

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 999-9003/94001(DRSS)

License No. Non-Licensee

Organization: Northeast Ohio Regional Sewer District (NEORSO)  
Cleveland, Ohio

Inspection At: NEORSO Southerly Wastewater Treatment Plant  
6000 Canal Road  
Cuyahoga Heights, OH 44125-1075

Inspection Conducted: Onsite November 23, 1993 and in office review of  
radioanalytical data on January 26, 1994

Inspector: *Ragman R. Glinski* 2/23/94  
R. V. Glinski Date  
Radiation Specialist

Approved By: *G. M. McCann* 2/23/94  
G. M. McCann, Chief Date  
Fuel Facilities and  
Decommissioning Section

Inspection Summary

Inspection on November 23, 1993 (Report No. 999-9003/94001(DRSS))

Areas Inspected: This was a special inspection which was limited to a partial radiological survey of Lagoon A and the collection of ash samples from the area surveyed. The survey consisted of a gamma radiation walkover survey of the perimeter of the bottom of Lagoon A and the collection of ash samples from the same area. Composite samples from grids randomly selected by the Oak Ridge Institute for Science and Education (ORISE) were collected from the bottom of Lagoon B for ORISE.

Results: The NRC inspector did not identify any radiation levels above ambient background. None of the ash samples collected from Lagoon A possessed a level of cobalt-60 (Co-60) contamination in excess of the NRC guideline value for decontamination of soil for release for unrestricted use of 8 picocuries per gram (pCi/g) [296 millibecquerel per gram {mBq/g}]. The samples collected from Lagoon B were sent to ORISE. The results of the Lagoon B samples will be incorporated into an ORISE site characterization report.

## DETAILS

### 1. Persons Contacted

\*Richard Connelly, Manager, Water Quality and Industrial Surveillance, Northeast Ohio Regional Sewer District (NEORS D)  
James Dean, Radiation Safety Project Manager, Radiation Service Organization, Inc.; NEORS D health physics contractor

\*Denotes individual contacted by telephone on February 17, 1994.

### 2. Background

The NEORS D is responsible for operating three wastewater treatment plants in and near Cleveland, Ohio. The Southerly Wastewater Treatment Plant (SWTP) of NEORS D began operations in 1927. The current process at SWTP involves degritting the sludge, thickening the sludge in a centrifuge, and thermally conditioning the sludge prior to vacuum filtration and incineration. The incinerated sewerage ash is liquified and then pumped into the three evaporation lagoons, designated as Lagoons A, B, and C.

An April, 1991 aerial radiation survey of the Cleveland area identified a few areas at SWTP with elevated levels of Co-60. The identified areas were the north edge of the plant, the sanitary ponds now in use, and the south fill area.

The NRC and an NRC contractor (Oak Ridge Institute for Science and Education - ORISE), began a limited radiological site characterization in the summer of 1991. Upon completion of the ORISE limited site characterization, NEORS D secured the services of a health physics vendor which conducted the remediation and the close-out surveys of the sanitary ponds. The remediation of Lagoon A involved the removal of the entire bottom to a depth of 1.5 - 2 feet (0.5 - 0.66 m) below grade, and a removal to 3 feet (1 m) below grade of 6 separate grids. The dimensions of the grids were 10 x 10 meters. After the remediation and close-out surveys were complete, NEORS D had a clay cover installed on the bottom of Lagoon A.

NEORS D requested in November 1993 that Lagoons A and B be conditionally released for use in order that those lagoons could be used in the event that Lagoon C became inoperable. This request was made because the ORISE confirmatory survey had not yet been completed, and consequently the lagoons had not been released for unrestricted use by the NRC. A previous survey by the NRC had found one ash sample from a total of fifteen taken from the bottom of Lagoon A that contained a concentration of Co-60 greater than the NRC release criteria of 8 pCi/g (296 mBq/g). Therefore, the NRC Region III office decided that in order to support the conditional release of Lagoon A, further surveys and sampling were necessary.

### 3. Survey Procedures

The gamma radiation walkover survey was conducted with a Victoreen Model 190 ratemeter, Serial No. 549, calibrated October 12, 1993, equipped with a 2" x 2" NaI(Tl) detector. The background count rate for this detector was 8,000 - 9,000 counts per minute (cpm) and the response of the detector was checked with a sealed Cs-137 source prior to the survey. Ash samples were collected at approximately 30 meter intervals around the perimeter of the bottom of Lagoon A. A map of Lagoon A with the approximate sampling points noted is presented in Attachment A.

Samples were collected in Lagoon B from randomly chosen 10 x 10 meter grids specified by ORISE. The samples were collected according to ORISE procedures as follows: five samples were collected from each grid, four of the samples were collected at the points two meters from the corners toward the grid center and one composite sample was collected by combining ash/soil from those four sampling points.

### 4. Survey Results

The inspector did not identify any areas with radiation levels above ambient background. The ash samples were submitted to the Region III Radiological Laboratory for gamma spectrometry analysis. None of the samples had concentrations of Co-60 in excess the NRC guideline value for decontamination of soil for release for unrestricted use of 8 pCi/g (296 mBq/g). The gamma isotopic analysis results are presented in Attachment B.

The composite samples, with a sample collection form, were sent to ORISE for analysis. This data will be incorporated into the ORISE characterization report.

### 5. Exit Meeting

Due to the nature of the inspection and the time of day when the sample collection was concluded, the inspector was unable to conduct an exit meeting. The inspector contacted Mr. Richard Connelly by telephone on February 17, 1994, and discussed the preliminary results of the inspection.

#### Attachments:

1. Lagoon A Survey Grid
2. Lagoon A Sample Results  
Bottom Perimeter

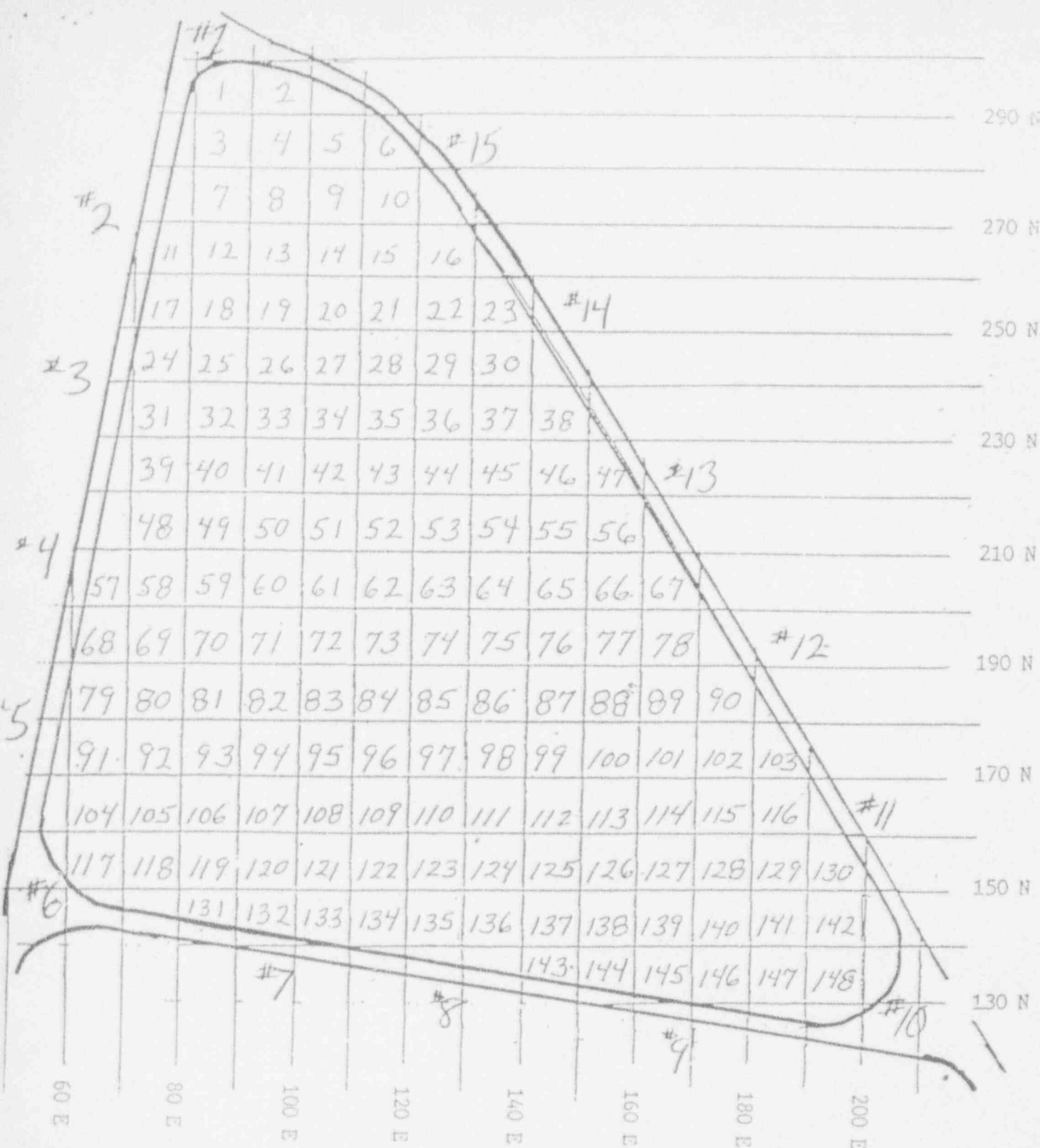


FIGURE 10 (a)  
LAGOON " A " SURVEY GRID  
1 GRID = 10m x 10m



## LAGOON A SAMPLE RESULTS - BOTTOM PERIMETER

SAMPLE NO.	SAMPLE DESCRIPTION	CO-60 (pCi/g)*§
1	NORTH CORNER	<MDA
2	30M SOUTH OF NORTH CORNER	<MDA
3	60M SOUTH OF NORTH CORNER	<MDA
4	90M SOUTH OF NORTH CORNER	0.45 +/- 0.18
5	120M SOUTH OF NORTH CORNER	0.33 +/- 0.19
6	SOUTHWEST CORNER	<MDA
7	30M EAST OF SW CORNER	0.36 +/- 0.14
8	60M EAST OF SW CORNER	<MDA
9	90M EAST OF SW CORNER	<MDA
10	SOUTHEAST CORNER	<MDA
11	30M NORTH OF SE CORNER	<MDA
12	60M NORTH OF SE CORNER	<MDA
13	90M NORTH OF SE CORNER	<MDA
14	120M NORTH OF SE CORNER	<MDA
15	150M NORTH OF SE CORNER	0.68 +/- 0.18

The uncertainties represent the 95% confidence level based only on counting statistics.

\* pCi/g x 37 = mBq/g

§ The MDA is 4.66 x the standard deviation of the background count rate. A typical MDA for these analyses is approximately 0.25 pCi/g.