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PRELIMINARY SURVEY OF
U.S. STEEL CORPORATION--AGRI-CHEMICAL
(former Armour Fertilizer Works)
Bartow, Florida

Work performed
by the
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Oak Ridge, Tennessee 37830

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Formerly Utilized Sites--
Remedial Action Program

U.S. STEEL CORPORATION--AGRI-CHEMICAL
(former Armour Fertilizer Works)
Bartow, Florida

At the request of the Department of Energy (DOE, then ERDA), a preliminary survey was performed at the U.S. Steel Corporation--Agri-Chemical Plant near Bartow, Florida (see Fig. 1), on April 4, 1977, to assess the radiological status of those facilities utilized under Atomic Energy Commission (AEC) raw materials contracts during the period 1951 through 1955. G. W. Beck, General Manager, provided useful information about the site, and W. J. Hecht, Manager of Technical Services, provided information and identified the facility utilized in the project. Contracts AT(30-1)-1391, AT(30-1)-1404, and AT(39-6)-915 were with Armour Fertilizer Works, whose name was changed in 1959 to the Armour Agricultural Chemical Company, and later became part of U.S. Steel Company. Contracts called for research and development of an extraction process to remove U_3O_8 from phosphoric acid recovered from the processing of phosphate rock. It was believed that a small pilot plant was constructed and operated at this site (see Fig. 2) and that no more than gram quantities of U_3O_8 were produced during the contract period. There is apparently no one presently employed by the company who worked at this facility during contract operations. No information was available pertaining to the radiological status of this facility at project termination or to the disposition of equipment utilized during this project.

Present Use of Facilities

The building in which the bench-scale plant operated is now a field office for the plant's diammonium phosphate loading area.

Results of Preliminary Survey

The preliminary survey was conducted by H. W. Dickson of the Oak Ridge National Laboratory and W. T. Thornton of the Department of Energy-Oak Ridge Operations Office (then ERDA).

Exploratory measurements of radiation levels inside the building, including the remaining lab bench area where the pilot plant was believed to be located, and areas outside the building were performed. The

measurements consisted of gamma-ray exposure rates at a height of 1 m above the surface and beta-gamma dose rates at 1 cm above surfaces. Additionally, a soil sample was obtained outside near the rear of the building at a point where a drain pipe from the building terminated.

Results of direct measurements of gamma-ray exposure rates indicated a maximum reading of 7 $\mu\text{R/hr}$ inside the building (see Fig. 3). The maximum direct reading of beta-gamma dose rates at corresponding points was 0.02 mrad/hr. The maximum gamma-ray exposure rate outside the building was 30 $\mu\text{R/hr}$ at 1 m above the surface and the beta-gamma dose rate at 1 cm at the same location was 0.1 mrad/hr. The beta-gamma dose rate inside the above-mentioned drain pipe was found to be 0.25 mrad/hr. Analysis of a soil sample taken outside the building revealed 28.3 pCi/g of ^{226}Ra . All other radionuclides in this sample were below detectable limits. The radium concentration in this sample is similar to that observed in other studies conducted in Central Florida¹⁻⁵. The above level of ^{226}Ra is commonly found in soil on land which has been mined for phosphate rock and in gypsum found around plants which process(ed) phosphate rock. This level of radium may also be found in the immediate vicinity of operating phosphate products plants.^{2,3} It does not appear that further measurements would result in additional information about radiological conditions at this site at the time AEC contract operations were terminated.

References

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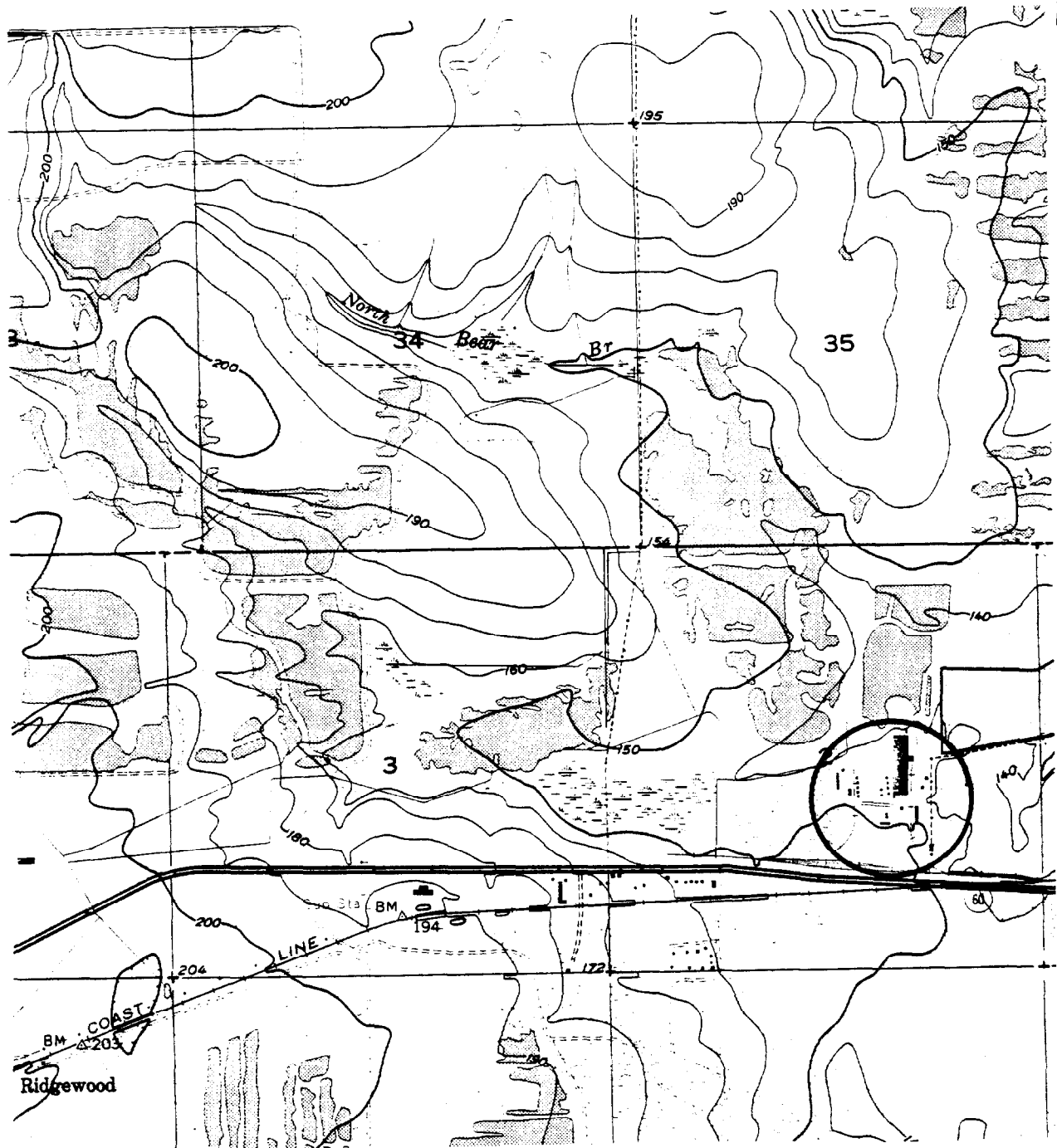


Fig. 1. Location of the U.S. Steel--Agri-Chemical Plant near Bartow, Florida.

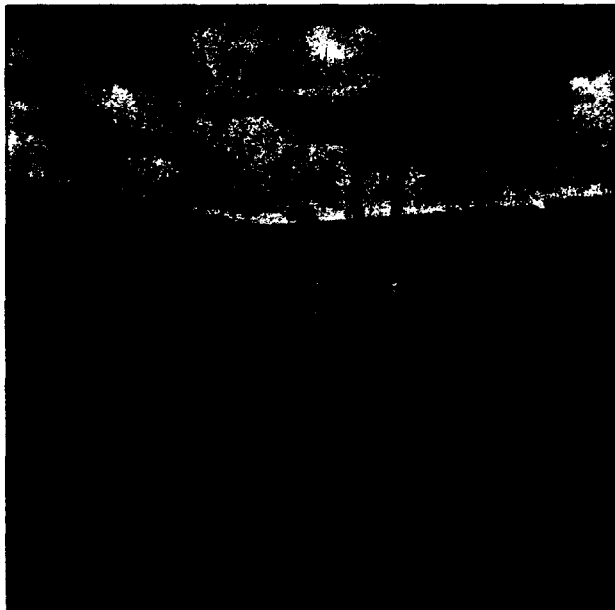


Fig. 2. Building in which pilot plant operated.

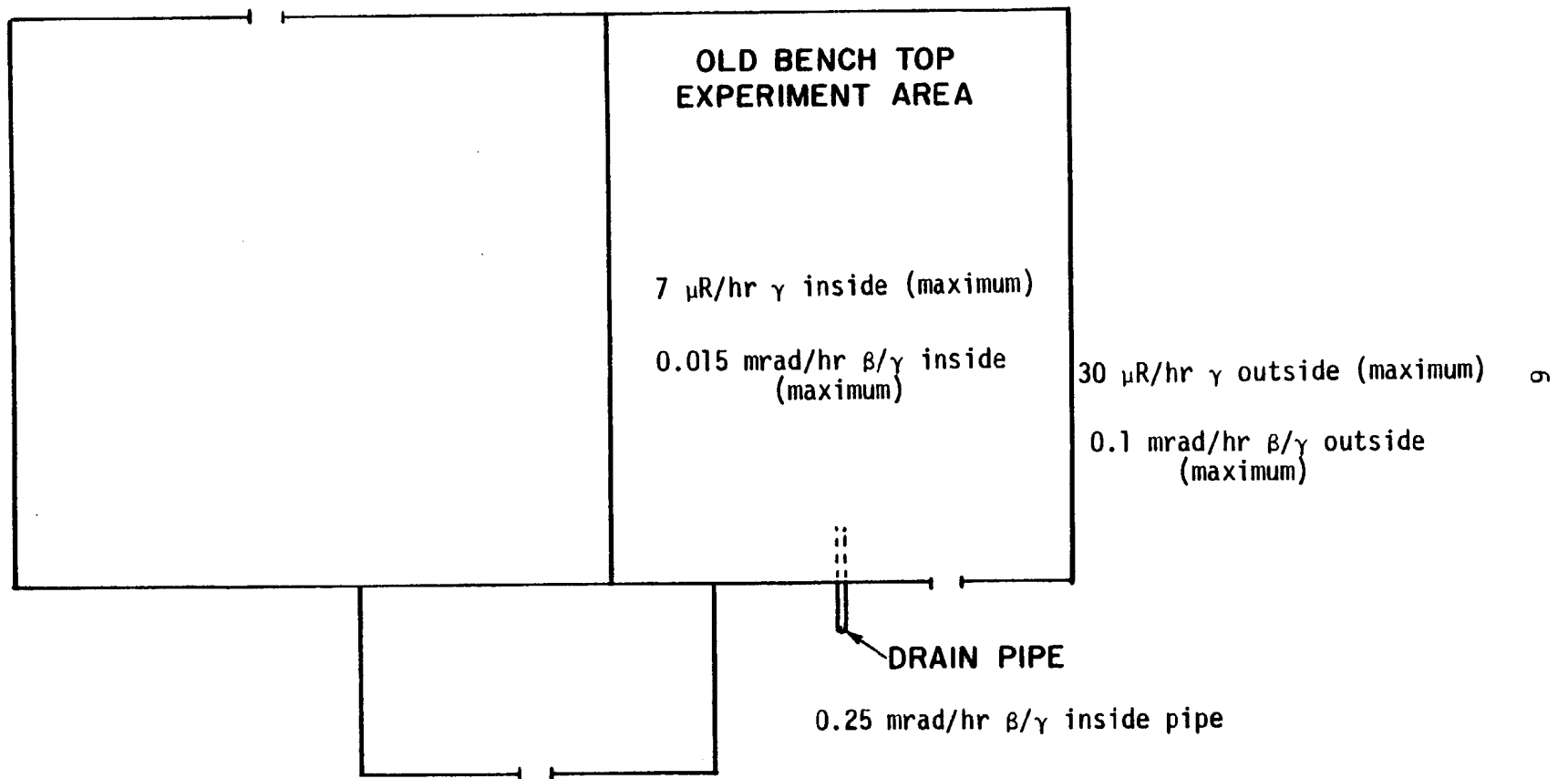


Fig. 3. The U.S. Steel Corporation--Agri-Chemicals site (former Armour Fertilizer Works) in Bartow, Florida.