

24 JUL 1981

Docket No. 40-8610

Town of Rochelle Park
ATTN. The Honorable William E. Guthrie, Jr.
Mayor
29 West Oldis Street
Rochelle Park, New Jersey 07662



Subject: Summary Report on Thorium Contamination

Dear Mayor Guthrie:

Enclosed for your information is a summary report of NRC activities regarding the thorium contamination in Maywood and Rochelle Park, New Jersey.

If you have any questions regarding this report, please call John D. Kinneman of my staff at (215-337-5252).

Sincerely,

(original signed by)
Boyce H. Grier
Director

Enclosure: As Stated

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State of New Jersey

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SUMMARY REPORT ON THE THORIUM CONTAMINATION IN THE MAYWOOD, NEW JERSEY AREA

I. PURPOSE AND BACKGROUND

This is a summary status report on radioactive thorium* contamination in the area of Maywood and Rochelle Park, New Jersey. Additional details can be found in NRC Inspection Reports 40-8610/80-01, 40-8610/81-02 and 40-8610/81-03.

The presence of this contamination in public areas was discovered by an area resident in October 1980 while he was assisting in the search for a sealed radioactive source which had been lost. He reported his radiation measurements to the State of New Jersey. The State confirmed these measurements and reported them to the NRC. Following up on this report, the NRC found that the thorium contamination resulted from the processing of thorium ores by the Maywood Chemical Works (MCW). Thorium, extracted from the ores, was sold by the company to companies who manufactured mantles for kerosene lamps.

From about 1895 to 1959, MCW operated a facility on property located between Maywood Avenue and the Saddle River just south of the New York and Susquehanna Railroad, near the location of the "discovered contamination." The waste product from the thorium extraction process was a sand-like material and contained residual amounts of thorium and its decay products and smaller quantities of uranium and its decay products. Since the waste product had no economic value, and there were no regulatory restrictions with respect to its control or disposal**, the waste was put in piles in various places on the MCW property. Prior to AEC licensing, the location of these piles of sand-like process residue was apparently not controlled. As time went by, some of the locations of the waste seem to have been forgotten.

Shortly after the time of initial licensing of MCW by the Atomic Energy Commission in 1954, MCW decided it would cease processing thorium. In 1959, MCW was acquired by the Stepan Chemical Company (Stepan). Stepan was not interested in the thorium extraction process. However, because it acquired the property on which the thorium waste was stored, it was issued an AEC license for possession of the licensable material.

*Thorium is a naturally occurring radioactive material which decays over a long period of time to a non-radioactive isotope of lead.

**Prior to enactment of the Atomic Energy Act in 1954, the possession and processing of thorium ores was not regulated. After the Act was promulgated and the Atomic Energy Commission (AEC) was formed, the Maywood Chemical Works was issued an AEC license for possession and processing of the ore.

In the 1960s, shortly after acquiring the property, Stepan began cleaning up the known piles of thorium waste. Stepan was issued AEC approval for this cleanup and for burial of the waste material in burial pits on the east side of its property. Later, some of the property Stepan had acquired from MCW, including property from which some of the waste products had been removed during cleanup, was sold by Stepan to other parties.

When thorium contamination was discovered in this area in late 1980, the NRC performed preliminary radiation surveys of the areas immediately surrounding the Stepan property, and of the Stepan property itself, to identify the location and extent of the contaminated areas. These initial surveys were made by NRC inspectors using portable, hand-held radiation survey instruments.

Contaminated areas were found on parts of the old MCW property which was acquired and later sold by Stepan to other parties. Contamination was also found on the present Stepan site itself, outside of the areas where the company had buried the bulk of the waste material under authority of NRC (formerly AEC) license.

Having identified several rather sizable areas of contamination on property adjacent to the Stepan site now owned by members of the public, and knowing that the operation of thorium ore processing had gone on for a number of years without regulatory control, the NRC decided as a prudent action to have a radiation survey made over a large area to detect any further spread of contamination. In January of 1981 an aerial radiation survey was made by a specially equipped helicopter of an area two miles on a side centered on the old Maywood Chemical Works (now Stepan Chemical Company) property.

The aerial survey identified three other contaminated areas. One area was located approximately one-half mile directly north of the Stepan property in a residential area, one was located in a commercial area approximately three-quarters of a mile to the southeast of the Stepan property, and one was located in an industrial area directly south of the Stepan property. NRC inspectors confirmed the presence of thorium contamination in these areas using portable, hand-held radiation survey instruments.

The following discussion summarizes the findings and conclusions resulting from these initial surveys.

II. THORIUM CONTAMINATION ON LICENSEE'S SITE

NRC and Stepan surveys have identified the presence of thorium contamination on the licensee's site in Maywood, New Jersey. The contamination consists primarily of thorium waste material mixed with dirt and covered by a thin layer of soil. In addition, thorium waste is stored in a burial site not authorized by the firm's current license.

This contamination does not pose any immediate radiological threat to public health and safety but it exceeds NRC limits for areas to which the public has unrestricted access. Stepan has erected fences to control access to these areas. Stepan is continuing to make surveys of the site and is studying alternative methods of decontaminating the site.

NRC inspections have determined that there is no contamination inside the Stepan buildings and that no Stepan employees are being exposed to radiation in excess of NRC limits. Samples of products made by Stepan were analyzed by the NRC. These samples contained no thorium or uranium in excess of the detection limits. Samples of water from the Westerly Brook, which runs through the plant property, and samples of water from nearby wells also have been analyzed and no thorium or uranium contamination has been detected.

III. OFFSITE THORIUM CONTAMINATION

Four areas offsite of the Stepan property have been identified as having elevated radiation levels due to the presence of thorium. Three of these areas were not known until identified by the aerial survey.

A. Empty Parcel of Land West of Route 17

One of the four areas is an empty parcel of land which was once owned by MCW and is located directly west of the licensee's property and west of NJ Highway 17. This property is also bordered by the backs of properties on Grove Street and Parkway in Rochelle Park. The known thorium waste storage area on the property was decontaminated by Stepan in 1968 and was released by the AEC as suitable for public use. Other areas on this property which apparently had been used by MCW to store waste were not surveyed at that time.

This area was surveyed on a preliminary basis in late 1980 by the NRC and more thoroughly in early 1981 by an NRC contractor, Oak Ridge Associated Universities (ORAU). The final ORAU report has not been completed. This site contains thorium contamination but does not pose any immediate threat to public health and safety. The property owners have been in contact with the NRC to determine what options are available with respect to decontamination and future use of the site. The matter remains under review.

B. Residential Areas

The aerial surveys of the Maywood/Rochelle Park area identified an area north of Stepan's property as being potentially contaminated. Followup NRC ground surveys of this area detected increased radiation levels on six adjoining residential properties in this area and also one minor spot of contamination on the lawn of a nearby residence. These surveys showed that soil contaminated with thorium resulted in elevated radiation levels in each of the six yards and inside two of the houses. A small increase in radiation levels was found inside a

limited area of a third residence. NRC surveys determined that no immediate threat to public health and safety exists, but the contamination does present the potential for radiation doses in excess of accepted limits for members of the public to a few persons living in these homes. The six properties above normal background radiation levels were more thoroughly surveyed by the Department of Energy (DOE) in June of 1981. The results of these surveys are in general agreement with NRC surveys.

C. Industrial Area South of Licensee Facility

This area was identified by the aerial survey as having elevated radiation levels caused by thorium. This area is bounded by NJ Route 17 on the west, by the back of residential properties on the east, and by the back of an industrial property on the south. This area may have once been owned by MCW. NRC surveys so far have identified slightly elevated radiation levels in unoccupied outdoor areas in this industrial complex. No radiation levels above background were found in any building. This area does not pose any immediate threat to public health and safety but does exceed NRC limits for public use.

D. Empty Lot Southeast of the Licensee Facility

This area was identified by the aerial survey as having elevated radiation levels caused by thorium. Ground level surveys performed by the NRC have confirmed that thorium contamination exists on this property. This area is bordered by Coles Brook, the back of industrial properties along Essex Street, and a railroad line. The thorium does not pose an immediate threat to public health and safety but does exceed NRC limits for public use.

E. Other Offsite Areas

No other areas with thorium contamination were identified by the aerial survey. NRC investigators have interviewed local residents who have claimed knowledge of other offsite contamination, but none of these concerns have been substantiated by any evidence of thorium contamination. Many of the concerns have been too vague to warrant ground level surveys, some were directly contradicted by the aerial survey results, while others were found to refer to known contaminated areas already discovered. Surveys were made in the Bergen Mall which had been mentioned as a possible contaminated site; no radiation levels above background were detected.

IV. WHOLE BODY COUNTING

The NRC has evaluated the desirability of whole body counting for determining uptake of thorium by former employees of MCW and nearby residents. The evaluation took into account the concentration of thorium in soil and the likelihood of uptake by workers and nearby residents. The NRC's evaluation concluded that there is no technical basis for the NRC to perform whole body counting.

V. DECONTAMINATION OF AREAS OUTSIDE THE LICENSEE'S SITE

Authority for cleanup of the offsite contamination has not yet been established. Several federal agencies, including NRC, DOE and EPA, are cooperating with Congressional, state and local officials to determine the agency with the necessary authority to ensure an acceptable decontamination.

VI. NRC ENFORCEMENT ACTION AGAINST STEPAN CHEMICAL

The NRC will pursue enforcement action to assure that the present Stepan facility is brought into compliance with NRC regulations. To date, this has been limited to a Notice of Violation informing the licensee of two items of noncompliance. The Notice of Violation cited the licensee for possession of thorium outside the two authorized burial sites and for allowing radiation levels to exceed the permissible levels for public access. Stepan has contested these citations in a written reply and the matter remains under review.