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ATOMIC ENERGY COMMISSION  
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October 1, 1973

Mr. Allen  
PA. 33  
PA, 33-5

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RESTORAL OF PALMERTON ORE STORAGE SITE -- FINAL ACTIVITIES

Introduction

The restored ore storage site at the East Plant of the New Jersey Zinc Company, Palmerton, Pa., was visited September 18 and 19 for final sampling of gamma radioactivity and radon 3 months after the ore was removed and 8 to 10 weeks after the stripped storage area had been backfilled with slag. Please refer to memoranda of 1/29/73, 6/7/73, 6/15/73, and 8/28/73 for background.

Summary and Conclusions

Gamma activity and radon levels in the area and surroundings are below the maxima of 60 microroentgens gamma and 2-1/2 times the 9/19/73 background radon, standards set by Division of Operational Safety. The site is deemed to be not hazardous and it is recommended that this case be closed.

Gamma Radioactivity

Enclosure "C" (Isorad Map of the Stockpile Area) of the 8/28/73 memorandum could not be included with that memorandum because of drafting delays, and is enclosed herewith. This map portrays gamma activity and radon levels at the site prior to backfilling with slag. For the 9/19/73 survey, the grid of the 7/5/73 survey was not duplicated because all the original readings were below the allowable maximum. Instead the minimum, maximum, and average gamma values were determined for the filled area and for the railroad bed which had not been disturbed.

Gamma Counts Per Second (Micro R/hr.)

	<u>Minimum</u>	<u>Maximum</u>	<u>Average</u>
Filled Area	52 (6.9)	72 (9.5)	58 (7.7)
Railroad Bed	40 (5.3)	80 (10.6)	60 (7.9)

Mt. Sopris Scintillation Counter

This unusually low radioactivity is attributed to the cover of slag which is much lower than that of average soil. The gamma background in Palmerton City Park is 90 (11).

#### Radon

The locations and radon concentrations of the radon samples taken 7/5/73 are shown on 8/28/73 enclosure "C". The locations and radon concentrations of the samples taken 9/19/73 have been added in red. The results of analyses are reported in enclosure A. Not shown are the July and September samples taken for background at the same spot in Palmerton City Park. The 7/5/73 background sample of 0.29 pc/liter compares with 1.6 pc/liter 9/19/73. The later, 5.5 times higher, may represent a normal cyclic change in the exhalation from the black soil of the park, or may result from something added to the soil during a carnival which was closing at the time of the second sample. The former is more probable and would illustrate a large variation of radon background as we found in Louisiana. At any rate, the later sample establishes a new background of acceptability for the stockpile site radon levels.

The highest level of 6.4 pc/liter at the railroad gate 7/5/73, which was 20 times background at the time, is only 4 times the new background. However, the 9/19/73 sample at the identical spot at the railroad gate is now only 0.53 pc/liter, less than the later background. It is therefore acceptable. The former high value may have been in error due to a misplaced decimal (the new value is about 10 times less), but the latest value is still comparatively high and an anomaly may have and might still exist. Sample 9/19/73-2 exhibits the highest level found in the stockpile area, and is 80 feet closer to the more radioactive east end of the pile area. The radon levels in the backfilled area are still consistently lowest.

As one logical explanation for the anomalies, the periphery of the pile area (particularly the railroad bed) was not excavated and backfilled, and is known to have received some uranium daughters from leaching of the pile. A few pieces of ore may still be buried in this ring area. Radon could emanate through the surficial slag and enter the atmosphere to be blown downwind. A common wind direction is from the northwest or west. Radon thus blown may accumulate against the barrier created by the solid board fence. However, the variations in the anomaly near the gate are well within the natural variation found in Louisiana where no uranium ore was known on the surface.

The radon data suggest a natural variation of about one order of magnitude at any locality. Accepting this variation as fact, it is apparent that the acceptable anomaly limit of twice background is

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unrealistic and could not even be ascertained without measurements over enough time to establish an accurate average.

*John W. Gabelman*  
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Staff Geologist  
Division of Production  
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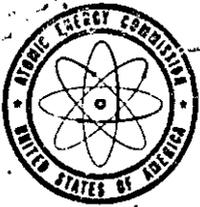
PMM:JWG

Enclosures:

1. Attachment 8/28/73-C  
Isorad Map of the Stockpile Area
2. Attachment 9/25/73-A  
Report of Radon Analyses

cc:

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September 25, 1973

Dr. John W. Gableman  
 Division of Production and Materials Management, HQ

RADON-222 ANALYSES

We have completed the radon-222 analyses of the six additional air samples collected at Palmerton, Pennsylvania. The sample descriptions are from the note accompanying each sample. The results of the measurements are shown below.

<u>Sample</u>	<u>Collection Date and Time</u>	<u>pCi Rn-222/liter*</u>
#1 Bottle #3	(Not given - assumed to be 19 September 73) 1020 EST	0.53 ± .02
#2	19 September 73 1020 EST	0.73 ± .02
#3 Bottle 1A	19 September 73 1030 EST	0.14 ± .01
#4	19 September 73 1040 EST	0.13 ± .01
#5	19 September 73 1045 EST	0.12 ± .01
#6	19 September 73 1140 EST	1.6 ± .1

\* Corrected to Collection Date and Time.

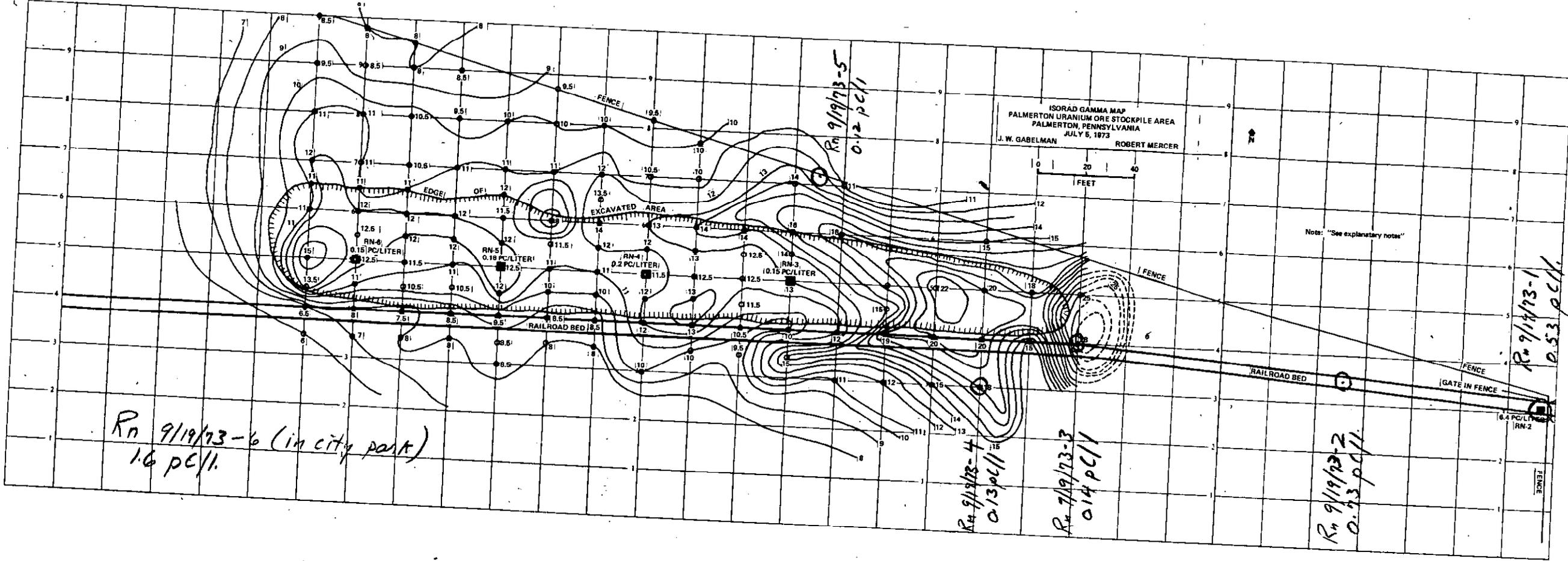
*Isabel M. Fisenne*

Isabel M. Fisenne, Chemist  
 Radiochemistry Division--HSC

cc: G. A. Welford, HSC  
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NOTES TO ACCOMPANY ISORAD GAMMA MAP

1. Survey made after ore removal and subexcavation to 2-1/2 feet maximum.
2. Data shown obtained with Eberline Model PRM-4 Scintillation Counter with SPA-2 probe reading in K (1000) counts per minute.
3. Radon samples (RN-2, ) obtained by sucking atmospheric air into jugs at 3.0 feet above ground. Radon concentrations determined by Isabel Fisenne, Chemist, Radiochemistry Division, Health and Safety Laboratory, AEC, New York City. Values reported in picocuries Rn-222 per liter of air.
4. Radon background in City Park = 0.29 pc Rn-222 per liter.
5. The natural background base level for comparison with stockpile area measurements is selected as the highest measured in the natural environment: 12.2 k cpm at 3.0 feet. Therefore maximum acceptable for decontamination (at 2-1/2 x bkgr) is 30.5 k cpm at 3.0 feet.



ISORAD GAMMA MAP  
 PALMERTON URANIUM ORE STOCKPILE AREA  
 PALMERTON, PENNSYLVANIA  
 JULY 5, 1973  
 J. W. GABELMAN ROBERT MERCER

0 20 40  
 FEET

Note: "See explanatory notes"

Rn 9/19/73-6 (in city park)  
 1.6 pc/l.

Rn 9/19/73-5  
 0.12 pc/l.

Rn 9/19/73-4  
 0.13 pc/l.

Rn 9/19/73-3  
 0.14 pc/l.

Rn 9/19/73-2  
 0.13 pc/l.

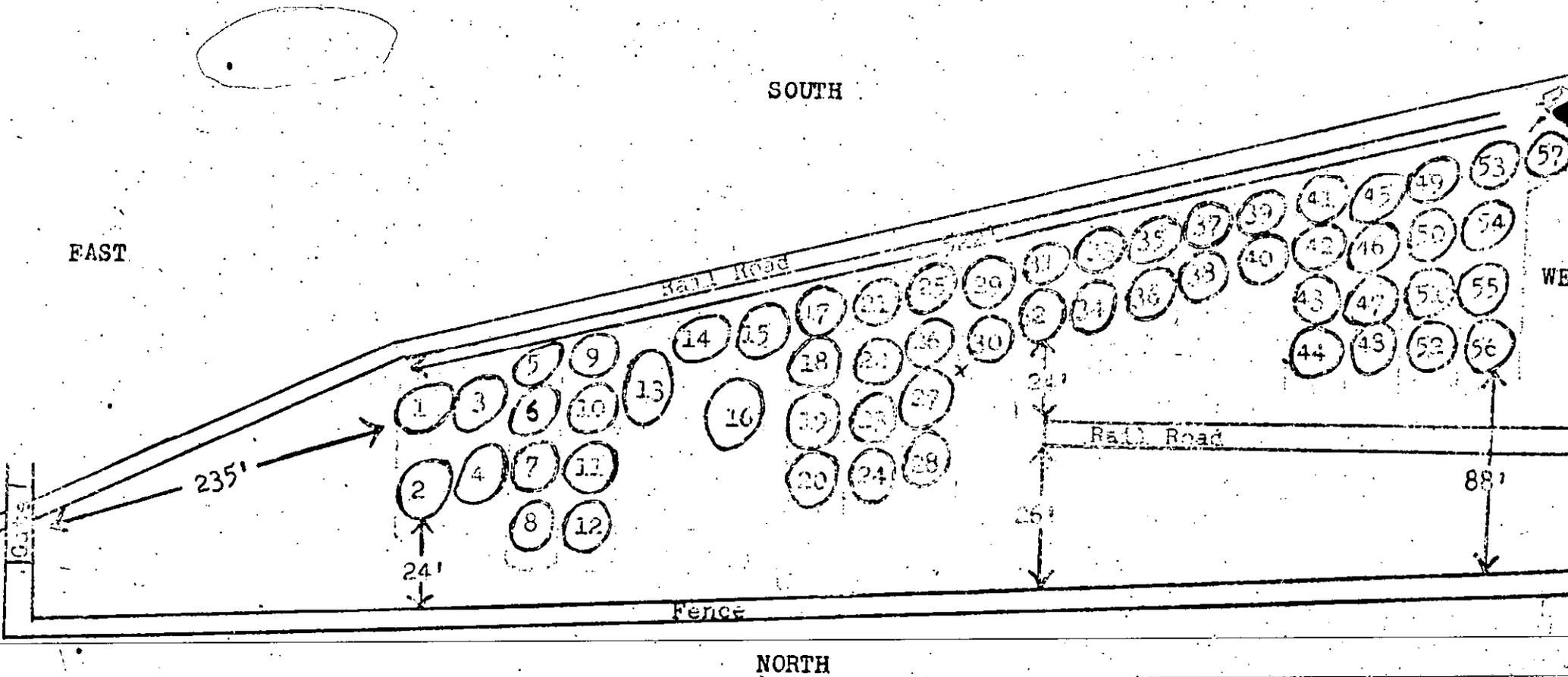
Rn 9/19/73-1  
 0.53 pc/l.

6.4 PC/LITER  
 RN-2

STOCKING ARRANGEMENT

URANIUM BEARING ORE - STOCKED FOR ATOMIC ENERGY COMMISSION

AT N.E. CORNER PALMERTON EAST PLANT



Numbers refer to truckloads.

Red circles indicate lots.

To identify lot numbers see tabulation attached.

11/17/54.

June 12, 1973

R. E. Hollingsworth, General Manager

THRU: G. F. Quinn, AGMP

DISPOSAL OF ORE STOCKPILE AT PALMERTON, PENNSYLVANIA

During 1954 the Division of Raw Materials purchased at a buying station established at the New Jersey Zinc Company smelter, Palmerton, Pa., 360 tons of uranium ore mined at Jim Thorpe, Pa. Insufficient ore was mined to justify a mill in the eastern U.S., and it has been uneconomic to ship the ore to a Western or Canadian mill. We now wish to dispose of the stockpile as part of our buying station cleanup program.

In accord with the May 29, 1963, memorandum (Leudecke to Headquarters and Field Offices, regarding low level solid radioactive waste burial, copy enclosed), approval is requested to dispose of the subject AEC-owned ore stockpile by adding it to a raffinate pond currently being covered at Fernald, Ohio. This disposal method is preferable to deposit in a commercial burial ground for the following reasons: The cost of burial at West Valley, New York, the closest commercial site, would be about \$52,000 compared to \$12,000 at Fernald. Also, the commercial burial of natural ore may set a precedent which could have disadvantageous effects on programs for the disposal of uranium mill tailings, and might bring pressure for such disposal of mine dumps, and even outcropping natural uranium deposits too low grade to mine. The cost of processing the ore at the closest domestic mill (Colorado) would be approximately 20 times its value.

Frank P. Baranowski, Director  
Division of Production and  
Materials Management

PMM:JWG

Enclosure:  
As stated.

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6/ /73

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H.A.Nowak  
6/ /73

OS  
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