U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 030-05470/87-01

Docket No. 030-05470

License No. 29-13841-01 Priority 3 Category E

Licensee: BASF Corporation
Chemicals Division
Agricultural Research Center
P.O. Box 13528
Research Triangle Park, North Carolina 27709-3528

Facility Name: BASF Corporation, Chemicals Division

Inspection At: Alpha, New Jersey, Field Site

Inspection Conducted: January 21, 1987

Inspector: John T. Jensen 8/20/87
John T. Jensen, Health Physicist date

Approved by: John D. Kinneman 8/27/87
John D. Kinneman, Chief date
Nuclear Materials Safety Section A

Inspection Summary: Closeout inspection conducted on January 21, 1987 (Report No. 030-05470/87-01)

Areas Inspected: A special, announced inspection to confirm the licensee's closeout survey of a field site in Alpha, New Jersey. Specific areas of the field site were sampled and surveyed to identify contaminated soil and residual radioactive material.

Results: The licensee's survey, enclosed with their letter dated November 18, 1986, does not accurately reflect the condition of the areas of the field site surveyed in that carbon-14 in excess of natural background is present in the areas sampled. The highest concentration found was 340 picocuries of carbon-14 per gram of soil.

DETAILS

1. Persons Contacted

No licensee representatives were present during the inspection. James R. Clark, Ph.D., Radiation Safety Officer, was contacted by telephone following the inspection.

2. Instrumentation and Analytical Technique Used in Survey

Radiation level measurements of surface soil at the field site were made with a Berthold Model 1211C gas-filled proportional counter, sensitive to low energy beta radiation. Soil samples were analyzed by an NRC contract laboratory at the Department of Energy Radiological and Environmental Science Laboratory in Idaho Falls, Idaho using the following method:

- like samples were combined and homogenized
- the resulting eight combined samples were oxidized in acid and the resulting products analyzed by liquid scintillation counting.

3. Use of Materials

The licensee sprayed chemically bound carbon-14 onto vegetation on 23 plots, each approximately 4'x 8', in an open field, approximately 30'x 70'. The radioisotope was used in tracer analysis of chemical compounds in soil and vegetation for research and development.

4. Radiation Survey Results

Random surveys of surface soil were made throughout the 30'x 70' area. No radiation levels above background were detected.

5. Soil Contamination Survey Results

Locations sampled in the 30'x70' field site are identified in Attachment 1. One combined vegetation sample was taken from various plants throughout the area. A total of 18 soil samples including surface and 6" Core Samples were taken in the area and like samples were combined such that eight separate analyses were performed. The composition of the combined samples and the liquid scintillation analysis results are given in Attachment 2. The licensee's letter dated November 18, 1986, states that no carbon-14 in excess of natural background was found in their samples. As Attachment 2 indicates, up to 340 picocuries of carbon-14 per gram of soil were found in the NRC samples.

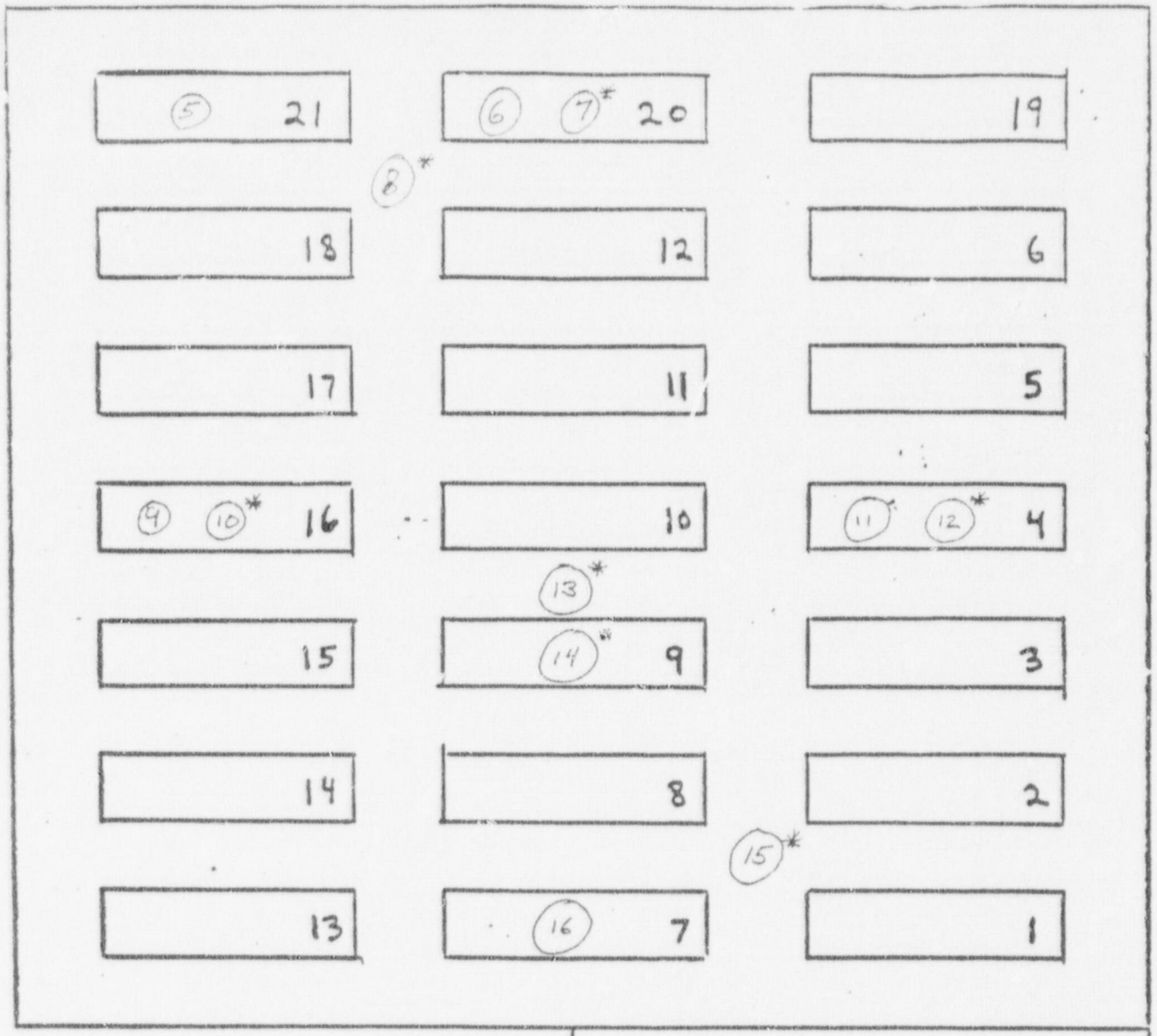
6. Transfer of Licensed Material

The inspector interviewed a licensee representative who stated that each of the 23 plots in the field had been excavated to a depth of approximately three feet and the contaminated soil had been deposited in 335, 55-gallon steel drums and transferred to a licensed land burial facility for disposal.

7. Exit Interview

The results of the radiation survey were reviewed with the licensee representative identified in paragraph 1.

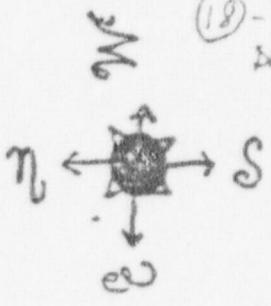
ATTACHMENT 1 — Diagram of Plot Locations at Alpha, New Jersey



(1) - CONTROL SAMPLE TAKEN ACROSS ROAD SEPERATING FIELD FROM DWELLINGS

(2)(3)(4) - SAMPLES TAKEN FROM WATER DRAINAGE AREAS

(18) - VEGETATION SAMPLE (NOT SHOWN ON DIAGRAM)



(2)

(4)

(3)

(1)

* - DENOTES 6" SOIL CORE SAMPLE

NOTE: NUMBERS NOT CIRCLED DENOTE LICENSEE'S SEQUENCE OF PLOT ORDER

Attachment 2

Soil Sample and Oxidation Analysis Results and Identification

Oxidation Analysis Sample Number	Carbon-14 Concentration (Picocuries per gram)	Soil Analysis Sample Number (from Attachment 1)
1	0.1	(1)-control
2	1.0	(2) (3) (4)
3	92	(18)-vegetation
4	0.9	(9) (10)
5	320	(6) (7)
6	57	(11) (12)
7	340	(5)
8	33	(8)(13)(14)(15)(16)(17)