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The Radiation Exposure Compensation Act (RECA): Compensation Related to Exposure to Radiation from Atomic Weapons Testing and Uranium Mining

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Summary

The Radiation Exposure Compensation Act (RECA) provides one-time benefit payments to persons who may have developed cancer or other specified diseases after being exposed to radiation from atomic weapons testing or uranium mining, milling, or transporting. Administered by the Department of Justice (DOJ), RECA has awarded nearly $2 billion in benefits to more than 30,000 claimants since its inception in 1990. The RECA program is scheduled to sunset in 2022.

RECA benefits are available to the following groups:

- onsite participants—$75,000 to persons who participated onsite in the atmospheric test of an atomic weapon and developed one of the types of cancers specified in the statute;
- downwinders—$50,000 to persons who were present in one of the specified areas near the Nevada Test Site during a period of atmospheric atomic weapons testing and developed one of the types of cancers specified in the statute; and
- uranium miners, millers, and ore transporters—$100,000 to persons who worked in mining, milling, or transportation of uranium between 1942 and 1971 and developed one of the types of diseases specified in the statute.

The RECA statute was last amended in 2000. Since then, Congress has frequently considered legislation to expand the downwinder-eligibility area by making persons who were affected in other states during periods of atmospheric atomic weapons testing eligible for benefits and by allowing uranium miners, millers, and ore transporters to qualify for benefits based on work after 1971. However, an expansion of the downwinder-eligibility area is not supported by a congressionally mandated National Research Council report on atomic test fallout and the inclusion of post-1971 uranium work, which was largely for commercial rather than governmental purposes, and is not consistent with the stated intent of the program.

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Introduction

The Radiation Exposure Compensation Act (RECA) was enacted in 1990 and provides one-time cash benefits to certain persons who participated in atomic weapons testing or lived near the Nevada Test Site during periods of atmospheric (above-ground) atomic weapons testing.[1] Benefits under RECA are also available to certain uranium miners, mill workers, and ore transporters who worked in the uranium industry between 1942 and 1971, when the federal government stopped its procurement of radiation for the atomic weapons program. All RECA claimants must have contracted one of the medical conditions specified in the statute after possible exposure to ionizing radiation from the detonation of an atomic weapon or after working in the uranium industry.

The RECA program is administered by the Civil Division of the Department of Justice (DOJ).[2] To date, DOJ has approved more than 30,000 RECA claims for nearly $2 billion in benefits. The majority of RECA claims are related to atomic weapons testing rather than the uranium industry. Complete RECA program data are provided in **Table A-1** in the **Appendix**.

Benefits under RECA are paid out of general revenue and are considered mandatory spending. Pursuant to the Radiation Exposure Compensation Act Amendments of 2000, P.L. 106-245, all RECA benefit applications must be filed before July 10, 2022, at which point the program will sunset.[3]

Atomic Weapons Testing at the Nevada Test Site

On July 16, 1945, the United States detonated the first atomic bomb at the Trinity Test Site near Alamogordo, New Mexico. This atomic weapons test, which was followed by the only two offensive uses of atomic weapons at Hiroshima and Nagasaki, Japan, ushered in an era of extensive development and testing of atomic weapons that would last until 1992. During this period, the United States, under the auspices of the Atomic Energy Commission (AEC) and later Department of Energy (DOE), conducted 1,054 atomic weapons tests.[4] The majority (928) of these tests were conducted at the Nevada Test Site (NTS), a 1,375 square-mile federal reservation located approximately 65 miles north of Las Vegas in Nye County, Nevada.[5] Of the 928 tests conducted at NTS, 828 were underground tests and 100 were atmospheric tests in which the atomic weapons exploded at or above ground level resulting in radioactive material being released into the atmosphere.[6] These 100 atmospheric tests and the initial Trinity test were the

[1] 42 U.S.C. §2210 note; enacted as P.L. 101-426 on October 15, 1990.

[2] The Radiation Exposure Compensation Act (RECA) program website is at http://www.justice.gov/civil/common/reca. Implementing regulations are at Part 79 of Title 28 of the Code of Federal Regulations (C.F.R.).

[3] Section 8(a) of RECA, as amended by P.L. 106-245 provides a filing deadline that is 22 years after the date of enactment of the 2000 amendments (July 10, 2000).

[4] Twenty-four of these tests were jointly conducted with the United Kingdom.

[5] The Nevada Test Site (NTS) is now referred to as the Nevada National Security Site and is administered by the Department of Energy (DOE), National Nuclear Security Administration. For additional information on the history and characteristics of the NTS, see Terrance R. Fehner and F.G. Gosling, *Origins of the Nevada Test Site*, Department of Energy, DOE/MA-0518, December 2000.

[6] During some underground tests, radioactive material escaped from underground through a process known as venting, thus releasing some radioactive material into the atmosphere.

only atmospheric atomic weapons tests conducted in the continental United States and Alaska. **Table 1** provides a summary of U.S. atomic weapons tests by location.

Table 1. United States Atomic Weapons Tests, by Location

Location	Number of Tests
South Atlantic Ocean Area	**3**
Pacific Ocean Area	**106**
United States other than Nevada Test Site (NTS)	**17**
Alamogordo, NM (Trinity Test Site)	1
Amchitka, AK	3
Carlsbad, NM	1
Central NV	1
Fallon, NV	1
Farmington, NM	1
Grand Valley, CO	1
Hattiesburg, MS	2
Nellis Air Force Range, NV	5
Rifle, CO	1
NTS	**928**
Total	**1,054**

Source: Department of Energy, *United States Nuclear Tests: July 1945 through September 1992*, DOE/NV-209-REV 15, December 2000, p. xiii.

Note: Includes 24 joint U.S.-U.K. tests conducted at NTS.

Atmospheric atomic weapons tests at NTS were conducted between January 27, 1951, and October 30, 1958, and again between July 7, 1962, and July 17, 1962. The largest atmospheric test at NTS in terms of energy yield was the Hood Test conducted on July 5, 1957, which had an energy yield equivalent to 74,000 tons (74 kilotons or kt) of trinitrotoluene (TNT).[7]

RECA Benefits

Compensation Payments

The following benefits are available under the RECA program:

- $75,000—*Onsite participants* (persons who were present at a test site during an atmospheric atomic weapons test);

[7] For comparison purposes, the first atomic bomb ever detonated had a yield of 21 kt; the atomic bombs dropped on Hiroshima and Nagasaki had yields of 15 kt and 21 kt, respectively; and the largest atmospheric test conducted by the United States, the Bravo Test at Bikini Atoll in the Marshall Islands on February 28, 1954, had a yield of 15 million tons (15 megatons or Mt).

- $50,000—*Downwinders* (persons who were present in certain areas north and west of NTS[8] during periods of atmospheric atomic weapons testing); and
- $100,000—*Uranium Workers* (uranium miners, uranium millers, and uranium ore transporters).

All benefits are one-time lump sum payments and are not adjusted to reflect changes in wages or the cost of living. Benefits are not subject to the federal income tax[9] but are reduced by any payments received from any lawsuit, workers' compensation system, or the Department of Veterans Affairs (VA) for any illnesses or injuries due to exposure to radiation from atomic weapons testing or work in the uranium industry covered by RECA.

No medical or other benefits are provided by the RECA program. However, uranium workers eligible for RECA are automatically eligible for an additional $50,000 in compensation and medical benefits that pay for all medical costs associated with their covered illnesses under Part B of the Energy Employees Occupational Illness Compensation Program Act (EEOICPA).[10]

Survivors' Benefits

Each onsite participant, downwinder, or uranium worker who qualifies for RECA is entitled to one benefit payment on his or her behalf. If the claimant is living, the benefit is paid to him or her directly. If claimant is deceased, then the benefit is paid to the following survivors according to order of precedence:

1. spouse, provided the spouse was married to the claimant for at least one year before the claimant's death;
2. children, in equal shares;
3. parents, in equal shares;
4. grandchildren, in equal shares; and
5. grandparents, in equal shares.

Only the survivors listed above are eligible for RECA benefits, and if there are no such survivors to a claimant, no benefit is paid on that claim.

RECA Eligibility

Onsite Participants

To be eligible for RECA benefits, an onsite participant must meet exposure and disease requirements.

[8] The areas eligible for downwinder compensation are listed in **Table 3** and provided in the map in the **Appendix**.

[9] 26 U.S.C. §104(a)(2).

[10] 42 U.S.C. §7384u. Onsite participants and downwinders are not automatically eligible for the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) and can only receive EEOICPA Part B benefits by establishing eligibility through work in the development, not testing, of atomic weapons.

Exposure Requirements

A person may be eligible for RECA benefits if he or she was present onsite and participated in an atmospheric atomic weapons test conducted by the United States and meets the specific geographic and participation requirements provided in the RECA regulations.

Geographic Requirements

A person must have been within or above one of the following geographic areas during a period of atmospheric atomic weapons testing,[11] including for up to six months after the period of testing ended:

- NTS;
- the Pacific Test Sites (Bikini Atoll, Enewetak Atoll, Johnston Island, Christmas Island, the test site for the shot during Operation Wigwam, the test site for Shot Yucca during Operation Hardtack I, and the test sites for Shot Frigate Bird and Shot Swordfish during Operation Dominic I) and the official zone around each site from which non-test affiliated ships were excluded for security and safety purposes;
- Trinity Test Site;
- the South Atlantic Test Site for Operation Argus and the official zone around the site from which non-test affiliated ships were excluded for security and safety purposes;
- any designated location within a naval shipyard, air force base, or other official government installation where ships, aircraft, or other equipment used in an atmospheric nuclear detonation were decontaminated; or
- any designated location used for the purpose of monitoring fallout from an atmospheric nuclear test conducted at NTS.[12]

Participation Requirements

A person must have held one of the following occupations and performed one of the following activities while onsite during a period of atmospheric atomic weapons testing, including for up to six months after the period of testing ended:

Required Occupations

- member of the Armed Forces;
- civilian employee or contract employee of the Manhattan Engineer District, the Armed Forces Special Weapons Project, the Defense Atomic Support Agency, the Defense Nuclear Agency, or the Department of Defense or its components or agencies or predecessor components or agencies;
- employee or contract employee of the AEC, the Energy Research and Development Administration, or the Department of Energy;

[11] The dates for each period of atmospheric atomic weapons testing are provided at 28 C.F.R. §79.31(d)(1).

[12] 28 C.F.R. §79.11(f).

- member of the Federal Civil Defense Administration or the Office of Civil and Defense Mobilization; or
- member of the U.S. Public Health Service;[13] and

Required Activities

- performed duties within the identified operational area around each atmospheric detonation of a nuclear device;
- participated in the decontamination of any ships, planes, or equipment used during the atmospheric detonation of a nuclear device;
- performed duties as a cloud tracker or cloud sampler;
- served as a member of the garrison or maintenance forces on the atoll of Enewetak between June 21, 1951, and July 1, 1952; between August 7, 1956, and August 7, 1957; or between November 1, 1958, and April 30, 1959; or
- performed duties as a member of a mobile radiological safety team monitoring the pattern of fallout from an atmospheric detonation of a nuclear device.[14]

Disease Requirements

An onsite participant must have contracted one of the types of cancers listed in **Table 2** after exposure to ionizing radiation from his or her participation in an atmospheric atomic weapons test.

Table 2. Specified Cancers for Eligibility as Onsite Participants and Downwinders

(all cancers must be primary cancers)

Onset of the disease was at least two years after first exposure to fallout		
Leukemia (other than chronic lymphocytic leukemia if exposure to fallout was after age 20)		
Onset of the disease was at least five years after first exposure to fallout		
Multiple Myeloma	Lymphomas (other than Hodgkin's disease)	Bile Duct Cancer
Brain Cancer	Breast Cancer (male or female)	Colon Cancer
Esophageal Cancer	Gall Bladder Cancer	Liver Cancer (except if cirrhosis or hepatitis B is indicated)
Ovarian Cancer	Pancreatic Cancer	Pharynx Cancer
Salivary Gland Cancer	Small Intestine Cancer	Stomach Cancer
Thyroid Cancer	Urinary Bladder Cancer	Lung Cancer

Source: 42 U.S.C. §2210 note.

[13] 28 C.F.R. §79.11(g)(1).

[14] 28 C.F.R. §79.11(g)(2).

Downwinders

To be eligible for RECA benefits as a downwinder, a person must meet specified exposure and disease requirements based on his or her physical presence near NTS, rather than through his or her participation in an atomic weapons test.

Exposure Requirements

A downwinder must have been physically present for a period of at least 24 consecutive months between January 21, 1951, and October 31, 1958; or for the entire period between June 30, 1962, and July 31, 1962, in one of the counties or geographic areas listed in **Table 3** and provided in the map in the **Appendix.**

Table 3. Downwinder Eligibility Areas

Arizona	Nevada	Utah
Apache County	Eureka County	Beaver County
Coconino County	Lander County	Garfield County
Gila County	Lincoln County	Iron County
Navajo County	Nye County	Kane County
Yavapai County	White Pine County	Millard County
Mohave County north of the Grand Canyon	Clark County townships 13 through 16 at ranges 63 through 71	Paiute County
		San Juan County
		Sevier County
		Washington County
		Wayne County

Source: 42 U.S.C. §2210 note.

Disease Requirements

A downwinder must have contracted one of the types of cancers listed in **Table 2** after exposure to ionizing radiation from an atmospheric atomic weapons test at NTS.

Uranium Workers

Miners

To qualify for RECA benefits, a uranium miner must meet specific exposure and disease requirements.

Exposure Requirements

A uranium miner must have worked in an above-ground or underground uranium mine for at least one year during the period between January 1, 1942, and December 31, 1971, or must have been

exposed to at least 40 working-level months (WLM) of radiation during this period, in one of the states listed in **Table 4**.[15]

Table 4. Uranium Worker Eligibility States

Arizona	Colorado	Idaho
New Mexico	North Dakota	Oregon
Texas	Utah	Wyoming

Source: 42 U.S.C. §2210 note.

Notes: Any additional state may apply for inclusion in this list and will be included if it is determined by DOJ that a uranium mine was operating in the state at any time during the period from January 1, 1942, to December 31, 1971. No state has ever been added to the list of eligible states.

A WLM is defined in the RECA statute as one working level of radiation exposure every work day for a month, or an equivalent exposure over a greater or lesser period of time. One working level of radiation exposure is defined as the concentration of decay products of radon that will release 130,000 megaelectron volts (MeV) of alpha energy per liter of air.[16]

Disease Requirements

A uranium miner must have developed lung cancer or one of the following non-malignant respiratory diseases after exposure to radiation:

- fibrosis of the lung;
- pulmonary fibrosis;
- corpulmonale related to fibrosis of the lung;
- silicosis; or
- pneumoconiosis.

Millers and Ore Transporters

Uranium millers and ore transporters may qualify for RECA benefits if they meet specific exposure and disease requirements.

Exposure Requirements

A uranium miller must have been employed in a uranium mill in one of the states listed in **Table 4** for at least one year during the period from January 1, 1941, to December 31, 1971.

An ore transporter must have worked transporting uranium ore or vanadium-uranium ore from a uranium mine or mill in one of the states listed in **Table 4** for at least one year during the period from January 1, 1941, to December 31, 1971.

[15] Any state may apply for uranium worker eligibility state status. If determined by the Department of Justice (DOJ) that a uranium mine was operating in the state at any time during the period from January 1, 1942, to December 31, 1971, that state will be added to the list. However, no state has ever been added to the list of eligible states.

[16] Radiation exposure in mines is largely caused by the inhalation of radon gas and the short-lived solid decay products of radon. In the RECA statute, these decay products are referred to as "short half-life daughters of radon."

Disease Requirements

A uranium miller or ore transporter must have developed one of the following conditions after exposure to radiation:

- primary lung cancer;
- primary renal cancer;
- a chronic renal disease, such as nephritis or kidney tubal tissue injury; or
- a non-malignant respiratory disease, specifically
  - fibrosis of the lung;
  - pulmonary fibrosis;
  - corpulmonale related to fibrosis of the lung;
  - silicosis; or
  - pneumoconiosis.

Application and Appeals Process

Application Process

DOJ's Civil Division administers the RECA program and makes eligibility decisions on claims. Benefit claims must be submitted in writing and on standard application forms provided by DOJ.

The RECA statute requires that claimants submit "written documentation" of their illnesses to qualify for benefits, and the RECA regulations provide detailed requirements on the types of documents that must be submitted. Section 6(d)(5) of the RECA statute requires that in cases submitted by Native Americans, the application and payment procedures established by DOJ must "take into consideration and incorporate, to the fullest extent feasible, Native American law, tradition, and custom."

Application decisions for RECA benefits are made by an assistant director within the Constitutional and Specialized Torts Section, Torts Branch, of the DOJ Civil Division. Decisions must be made within 12 months of the receipt of a completed application and all supporting materials. If no decision is made within 12 months, the application is automatically approved for benefits.

Radiation Exposure Screening and Education Program

Section 4 of the 2000 RECA amendments authorized the Department of Health and Human Services (HHS) to provide grants to federal, state, and local health centers and nonprofit organizations to (1) conduct cancer screenings of persons who may be eligible for RECA and (2) provide assistance with securing the medical documentation needed to file RECA claims. These grants are administered by the HHS Health Resources and Services Administration (HRSA) as the Radiation Exposure Screening and Education Program (RESEP). There are currently six RESEP clinics operating in Arizona, Colorado, New Mexico, Nevada, and Utah with one clinic

providing services exclusively to Native Americans.[17] Applicants for RECA benefits are not required to be screened for cancer at RESEP clinics.

Appeals Process

An applicant who is denied RECA benefits may file an appeal with the DOJ, which will be ruled on by an appeals officer appointed by the assistant attorney general of the Civil Division of DOJ. Appeals must be made in writing within 60 days of the initial decision, and the appeals officer must make a decision to affirm or reverse the initial decision or remand the case back to the assistant director for further action. An applicant dissatisfied with the outcome of his or her appeal may seek judicial review in the U.S. district court.

Attorney's Fees

Applicants for RECA benefits and applicants filing appeals of benefit denials may be represented in all matters related to the program by licensed attorneys. In addition, Native American claimants may be represented by non-attorney representatives of tribal organizations. These are the only non-attorneys authorized to represent RECA claimants. Non-attorney representatives may not charge fees for their representation. The RECA statute provides the following limitations on fees that may be collected by licensed attorneys who represent RECA claimants:

- for initial claims in which the attorney entered into a contract with the claimant on or after July 10, 2000, 2% of the benefits awarded;
- for initial claims in which the attorney entered into a contract with the claimant before July 10, 2000, 10% of the benefits awarded; and
- for the resubmission of previously denied claims, 10% of the benefits awarded.

In the case of an unsuccessful claim, an attorney may recover his or her costs associated with representing the claimant. Pursuant to a 2007 decision by the U.S. court of appeals and subsequent regulations, an attorney representing a successful claimant may recover his or her expenses associated with the claim in addition to the 2% or 10% fee.[18]

Outstanding Issues

As the RECA program enters its 25th year of providing benefits to onsite participants, downwinders, and uranium workers, some Members of Congress have introduced legislation to expand the eligibility area for downwinders and provide benefits to uranium workers who may have been exposed to radiation after 1971. While there have been no statutory changes to the RECA program since 2000, these outstanding issues will likely ensure that RECA remains on the congressional agenda.

[17] Additional information on the Radiation Exposure Screening and Education Program (RESEP) is available on the Department of Health and Human Services (HHS) website at http://www.hrsa.gov/gethealthcare/conditions/radiationexposure/index.html.

[18] Hackwell v. United States, 491 F. 3d 1229 (10 Cir. 2007); and 28 C.F.R. §79.74(b).

Expansion of the Downwinder Eligibility Area

Under current law, to qualify for RECA benefits as a downwinder, a person must have been present in one of the designated counties in Arizona, Nevada, or Utah during a period of atmospheric testing at NTS. Residents of other areas during testing, including some areas closer to NTS than the designated downwinder areas, areas near the Trinity test site in New Mexico, or residents of Guam who may have been affected by fallout from atomic weapons testing in the Pacific Ocean area are not eligible for benefits and new downwinder eligibility areas cannot be added to the program through regulation or executive action.

However, even before RECA became a federal program, residents of areas outside of the current downwinder eligibility area had expressed concern about the health effects of fallout from atomic weapons testing and attempted to gain compensation from the federal government through the civil courts.[19] The inability of downwinders to win civil judgments against either the federal government or atomic weapons testing contractors was one of the factors that led Congress to create the RECA program in 1990.[20]

Eligibility Areas in Early Legislation to Compensate Downwinders

The first bills to provide compensation to civilian downwinders affected by atmospheric testing at NTS were introduced during the 96th Congress in 1979. In the House of Representatives, H.R. 4766 would have made the United States liable for damages caused by atmospheric atomic testing at NTS to downwinders with cancer, onsite participants, and sheep herds damaged by atmospheric tests in 1953. Coverage under this bill would have been provided to downwinders with leukemia, thyroid cancer, bone cancer, or any other cancer that occurred more often in the affected area than would be expected as determined by the Secretary of Health, Education, and Welfare.

The affected area for downwinder eligibility in H.R. 4766 was a rectangular area around NTS from 112 degrees to 117.5 degrees longitude and from 36.5 degrees to 39 degrees latitude. In addition to areas in Nevada, Utah, and a small part of Inyo County, California, this area includes the northern portions of Mohave and Coconino Counties in Arizona, but does not extend south as far as the Colorado River. The boundaries as proposed by H.R. 4766 are provided in the map in the **Appendix**.

A companion Senate bill (S. 1865) also would have made the United States liable for damages to downwinders, onsite participants, and affected sheep herds as well as uranium miners. The bill would have created a federal advisory board with the authority to add to the list of specified cancers. The affected area for downwinder eligibility was expressed in terms of counties and other geographic features and included the following areas:

- in Arizona, the area north of the Grand Canyon and west of the Colorado River;

[19] For additional information on the history of the downwinder movement, see A. Costadina Titus, *Bombs in the Backyard: Atomic Testing and American Politics* (Reno, NV: University of Nevada Press, 2001).

[20] Lawsuits against the federal government for damages related to atomic weapons testing were barred by the principle of sovereign immunity and the discretionary function exemption to the Federal Tort Claims Act (FTCA; see Allen v. United States, 816 F.2d 1417 (10th Cir. 1987) and In re Consolidated United States Atmospheric Testing Litigation, 820 F.2d 982 (9th Cir. 1987)). Lawsuits against atomic weapons testing contractors were barred by Section 1631 of the Department of Defense Authorization Act of 1985 (P.L. 98-525; commonly known as the Warner Amendment), which made lawsuits under the FTCA (already barred) the sole remedy for injuries due to exposure to radiation from atomic weapons tests thus providing immunity to any contractors involved in the atomic testing program. For additional information on the FTCA, see CRS Report 95-717, *Federal Tort Claims Act (FTCA)*, by Vivian S. Chu.

- in Nevada, the counties of Eureka, Lander, Lincoln, Nye, and White Pine; and
- in Utah, the counties of Beaver, Carbon, Duchesne, Emery, Garfield, Grand, Iron, Kane, Juab, Millard, Piute, San Juan, Sanpete, Sevier, Uintah, Washington, and Wayne.

In addition, the bill would have given the Secretary of Health, Education, and Welfare the authority to add to the list of affected areas.

Eligibility Areas in the Original RECA Statute and the 2000 Amendments

The original RECA statute included a smaller downwinder eligibility area than is currently covered by the program. Initially, only residents of the following areas were covered by RECA:

- in Arizona, the area north of the Grand Canyon and west of the Colorado River;
- in Nevada, the counties of Eureka, Lander, Lincoln, Nye, and White Pine and Clark County townships 13 through 16 at ranges 63 through 71; and
- in Utah, the counties of Beaver, Garfield, Iron, Kane, Millard, Piute, and Sevier.

The current downwinder eligibility area was established with the enactment of the 2000 RECA amendments, which added geographical areas in Arizona and Utah and created the current area described in **Table 3**.[21] The initial and current RECA downwinder eligibility areas are provided in the map in the **Appendix**.

Legislative Attempts to Expand the Downwinder Eligibility Area

Since the enactment of the 2000 RECA amendments, Members of Congress have introduced numerous bills over multiple Congresses to expand the downwinder eligibility area. These bills would have expanded eligibility for NTS downwinders to persons who were living in Colorado, Idaho, Montana, and New Mexico as well as in the entire states of Arizona, Nevada, and Utah during periods of atmospheric atomic weapons testing at NTS. Additional legislation would have created downwinder eligibility for persons living in Guam during atomic weapons testing in the Pacific and for persons affected by fallout from the initial Trinity test in New Mexico.

National Research Council Review of the RECA Downwinder Eligibility Area

In 2002, in response to a mandate from Congress contained in the House report to accompany the 2002 Supplemental Appropriations Act for Further Recovery From and Response to Terrorist Attacks on the United States, P.L. 107-206, HRSA asked the National Research Council (NRC) Board on Radiation Effects Research to study scientific evidence related to the health effects of radiation exposure and make recommendations to Congress, including whether the RECA downwinder area should be expanded.[22] The NRC issued its final report on this study in 2005.[23]

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[21] The 2000 RECA amendments inadvertently excluded the portion of Mohave County, Arizona, that is north of the Grand Canyon that had been included in the original RECA legislation. This portion of Mohave County was added back to the downwinder eligibility area by Section 11007 of the 21st Century Department of Justice Appropriations Authorization Act, P.L. 107-273.

[22] U.S. Congress, House Committee on Appropriations, *Making Supplemental Appropriations for Further Recovery From and Response to Terrorist Attacks on the United States for the Fiscal Year Ending September 30, 2002, and for Other Purposes*, report to accompany H.R. 4775, 107th Cong., 2nd sess., May 20, 2002, H.Rept. 107-480, p. 38.

[23] National Research Council, *Assessment of the Scientific Information for the Radiation Exposure Screening and Education Program*, 2005.

The NRC concluded that any decisions on additional eligibility for downwinders should not be made solely on the basis of geographic area. Thus, it advised against simply adding more downwind counties. Citing studies showing that NTS fallout covered the entire country and that people living far beyond the current downwinder eligibility area may have been exposed to higher amounts of radiation, the NTC recommended an alternative science-based approach to determining downwinder eligibility for RECA benefits.

Individuals' exposure to fallout depended on multiple factors, including where they lived, the amount of time they spent outdoors, and their consumption of milk. That last factor is especially significant because the most important pathway of exposure was the ingestion of Iodine 131 (^{131}I)[24] through the consumption of milk from cows and goats that ate contaminated vegetation.[25]

To be equitable, the NRC report recommended that the RECA program use a model of probability of causation to evaluate individual claims for benefits instead of basing downwinder eligibility solely on geography and a presumption of eligibility. Under this model, each applicant's individual absorbed dose of radionuclides would be estimated using geographic, demographic, and behavioral factors and every person in the country would be eligible to apply for benefits. This estimated dose would then be used to calculate, using established radio-epidemiology formulas developed by NCI, the probability that the individual's specific type of cancer was caused by his or her exposure to ionizing radiation. Congress would then have to set the threshold at which to award benefits or perhaps award varying levels of benefits based on a sliding scale of probabilities.

This model, which is similar to one of the methods used to determine eligibility for benefits under Part B of EEOICPA and for disability compensation provided by the VA, has never been part of the RECA program or its amendments to expand the downwinder area. No legislation has ever been introduced to convert RECA downwinder eligibility from a model based on geography to one based on the probability of causation. In addition, in both the EEOICPA and veterans' programs, the probability of causation model has been largely supplanted by a presumption of eligibility model similar to that used in RECA.[26]

The presumptive eligibility model used by RECA may be favored by some advocates for compensation because the probability of causation model recommended by the NRC is likely to result in fewer successful claims. This is due to the generally low levels of radiation exposure from fallout and the fact that ionizing radiation is not an especially potent cancer-causing agent. In the executive summary to its report, the NRC states,

> The scientific evidence indicates that in most cases it is unlikely that exposure to radiation from fallout was a substantial contributing cause to developing cancer. Moreover, scientifically based changes that Congress may make in the eligibility criteria for compensation in response to this report are likely to result in few successful claims. The committee is aware that such conclusion may be disappointing, but they have been

[24] Iodine 131 is a radioactive isotope of the element iodine.

[25] National Cancer Institute, Estimated Exposures and Thyroid Doses Received by the American People from Iodine-131 in Fallout Following Nevada Atmospheric Nuclear Bomb Tests, October 1997. Additional information on this study, including detailed county-level data and an online calculator to estimate ^{131}I doses, is available at http://www.cancer.gov/cancertopics/causes/i131.

[26] In the case of the Energy Employees Occupational Illness Compensation Program Act (EEOICPA), the majority of cases paid have come through the Special Exposure Cohort process rather than the dose reconstruction process. In the case of veterans, the Radiation Exposed Veterans Compensation Act (REVCA; P.L. 100-321) was enacted in 1988 to provide a presumption of eligibility model for disability compensation benefits.

> reached in accordance with the committee's charge to base its conclusions on the results of best available scientific information.[27]

Benefits for Post-1971 Uranium Workers

Under current law, RECA benefits for uranium miners, millers, and ore transporters are only available if the worker was exposed to radiation during uranium work before 1972. In the original RECA legislation, the December 31, 1971 cut-off date for uranium worker eligibility was selected because the federal government's procurement of uranium for atomic weapons ended in 1971.

Beginning in 1964 with the enactment of the Private Ownership of Special Nuclear Materials Act, P.L. 88-489, private ownership of uranium for fuel for nuclear power plants has been legal, creating an additional market for mined and milled uranium and ensuring that mining, milling, and transporting uranium continued after the cut-off date for RECA eligibility.

Since the enactment of the 2000 RECA amendments, legislation has been introduced in Congress to expand RECA eligibility to uranium workers who may have been exposed to radiation after 1971. Legislation has also been introduced to include uranium mine core drillers in the RECA program and to require research into the health effects of uranium tailing piles.

Advocates for extending RECA eligibility for uranium work after 1971 argue that despite improved safety regulations enacted since 1971, including the enactment in 1977 of the Mine Safety and Health Act, P.L. 91-173, uranium workers, especially miners, remain at elevated risk for radon-induced diseases.[28] For example, the current Mine Safety and Health Administration (MSHA) annual exposure limit for radiation of 4 WLM[29] is higher than the annual exposure limit of 1 WLM recommended by the National Institute for Occupational Safety and Health (NIOSH), meaning that current uranium miners can be exposed to higher than recommended levels of radon while still being in compliance with federal safety standards.[30]

The intent of the RECA program, as expressed in Section 2 of the statute is to make "partial restitution" to persons who were affected by fallout from atomic weapons tests and uranium miners who were working in mines "that were providing uranium for the primary use and benefit of the nuclear weapons program of the United States Government," in recognition that the "lives and health of uranium miners and of individuals who were exposed to radiation were subjected to increased risk of injury and disease to serve the national security interests of the United States."

An expansion of RECA to cover post-1971 uranium activities would largely cover workers in the commercial uranium sector, which would expand the program beyond its original statutory intent. In addition, illnesses contracted during uranium mining, milling, and ore transporting for commercial clients, rather than the federal government, would likely be covered by existing state workers' compensation systems, which are the traditional means of providing medical benefits and compensation in cases of commercial workplace injuries, illnesses, or deaths.

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[27] Ibid., p. 4.

[28] See, e.g., Gary E. Madsen and Susan E. Dawson, "Unfinished Business: Radiation Exposure Compensation Act (RECA) for Post-1971 U.S. Uranium Underground Miners," *Journal of Health and Social Policy*, vol. 19, no. 4 (2004), pp. 45-59.

[29] 30 C.F.R. §57.5038.

[30] National Institute for Occupational Safety and Health, *A Recommended Standard for Occupational Exposure to Radon Progeny in Underground Mines*, October 1987.

Appendix. RECA Program Data and Downwinder Area Map

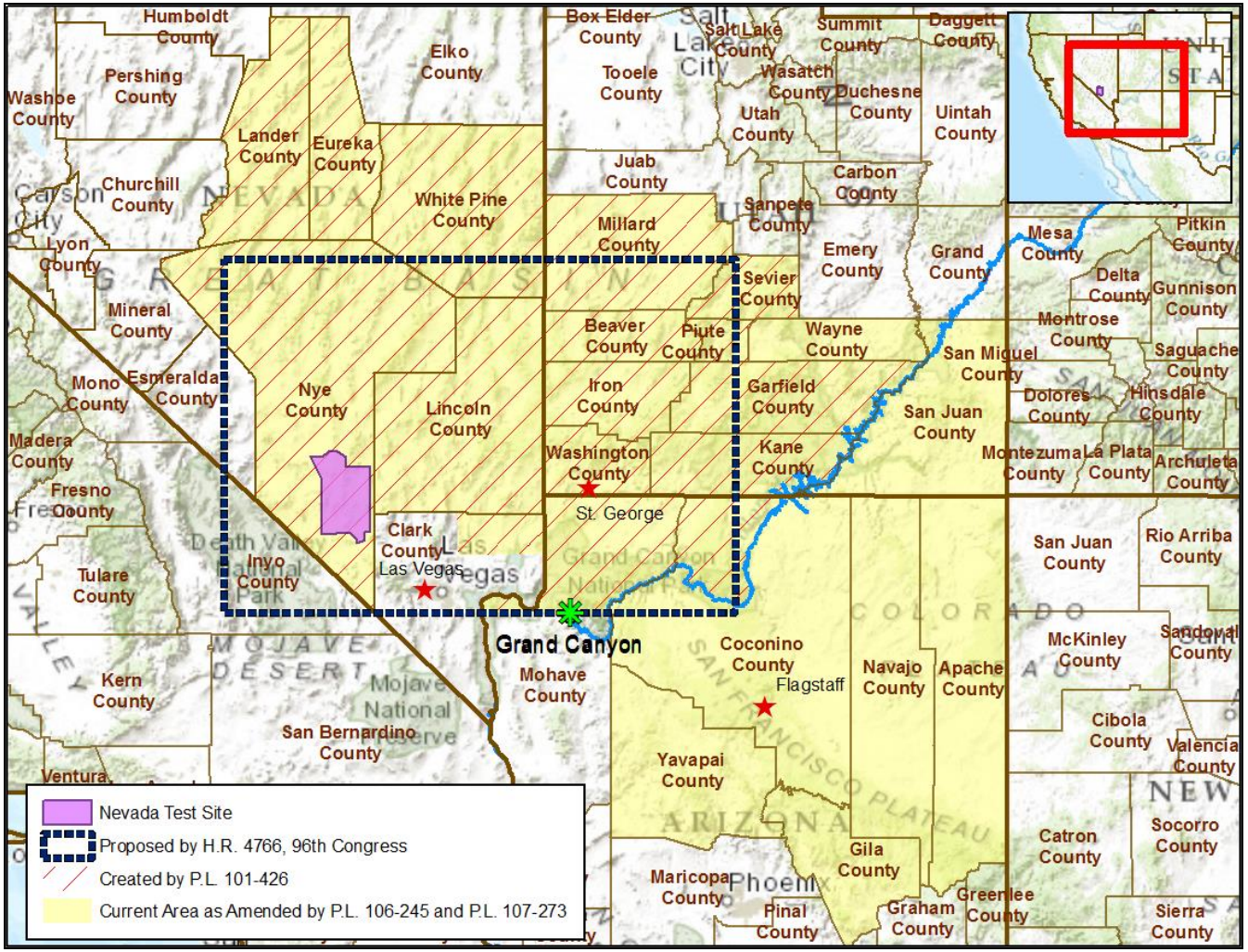
Table A-1. RECA Program Claims Data

(as of February 25, 2015)

Claim Type	Pending	Approved	Denied	Total	Benefits Approved ($)
Onsite Participant	254	3,670	3,088	7,022	266,929,545
Downwinder	428	18,550	4,255	23,233	927,470,000
Uranium Miner	97	6,105	3,554	9,756	609,774,560
Uranium Miller	42	1,627	492	2,161	162,700,000
Ore Transporter	14	316	140	470	31,600,000
Total	845	30,268	11,529	42,642	1,998,474,105

Source: Department of Justice, Radiation Exposure Compensation System, *Awards to Date Summary of Claims Received by 2/25/2015*, February 26, 2015, http://www.justice.gov/civil/awards-date-02262015.

Figure A-1. RECA Downwinder Area



Source: Congressional Research Service.

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