

OPTIONAL FORM NO. 10
5010-106
UNITED STATES GOVERNMENT

Memorandum

Category: I-C
Priority: III
Type Insp: Reinspection (1)

DATE: OCT 23 1962

TO : Eber R. Price, Assistant Director
Division of Licensing and Regulation
FROM : Roger T. Woolsey, *R.T. Woolsey* Radiation Specialist (Reviewer)
Region IV, Division of Compliance

SUBJECT: U. S. GEOLOGICAL SURVEY, QUALITY OF WATER BRANCH, DENVER
COLORADO - LICENSE NO. 5-1399-3

OO:IV:RUP

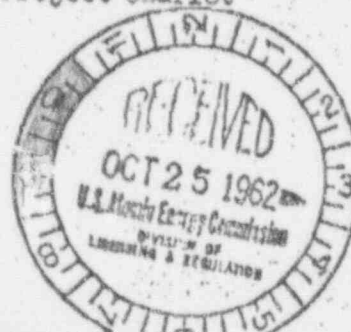
This memorandum constitutes the report of a partial inspection of the activities of the subject licensee. The scope of the inspection was limited to the conduct of an experiment by the licensee at the Project Chariot site, Cape Thompson, Alaska, as authorized by Conditions 14 and 15 of the license issued as Amendment No. 8 on July 26, 1962.

Background

On July 12, 1962, U. S. Geological Survey requested that they be granted authority to transport 5 curies of ~~mixed~~ fission products in the form of contaminated soil samples to the Project Chariot site, Cape Thompson, Alaska. The use of the material was to make a hydrologic runoff study on several plots of ground on the Chariot site. Six areas of 1 square meter were to be seeded with radioactive material and the amount of rain runoff was to be gathered and its radioactive content analyzed. On August 8, 1962, Region V, Division of Compliance contacted this office and requested a copy of Amendment No. 8 to the subject license. Region V personnel stated that inspections were planned in Alaska during the fall of 1962, and a field inspection of the USGS experiment would be made. A field inspection was conducted on September 7, 1962. However, at this time, the authorized users of USGS, W. A. Beeten and V. J. Janzer, were no longer in the Cape Thompson, Alaska area. A copy of the assist inspection made by Region V is attached to this memorandum.

Inspection at USGS, Denver Federal Center

On October 5, 1962, an inspection was made of the U. S. Geological Survey, Quality of Water Branch, Denver Federal Center. This inspection was limited to a review of the licensee's records as they pertained to the Project Chariot



experiment and to a discussion with V. J. Janzer, one of the authorized users listed in Condition 15 of the license and Heinz Wilms, Health Physicist for USQS. Janzer stated that W. A. Beetsen was the Engineer in charge of the field experiment, but that Beetsen was in Washington, D. C. at the time of the Denver portion of the subject inspection. Janzer said that the experiment at Cape Thompson was performed during the period August 19, through 25, 1962; that he and Beetsen were present during all phases of the experiment; that the experiment consisted of seeding 10 plots ranging in size from approximately 2' x 2' to 4' x 6' with various radioactive materials, the subsequent spraying of the plots with water to simulate rain and collection of soil samples at various depths below each plot. Janzer said that of the ten plots seeded, three of them were contaminated with Cesium-137, two with Strontium-85, two with Iodine-131, and three with "Sedan" mixed fission products of classified composition. Janzer said that in addition, approximately 3 millicuries of the "Sedan" material was placed in Snow Bank Creek, Tributary No. 3 (See Annex A to Region V report) and samples collected at points 20', 40', and 60' down stream from the point where material was added to the creek. Janzer said that analyses of these samples were not yet available. Janzer said that the total amount of radioactive material taken to Alaska from the Denver Federal Center was 5 millicuries of Strontium-85, 5 millicuries of Cesium-137, 5 millicuries of Iodine-131, and 5 millicuries of "Sedan" material. Janzer exhibited records of receipt for the individual isotopes. It was noted that the materials had been received from ORNL during the period June 26 through August 10, 1962. Janzer said that in each case, except for the "Sedan" material, the isotopes were placed on soil at the Denver Federal Center; that in the case of the Strontium-85 and Cesium-137, the isotopes were fixed by drying at a temperature of 80 to 100° C overnight. He said that the "Sedan" material, when it was received from the Nevada Test site, was already in the form of contaminated soil. Janzer stated that at the completion of the experiment, all plots were completely dug up to a depth where surveys showed no reading greater than 0.1 mr/hr. He said that this dirt was placed into 15, 55-gallon drums and transported to the burial site. Janzer said that the material was not actually buried because of the presence of permafrost at a depth of approximately 2 feet. He said that instead, the contaminated soil was covered with approximately 6 feet of uncontaminated dirt. Janzer stated that surveys had been conducted at the site of each test plot to make certain that radiation levels were below 0.1 mr/hr, but that no records of

the results of these surveys had been maintained. Janzer also said that no formal record of the amount of material buried had been maintained. He said that all material that had been taken to Alaska was buried except for the 3 millicuries of "Sedan" material placed in the stream, and that his records did show how much material had been taken to Alaska. He said that he felt that this constituted an adequate record of disposal. Janzer estimated that of all material taken to Alaska, less than 2% was returned to the Denver Federal Center in samples collected. Janzer said that he and Beeten wore film badges during the experimental work, but did not wear dosimeters. He said that they considered the use of dosimeters impractical because of the heavy manual labor that was involved in the experimental work and the possibility of losing the dosimeters or accidentally discharging them by a physical blow. Heinz Wilms exhibited records of the results of film badges worn by Beeten and Janzer during the period August 19 through September 20, 1962. It was observed that these film badges were supplied by Nuclear-Chicago Corporation, and that during the period, Beeten received 200 millirem gamma and Janzer 79 millirem gamma. Wilms stated that a portion of Beeten's exposure may have been received at the Nevada Test station which he visited during the film badge period.

Items of noncompliance observed or otherwise noted during the course of this inspection are as follows:

- 10 CFR 20.401 (b) Records of surveys, radiation monitoring and disposal
- in that records were not maintained of the surveys conducted after decontamination to assure that all plots contained radiation levels less than 0.1 mr/hr.
- 10 CFR 20.304 (a) Disposal by burial in soil
- in that approximately 4 millicuries of Strontium-85 were buried at the Cape Thompson, Alaska site. This isotope is not listed in Appendix C to Part 20.
- (a) - in that approximately 6 millicuries of Cesium-137 were buried in one location, at the Cape Thompson, Alaska site. This quantity is greater than 1,000 times the amount specified in Appendix C.

Eber R. Price

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License Item 6.B.G. - in that in addition to mixed fission products, the licensee used Strontium-85, Iodine-131, and Cesium-137 in hydrologic runoff studies at Project Chariot site Cape Thompson, Alaska.

Licensee's Reply to Items of Noncompliance

Janzer stated that the failure to record the results of surveys was merely an oversight and that since he knew the results of these surveys, a record of them could be made in the project notebook. With respect to the burial of radioactive materials, Janzer stated that the burial was made in a very remote area, the nearest habitation being one Eskimo lodging approximately eight miles to the south. He said that the nearest concentration of people was approximately 20 miles to the north. With respect to the use of materials other than the mixed fission products, Janzer stated that he was unaware that they were not authorized to use these materials. He stated that the experiment had been a cooperative effort of several groups and that possibly the failure to request approval for use of these specific isotopes was due to a lack of coordination between the groups. Janzer stated that he did not feel that the use of these isotopes in millicurie amounts constituted any hazard since the Commission had given approval for the use of 5 curies of fission products. He said that if they had used 5 curies of fairly fresh mixed fission products, the mixture probably would have contained at least the amounts of materials they used, that is, 5 millicuries of Strontium-85, 6 millicuries of Cesium-137, and 5 millicuries of Iodine-131.

A copy of this report has been forwarded to Region V at their request.

Notification of Licensees

Since the subject inspection was concerned solely with the licensee's experiment at the Project Chariot site in Cape Thompson, Alaska, we would suggest that this point be reflected in the letter to the licensee. Should L&R desire to correspond with the licensee relative to this inspection, correspondence may be directed to the individual in charge of the Project Chariot experiment, W. A. Beeten, Chemist, U. S. Geological Survey, Quality of Water Branch, Denver Federal Center, Denver 2, Colorado.

Attachment:

Region V Assist Inspection

CO:HQ.
L&R ✓
CO:V
CO:IV