAL RISK ASSESSMENT



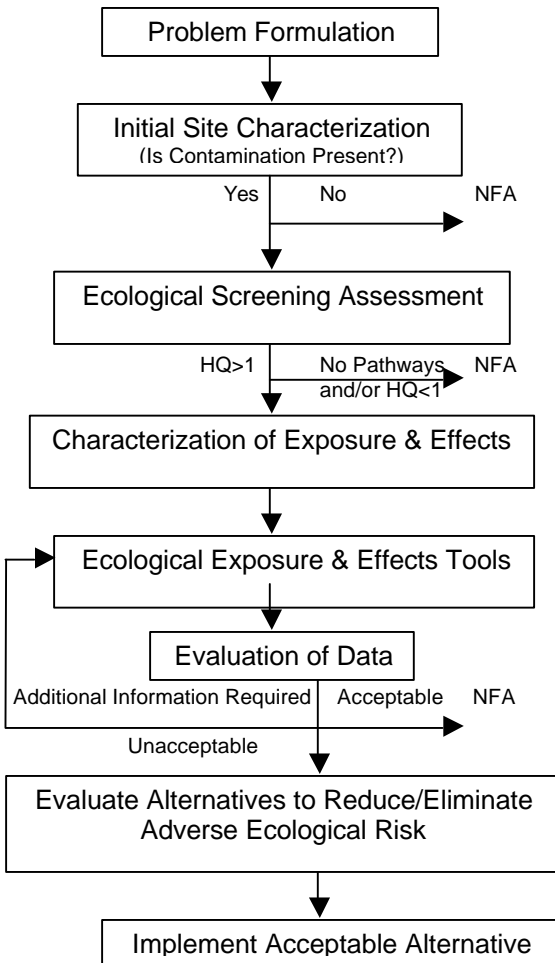
Cañon de Valle eco-system

If the assessment indicates that contamination at a site does not adversely impact the environment, that site may be proposed for no further action. However, if the assessment concludes that adverse impacts exist, a site-specific assessment may be conducted to confirm or disprove this finding. The assessment uses several tools to determine potential adverse ecological impacts. The tools include problem formulation, data analysis, field surveys, environmental data, toxicity tests, biota sampling, and modeling.

ECOLOGICAL RISK ASSESSMENT ACTIVITIES

All sites that require site characterization, i.e., the collection of samples, are evaluated for potential ecological risk using screening assessment methodologies. The NMED HWB has accepted sites as complete and has removed several sites from the Laboratory's Hazardous Waste Facility Permit based on the information obtained from screening assessments.

Ecological Risk Assessment Approach



*NFA – No Further Action
*Hazard quotient

An ecological risk assessment was implemented at solid waste management unit (SWMU)16-021(c). SWMU 16-021(c) is the outfall from high explosives production facilities at Technical Area (TA) 16. The screening assessment indicated potential effects to human health and the environment from barium and the high explosive RDX. In addition, a nesting pair of Mexican spotted owls, which is a threatened and endangered species, raised additional concerns. As a result, several ecological investigations were undertaken including small mammal (rodent) sampling, tissue analyses, and population studies, sediment toxicity tests, and biological surveys of the stream channel.

Another ecological risk assessment was implemented at Los Alamos/Pueblo Canyon watershed. This assessment is based on potential adverse impacts to plants and animals from contaminants released into the canyons from outfalls, potential release sites, and runoff. The COPECs in this watershed include polychlorinated biphenyls (PCBs), metals, radionuclides, and organic chemicals. Several ecological investigations (sampling, surveys, modeling) have been or will be started in the canyons.

The ecological risk assessment results will be used to propose actions where adverse impacts have been found. These actions may include remediation of contaminated areas and/or sources, best management practices to minimize the impact, and/or monitoring and surveillance to determine if natural processes eliminate/lessen the impacts or whether the impact has long-term consequences.

OPPORTUNITIES FOR PUBLIC INVOLVEMENT

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