

GAO

United States General Accounting Office
Fact Sheet for Congressional Requesters

July 1994

NUCLEAR HEALTH AND SAFETY

Sites Used for Disposal of Radioactive Waste in Alaska



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United States
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-256471

July 6, 1994

The Honorable John Glenn
Chairman, Committee on
Governmental Affairs
United States Senate

The Honorable Ted Stevens
United States Senate

You requested that we determine whether any adverse health and safety consequences are known to have occurred as a result of an experiment (entitled Project Chariot) conducted in the 1960s by the former Atomic Energy Commission whereby radioactive waste was buried in Alaska. In addition, you asked us to determine, to the extent possible, whether radioactive waste was disposed of by the federal government at other abandoned sites in Alaska. During our review, we became aware of nonfederal sites where radioactive materials may have been disposed of, and as agreed with your offices we determined the current status of these sites as well as those that are or were the responsibility of the federal government.

In summary, our review of the available information concerning the Project Chariot site indicates that the amounts or distributions of radioactive materials involved would not appear to lead to adverse health effects. With respect to other sites where the federal government may have disposed of radioactive materials, we identified six Army and Air Force installations in Alaska where radioactive materials had either been disposed of or stored on-site. According to available records, these radioactive materials consisted of such things as nuclear power reactor cooling water and smoke detectors. In addition, the Naval Arctic Research Laboratory was used by various institutions for research that included the use of radioactive tracers. The facility has been decommissioned and conveyed to a Native American corporation. The Navy plans to perform a radiological survey of the facility in July 1994. Furthermore, an area at Amchitka Island, where underground nuclear tests had been performed from 1965 through 1971, is being monitored by the Department of Energy (DOE) and the Environmental Protection Agency. The

Army Corps of Engineers must still determine whether 138 defense facilities no longer owned by the federal government are contaminated by hazardous or radioactive materials and, if so, whether remedial action is required.

Sites at five other nonfederal facilities that have involved the disposal or storage of radioactive materials were brought to our attention. Three of these sites have been used to store pipe contaminated with naturally occurring radioactive material (NORM) resulting from oil-drilling operations. The other two sites involved land and ocean disposal of radioactive waste from university research projects and aircraft manufacturing, respectively.

PROJECT CHARIOT

Under a license held by the U.S. Geological Survey's (USGS) Denver, Colorado, office, USGS conducted erosion and weathering tests using small amounts of mixed fission products and soluble isotopes at the Project Chariot site in Ogotoruk Creek Valley, near Cape Thompson, Alaska, in 1962. At the conclusion of the tests, the materials from several plots used during the tests were scraped up, consolidated, and buried nearby. In total, about 26 millicuries of cesium-137, iodine-131, strontium-85, and fission products was buried at the site. On the basis of our review of the available information, it would not appear that the amount of radioactive materials involved and its distribution in the ground would lead to adverse health effects. Moreover, in 1993, DOE unearthed the materials and the surrounding soil and placed them in shipping containers. In total, about 300,000 pounds of contaminated soil was transported to DOE's Nevada Test Site for disposal in September 1993.

FEDERAL SITES THAT INVOLVED RADIOACTIVE MATERIALS

We identified six Army and Air Force installations in Alaska that had stored or disposed of radioactive materials on-site and one site--the Naval Arctic Research Laboratory--where various isotopes were used in experiments. In addition, another site--Amchitka Island--was used for underground nuclear testing. Moreover, at the two installations where the existing records do not specify the materials involved, the disposal sites have been cleaned up. (See sec. 1 for more detailed information on the sites.)

The Army Corps of Engineers, under its Environmental Restoration Program for Formerly Used Defense Sites, has identified 555 sites in Alaska that are no longer owned by the federal government. The Corps is responsible for tracking each of these sites, determining whether they have been used to dispose of hazardous or radioactive materials, and if so performing any required remediation. According to Corps officials, as of January 5, 1994, only 2 of the 417 sites where preliminary assessments had been completed involved radioactive materials. These sites are Project Chariot and Amchitka Island. The Corps expects to complete the remaining 138 site assessments in fiscal year 1995.

During our review, two additional federal sites--Donnelly Dome and Anaktuvuk Pass--were brought to our attention as possible radioactive sites. However, as summarized below, we were unable to obtain any evidence that these sites were used for radioactive waste disposal.

Donnelly Dome

Allegations have been made that this site was used for the disposal of hazardous and/or radioactive waste from Fort Greely during the 1970s. According to Alaska Department of Environmental Conservation officials, they plan to visit the site in the summer of 1994 to determine whether such materials were actually disposed of there. Army officials said that they knew nothing about the disposal of radioactive materials at Donnelly Dome and it was not listed in the Army Environmental Center's inventory of contaminated sites.

Anaktuvuk Pass

Radioactive materials were allegedly buried at this site during the 1960s. The Hanford, Washington, site management and operations contractor at the time--the General Electric Company--hired Dr. Wayne C. Hanson to perform tracer experiments on lichens at this site during the period 1964-66. In a September 1993 trip report, Dr. Hanson stated that no radioactive materials were buried at Anaktuvuk Pass. During his research on fallout radionuclides, Dr. Hanson used extremely minute quantities of cesium-137, cesium-134, strontium-90, and strontium-85 on test plots of lichens. Upon completion of the experiments, the lichens in the test plots were removed.

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In September 1993, Alaska Department of Environmental Conservation staff and the North Slope Borough's radiation consultant from Foster-Wheeler traveled to Anaktuvuk Pass to sample the soil at Dr. Hanson's test plots. According to the Alaska Department of Environmental Conservation, the radioactivity levels observed during the soil tests were not considered to be anomalous, or outside of the typical worldwide fallout levels.

NONFEDERAL SITES THAT
INVOLVED RADIOACTIVE MATERIALS

We identified five nonfederal sites in Alaska that have involved the disposal of radioactive materials or the storage of well-drilling pipe contaminated with NORM. (See table 1.) (See sec. 2 for more detailed information on the location and status of these nonfederal sites.)

Table 1: Nonfederal Sites Involving Radioactive Materials in Alaska

Location	Current status
Pacific Ocean southwest of Ketchikan	A total of 294 drums of radioactive materials from the Boeing Company in Seattle, Washington, was disposed of in the ocean. The radioactive materials consisted of many waste types including radium-226, cobalt-60, and strontium-90.
University of Alaska, Fairbanks Campus	Contaminated carcasses, animal bedding, and plants were buried in three landfills. The university considers the burials safe and does not plan to monitor or recover the materials.
Kenai Peninsula	An oil industry pipe-cleaning yard contaminated with NORM was cleaned up in 1991.
North Slope	In 1993, 2,700 NORM-contaminated pipes were cleaned up. Three hundred will be cleaned up in 1994.
Cook Inlet	Operators plan to clean up about 3,500 NORM-contaminated pipes in 1994.

SCOPE AND METHODOLOGY

To develop this fact sheet, we used diverse sources of information because of the lack of complete, definitive government records on the disposal of radioactive materials that may have been buried during the last 40 to 50 years in Alaska, notwithstanding whether the materials were regulated or exempted. As a result, our results are based on--and limited to--available information drawn from agencies' files, private records, and interviews with knowledgeable individuals. Therefore, other sites not documented in this fact sheet may exist in Alaska. Moreover, it was not an objective of this review to determine whether the storage or disposal of radioactive materials was in compliance with then-existing laws or regulations or whether it would violate any current laws or regulations.

We requested that DOE and the Departments of Defense (DOD) and the Interior identify all sites where radioactive

materials may have been disposed of as well as the identities and quantities of the materials involved. We also requested that these agencies provide as much documentation as possible on the particular site and the current status. However, Department of the Interior officials at the National Park Service, Minerals Management Service, Bureau of Land Management, USGS, and the Bureau of Indian Affairs area offices in Anchorage, Fairbanks, Juneau, and Nome stated that they had no knowledge of their agencies' having any inactive radioactive waste burial sites in Alaska. Officials at Interior's Fish and Wildlife Service identified three inactive radioactive burial sites (Project Chariot, Amchitka Island, and Fort Greely) that had already been made known to us through other sources. We also interviewed Nuclear Regulatory Commission (NRC) officials, state of Alaska officials, and other knowledgeable people to help identify potential sites. We requested and reviewed documentation related to the disposal of radioactive materials at these sites. We performed our review from June 1993 through June 1994. (App. I lists the organizations and individuals contacted during our review.)

AGENCY COMMENTS

DOE and DOD officials agreed with the information presented in this fact sheet that relates to their respective agency's activities in Alaska. Minor technical or editorial changes suggested by these officials were incorporated into the fact sheet. (See apps. II and III for a copy of DOE's and DOD's comments.)

NRC suggested several minor wording changes to improve the accuracy and clarity of the presentation. These changes were incorporated into the fact sheet. (See app. IV for a copy of NRC's comments.)

Interior commented that the fact sheet should include sites at which the Air Force operates Radioisotope Thermal Generators (RTG). Specifically mentioned was the Air Force site at Burnt Mountain, north of Fort Yukon. We did not include RTGs operated by the Air Force or the Navy because these sites are neither abandoned nor considered radioactive waste disposal sites. There have been no reported radiation releases from these sites, and the Alaska Department of Environmental Conservation has reviewed the manufacturer's drawings and literature and, after visiting the Burnt Mountain site, found that the

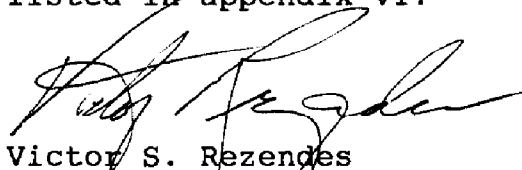
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RTGs appeared to be very durable. (See app. V for a copy of Interior's comments.)

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As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this fact sheet until 30 days from the date of this letter. At that time, we will send copies of this fact sheet to the appropriate congressional committees; the Secretaries of Energy, Defense, and the Interior; the Chairman, NRC; Alaska state officials; and knowledgeable industry officials. We will make copies available to others on request.

Please call me at (202) 512-3841 if you or your staff have any questions. Major contributors to this fact sheet are listed in appendix VI.



Victor S. Rezendes
Director, Energy and
Science Issues

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ABBREVIATIONS

AEC	Atomic Energy Commission
DOE	Department of Energy
EPA	Environmental Protection Agency
GAO	General Accounting Office
NARL	Naval Arctic Research Laboratory
NORM	naturally occurring radioactive material
NRC	Nuclear Regulatory Commission
USGS	U.S. Geological Survey

SECTION 1

FEDERAL STORAGE OR DISPOSAL SITES

The following summarizes the current status of 10 federal sites located at six Army and Air Force installations that were once used for the disposal or storage of radioactive materials in Alaska. Summaries are also provided for the Naval Arctic Research Laboratory (NARL) and Amchitka Island (a site once used for underground nuclear testing).

ARMY--FORT WAINWRIGHT

In 1973, the Yukon Sentinel reported that the Army discovered an old radioactive disposal site. On the basis of a search of Army records, Army officials were unable to document the type of radioactive materials involved. However, these officials believe that the materials disposed of consisted of watches, compass dials, radio vacuum tubes, and other items that may contain small amounts of radioactivity. The site reportedly contained four holes that were 18 inches in diameter. Each hole was lined with a concrete drain pipe and had a concrete cover. Under a Comprehensive Environmental Response, Compensation, and Liability Act Federal Facility Agreement, a Preliminary Source Evaluation of this site was performed. The February 12, 1992, evaluation report recommended that no further action be taken because (1) interviews with individuals confirmed that the site was cleaned up, possibly in 1973, and (2) a 1992 survey of the site using both a conventional Geiger counter and a broad-band gamma ray scintillometer found no radiation readings above background levels. The geologist for the state of Alaska concluded that no radioisotopes were present that would pose a threat to human health or the environment.

Fort Wainwright also stores and uses compasses, rifle and weapon sights, and other instruments that contain low-level radioactive materials. This is done under Nuclear Regulatory Commission (NRC) licenses held by the Army Armament Munitions and Chemical Command, Illinois, and the Army Communications and Electronics Command, Fort Monmouth, New Jersey. A September 8, 1983, Installation Assessment Report indicated that the Fort had about 1,200 obsolete light antitank weapon sights, each containing 3 millicuries of promethium-147 (pure beta-emitting) consolidated in a secure area of the Ammunition Supply Point and was awaiting disposal. According to Army records, the light antitank weapon sights were shipped to the Defense Consolidation Facility in Snelling, South Carolina, on January 27, 1994.

ARMY--FORT GREELY DISPOSAL
INTO JARVIS CREEK

Army records show that, starting about 1962 and ending when injection wells came into use probably in 1968, the Army treated and diluted the Fort Greely nuclear power reactor's cooling water prior to placing it into Jarvis Creek. According to Army officials, the level of radioactivity of the water at the point of release was below the standard established by NRC under 10 C.F.R. 20.

ARMY--FORT GREELY INJECTION WELLS

According to Army documents, the Army began using injection wells (probably in 1968) near Delta Junction to dispose of treated reactor cooling water. A December 1992 historical summary of the site, prepared by an Army Corps of Engineers contractor, indicated that the radiation level of the treated cooling water was below the standard established by NRC under 10 C.F.R. 20 at the time of injection. Moreover, the historical record indicates that tests performed before the use of this disposal method showed no connection between the discharge aquifer and other aquifers used for water supply. Subsequent sampling of wells at Fort Greely and in the local community showed no contamination of the water supply.

ARMY--FORT GREELY STORAGE OF
DECOMMISSIONED POWER REACTOR

The Army SM-1A power reactor at Fort Greely was built by the Corps and decommissioned by the Corps in 1971. The reactor was sealed in 1973 and is scheduled to be dismantled and removed in 2023, when the radioactivity has decayed to acceptable levels. According to Army records, the reactor has been subjected to periodic inspections to monitor both the integrity of the encasement structure and the radiation levels in the vicinity of the reactor. In 1992, the Army repaired a crack in a concrete wall that was initially placed at the site during decommissioning. The repair required the excavation of soil contaminated with cesium and other gamma-emitting waste. This soil--considered low-level waste--was placed into 58 drums and was shipped to DOE's Hanford Site in Washington for disposal in July 1993.

ARMY--FORT RICHARDSON

Army records show that Fort Richardson was licensed by the Atomic Energy Commission (AEC) (the predecessor to NRC) as a radioactive materials disposal facility. However, NRC inspection reports indicate that the facility served only as a consolidation operation (i.e., smaller packages were combined to make larger packages on storage pad 45886) and that Army health physicists found no loose contamination during their routine surveys of the area. Most of the waste was generated by the SM-1A nuclear power

reactor located at Fort Greely. Waste materials were also received from the Naval Station at Kodiak, the Aeromedical Laboratory at Fort Wainwright, and the Supply Activities at Fort Richardson and Elmendorf Air Force Base. All of the waste was transferred by truck, rail, and air to a waste disposal facility in Richland, Washington.

According to the April 1993 Army listing of contaminated sites, a preliminary assessment and site investigation of storage pad 45886 was performed. Although the listing of contaminated sites indicated that no remedial investigation/feasibility study or remedial design was recommended, an NRC official said that NRC expects to receive the results of an Army survey of storage pad 45886 sometime during the summer of 1994, but if the Army does not do a survey, then an NRC inspector will survey the site this summer. NRC intends to keep its investigation of the site open until the Army completes its survey. At that time, NRC will either close its investigation or, if needed, require the Army to decontaminate the site.

AIR FORCE--ELMENDORF AIR FORCE BASE

According to Air Force documents, the Air Force buried an unspecified number of 55-gallon drums in a 150-square-foot area at Elmendorf Air Force Base in 1955 and 1956. The drums were buried at a depth of 5 to 7 feet and then covered with 4 inches of concrete. The site was disinterred in July 1982, and no radioactive materials were found. In 1992, Armstrong Laboratory personnel surveyed an open concrete container found at this site. Measurements for radioactivity made on the inside and outside of the container produced no measurable activity, according to Air Force documents. Although Air Force officials could document that a radioactive waste burial site was located at Elmendorf Air Force Base, the documentation did not specify the types of materials that had been buried. Air Force officials consider the radioactive waste issue at this site resolved and do not plan to take additional action.

AIR FORCE--CLEAR AIR FORCE BASE

The Air Force has identified Clear Air Force Base as a radioactive waste burial site. According to a December 20, 1993, Air Force Management Action Plan, one site at this base was used for the storage and disposal of radioactive materials. With respect to disposal, small electronic tubes with low levels of radioactivity were buried at this site. Air Force officials were unable to provide information on the quantities of radioactive materials buried or when the burials took place. On the basis of a preliminary assessment and site inspection performed by an Air Force contractor, the Air Force determined that the site did not pose a significant health hazard and therefore plans no further action.

AIR FORCE--EIELSON AIR FORCE BASE

Sometime during mid-to-late 1977, approximately 100 smoke detectors, each containing 2.5 microcuries of americium-241, were removed from base housing and disposed of in a landfill. The exact landfill location is unknown. According to the Air Force, similar units are exempt from controlled disposal under 10 C.F.R. 30.20. NRC officials told us that the Commission does not require the disposal of most smoke detectors in licensed disposal facilities.

Through a review of NRC records, we identified another site at Eielson Air Force Base that may have been used to dispose of radioactive materials. According to information related to AEC license 50-13057-01, a radiochemistry laboratory at the Base may have buried radioactive waste in 55-gallon drums in the early 1970s and before. This site was not identified as a potential radioactive waste disposal site in documents provided to us by the Air Force. Subsequent to our inquiries into this matter, Air Force officials initiated a preliminary investigation. According to an Air Force official, the investigation indicated that some radioactive materials had been disposed of in a landfill. However, at this point, the location of the landfill, when the disposals took place, and the amount of radioactive materials involved are all unknown. This official said that an investigation is underway to determine exactly what took place at the radiochemistry laboratory.

NAVAL ARCTIC RESEARCH LABORATORY

The Naval Arctic Research Laboratory, located at Point Barrow, Alaska, was used by a variety of civilian, federal, and foreign institutions, some of which used radioisotopes in their experiments. Our review of records obtained from the Navy, NRC, and Alaska Department of Environmental Conservation indicates the following:

- NARL was decommissioned and placed in caretaker status in June 1981. During phasedown, a box containing about 200 vials of carbon-14 waste was found abandoned in the radioisotope laboratory. An analysis of smear samples taken throughout the laboratory showed no contamination above background levels. However, because radioactive waste materials were found, it was recommended that a radiation contamination survey be conducted before releasing the facility for other uses. According to the Navy, the Department of the Interior owned the land on which NARL was located. On June 1, 1989, Interior conveyed the NARL facility to a Native American corporation before a radiological survey was performed. In March 1994, the Alaska Department of Environmental Conservation asked the Navy to perform radiological surveys on several sites that were used by NARL for waste disposal purposes. A Naval

official said that the Navy plans to perform these surveys in July 1994 and at that time will also perform a radiological survey of the NARL facility.

- Many institutions performed research at the facility, including experiments using radioactive tracers. However, data are not available on the number of institutions that used radioactive materials or the types of materials and quantities involved. NRC, in searching its data base, found no indication that any licensees, other than the University of Alaska, Fairbanks, used radioactive materials at NARL.
- The University of Alaska, Fairbanks, held an NRC license to conduct radioactive experiments at NARL. Under the license, the university was allowed to dispose of the waste by release into the sanitary sewage systems or by burial into the soil. However, university documents given to us by the university's radiation officer indicate that no radioisotopes were disposed of at NARL. According to these documents, in those instances where disposal was necessary, the waste was removed from NARL and buried at the University of Alaska, Fairbanks.

DOE--AMCHITKA ISLAND IN THE ALEUTIANS

DOE records show that, between 1965 and 1971, AEC conducted three high-yield underground nuclear detonations on Amchitka Island--an island in the Aleutians at the east end of the Rat Island group. One detonation--referred to as "Long Shot"--produced a minor seep of activity near the surface at ground zero. According to AEC studies, the potential exists for radionuclide movement over time from deep aquifers to the Pacific Ocean and the Bering Sea.

DOE and the Environmental Protection Agency (EPA) are monitoring surface water and shallow ground water sites on the island every 2 years. The most recent data published by EPA in 1991 stated that radiation levels for tritium were well below the 20,000-picocuries-per-liter (pCi/L) guideline for drinking water. The monitoring program is focusing on tritium because its mobility in water makes it a good indicator of whether other radionuclides are moving toward water sources. Monitoring to date has detected no movement of radionuclides. In August 1993, EPA completed its most recent sampling of the site, and preliminary results indicate that no significant concentrations of radionuclides were found. The final report will be published by the end of 1994.

SECTION 2

NONFEDERAL SITES INVOLVING RADIOACTIVE MATERIALS

The following summarizes the current status of sites at five nonfederal facilities in Alaska that were or are being used to store and/or dispose of radioactive materials.

BOEING AIRCRAFT--PACIFIC OCEAN SOUTHWEST OF KETCHIKAN

NRC records show that American Mail Line, Inc., was licensed to receive, possess, and dispose of radioactive waste generated by the Boeing Company located in Seattle, Washington. The related AEC license (46-3623-1) required that disposal of this waste in the Pacific Ocean take place at least 150 miles from the continental shelf and at a depth of greater than 6,000 feet. Prior to disposal, the licensee had to provide written notice to AEC that included the date of disposal, location of disposal, number of containers to be disposed of, total activity of the byproduct materials, amount of materials involved, and the identity of the most hazardous isotope in each container. Materials disposed of included radium-226, cobalt-60, strontium-90, promethium-147, phosphorus-32, fission products, heat lamps, and beryllium waste.

Between 1958 and 1969, American Mail Line dumped 294 55-gallon drums of radioactive waste in the Pacific Ocean about 350 miles southwest of Ketchikan. According to AEC records, AEC personnel observed the sea disposal operation and, in addition, made periodic inspections of the company's records and facilities. According to these records, no major instances of noncompliance were found.

UNIVERSITY OF ALASKA--FAIRBANKS

The University of Alaska, Fairbanks, buried contaminated carcasses, animal bedding, plants, and disposable lab ware at three locations on university-owned property at approximately 1- to 2-year intervals from July 1969 to January 19, 1981. The three burial sites were (1) the Large Animal Research Station, (2) a fill area near the intersection of Tanana Loop and Fairbanks Street, and (3) a fill area near the intersection of Farmers Loop Road and Taku Drive.

Many of the 19 nuclides present in the waste materials were short-lived. As of 1993, only carbon-14 (24.5 mCi) and tritium (28 mCi) were remaining. According to the university's Radiation Safety Officer, these isotopes are weak beta-emitters and are easily blocked; for example they cannot penetrate clothing, skin, or even a few feet of air space. To prevent inadvertent inhalation of these nuclides, they were buried under at least 4 feet of soil.

The university's radiation officer stated that even if a portion of the buried materials were to be inhaled or ingested, which is unlikely, harmful effects would not occur because of the low toxicity of the radioisotopes involved. Moreover, she said that because these materials pose no present or future hazard to humans, animals, or the environment, the university does not monitor the sites and does not plan to recover the buried materials. The university does not plan to excavate the sites as part of any future construction activities. However, in case this changes, records of the burials are being kept, and responsible university officials are aware of the disposal sites so that the materials would not be disturbed during future excavations.

OIL INDUSTRY--KENAI PENINSULA

In December 1990, an expert from the Louisiana Department of Environmental Conservation, hired by the Anchorage Daily News, found some residual naturally occurring radioactive material (NORM) in an oil industry pipe-cleaning yard on the Kenai Peninsula. The site was cleaned up in 1991, and the contaminated soil was stored in 189 drums until the summer of 1993. At that time, a pilot test to separate the NORM from the gravel was conducted, resulting in about 29 drums of fine-grained, high-density barium sulfate NORM scale.¹ On January 18, 1994, the drums were shipped to US Ecology--an EPA-approved disposal site located on DOE's Hanford Site in Washington--for disposal.

OIL INDUSTRY--NORTH SLOPE

This site stores NORM-contaminated pipes used in oil-drilling operations. During the summer of 1993, all but 300 of the 3,000 NORM-contaminated pipes from the North Slope were cleaned to levels below 0.05 millirems per hour. The remaining pipes will be cleaned in 1994. All of the NORM was slurried and reinjected into the ground near where it came from at a depth of about 3,400 feet in an approved Class-II disposal well. According to a British Petroleum Company official, no workers were exposed to measurable radiation during the cleaning and disposal operation, and no releases to the surface environment occurred. Moreover, he said that this program was reviewed and approved by the Alaska Oil and Gas Conservation Commission, Alaska Radiation Health Physicist, Alaska Department of Environmental Conservation, and EPA.

¹The primary sources of radiation in NORM scale are radioactive elements, such as radium 226 and 228, that are naturally present throughout the earth. These materials along with barium sulfate and, in some instances, calcium carbonate become dissolved in the water and oil produced from deep underground. Over time, this results in a scale build up in some oil field piping and production vessels.

OIL INDUSTRY--COOK INLET

This site is also used for storing NORM-contaminated pipe. Approximately 3,500 pipes are stored in the Cook Inlet region. Cook Inlet operators are considering funding the cleanup of the pipes during the summer of 1994 using methods similar to those used at the North Slope.

ORGANIZATIONS AND INDIVIDUALS CONTACTED BY GAOBRITISH PETROLEUM

Staff Petrophysicist, Environmental
and Regulatory Affairs

DEPARTMENT OF DEFENSE

Deputy Undersecretary, Environmental
Secretary, Environmental Clean-Up Office

DEPARTMENT OF ENERGY

Director, Albuquerque Laboratory
and Nevada Programs Division

Environmental Health Physicist,
Office of Environmental Restoration

Environmental Scientist,
Office of Environmental Restoration

DEPARTMENT OF THE INTERIOR

Environmental Review Officer,
Office of the Secretary,
Office of Environmental Affairs

Assistant Director for Engineering Geology,
U.S. Geological Survey

Hazardous Materials Management
Program Coordinator,
National Park Service

Regional Supervisor for Leasing and
Environment, Alaska Region, Minerals
Management Service

Chief, Division of Environmental
Contaminants, Fish and Wildlife Service

Chief, Juneau Operations Branch,
Bureau of Mines

Former Chief, Juneau Operations Branch,
Bureau of Mines

Chief, Environmental Service,
Bureau of Indian Affairs

Superintendent, Anchorage Agency,
Bureau of Indian Affairs

Superintendent, Fairbanks Agency,
Bureau of Indian Affairs

Superintendent, Nome Agency,
Bureau of Indian Affairs

Senior Physical Scientist,
Bureau of Land Management

Audit Liaison Specialist

ENVIRONMENTAL PROTECTION AGENCY

Project Manager, Office of
Radiation and Indoor Air

GOVERNOR HICKEL'S TASK FORCE

Program Manager of Government
Preparedness and Response Program,
Division of Spill Prevention
and Response

HANSON ENVIRONMENTAL
RESEARCH SERVICES

Radiation Ecologist

HOMER ENVIRONMENTAL GROUP

Executive Director, Homer
Environmental Group,
Cook Inlet Vigil, Alaska

NUCLEAR REGULATORY COMMISSION

Project Manager, Operations Branch,
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and Nuclear Safety

Section Leader--Regulatory Issues,
Division of Low Level Waste
Management and Decommissioning

GAO Liaison

STATE OF ALASKA

Chief, Department of Radiation
(Also Governor Hickel's Task Force)

Environmental Specialist, Division of
Environmental Quality, Solid and
Hazardous Waste Management, Department
of Environmental Conservation

Environmental Specialist, Spill
Prevention and Response Division,
Contaminated Sites Section,
Department of Environmental
Conservation

Director, Division of Information
and Administrative Services,
Department of Environmental
Conservation

Environmental Specialist, Northern
Regional Office, Contamination
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Environmental Manager, District Manager,
Northern Alaska District Office,
Department of Environmental
Conservation

U.S. AIR FORCE

Staff Health Physicist,
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Brooks Air Force Base, Tex.

UNIVERSITY OF ALASKA, FAIRBANKS

Researcher

Radiation Safety Officer

U.S. ARMY

Environmental Engineer,
Military Programs Restoration--
Formerly Used Defense Sites,
Corps of Engineers

Chief, Environmental Restoration
Division, Army Environmental
Center, Aberdeen, Md.

Environmental Engineer,
Army Environmental Center,
Aberdeen, Md.

Health Physicist,
Headquarters Army Munitions
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Rock Island Arsenal, Ill.

Senior Environmental Protection
Specialist Under the Assistant
Chief of Staff, Installation
Management Directorate of
Environmental Programs

U.S. COAST GUARD

Pollution Prevention Program Manager

U.S. NAVY

Radiation Health Coordinator,
Chief of Naval Operations,
Environmental Protection, Safety and
Occupational Health Division,
Radiological Control and
Health Branch

Radiologic Physicist,
Chief of Naval Operations,
Environmental Protection, Safety and

Occupational Health Division,
Head of the Radiological Control
and Health Branch

NORTH SLOPE BOROUGH

North Slope Borough, Mayor's Office,
Project Coordinator for Project Chariot

FOSTER WHEELER COMPANY

Project manager for independent samples
taken at Project Chariot
for the North Slope

SEARCH

Investigator for the North Slope Borough
Project Chariot who took independent
samples at Project Chariot for the
North Slope Borough

NORTHWEST ARCTIC BOROUGH

Planning Director

COMMENTS FROM THE DEPARTMENT OF ENERGY**DEPARTMENT OF ENERGY**

Washington, DC 20585

June 28, 1994

Mr. Victor S. Rezendes
Director, Energy and Science Issues
Resources, Community, and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Rezendes:

The Department of Energy appreciates the opportunity to review and comment on the General Accounting Office Draft report entitled "Nuclear Health and Safety: Sites Used for Disposal of Radioactive Waste in Alaska."

The Department concurs with the report as it relates to Department of Energy activities in Alaska.

Minor editorial changes have been provided directly to the General Accounting Office auditor by our reviewing staff. The Department hopes that these comments will be helpful in the preparation of the final report.

Sincerely,

A handwritten signature in cursive script that reads "Elizabeth E. Smedley".

Elizabeth E. Smedley
Acting Chief Financial Office



COMMENTS FROM THE DEPARTMENT OF DEFENSE



ACQUISITION AND
TECHNOLOGY

THE UNDER SECRETARY OF DEFENSE

3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010



MAY 11 1994

Mr. Victor S. Rezendes
Director, Energy and Science Issues
Resources, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Rezendes:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft fact sheet, "NUCLEAR HEALTH AND SAFETY: Sites Used for Disposal of Radioactive Waste in Alaska," dated April 19, 1994 (GAO Code 302089/OSD Case 9666).

The DoD reviewed the draft fact sheet and found it to be accurate. The Department fully concurs. (An annotated copy of the draft was provided separately to your staff with a few minor technical changes.)

The Department appreciates the opportunity to comment on the draft.

Sincerely,

R. Neal Longusinski
Principal Deputy Under Secretary of
Defense (Acquisition & Technology)



COMMENTS FROM THE NUCLEAR REGULATORY COMMISSION

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

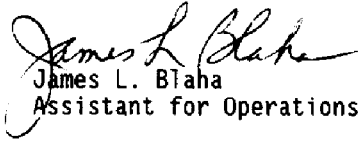
May 17, 1994

Mr. Victor S. Rezendes
Director, Energy and Science Issues
U.S. GAO
Washington, D.C. 20548

Dear Mr. Rezendes:

Attached are the requested NRC's comments on the fact sheet entitled Nuclear Health and Safety: Sites Used for Disposal of Radioactive Waste in Alaska (GAO/RCED-94-130FS). If you have any questions, please contact Jim Turdici at (301) 504-1728.

Sincerely,


James L. Blaha
Assistant for Operations, OEDO

Attachment:
As stated

NRC COMMENTS ON DRAFT GAO FACT SHEET,
"NUCLEAR HEALTH AND SAFETY:
SITES USED FOR DISPOSAL OF RADIOACTIVE WASTE IN ALASKA"
GAO/RCED-94-130FS

- Now on p. 3. 1. pp. 4-5
See comment 1. The sentence which runs between the pages appears to be garbled or incomplete.
- Now on p. 7. 2. Page 8
See comment 2. Substitute "Chairman" for "Commissioner" in the expression "the Commissioner, NRC" in the second sentence on this page.
- Now on p. 12 3. Page 14
See comment 3. The last sentence of the first paragraph of the description of Eielson Air Force Base should be revised as follows: "...that the Commission does not require regulate the disposal of most smoke detectors in licensed disposal facilities.
- Now on p. 14. 4. Page 18
See comment 4. The text states that 24.5 mCi of ¹⁴C and 28 mCi of ³H remained as of 1993 in the three radioactive waste burial sites operated by the University of Alaska at Fairbanks. NRC's data base for 10 CFR 20.302/304 disposals indicates that the waste disposed by the University did not exceed a total activity of 10 mCi. However, the discrepancy between the activity values may be explained if the 10 mCi value was an annual limit that was applied each year for several years.
- The University applied for and was denied authorization to continue burials under 10 CFR 20.302 in 1985 on the basis that information provided was insufficient and did not demonstrate that potential doses to members of the public would be sufficiently low.

Enclosure

The following are GAO's comments on the Nuclear Regulatory Commission's letter dated May 17, 1994.

GAO COMMENTS

1. GAO added the words that were missing in the sentence.
2. GAO substituted "Chairman" for "Commissioner" as suggested by NRC.
3. GAO made the revisions suggested by NRC.
4. GAO discussed this point with NRC officials and provided them with information that was not currently included in their data base. NRC officials agreed to investigate this issue further.

COMMENTS FROM THE DEPARTMENT OF THE INTERIOR

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

JUN 17 1994

Mr. Victor S. Rezendes
Director
Energy and Science Issues
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Rezendes:

The Department of the Interior has reviewed the draft GAO report entitled "Nuclear Health and Safety: Sites Used for Disposal of Radioactive Waste in Alaska" (GAO/RECED-94-130FS) and has the following comments.

Now on p. 6.
See comment 1.

On page seven the report states that the Fish and Wildlife Service (FWS) in Anchorage "had no knowledge of their agencies' having any inactive radioactive waste burial sites in Alaska." The statement is incorrect in that when first contacted, the Anchorage Office for the FWS identified Cape Thompson (Project Chariot site), Amchitka Island, and Burnt Mountain as potential sites with radioactive material.

See comment 2.

The previously identified Burnt Mountain site, although not an abandoned site, should be included in the report. The U.S. Air Force has a facility on a withdrawal from the Yukon Flats National Wildlife Refuge where 10 radioisotope thermal generators (RTGs) supply power to a monitoring grid. The 10 RTGs use strontium 90 as a power source and the amount of strontium 90 present in November 1992, ranged from 81,000 curies to 250,000 curies. The site is not manned although it is monitored.

See comment 3.

Regarding monitoring at Amchitka Island, to this point monitoring has detected no movement of radionuclides. However, the Department of Energy (DOE) and the Environmental Protection Agency do not yet know the rate of migration of radionuclides or, whether the migration is toward the Bering Sea, the Pacific Ocean, or both. DOE is prepared to begin a deep aquifer monitoring program, but the program is expensive and sufficient funding has not been obtained.

We hope this information will be helpful to you in the preparation of the report.

Regards,

for William R. Taylor
Jonathan P. Deason
Director
Office of Environmental Policy
and Compliance

The following are GAO's comments on the Department of the Interior's letter dated June 17, 1994.

GAO COMMENTS

1. GAO revised its statement to show that the Fish and Wildlife Service did identify three inactive radioactive burial sites that had already been made known to GAO through other sources.
2. On page 6 of the final report, GAO lists the following reasons for not including the radioisotope thermogenerators operated by the Air Force and Navy: (1) these sites are neither abandoned nor considered radioactive waste disposal sites and (2) there have been no reported radiation releases from these sites.
3. GAO revised page 13 of the final report to indicate that monitoring, to date, has detected no movement of radionuclides.

MAJOR CONTRIBUTORS TO THIS FACT SHEET

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