



Statement of

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Subcommittee on the Constitution, Civil Rights, and Civil Liberties
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Hearing on

**“Examining the Need to Expand Eligibility
Under the Radiation Exposure
Compensation Act”**

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Chairman Cohen, Vice Chair Ross, Ranking Member Johnson, and Members of the Subcommittee, my name is Scott Szymendera and I am an analyst at the Congressional Research Service (CRS). Thank you for inviting CRS to testify at today's hearing on the Radiation Exposure Compensation Act (RECA) and possible expansions of RECA eligibility for onsite participants (persons who participated in an atmospheric atomic weapons test, including those involved in certain decontamination and cleanup activities), downwinders (persons who were present in specified geographic areas near the site of atmospheric atomic weapons testing in Nevada), and uranium workers (uranium miners, millers, and ore transporters). My testimony will provide a history of the RECA legislation, an overview of the RECA program, and a discussion of potential expansions of eligibility for onsite participants, downwinders, and uranium workers.

The intent of RECA is to provide partial compensation to persons with cancers likely related to America's atomic weapons testing program, and persons with certain health conditions likely related to their work in the mining, milling, and transportation of uranium for the nation's atomic weapons program. Since its enactment in 1990, RECA has paid out nearly \$2.5 billion in benefits to more than 37,000 claims filed by and on behalf of onsite participants, downwinders, and uranium workers currently covered by the act.¹ The largest category of approved RECA claims is from downwinders, with these claims making up 63% of all approved claims.

Pursuant to the 2000 RECA amendments, the RECA program is scheduled to sunset on July 10, 2022, and absent congressional action to reauthorize the program, no new claims for benefits will be accepted by the Department of Justice after that date.² The FY2021 William M. (Mac) Thornberry National Defense Authorization Act included a provision expressing the sense of Congress that the federal government should continue to recognize and compensate individuals affected by exposure to radiation during atmospheric atomic weapons testing or by work in the uranium industry during the Cold War beyond the scheduled RECA sunset date in 2022.³

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 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 the 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

¹ Department of Justice, *Radiation Exposure Compensation System: Claims to Date Summary of All Claims Received by 3/17/2021*, March 17, 2021, <https://www.justice.gov/civil/awards-date-03172021>.

² Section 3(g) of the Radiation Exposure Compensation Act Amendments of 2000, P.L. 106-245. Prior to the enactment of this amendment, the RECA program was scheduled to sunset on October 15, 2010, the date that was 20 years after the date of enactment of the original Radiation Exposure Compensation Act, P.L. 101-426 (October 15, 1990).

³ Section 3147 of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, P.L. 116-283.

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

⁵ The NTS is now referred to as the Nevada National Security Site and is administered by the Department of Energy, 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.

material being released into the atmosphere.⁶ These 100 atmospheric tests were the only atmospheric atomic weapons tests conducted in the continental United States, Alaska, or Hawaii. **Table 1** provides a summary of U.S. atomic weapons tests by location.

Table 1. United States Atomic Weapons Tests

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
Nevada Test Site (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 United States-United Kingdom 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

The Path to RECA

There were mixed opinions among residents of the areas near NTS about the unique role their part of the country was playing in the Cold War. Some embraced the nearby testing, such as the Las Vegas casinos which advertised views of the tests from their properties, and Clark County, Nevada, which incorporated a mushroom cloud into its official seal. Others, however, expressed concern over potential health and

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

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).

property damage caused by the detonations. The AEC paid small amounts of compensation to area residents who suffered damages to property and loss of livestock.⁸

Throughout the 1970s, groups representing downwinders, NTS workers, veterans, and uranium workers gained political strength, aided by growing scientific evidence of the negative health effects of exposure to ionizing radiation,⁹ changing views in society on nuclear weapons,¹⁰ and congressional hearings held in 1978 and 1979 on the possible health effects of atomic weapons testing.¹¹

The Forgotten Guinea Pigs Report

The 1979 congressional hearings led to a report from the House Committee on Foreign and Interstate Commerce, Subcommittee on Oversight and Investigations, titled *The Forgotten Guinea Pigs*.¹² This report is notable for its conclusions regarding the impact of atomic testing at NTS on downwinders. The report concludes that the AEC failed to warn downwind residents of the dangers of testing at NTS, failed to properly monitor radiation exposure from NTS testing, and failed to properly study the health effects of NTS testing on downwinders. The report also states that:

...exposure to radioactive fallout emitted during the atmospheric nuclear test operations was, more likely than not, responsible for the serious adverse health effects suffered by the downwind residents.¹³

The report also recommends that Congress devise a compensation program for downwinders and provides detailed recommendations on how such a program should determine eligibility for compensation. The report recommended that a compensation program be based on the geographical location of persons affected by the testing.

Legal Activities

Among the first groups of downwinders to seek to use the courts to secure a remedy for damages allegedly sustained as a result of atmospheric testing at NTS were a group of Utah sheepherders. In 1956, they alleged that over 4,000 of their sheep were killed as a result of exposure to radioactive fallout from the 11 atmospheric tests conducted at NTS as part of Operation Upshot-Knothole between March 17, 1953, and June 4, 1953. The United States District Court for the District of Utah initially permitted the

⁸ A. Costadina Titus, *Bombs in the Backyard: Atomic Testing and American Politics* (Reno, NV: University of Nevada Press, 2001), p. 99.

⁹ See, for example, S. G. Machado et al., "Cancer Mortality and Radioactive Fallout in Southeastern Utah," *American Journal of Epidemiology*, vol. 127 (1987), pp. 44-61. Machado et al. found a statistically significant increase in leukemia deaths among adults and children living downwind from NTS in southwestern Utah.

¹⁰ Comprehensive histories of the development of the downwinder groups can be found in A. Costadina Titus, "Governmental Responsibility for Victims of Atomic Testing: A Chronicle of the Politics of Compensation," *Journal of Health Politics, Policy, and Law*, vol. 8, no. 2 (Summer 1983), pp. 277-292; and A. Costadina Titus, *Bombs in the Backyard: Atomic Testing and American Politics* (Reno, NV: University of Nevada Press, 2001).

¹¹ U.S. Congress, House Committee on Interstate and Foreign Commerce, Subcommittee on Health and the Environment, *Effect of Radiation on Human Health: Health Effects of Ionizing Radiation*, 95th Cong., 2 sess., January 24-26, 1978, Serial No. 95-179 (Washington: GPO, 1979); and U.S. Congress, House Committee on Interstate and Foreign Commerce, Subcommittee on Oversight and Investigations, *Low-Level Radiation Effects on Health*, 96th Cong., 1 sess., April 23, May 24, and August 1, 1979, Serial No. 96-129 (Washington: GPO, 1979).

¹² U.S. Congress, House Committee on Interstate and Foreign Commerce, Subcommittee on Oversight and Investigations, *The Forgotten Guinea Pigs: A Report on Health Effects of Low-Level Radiation Sustained as a Result of the Nuclear Weapons Testing Program Conducted by the United States Government*, 96th Cong., 2 sess., August 1980, Committee Print 96-IFC-58 (Washington: GPO, 1980).

¹³ *Ibid.*, p. 22.

sheepherders' claims to proceed despite objections from the government that such suits were barred by the Federal Tort Claims Act (FTCA) because they involved the discretionary functions of the federal government.¹⁴ While the court allowed the *Bulloch* suit to proceed, it ultimately ruled against the plaintiffs on the grounds that the "great weight of the evidence" demonstrated that:

the maximum radioactive doses to which the Bulloch sheep could have been subjected, whether as a result of direct fallout, residuals therefrom, ingestion of plants or water, or through other means, was substantially less than would have caused damage; that the expected and actual fallout in the areas in which the sheep were, or in which they could reasonably have been expected to be, was well within the permissible maximums for human or animal body tolerance; that there was no contamination of air, water or earth not consistent with benign conditions in the areas where the Bulloch sheep were located; that the signs and symptoms detected upon an examination of the sheep were not effects of radiation; and that since there was no substantial danger of damage to the sheep in question, and none occurred as a result of the Upshot-Knothole series, no negligence on the part of the Government has been established within the issues of the case.¹⁵

The Federal Tort Claims Act

The Federal Tort Claims Act (FTCA) is the statute which authorizes certain civil lawsuits against the United States government.¹⁶ Absent the provisions of the FTCA, the government enjoys sovereign immunity and thus "the United States cannot be sued without its consent."¹⁷ The FTCA is an express waiver of the government's sovereign immunity and provides both the circumstances under which the federal government can be sued, and the exceptions which prohibit suit against the government. One such exception to the FTCA is the discretionary function exception. It provides that the provisions of the FTCA do not apply to:

[a]ny claim based upon an act or omission of an employee of the Government, exercising due care, in the execution of a statute or regulation, whether or not such statute or regulation be valid, or based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the Government, whether or not the discretion involved be abused.¹⁸

Although the court in *Bulloch* ultimately ruled against the plaintiffs for reasons not related to the FTCA's discretionary function exception, downwinders and other civilians in future cases often found their path to recovery in the courts blocked by this clause of the FTCA.¹⁹ In both *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), the federal courts of appeals ruled that the discretionary function exception of the FTCA barred the claims by civilians against the federal government for damages resulting from atomic weapons testing. As stated by a judge concurring in the *Allen* decision:

¹⁴ *Bulloch v. United States*, 133 F. Supp. 885 (1955) (rejecting the government's motion to dismiss the suit). The FTCA is codified at 28 U.S.C. §§1346(b), 2671-2680.

¹⁵ *Bulloch v. United States*, 145 F. Supp. 824 (1956). In its report *The Forgotten Guinea Pigs*, the House Committee on Foreign and Interstate Commerce, Subcommittee on Oversight and Investigations concluded that the loss of the Utah sheep was "more likely than not" caused by radioactive fallout from the Operation Upshot-Knothole tests.

¹⁶ For additional information on the FTCA see CRS Report R45732, *The Federal Tort Claims Act (FTCA): A Legal Overview*.

¹⁷ *Federal Housing Administration v. Burr*, 309 U.S. 242, 244 (1940).

¹⁸ 28 U.S.C. §2680(a).

¹⁹ Members of the armed forces who participated in atomic weapons testing were also barred from bringing claims against the federal government under the *Feres* doctrine which prohibits members of the military from recovering damages from the United States [*Feres v. United States*, 340 U.S. 135 (1950)].

...while we have great sympathy for the individual cancer victims who have borne alone the costs of the AEC's choices, their plight is a matter for Congress. Only Congress has the constitutional power to decide whether all costs of government activity will be borne by all the beneficiaries or will continue to be unfairly apportioned, as in this case.²⁰

The Warner Amendment

One possible way around the immunity offered the federal government by the discretionary function exception of the FTCA was for downwinders and others to bring suit against the federal contractors who played various roles in the testing at NTS. However, this remedy was removed by Congress with the enactment of Section 1631 of the Department of Defense Authorization Act of 1985, P.L. 98-525, commonly known as the Warner Amendment after its sponsor, Senator John Warner. The Warner Amendment provides that a lawsuit under the FTCA is 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. In addition, the Warner Amendment provides that for the purposes of any lawsuit, the employees of a contractor are to be considered federal employees.

The intent of the Warner Amendment was to protect atomic weapons testing contractors from lawsuits because they were acting as “de facto instruments of the United States government in carrying out a governmental purpose” and to protect the federal government from the costs of paying judgments against the contractors, since under the provisions of the atomic weapons contracts, the contractors were indemnified by the federal government against any legal judgments.²¹

Because downwinder lawsuits against the federal government were already prohibited under the FTCA, the effect of the Warner Amendment was to remove any avenue downwinders or other civilians may have had to receive any remedy in the courts for injuries that they alleged were caused by the atomic testing program. As stated by the House Committee on the Judiciary in its report to accompany H.R. 1338, legislation to permit suits against atomic weapons testing contractors, “the real effect of the Warner Amendment is to leave the harmed individuals with no remedy at all.”²²

The First Federal Compensation Programs

Before the enactment of RECA in 1990, Congress had created two compensation systems for groups of people harmed by the atomic testing program, residents of the Marshall Islands and military veterans.

Compensation for Residents of the Marshall Islands

The largest atomic test conducted by the United States was the Bravo Test at Bikini Atoll in the Marshall Islands on February 28, 1954, which had a yield of 15 Mt. This test, along with other tests in the Marshall Islands, caused widespread environmental damage to the islands and surrounding waters and resulted in high levels of radioactive fallout landing on residents of nearby islands. Some of the Marshall Islands were completely vaporized by the Bravo Test while other parts of the Marshall Islands, including Bikini

²⁰ Allen, 816 F.2d at 1427. The Supreme Court declined to review either the court of appeals decision in *In re Consolidated* [*cert. denied*, 485 U.S. 905 (1988)] or *Allen* [*cert. denied*, 484 U.S. 1004 (1988)]. The district court ruled in a similar case, *Begay v. United States*, 591 F. Supp. 991 (1984), that the discretionary function exemption of the FTCA barred a claim brought by a uranium miner against the federal government for damages resulting from his work.

²¹ U.S. Congress, Senate Committee on Armed Services, *Omnibus Defense Authorization Act, 1985*, report to accompany S. 2723, 98th Cong., 2nd sess., May 31, 1984, S. Rept. 98-500 (Washington: GPO, 1984), pp. 376-377.

²² U.S. Congress, House Committee on the Judiciary, *Amending Title 28, United States Code, to Allow Suits Against the United States for Acts or Omissions of Contractors in Carrying Out the Atomic Weapons Testing Program, and to Substitute the United States as the Party Defendant in Suits Brought Against Such Contractors*, report to accompany H.R. 1338, 99th Cong., 2nd sess., April 29, 1986, H. Rept. 99-567 (Washington: GPO, 1986), p. 3.

and Enewetak Atolls, remain largely uninhabitable to this day because of atomic testing. At the time of the atomic testing, the United States had complete administrative control over the Marshall Islands as trustee for the United Nations Trust Territory of the Pacific Islands.

In the years following the Marshall Islands tests, the federal government provided intermittent payments and other forms of compensation and assistance to residents of the Marshall Islands. These payments were made in the absence of a formal compensation program. In 1986, the Marshall Islands was granted its independence from the United States and became a sovereign nation with economic and security ties to the United States. Section 177 of the Compact of Free Association between the United States and the Marshall Islands created a Nuclear Claims Fund (NCF) to be financed by the United States to pay claims to persons who suffered injuries or property damage from the atomic weapons tests.²³ A Nuclear Claims Tribunal (NCT) was established to disburse benefits from the NCF.

Disability Compensation for Atomic Veterans

In 1984 Congress passed the Veterans' Dioxin and Radiation Exposure Compensation Standards Act of 1984, P.L. 98-542, establishing the first program to provide disability compensation to veterans who were exposed to ionizing radiation while participating in atmospheric atomic testing or while serving in the occupation of Hiroshima and Nagasaki, Japan at the end of World War II. Under the 1984 law, a veteran may qualify for disability compensation from the Department of Veterans Affairs (VA) if it is determined by the VA that the veteran's disability is "at least as likely as not" to have been caused by an exposure to radiation while in service.²⁴ This determination is made based on the estimated dose of radiation the veteran received while in service, provided by either the Defense Threat Reduction Agency (DTRA) or another credible source. Using this estimated dose and radio-epidemiological formulas established by the National Cancer Institute (NCI), it is possible to estimate the probability that a given veteran's medical condition was caused by his or her estimated dose of radiation. If this probability of causation is 50% or greater, benefits are awarded based on the level of disability.

Radiation-Exposed Veterans Compensation Act (REVCA)

Veterans expressed concerns about the difficulty in receiving compensation under the 1984 law, Congress in 1988 enacted the Radiation-Exposed Veterans' Compensation Act (REVCA), P.L. 100-321. Under REVCA, any veteran who participated in a specified radiation-risk activity and has one of the specified cancers is presumed to have a service-connected condition and is eligible for disability compensation. The original REVCA legislation included three radiation-risk activities and 13 specified cancers. Amendments to REVCA in 1992²⁵ and 1999²⁶ added three cancers to the presumptive eligibility list. Regulatory changes by the VA in 2002 added five cancers to the presumptive eligibility list and added two activities to the list of radiation-risk activities.²⁷ An amendment to REVCA in 2004 designated that any service that

²³ Approval of the Compact of Free Association between the United States and the Marshall Islands was provided by enactment of the Compact of Free Association Act of 1985, P.L. 99-239.

²⁴ For additional information on disability compensation for veterans see CRS Report R44837, *Benefits for Service-Disabled Veterans*.

²⁵ Veterans' Radiation Exposure Amendments of 1992, P.L. 102-578.

²⁶ Veterans Millennium Health Care and Benefits Act, P.L. 106-117.

²⁷ Department of Veterans Affairs, "Diseases Specific to Radiation-Exposed Veterans," 67 *Federal Register* 3612, January 25, 2002. The five cancers added by this regulation were later added by law with the enactment of the Veterans Benefit Improvement Act of 2004, P.L. 108-454.

would be part of the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) Special Exposure Cohort (SEC) is considered a radiation-risk activity.²⁸

The Radiation Exposure Compensation Act

Legislative History of Eligibility Provisions

The first bills to provide compensation to civilian downwinders affected by atmospheric testing at NTS were introduced in 1979. In the House of Representatives, H.R. 4766, introduced by Representative K. Gunn McKay of Utah, 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 otherwise be expected as determined by the Secretary of Health, Education, and Welfare.

Also in 1979, in the Senate, S. 1865 would have also 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. In addition, the bill would have given the Secretary of Health, Education, and Welfare the authority to add to the list of affected areas. The 1979 House and Senate bills were not enacted into law.

Proposed Hatch Amendment to the Marshall Islands Compact

In 1985, Senator Orrin Hatch of Utah introduced an amendment to P.L. 99-239, the legislation that approved the Compact of Free Association between the United States and the Marshall Islands. This amendment would have created a compensation system, similar to that created for residents of the Marshall Islands, for NTS downwinders with cancer, uranium miners, or persons who suffered livestock damage due to exposure to ionizing radiation from NTS. This amendment was not in the final legislation that became law.

The Radiation Exposure Compensation Act of 1990

On October 15, 1990, President George H. W. Bush signed the Radiation Exposure Compensation Act, P.L. 101-426, into law. The RECA act began with the following findings:

- (1) fallout emitted during the Government's above-ground nuclear tests in Nevada exposed individuals who lived in the downwind affected area in Nevada, Utah, and Arizona to radiation that is presumed to have generated an excess of cancers among these individuals;
- (2) the health of the individuals who were unwitting participants in these tests was put at risk to serve the national security interests of the United States;
- (3) radiation released in underground uranium mines that were providing uranium for the primary use and benefit of the nuclear weapons program of the United States Government exposed miners to large doses of radiation and other airborne hazards in the mine environment that together are presumed to have produced an increased incidence of lung cancer and respiratory diseases among these miners;
- (4) the United States should recognize and assume responsibility for the harm done to these individuals; and

²⁸ P.L. 108-454. For additional information on EEOICPA, see CRS Report R46476, *The Energy Employees Occupational Illness Compensation Program Act (EEOICPA)*.

(5) the Congress recognizes that the lives and health of uranium miners and of innocent individuals who lived downwind from the Nevada tests were involuntarily subjected to increased risk of injury and disease to serve the national security interests of the United States.

The act also provided an apology from Congress on behalf of the United States to downwinders, onsite participants, and uranium miners and their respective families “for the hardships they have endured.”

Onsite Participant and Downwinder Provisions

The original RECA act provided one-time cash payments, to be administered by the Department of Justice (DOJ), to onsite participants, downwinders, and uranium miners, or their eligible survivors. Onsite participants and downwinders were eligible for \$50,000 payments. To be eligible for benefits, onsite participants and downwinders were required to have one of the following types of cancer:

- leukemia, other than chronic lymphocytic leukemia, provided onset was between two and 20 years after first exposure to fallout;
- any of the following cancers provided onset was at least five years after exposure to fallout:
 - multiple myeloma;
 - lymphomas other than Hodgkin’s disease;
 - thyroid, provided initial exposure to fallout occurred before age 20;
 - female breast, provided initial exposure to fallout occurred before age 40;
 - esophagus, provided low alcohol consumption and not a heavy smoker;
 - stomach, provided initial exposure before age 20;
 - pharynx, provided not a heavy smoker;
 - small intestine;
 - pancreas, provided not a heavy smoker and low coffee consumption;
 - bile ducts;
 - gall bladder; and
 - liver, except if cirrhosis or hepatitis B indicated.

This list of cancers provided by the original RECA act was the same as those provided in the 1988 REVCA legislation. However, for each cancer, the REVCA legislation does not include the qualifying behavioral factors such as alcohol consumption.

To qualify for benefits as a downwinder, a person had to have one of the listed cancers and have been physically present for two years (one year if claiming benefits based on leukemia with initial exposure to fallout occurring before age 21) during the period between January 21, 1951 and October 31, 1958, or during the entire period between June 30, 1962, and July 31, 1962, in one of the following counties or areas:

- 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 the area of Clark County that consists of townships 13 through 16 at ranges 63 through 71;²⁹ and

²⁹ This is a small area in the northern part of Clark County.

- In Utah the counties of Beaver, Washington, Garfield, Iron, Kane, Millard, Piute, and Sevier.

The downwinder area in the original RECA act is larger than was first proposed in the 1979 bill in the House but smaller than what was proposed in the 1979 bill in the Senate. Regulations implementing the original RECA act were published by the Department of Justice on April 10, 1992.³⁰

Uranium Worker Provisions

The original RECA act provided compensation of \$100,000 to eligible uranium miners who worked in uranium mines in Arizona, Colorado, New Mexico, Utah, or Wyoming during the period from January 1, 1947 through December 31, 1971. To be eligible for compensation, uranium miners had to satisfy the conditions of one of the following categories, based on work history, smoking history, and disease:

- If a nonsmoker, exposed to at least 200 working-level months (WLM) of radiation, and developed lung cancer or a specified nonmalignant respiratory disease after exposure;³¹
- If a smoker, exposed to at least 300 WLM of radiation, and developed lung cancer or a specified nonmalignant respiratory disease after exposure and before age 45; or
- If a smoker, exposed to at least 500 WLM of radiation, and developed lung cancer or a nonmalignant respiratory disease after exposure and at any age.

The nonmalignant respiratory diseases specified in the act and eligible for compensation were:

- For miners at all mines:
 - Fibrosis of the lung, pulmonary fibrosis, and cor pulmonale related to fibrosis of the lung;³² and
- For miners at mines on Indian Reservations:
 - All of the diseases specified for miners at all mines, and moderate or severe silicosis or pneumoconiosis.

The Radiation Exposure Compensation Act Amendments of 2000

The original RECA act was amended by Congress in 2000 with the enactment of the Radiation Exposure Compensation Act Amendments of 2000, P.L. 106-697. These amendments made significant changes to the eligibility requirements for downwinders, onsite participants, and uranium workers.

Changes to Eligibility for Onsite Participants and Downwinders

The 2000 amendments removed from the list of cancers eligible for compensation for onsite participants and downwinders many of the qualifying statements based on a person's behavior. For example, under the original act a person was eligible if he or she had primary cancer of the pancreas only if he or she was not a heavy smoker or coffee drinker; under the amendments in 2000, the references to smoking and coffee were removed so that a person's behavior was not a factor in his or her determination of eligibility.

³⁰ Department of Justice, "Radiation Exposure Compensation Act," *57 Federal Register* 12428, April 10, 1992.

³¹ 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." 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.

³² Cor pulmonale, commonly spelled cor pulmonale, is an enlargement of the right ventricle of the heart secondary to a lung disorder that causes high blood pressure in the pulmonary artery.

In addition, the downwinder area was expanded with the addition of San Juan and Wayne Counties in Utah. In Arizona, the downwinder area was changed from the area north of the Grand Canyon and West of the Colorado River to the areas comprising the counties of Apache, Coconino, Gila, Navajo, and Yavapai. In making this change, the northern area of Mohave County, located north of the Grand Canyon, which had been part of the original RECA downwinder area, was removed from the downwinder area as Mohave County is not listed in the amendments in 2000.

Changes to Eligibility for Uranium Workers

The 2000 amendments expanded RECA eligibility for uranium workers. The amendments granted eligibility to certain uranium millers and ore transporters in addition to uranium miners. The list of eligible states for uranium worker eligibility was expanded to include Idaho, North Dakota, Oregon, South Dakota, and Texas, and the Attorney General was given the authority to add states to this list. In addition, the threshold for eligibility of miners was reduced to 40 WLM or one year of mine work, with no eligibility categories related to smoking behavior. Pursuant to the 2000 amendments, all uranium workers, regardless of whether or not they worked on Indian Reservations, could become eligible based on silicosis and pneumoconiosis and uranium millers and ore transporters could become eligible based on renal cancer or other chronic renal diseases.

The 21st Century Department of Justice Appropriations Authorization Act

The 2000 RECA amendments removed the northern part of Mohave County, Arizona from the downwinder eligibility area. This area of Mohave County was added back to the eligibility area in 2002 with the enactment of Section 11007 of the 21st Century Department of Justice Appropriations Authorization Act, P.L. 107-273. This provision, listed as a “technical amendment” in the legislation, returned the area in Arizona north of the Grand Canyon to the RECA downwinder eligibility area. The only area in Arizona affected by this change was the northern portion of Mohave County.

RECA Today: Eligibility and Benefits

The RECA program is administered by the Civil Division of the Department of Justice (DOJ) and is codified in statute at 42 U.S.C. § 2210 note with implementing regulations at 28 C.F.R. §§ 79.1-79.75.³³ RECA pays one-time compensation of \$75,000 to eligible onsite participants or their eligible survivors, \$50,000 to eligible downwinders or their eligible survivors, and \$100,000 to eligible uranium miners, millers, and ore transporters or their eligible survivors. Decisions on eligibility and benefits are made by the DOJ and can be appealed in the federal courts.

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.

³³ The RECA program website is at: <http://www.justice.gov/civil/common/reca.html>.

RECA Eligibility

Onsite Participants

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

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,³⁴ including for up to six months after the period of testing ended:

- NTS;
- the Pacific Test Sites (Bikini Atoll, Eniwetok 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.³⁵

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 DOE;

³⁴ The dates for each period of atmospheric atomic weapons testing are provided at 28 C.F.R. §79.31(d)(1).

³⁵ 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;³⁶ 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.³⁷

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.

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**.³⁸

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.

³⁶ 28 C.F.R. §79.11(g)(1).

³⁷ 28 C.F.R. §79.11(g)(2).

³⁸ The RECA regulations at 28 C.F.R. §79.23 provide that a person who resided or was employed full-time in the downwinder eligibility area is presumed to have been physically present in the area for the duration of his or her residence or employment.

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	Multiple Myeloma	Multiple Myeloma
Brain Cancer	Brain Cancer	Brain Cancer
Esophageal Cancer	Esophageal Cancer	Esophageal Cancer
Ovarian Cancer	Ovarian Cancer	Ovarian Cancer
Salivary Gland Cancer	Salivary Gland Cancer	Salivary Gland Cancer
Thyroid Cancer	Thyroid Cancer	Thyroid Cancer

Source: 42 U.S.C. §2210 note.

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.

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**.³⁹

³⁹ Any state may apply for uranium worker eligibility state status. If determined by the Department of Justice (DOJ) that a

Table 4. Uranium Worker Eligibility States

Arizona	Colorado	Idaho	New Mexico
North Dakota	Oregon	South Dakota	Texas
Utah	Washington	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 through this process.

Disease Requirements

A uranium miner must have developed lung cancer or one of the following nonmalignant 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.⁴⁰

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.

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 nonmalignant respiratory disease, specifically
 - fibrosis of the lung;

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.

⁴⁰ Uranium milling is the process of extracting or leaching uranium from the mined ore and then concentrating the extracted uranium into a solid form of uranium dioxide commonly referred to as yellowcake.

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

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);
- \$50,000—*Downwinders* (persons who were present in certain areas north and west of NTS 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 tax⁴¹ but are offset by any payments received from any lawsuit or settlement, or by any disability compensation or Dependency and Indemnity Compensation (DIC) payments from 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.⁴² For onsite participants with claims based on diseases other than leukemia, RECA benefits are offset by the actuarial present value of prior payments.⁴³ For all other beneficiaries, including onsite participants with claims based on leukemia with radiation exposure prior to age 21, RECA benefits are offset by the actual value of prior payments. A veteran who has received RECA benefits prior to the receipt of disability compensation benefits from the VA under the presumptive eligibility provisions of the REVCA, is required to have his or her VA benefits reduced by the amount of his or her RECA benefits.⁴⁴

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 for 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).⁴⁵

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 the claimant is deceased, then the benefit is paid to the following survivors according to order of precedence:

⁴¹ 26 U.S.C. §104(a)(2).

⁴² Section 6(c)(2) of the Radiation Exposure Compensation Act (42 U.S.C. §2210 note).

⁴³ The actuarial present value of prior payments is calculated in accordance with 28 C.F.R. §79.75(e) and Appendix C to Part 79 of Title 28 of the C.F.R.

⁴⁴ 38 U.S.C. §1112(c)(4).

⁴⁵ 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.

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.⁴⁶

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.

Possible Expansions of RECA Eligibility

Expansion of Eligibility for Onsite Participants

Eligibility of Enewetak Cleanup Workers

Between 1948 and 1958, the federal government conducted 41 atmospheric and two underwater atomic weapons tests at Enewetak Atoll in the Marshall Islands.⁴⁷ Included in these tests was the atmospheric Mike Test, part of Operation Ivy, on November 1, 1952. This was the first full-scale test of a fusion weapon by the United States and resulted in a yield of 10.4 Mt.⁴⁸ Beginning in 1972, the federal government began to prepare for the cleanup of radiological material at Enewetak, with onsite cleanup activities involving members of the American military and American civilians beginning on May 3, 1977, and lasting until the final American personnel left Enewetak on May 13, 1980.⁴⁹ More than 100,000 cubic yards of radiological material, including contaminated soil and debris, from throughout Enewetak was moved to Runit Island and placed in a 374-foot diameter and 24.3-foot high cement containment dome built over the crater made by the 1958 Cactus Test.⁵⁰ A total of 7,984 persons participated in the federal government's cleanup efforts at Enewetak, including 5,617 members of the military and 2,367 civilians.⁵¹

Under current RECA program regulations, persons who participated in the cleanup of Enewetak Atoll are not considered onsite participants and thus are not eligible for RECA benefits. The RECA regulations limit eligibility of post-test cleanup workers to those in the following categories:

- performed duties in the operational area of a test during the test and during the six-month period after a test;⁵²
- participated in the decontamination of ships, planes, or equipment used in an atmospheric test;⁵³ and

⁴⁶ Section 6(c)(4) of the Radiation Exposure Compensation Act (42 U.S.C. §2210 note).

⁴⁷ Department of Energy, *United States Nuclear Tests: July 1945 through September 1992*, DOE/NV-209-REV 15, December 2000.

⁴⁸ For additional information on atomic weapons testing at Enewetak Atoll, see Defense Nuclear Agency, *The Radiological Cleanup of Enewetak Atoll*, Washington, DC, 1981.

⁴⁹ Defense Nuclear Agency, *The Radiological Cleanup of Enewetak Atoll*, Washington, DC, 1981; and Defense Threat Reduction Agency, *The Radiological Cleanup of Enewetak Atoll*, Fact Sheet, Fort Belvoir, VA, March 2018.

⁵⁰ Department of Energy, *Report on the Status of the Runit Dome in the Marshall Islands*, Report to Congress, June 2020, p. 2.

⁵¹ Defense Nuclear Agency, *The Radiological Cleanup of Enewetak Atoll*, Washington, DC, 1981, pp. 645-646.

⁵² 29 C.F.R. §§79.11(g)(2)(i) and (h).

⁵³ 29 C.F.R. §79.11(g)(2)(ii).

- served as a member of the garrison or maintenance forces on 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, 1959.⁵⁴

Persons who participated in the cleanup of Enewetak Atoll between 1977 and 1980 do not fall into any of these eligibility categories because they were in Enewetak after the six-month post-testing period and outside of the periods specified in the regulations and were involved in debris and soil cleanup rather than the decontamination of ships, aircraft, or equipment.

Legislation (H.R. 1585 and S. 565) has been introduced in the 117th Congress to make military service during the Enewetak cleanup a radiation-risk activity for the purposes of presumptive eligibility for veteran's disability compensation under RECA. While this legislation would not change RECA eligibility for civilians involved in the Enewetak cleanup, it would create a precedent of federal eligibility for benefits based on exposure to radiation during this cleanup period. Section 4(d) of the Radiation Exposure Compensation Amendments of 2019, H.R. 3783 in the 116th Congress, would have amended the RECA statute to provide that persons who participated in the cleanup of Enewetak Atoll between 1977 and 1980 were onsite participants for the purposes of RECA eligibility.

Advocates for this legislation, such as the National Association of Atomic Veterans, cite high numbers of cancers, other diseases, and premature deaths among former Enewetak cleanup workers as evidence of the radiation risk faced by these workers and need for them to be compensated.⁵⁵ Including Enewetak cleanup workers in the RECA definition of onsite participants would create parity between these workers and the cleanup and decontamination workers that are currently covered by RECA: those that performed cleanup activities onsite in the six months after a test and those that were involved in the decontamination of ships, aircraft, and equipment used in atomic weapons tests.

If RECA eligibility were extended to Enewetak cleanup workers, questions could be raised about eligibility for other persons who worked at test sites long after periods of atmospheric testing. The NTS, for example, continued to conduct underground atomic weapons tests until September 23, 1992, and workers who participated in those tests or post-test cleanup efforts may have been exposed to radiation from venting events during the underground tests or during cleanup of equipment and debris. Today, there are still federal employees and contractors working in a variety of roles at NTS, which has been renamed the Nevada National Security Site, and an extension of eligibility for Enewetak cleanup workers could raise questions about the eligibility of these present-day workers at the Nevada site.

Expansion of Eligibility for Downwinders

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. New downwinder eligibility areas cannot be added to the program through regulation or executive action. Thus, 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 and the Commonwealth of the Northern Mariana Islands who may have been affected by fallout from atomic weapons testing in the Pacific Ocean area, are not eligible for benefits.

⁵⁴ 29 C.F.R. §79.11(g)(iv).

⁵⁵ Claudia Grislaes, "Conspiracy of Silence: After Atomic Blasts, a Dangerous Cleanup Scarred Troops for Life," *Stars and Stripes*, June 18, 2019, <https://www.stripes.com/news/conspiracy-of-silence-after-atomic-blasts-a-dangerous-cleanup-scarred-troops-for-life-1.586563>.

Expansion of the NTS Downwinder Area

The two versions of the Downwinders Parity Act of 2021 introduced in the 117th Congress, H.R. 538 and H.R. 612, would expand the RECA downwinder area to include all of Clark County, Nevada, and Mohave County, Arizona. Under current law, only parts of these counties are included in the downwinder eligibility area, making these the only two counties that are only partially included in the eligibility area. In past Congresses, legislation has been introduced to include areas in states other than Arizona, Nevada, and Utah in the downwinder eligibility area. For example, in the 116th Congress, Section 4(g) of H.R. 3783 would have expanded the downwinder areas for tests conducted at NTS to include the entirety of the states of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, and Utah.

History of the NTS Downwinder Area Provision

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 in 1979 are provided in the map in the **Appendix**.

A companion bill in the Senate (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 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;
- 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 covered downwinder 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**.⁵⁶ The initial and current RECA downwinder eligibility areas are provided in the map in the **Appendix**.

Issues Related to the Possible Expansion of the NTS Downwinder Area

The decision on whether and how to expand the RECA downwinder area is ultimately a political one that may be made by Congress. A congressionally-mandated review of RECA by the National Research Council (NRC) in 2002 did not find scientific evidence to support expanding the downwinder eligibility area solely by adding additional geographic areas. Rather, the NRC recommended a new probability of causation model be used to determine RECA eligibility. However, experience with other programs that provide benefits to persons affected by ionizing radiation has shown this model to be difficult to administer effectively and efficiently.

National Research Council Review of RECA

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, the Department of Health and Human Services (HHS), Health Resources and Services Administration (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 several recommendations to Congress including whether or not the RECA downwinder area should be expanded.⁵⁷ The NRC issued its final report on this study in 2005.⁵⁸

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 reached in accordance with the committee's charge to base its conclusions on the results of best available scientific information.⁵⁹

In its report, the NRC concluded that any decisions on additional eligibility for downwinders should not be made solely on the basis of geographic area. Citing, among other studies, county-level estimates of thyroid doses of Iodine 131 (¹³¹I)⁶⁰ resulting from all atmospheric tests at NTS prepared by the NCI, the NRC concluded that factors other than geography, including age at the time of exposure and certain behaviors, are also correlated with a person's dose of ionizing radiation from atomic testing fallout.⁶¹

⁵⁶ 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).

⁵⁷ 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.

⁵⁸ National Research Council, Committee to Assess the Scientific Information for the Radiation Exposure Screening and Education Program, *Assessment of the Scientific Information for the Radiation Exposure Screening and Education Program*, National Academies Press, 2005.

⁵⁹ *Ibid.*, p. 4.

⁶⁰ Iodine 131 is a radioactive isotope of the element Iodine.

⁶¹ 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 ¹³¹I doses is online at: <http://www.cancer.gov/cancertopics/causes/i131>.

In addition, building on the work done by the NCI, the NRC report shows that, at least in the case of ^{131}I , atmospheric tests at NTS did not always produce the highest levels of fallout in the downwinder states of Arizona, Nevada, and Utah due to the specific composition of the fallout and atmospheric conditions during and after detonation. For example, because a common pathway of ^{131}I into the human thyroid gland, where it can cause thyroid cancer, is through the consumption of milk from cows or goats which have ingested vegetation coated with ^{131}I from atomic fallout, any estimates of human doses of ^{131}I absorbed after a release of ionizing radiation must take into account the type and quantity of milk that a person drank in the period after the release. The data showing a lack of clear patterns of fallout limited to states near NTS, and the behavioral factors cited by the NRC in its discussion of the impact of ^{131}I demonstrate the limitations of the current model of downwinder eligibility based solely on geography.

The Probability of Causation Model

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. 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 some threshold at which to award benefits or perhaps award varying levels of benefits based on a sliding scale of probabilities. This model has never been part of the RECA program or its amendments to expand the downwinder area.

Probability of Causation in Practice: Veterans and EEOICPA

Two existing programs that provide compensation based on exposure to ionizing radiation use the probability of causation model recommended by the NRC to make eligibility decisions. Under the Veterans' Dioxin and Radiation Exposure Compensation Standards Act of 1984, veterans who do not have one of the specified cancers listed under RECA may be awarded disability compensation if it is determined that the probability that their disease was caused by their exposure to ionizing radiation is 50% or greater. For each veteran who applies for benefits, his or her individual dose of absorbed radiation is estimated through a process referred to as dose reconstruction using available records, dosimetry badge data, or other information. This estimated absorbed dose, along with the established radio-epidemiology formulas established by the NCI, allows the VA to estimate the probability of causation for each veteran.

Under Part B of EEOICPA, former atomic weapons industry workers may receive compensation for cancer through two pathways. If their former worksite has been added to the EEOICPA Special Exposure Cohort (SEC), then they need only show that they have one of the specified cancers to be eligible for benefits. However, if their worksite is not part of the SEC, then they must apply for benefits individually. Individual applicants have their total absorbed doses of ionizing radiation estimated through dose reconstruction and the probability of causation estimated using the NCI radio-epidemiological formulas. As in the case of veterans, workers under EEOICPA are eligible for benefits if their probability of causation is 50% or greater.

Challenges Involved in Probability of Causation

While the probability of causation can provide an estimate of the likelihood that a person's cancer is linked to their exposure to ionizing radiation, experience with the veterans and EEOICPA programs has brought to light several challenges faced when using this as a model for compensation.

First, the probability of causation model relies on accurate dose reconstruction, which is a process fraught with uncertainty because of the limited exposure data that is often available. Using the example of ^{131}I

exposure, for an accurate dose estimation a person would have to accurately provide information on the type of milk that they drank (cow or goat), the source of that milk (fresh or store-bought), and the quantity of milk that they regularly consumed over 60 years ago. Dose reconstruction models generally use the upper limit of the range of possible doses in order to give the exposed individual the benefit of the doubt. In a 2003 report, the NRC concluded that despite this general approach, certain aspects of the dose reconstruction process can still lead to underestimates of exposure. However, the NRC further concluded that adopting its recommendations to revise dose reconstruction would not have a significant impact on the number of successful claims for compensation.⁶²

Second, moving from a model based on presumptive eligibility based on geography to one based on individual probability of causation would be to move the RECA program in a direction opposite of the development of the veterans and EEOICPA programs. In the case of veterans, difficulties with the probability of causation model were one of the factors which led Congress to create the presumptive eligibility model under REVCA. While Congress in 2000 created Part B of EEOICPA with a probability of causation model, it also offered an alternative pathway, the SEC, based on presumptive eligibility and even mandated that workers at the Paducah, Kentucky; Portsmouth, Ohio; and Oak Ridge, Tennessee gaseous diffusion plants; and the Amchitka Island, Alaska underground test site be included in the SEC. For all other workers, Congress created a process by which a federal advisory panel and the Secretary of Health and Human Services can add groups of workers to the SEC. To date, 128 additional groups of workers and worksites have been added to the EEOICPA SEC⁶³ and more than 70% of the cases that have been awarded benefits under Part B of EEOICPA have been awarded through the SEC process and not the probability of causation pathway.⁶⁴

Third, moving from the current geographical model to one based on probability of causation would increase the administrative complexity and costs of the RECA program as DOJ would now have to gather additional information on each claimant before making an eligibility decision. Providing the necessary information for dose estimation and the probability of causation model to work might also place additional burdens on claimants and their families. While the NCI has produced county-level estimates of absorbed thyroid doses of ¹³¹I from NTS atmospheric tests, ¹³¹I is just one of many, perhaps as many as 200, radionuclides produced and released with the detonation of an atomic weapon and the thyroid is one of several body systems that may be affected by internal or external exposure to ionizing radiation.⁶⁵ For a probability of causation to be accurate, additional dose estimations would have to be made which would require time and money.⁶⁶

Fourth, moving away from the existing downwinder eligibility system after more than 30 years of the program and replacing it with what the NRC predicts will be a model less likely to award benefits would raise questions of equity between those who applied under the old and new systems. While some delays in applications may be the fault of the applicant, in some cases the long latency period of cancer might result in a person not being diagnosed with a covered cancer until the program has moved to more restrictive rules. Unless Congress were to mandate that existing beneficiaries be re-evaluated under the new model,

⁶² National Research Council, *A Review of the Dose Reconstruction Program of the Defense Threat Reduction Agency*, The National Academies Press, 2003.

⁶³ The complete list of approved, denied, and pending SEC petitions is available online from the National Institute for Occupational Safety and Health (NIOSH) at: <https://www.cdc.gov/niosh/ocas/secstatusTable.html>.

⁶⁴ Data for the EEOICPA program is available online from the Department of Labor at: <http://www.dol.gov/owcp/energy/regs/compliance/weeklystats.htm#1>.

⁶⁵ Institute of Medicine and National Research Council, *Exposure of the American People to Iodine-131 from Nevada Nuclear-Bomb Tests: Review of the National Cancer Institute Report and Public Health Implications*, The National Academies Press, 1999, p. 21.

⁶⁶ The NCI ¹³¹I dose estimates took over 10 years to prepare.

this could create a system of winners and losers based solely on when one was first diagnosed with cancer.

Creation of a Downwinder Area for the Trinity Test Site

The first detonation of an atomic weapon took place on July 16, 1945, at the Trinity Test Site near Alamogordo, New Mexico. This atmospheric test had a yield of 21 kt. There are no provisions in the RECA statute for any benefits to be paid to any persons who lived near the Trinity Test Site during this detonation. Sections 4(c) and (g) of H.R. 3783 in the 116th Congress would have created a new downwinder area, consisting of the entirety of the state of New Mexico, for the Trinity Test Site. Any person who was present in the state of New Mexico for at least one year during the period beginning on June 30, 1945, and ending on July 31, 1962, would be considered a downwinder.

Issues Related to the Possible Creation of a Downwinder Area for the Trinity Test Site

Any creation of a geographic downwinder area for the Trinity Test Site would be contrary to the recommendations of the NRC in its 2005 report on RECA. However, as discussed in relation to expanding the NTS downwinder area, the NRC's recommendation to shift RECA from a geographic presumption model to a probability of causation model would create its own set of challenges.

If Congress were to decide to create a downwinder area for the Trinity Test Site, it would have to consider that there was one test, with a yield of 21 kt, at that site, compared to 100 atmospheric tests at NTS. The eligibility periods for presence in the NTS downwinder area all but assure that persons would have been present for more than one atmospheric test. Congress would have to determine if the radiation risk to the human health of persons in New Mexico during the period of the Trinity Test is sufficiently large to justify their inclusion in the RECA program as downwinders.

Creation of a Downwinder Site for the Pacific Tests

The United States conducted 106 atomic weapons tests at various sites in the Pacific Ocean, including the largest-ever American detonation of an atomic weapon, the Bravo Test, part of Operation Castle, on February 28, 1954, on Bikini Atoll in the Marshall Islands. The Bravo Test resulted in a yield of 15 Mt. Despite the amount of atomic testing in the Pacific, there are no downwinder areas associated with these tests. Section 4(c) and (g) of H.R. 3783 in the 116th Congress would have created a downwinder area consisting of the entirety of the U.S. territory of Guam for tests conducted in the Pacific.⁶⁷

Issues Related to the Possible Creation of a Downwinder Site for the Pacific Tests

Similar to any discussion of using geography alone to expand the RECA downwinder area, the creation of a new downwinder area for the Pacific tests would be contrary to the conclusions of the NRC in its 2005 report on RECA. The NRC devoted an appendix of its report to the issue of fallout on Guam following Pacific tests and issued this conclusion regarding the expansion of the RECA downwinder area to Guam:

As a result of its analysis, the committee concludes that Guam did receive measurable fallout from atmospheric testing of nuclear weapons in the Pacific. Residents of Guam during that period should

⁶⁷ The U.S. territory of the Commonwealth of the Northern Mariana Islands (CNMI) is not included in this legislation, despite its location just to the north of Guam. The inclusion of CNMI could be considered as part of an expansion of the RECA downwinder area to include areas affected by the Pacific tests.

be eligible for compensation under RECA in a way similar to that of persons considered to be downwinders.⁶⁸

Taken on its own, this conclusion might appear to support the creation of a downwinder site for the Pacific tests and this conclusion from the NRC was included in the “findings” section of H.R. 1630 in the 111th Congress, a bill to include Guam in the RECA downwinder area. However, it is important to view this conclusion in the context of the entire NRC report, which specifically rejects using geography alone for determining downwinder benefit eligibility and instead proposes new scientific criteria for determining RECA eligibility. Taken in this context, the NRC statement regarding the residents of Guam is not recommending the inclusion of Guam in the RECA downwinder area, but rather is recommending that Guam residents be subject to the same probability of causation model advocated by the NRC report for all residents of the United States and its territories.⁶⁹

Additional Evidence on Radiation Exposure in Guam and Health Effects of Nuclear Testing in the Pacific

In an appendix to its 2005 report, the NRC evaluated evidence of radioactive fallout in Guam, cancer incidence in Guam compared to the rest of the United States, and a study of the radionuclide levels in the plants, animals, and soil in Guam.

The NRC report examined fallout data taken from aerial surveys of Guam after the 10.4 Mt Mike test at Enewetak Atoll. The NRC concluded that while there was a spike in the levels of external gamma radiation in Guam after the test, Guam residents’ effective radiation dose from the Mike test was less than 20% of the naturally occurring background annual effective dose for the continental United States and 50% of the background dose for Guam.⁷⁰

Fallout data from the Operation Castle tests conducted between 1954 and 1958 in Bikini Atoll in the Marshall Islands were collected using gummed-film stations to measure levels of strontium-90 (⁹⁰Sr). Using these data, the NRC report concluded that “the fallout level in Guam during that period was similar to that in other parts of the U.S. and its territories.”⁷¹

The NRC report compared the incidence of cancer in Guam for the period between 1990 and 1995 and for 1999 with the cancer incidence in the entire United States for the period between 1995 and 1999. For all types of cancer combined, the incidence rate in Guam for both males and females was less than the rate in the entire United States as were the incidences of breast, lung, and colon cancer.⁷²

The NRC report also cited the findings of an extensive radiologic monitoring program conducted in the 1970s by the University of Washington Laboratory of Radiation Ecology and the Brookhaven National Laboratory that looked at radionuclide levels in plants, animals, and soil in several areas of Micronesia, including Guam.⁷³ The study concluded that the estimated annual effective dose from residual fallout on

⁶⁸ National Research Council, Committee to Assess the Scientific Information for the Radiation Exposure Screening and Education Program, *Assessment of the Scientific Information for the Radiation Exposure Screening and Education Program*, The National Academies Press, 2005, p. 200.

⁶⁹ This interpretation of the NRC report’s findings was confirmed by Thomas Borak, who served on the NRC Committee to Assess the Scientific Information for the Radiation Exposure Screening and Education Program, which authored the report, in personal conversation with Scott Szymendera of CRS on February 26, 2010.

⁷⁰ National Research Council, Committee to Assess the Scientific Information for the Radiation Exposure Screening and Education Program, *Assessment of the Scientific Information for the Radiation Exposure Screening and Education Program*, The National Academies Press, 2005, pp. 359-361.

⁷¹ *Ibid.*, p. 362.

⁷² *Ibid.*, p. 363.

⁷³ Victor A. Nelson, *Radiological Survey of Plants, Animals, and Soil in Micronesia*, Department of Energy, Nevada Operations

Guam due to atmospheric nuclear weapons tests was only a small fraction of the dose that residents receive from natural sources of radiation.⁷⁴

Expansion of Eligibility for 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.

Eligibility of Post-1971 Uranium Workers

In the original RECA legislation, the December 31, 1971, cutoff 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 of uranium continued after the cutoff date for RECA eligibility.

Section 5(a) of H.R. 3783 in the 116th Congress would have provided for the eligibility of RECA benefits for uranium workers for work through December 31, 1990.

Issues Related to the Expansion of the Uranium Worker Eligibility Period

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. 95-173, uranium workers, especially miners, remain at elevated risk for radon-induced diseases.⁷⁵ For example, the current Mine Safety and Health Administration (MSHA) annual exposure limit for radiation of 4 WLM⁷⁶ 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.⁷⁷

Intent of RECA

The RECA program's intent, as expressed in Section 2 of the original RECA legislation, 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,

Office, Contract No. EY-76-08-0269, Seattle, WA, January 1979.

⁷⁴ National Research Council, Committee to Assess the Scientific Information for the Radiation Exposure Screening and Education Program, *Assessment of the Scientific Information for the Radiation Exposure Screening and Education Program*, The National Academies Press, 2005, p. 365.

⁷⁵ See, for example, 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.

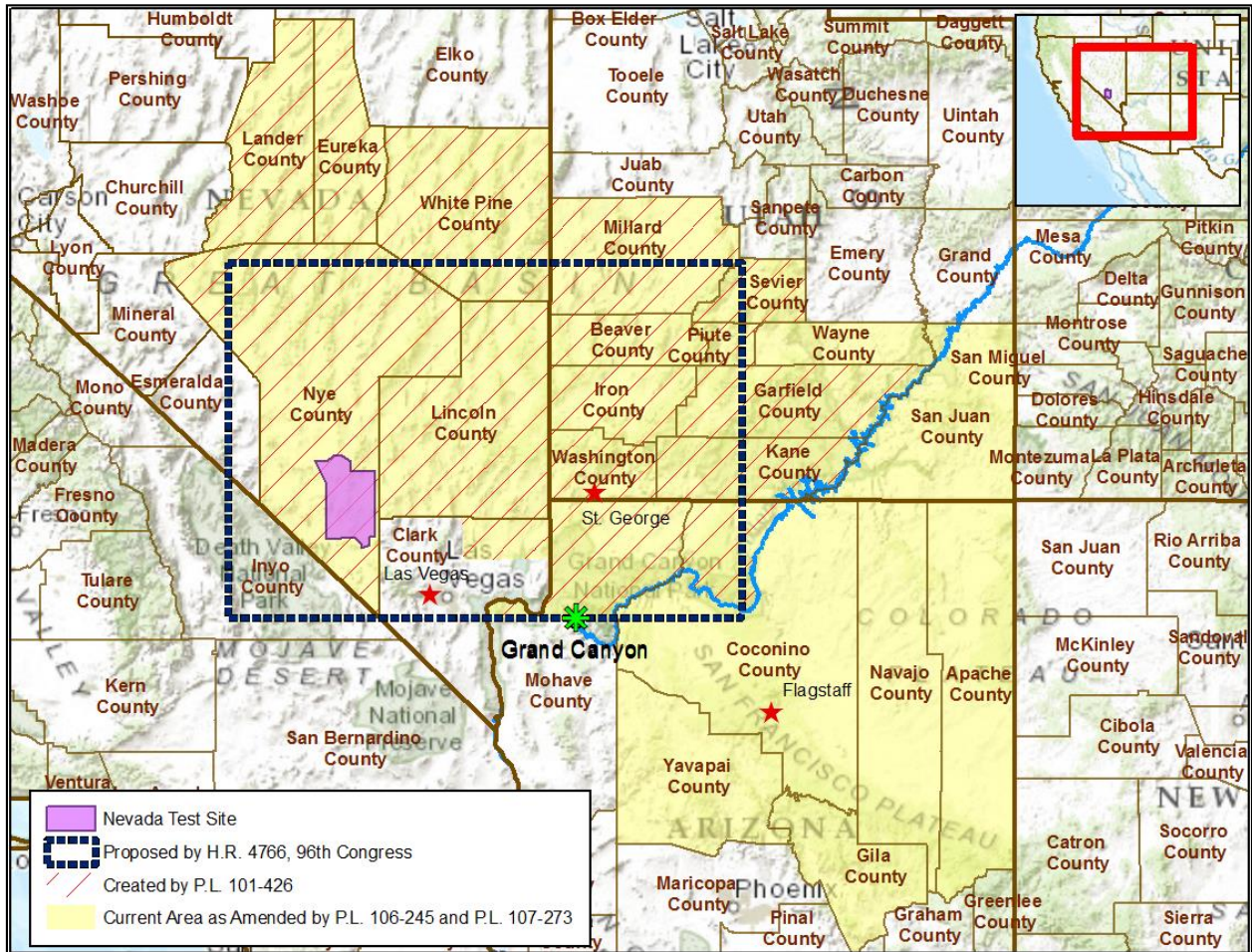
⁷⁶ 30 C.F.R. §57.5038.

⁷⁷ National Institute for Occupational Safety and Health, *A Recommended Standard for Occupational Exposure to Radon Progeny in Underground Mines*, October 1987.

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.

Appendix

Figure I. RECA Downwinder Area



Source: Congressional Research Service (CRS).