18335

SURVEY REPORT

MCGEAN CHEMICAL CO.
HARVARD AVENUE
CLEVELAND, OHIO

February 1979

Conducted by

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205

For

Allegheny Ludlum Industries Inc.
2 Oliver Plaza
Pittsburgh, Pennsylvania 15222

McGean Chemical Company, Inc.
1250 Terminal Tower
Cleveland, Ohio 44113

For NLI, Inc.

David W. Leigh
Decommissioning Manager

Eileen D. Hotte, Ph. D.
Consultant

7907130006

F/1

Table of Contents

SUMMARY OF SURVEY FINDINGS

1. SUMMARY OF FINDINGS

Area 21-A*

This area is generally 5 times the average acceptable fixed Beta-Gamma activity limit specified in Table I of USNRC Regulatory Guide 1.86 and about 7 times the limit for maximum fixed Beta-Gamma.

Area 21-B

This area is the most highly contaminated of the involved areas with floors at 21 times the limit for the average acceptable condition and 26 times the maximum acceptable limit. Components of the walls are 35 times the average and 12 times the maximum while structural steel and its adjacent piping, sprinklers, and conduit are 60 times the average and 20 times the maximum acceptable conditions for fixed Beta-Gamma contamination. Ceilings which were accessable also are contaminated to 15 times average acceptable limits.

Area 21-C

This area is only slightly contaminated with the floors having the only indication of contaminants which are generally slightly below the average fixed Beta-Gamma Limits. All other surfaces appear to be at background.

ADJACENT GROUNDS

Spot samples will be made to assure no soil contamination exists in traffic areas and lands bordering the involved areas.

1. SUMMARY OF FINDINGS

Area 21-A

Floor: The floor in this area has generally 4.7 times the average fixed Beta-Gamma limit specified in Table I of USNRC Regulatory Guide 1.86 of 5000 DPM/100cm^2. The maximum fixed Beta-Gamma is 7.3 times the limit set for that condition 1500 DPM/100cm^2.

TABLE I

Grid	Average Fixed Beta Gamma 10^3 DPM/100cm^2	Maximum Fixed Beta Gamma 10^3 DPM/100cm^2
A	27.50	100.0
B	30.00	87.5
C	20.00	37.5
D	16.08	37.5
E	10.31	20.0
F	9.72	15.0
G	53.89	300.0
H	27.86	37.5
I	18.89	37.5
J	61.11	275.0
K	24.06	75.0
L	15.63	50.0
M	8.06	15.0
N	25.75	125.0
O	109.72	750.0
P	17.50	37.5
Q	17.50	25.0
R	27.50	37.5
S	8.75	15.0

Walls

A random survey indicates the interior wall is about two times background and the exterior wall paneling is five times the release limits in places where the panneling attaches to the structure.

Temporary Office

There is a wooden office and laboratory which was used as a Plant Process Operations Facility. This structure is about 20 feet by 40 feet and is located in the northeast corner of this area. The roof deck is six times release criteria. The walls are two times background.

Structural Steel

The Structural steel was surveyed at random and found to be encrusted with dust, paint, and corrosion product. This survey indicated contamination levels of five times the average fixed beta-gamma limits in Regulatory Guide 1.86. A thorough survey of these structural members would be very time consuming, and would be more cost effective as part of the decontamination effort.

Service Piping and Conduit

The miscellaneous pipes, sprinklers, and electrical conduit appear to be in the same condition as the structural steel random surveys indicated contamination levels of 2.5 times regulatory guide limits.

The Ceiling

The ceiling is the underside of the roof deck. A random survey has revealed that all areas are at or below the average acceptable limits. Visual inspection did not reveal stains or

deposits of material as is the case in the 21-B area in the southeast quarter of that area.

Removable Contamination

An area of about 4 square feet in grid "C" was

a) Surveyed

b) Vacuumed

c) Surveyed

d) Scrubbed with tide and water

e) Scrubbed with dilute nitric acid

No measurable difference in beta-gamma radiation was detected. It was concluded that with possible exceptions of "Contaminated Scale" on the structural steel, service piping, and conduit, that the vast majority of beta-gamma activity resides in the corroded surfaces of the metal and has leached into the surface of the concrete floors.

Area 21-B

Floors

The floors in this area are 21 times the criterion for average fixed beta-gamma contamination, and 26.3 times the criterion for maximum fixed beta-gamma. The greater portion of the contamination is in the eastern two thirds of this area, however, there are other isolated areas which are also at these higher levels.

TABLE 2

Grid	Average Fixed Beta-Gamma 10^3 DPM/100cm^2	Maximum Fixed Beta-Gamma 10^3 DPM/100cm^2
A	225.0	1000.0
B	175.0	875.0
C	75.0	100.0
D	80.0	300.0
E	140.0	500.0
F	112.5	350.0
G	50.0	300.0
H	132.5	625.0
I	110.0	250.0
J	52.5	112.5
K	37.5	62.5
L	75.0	250.0

Fixed Alpha

An Alpha survey was conducted in Grid F of this area. The survey indicates that the average fixed Alpha activity exceeds NRC Regulatory Guide 1.86 by a factor of 1.6 and the maximum fixed Alpha is 2/3 of the guide line limits.

Area 21-B

Walls

The sills of the apron walls which sit on the brick knee-wall are generally 35 times the average acceptable limit and 11.7 times maximum acceptable limit. Wall paneling at random locations is 15 times the average acceptable and 5 times the maximum acceptable limit.

Structural Steel

The steel in this area is 60 times the average acceptable limit and 20 times the maximum acceptable limit. The random survey of these structural members revealed heavily crusted scale and oxidized surfaces.

Service Piping and Conduit

Service piping, sprinklers and electrical conduit is in generally the same condition of the structural steel described above.

The Ceiling

Random measurements of the ceiling in areas which could be reached, readily, revealed contamination 15 times the average acceptable limit. There are areas which could not be reached but, visual observation reveals, stains and deposits of contaminating materials.

Area 21-B

Removable Contamination

The vacuum, soap and water, and acid procedures were applied to about 2 feet by 2 feet of floor area in Grid B of area 21-B with results identical to those observed in area 21-A. Chips of the floor concrete were taken and counted. Recognizing the limitations of this type analysis, the results do tend to support our conclusions.

TABLE 3

Samples	Activity at 1cm of Surface Sampled 10^3 DPM/100cm^2	Gross Beta Activity
Concrete Chips	12.5	6.5 DPM
Concrete Chips	1000	160.75 DPM

A final word with regard to the condition of the floor contamination. An area about 2 feet by 2 feet in Grid A, area 21-B, was jackhammered with results listed in the Table 4, below.

TABLE 4

Depth of Surface	Fixed B,? 10^3 DPM/100cm^2
Surface	100.00
At 1 Inch	5.00
At 2 Inches	Approximately Background

A smear survey was conducted in Area 21-B, Grids A & B. The results are reported in Table 5.

TABLE 5

Sample	Beta-Gamma DPM/100cm^2
A-1	42.5
A-2	12.25
A-3	Background
A-4	4.25
B-1	2.5
B-2	3.5
B-3	1.5
B-4	5.75

Sample	Alpha DPM/100cm^2
A-1	14
A-2	5
A-3	2
A-4	3.5
B-1	3.0
B-2	Background
B-3	3.5
B-4	2.0

Area 21-C

Floors

The floors are slightly below acceptable average surface fixed contamination levels and are approximately 1.7 times the maximum acceptable limit in one small area.

Walls

Random survey of the walls indicate all walls are at background.

Structural Steel

The structural steel was surveyed at random and in areas which might be contaminated. All data indicates all structural steel in this area is at background.

Service Piping and Conduit

The miscellaneous pipes, sprinklers and electrical conduit appears to be consistent with the condition of the structural steel in this area, therefore, at background.

The Ceiling

The underside of the roof deck was surveyed at random and all results indicate the ceiling is at background.

DESCRIPTION OF HARVARD AVENUE FACILITY

2. Facility Description

The areas requiring decontamination are located at the south end of McGean Chemical Company's Building 21, which is located along the western boundary of the company's Harvard Avenue Facility. There are two large open areas which formerly housed a uranium oxide and catalyst manufacturing process.

Building 21 is an industrial structure Circa 1900 and typifies industrial architecture of that era. The floors are about 5-7 inches of unreinforced Portland Concrete. The structure consists of Canteliever "N" strut trusses supported by wide flange steel columns. The trusses are angle-iron gusseted and riveted. The exterior walls are apron type consisting of a brick knee-wall with corrigated aluminum panels to the eave. The roof is an inverted ridge hip, with clear story lights and shed decks outboard of the clear story and extending to the eave. The foof is a 5 ply built up asbestos roof on 2 x 6 inch tongue and grove roof boards laid to the 6 inch side. The roof deck which is exposed to the inside of the building is creasoted in all cases except several areas which have been repaired recently.

The catalyst manufacturing was located in the extreme south end of Building 21, identified as Area 21-A, (see map in Section 4) and involved an area of approximately 17,750 square feet.

The oxide process was located in an area (21-B) adjacent to the catalyst manufacturing area and involved 10,000 square feet.

An area adjacent to oxide process area and referred to as; 21-C, 21-D, and 21-E (See map in Section 4). This area is involved only by virtue of its proximity to areas 21-A and 21-B and the potential therefore, to have been contaminated by traffic into, through and out of, the oxide processing area.

The manufacturing processes (described in Section 3) produced dust and corrosive vapors which etched and deposited contaminating materials on most of the building's surface, structural members, service piping and electrical conduit. There has been no manufacturing in any of these areas for the past 8 - 9 years.

EXISTING CONDITION OF FACILITY

The catalyst manufacturing area (21-A) and the oxide processing location (Area 21-B) are both empty floor areas. The building is open at doors and some windows. The roof is in good condition with minor leaks in each area.

The area adjacent to 21-B referred to here as 21-C has some drums and skids stored on the floor but is in the process of being cleaned out.

McGean Chemical Company, Inc.

Corporate Headquarters: McGEAN CHEMICAL COMPANY, INC. • 1250 TERMINAL TOWER • CLEVELAND, OH 44113 • TELEPHONE: 216-621-6425 • TELEX: 98-0403

In reply refer to: PLANT and LABORATORY • P.O. BOX 09087 • CLEVELAND, OHIO 44109 • TELEPHONE 216/441-4900

February 12, 1979

Mr. David Leigh
New Venturs Manager
NL Nuclear
NL Indries Inc.
P.O. Box 2046
Wilmington, Delaware 19801

Dear Dave:

Attached is a brief summary of the manufacturing procedure for producing both the Uranium Oxide and the Catalyst. Also enclosed are 4 additional drawings.

If additional information is requested, please give me a call. I plan to be in on February 18, for a while, in the event you have any questions or need any assistance.

Very truly yours,

James E. Vamos,
Vice President, Manufacturing

JEV/jg
Enclosures

URANIUM OXIDE & CATALYST MANUFACTURE

Area 21B

Depleted Uranium Oxide was manufactured by reacting Uranium Hexafluoride with steam to produce Uranyl Fluoride. The Uranyl Fluoride was put into solution and Ammonium Hydroxide added to precipitate Ammonium Diuranate. This was then filtered and calicined to produce Uranium Oxide.

The process included a fluidized bed reactor, two precepitation tanks, or rotary vacuum filter and an indirect fired calciner. In addition there was a condensor and scrubber system for the offgases from the reactor and calciner.

Area 21A

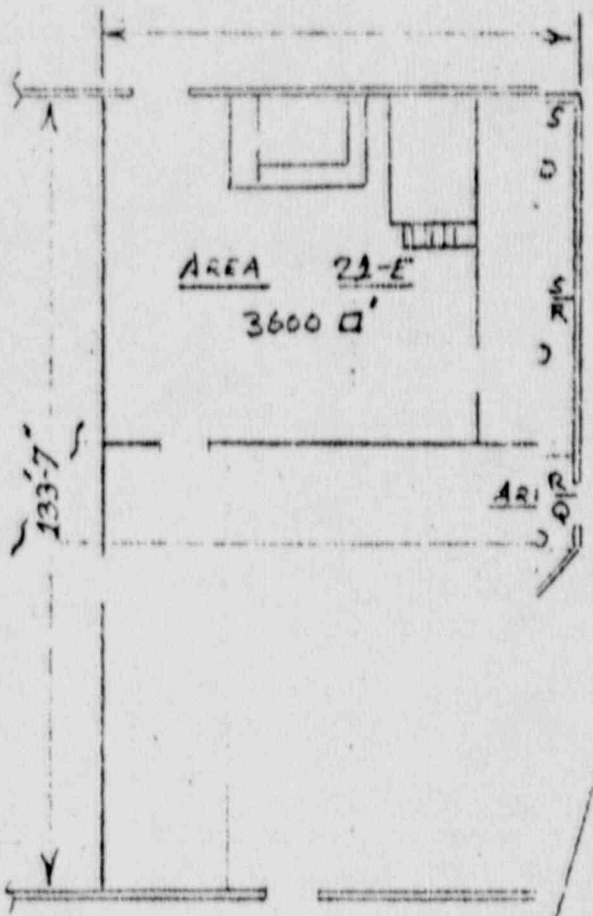
The Catalyst manufacturing involved the mixing and reacting of the components, including Antimony Oxide, Uranium Oxide and Silicon Dioxide. After reaction a precipitation step was followed by filtration, washing, and drying. The dried material was then Calcined.

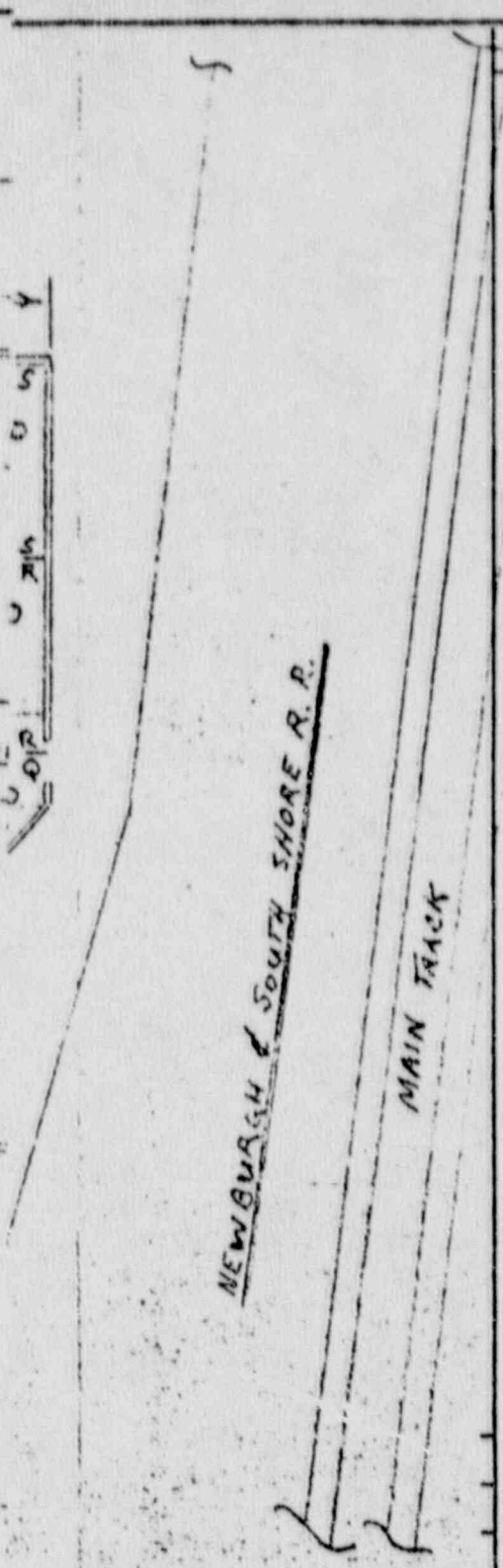
The calcined product at this point was either packaged for further processing at another location, or futher processed. The additional processing including mixing with additional Silicon Dioxide, and drying. The dried product was drummed for sale.

MAP OF INVOLVED AREAS

ISSUE 1

1001





NOTE	DWG NUMBER	ITEM

NEXT ASSEMBLY

McGEAN CHEMICAL COMPANY
SOUTH END OF BUILDING 11
CLEVELAND OHIO

NUCLEAR DIVISION
NATIONAL LEAD CO. ALBANY, N.Y.

DER	NUMBER	ISSUE
	B	

K & E CO 10 8155 71840

SURVEY DATA

a) Typical Data Display

b) Data Grids For Each Area

a. Number - a serial system of identification.

b. The total weight of the package.

c. Stencil on drum/carton: "RADIOACTIVE LSA"

d. Cubic feet of boxes containing contaminated materials.

"_____ cubic feet."

Marks will be located as indicated below:

DRUMS

a.

NUMBER
TOTAL WEIGHT

on drum head

b. "RADIOACTIVE LSA" at mid-level.

BOXES

a.

NUMBER
TOTAL WEIGHT
CUBIC VOLUME

on one end in upper right hand corner

b. "RADIOACTIVE LSA" on opposite sides.

"LSA" on opposite ends.

4. Survey and Analysis

a. A quantitative contamination analysis for uranium in soil/concrete/rubble expressed in millicuries per gram.

b. Calculate total activity in the soil/concrete/rubble.

c. Confirm constituents in drums/boxes.

d. Radiation intensity (MR/HR) measured on the surface and at 3 feet.

e. External alpha contamination in DPM/100 cm^2. (Not to be in excess of 200 d/m/100 cm^2).

5. Package Closure and Security

   a. All drums will be closed with gasketed heads held with clamping rings which should be fastened with 5/8" bolts.

   b. All boxes will have inner lining material sealed and lids nailed securily in place. 1" banding will be fastened around the box midway between the ends and the center of the box being careful to assure banding does not interfer with box skids.

6. Vehicle Loading

   a. All vehicles will be parked adjacent to staged load with adequate space to facilitate safe, efficient handling and loading.

   b. Cover truck bed with 1/4" plywood.

   c. Palletized drums will be loaded with a fork lift onto truck bed.

   d. Boxes will be loaded onto the truck bed with a fork lift.

   e. Load binders and blocking will be installed.

7. Vehicle Inspection and Shipment Release

   a. All ladings and shipment records will be completed and certified by J. Adler and executed by D. Stukenbroeker. Proper placards will be posted.

   b. The driver will be briefed on:

      a. Type of load

      b. Radiation information

      c. Lading and records

      d. Routing

      e. Accident/Breakdown reporting

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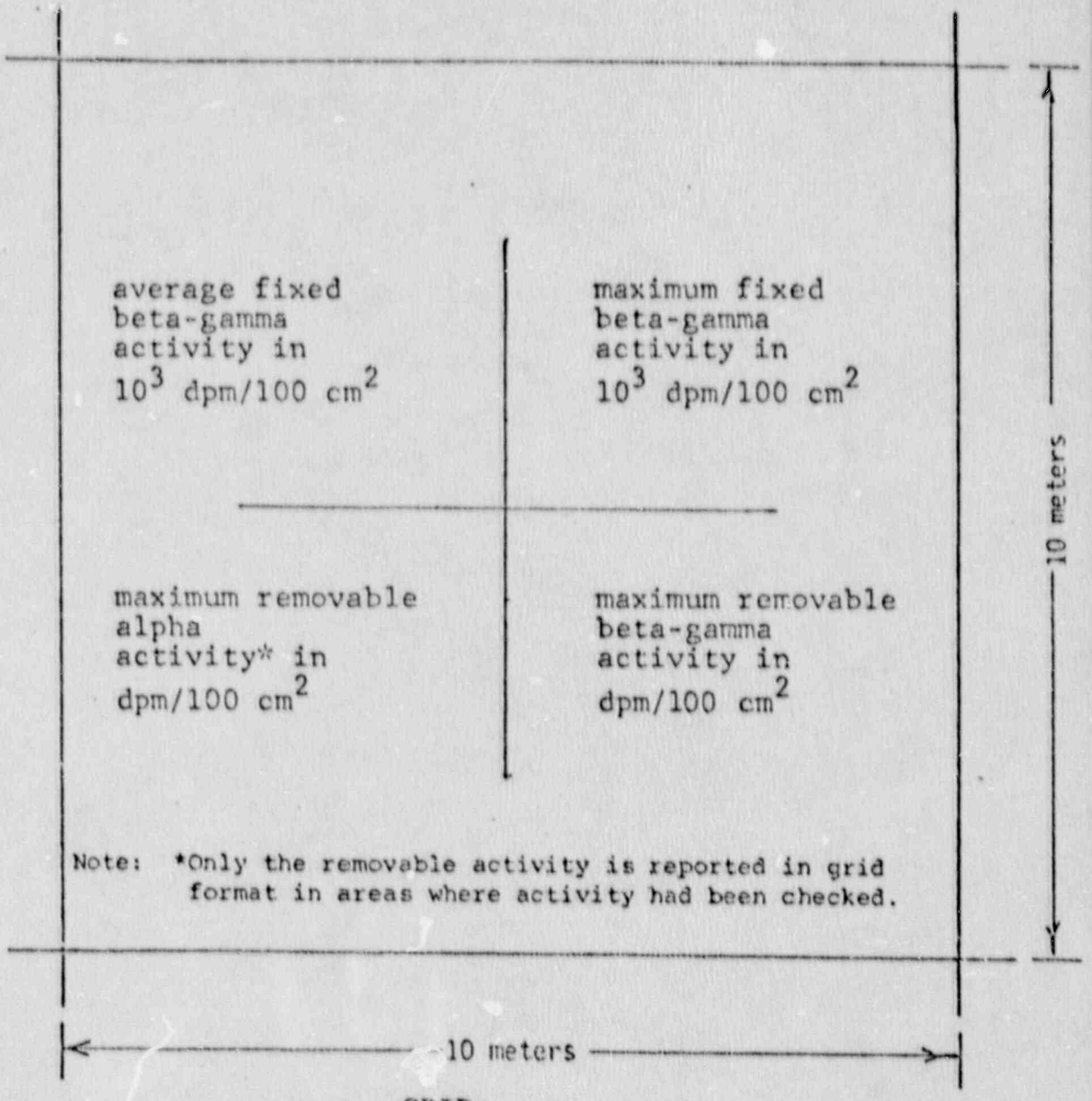
Nuclear Division
1130 Central Avenue
Albany, New York 12205

Grid Legend



Note: *Only the removable activity is reported in grid format in areas where activity had been checked.

GRID _____

Building 21

Area 21- _____

McGean Chemical Co.
Cleveland, Ohio

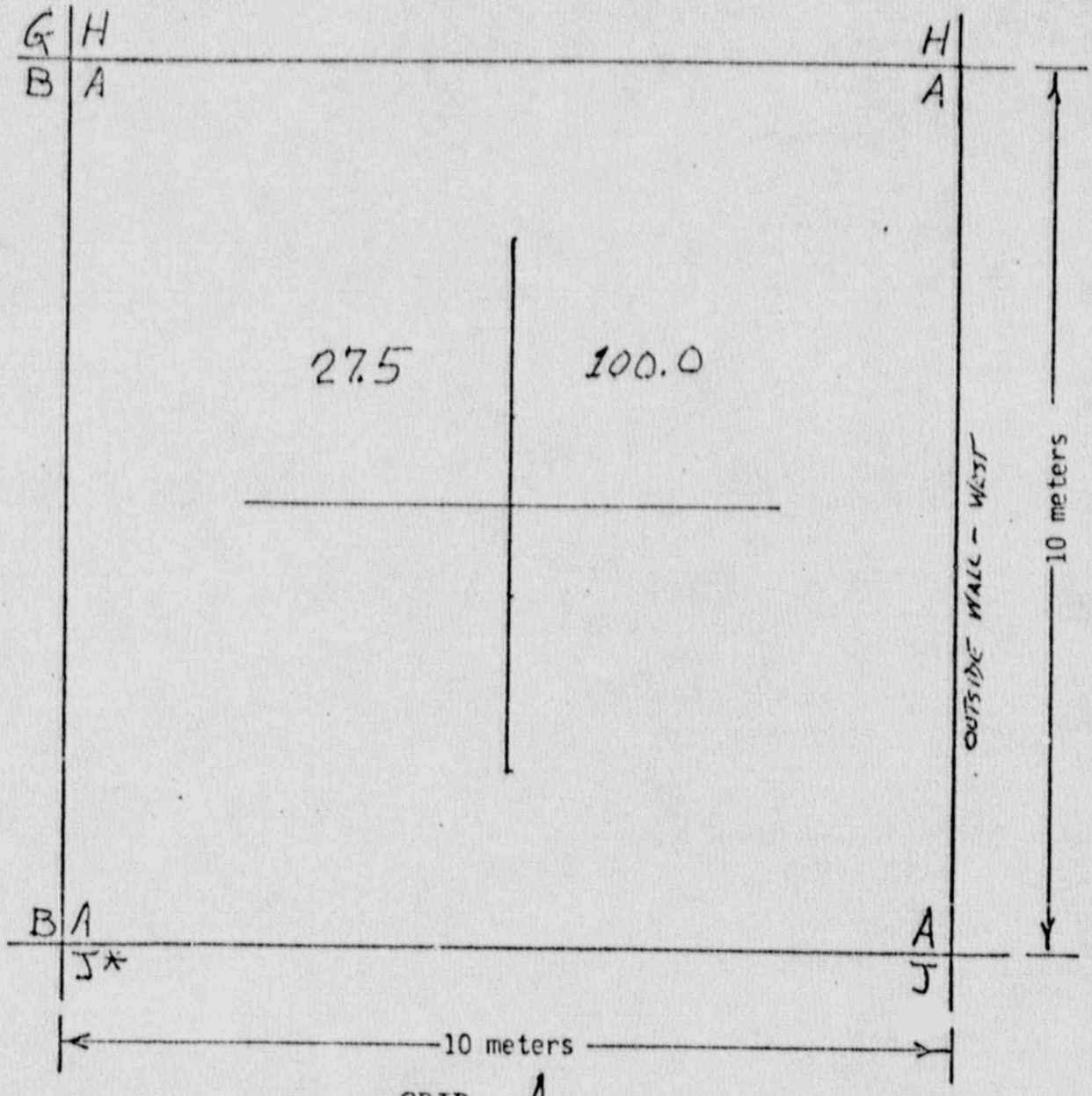
Date: _____

_____ Survey

By: _____
D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205

NOTE: ADJOINS "J" OF AREA 21-B



GRID A

Building 21

Area 21- A

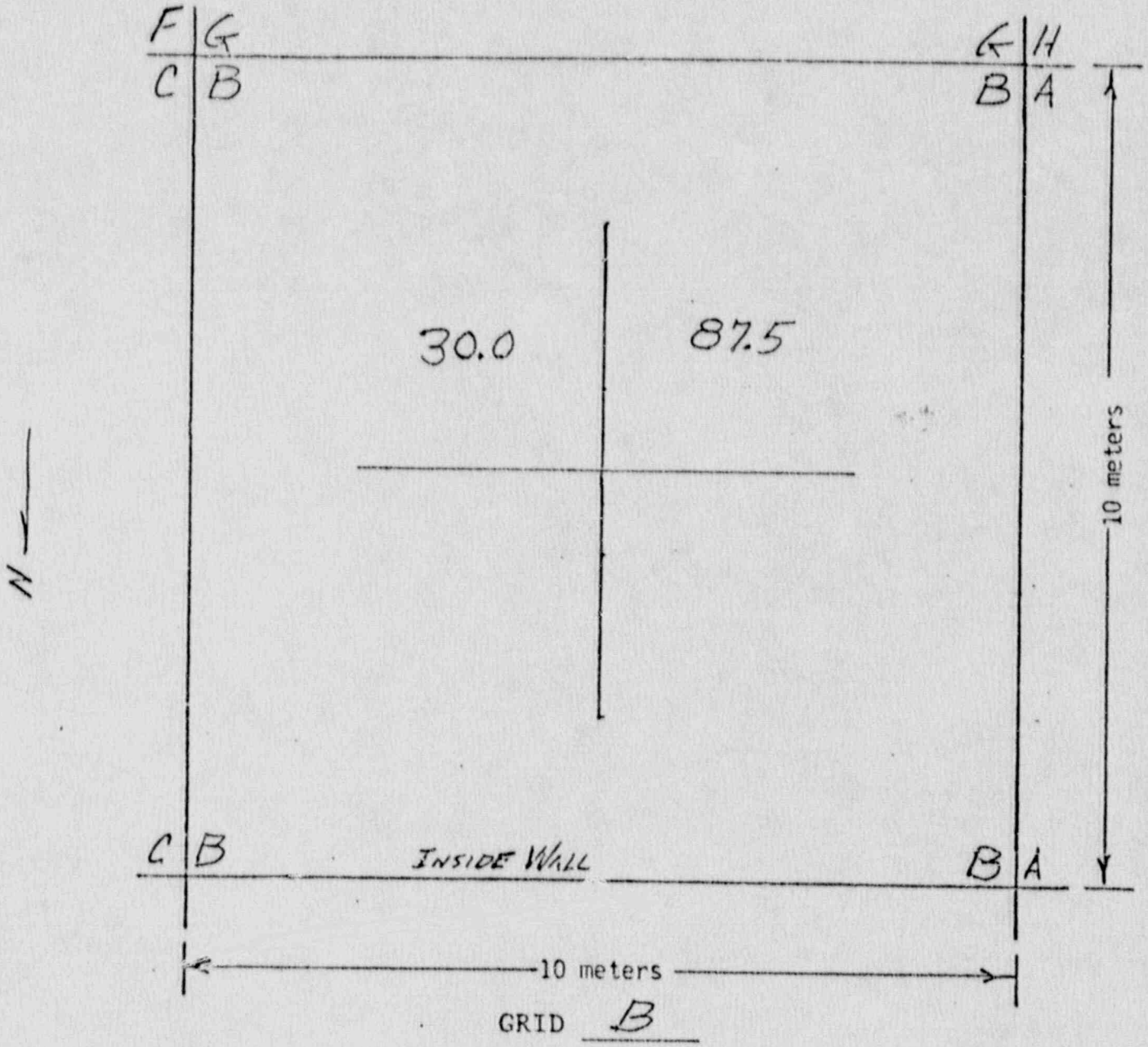
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: [signature]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID B

Building 21

Area 21- A

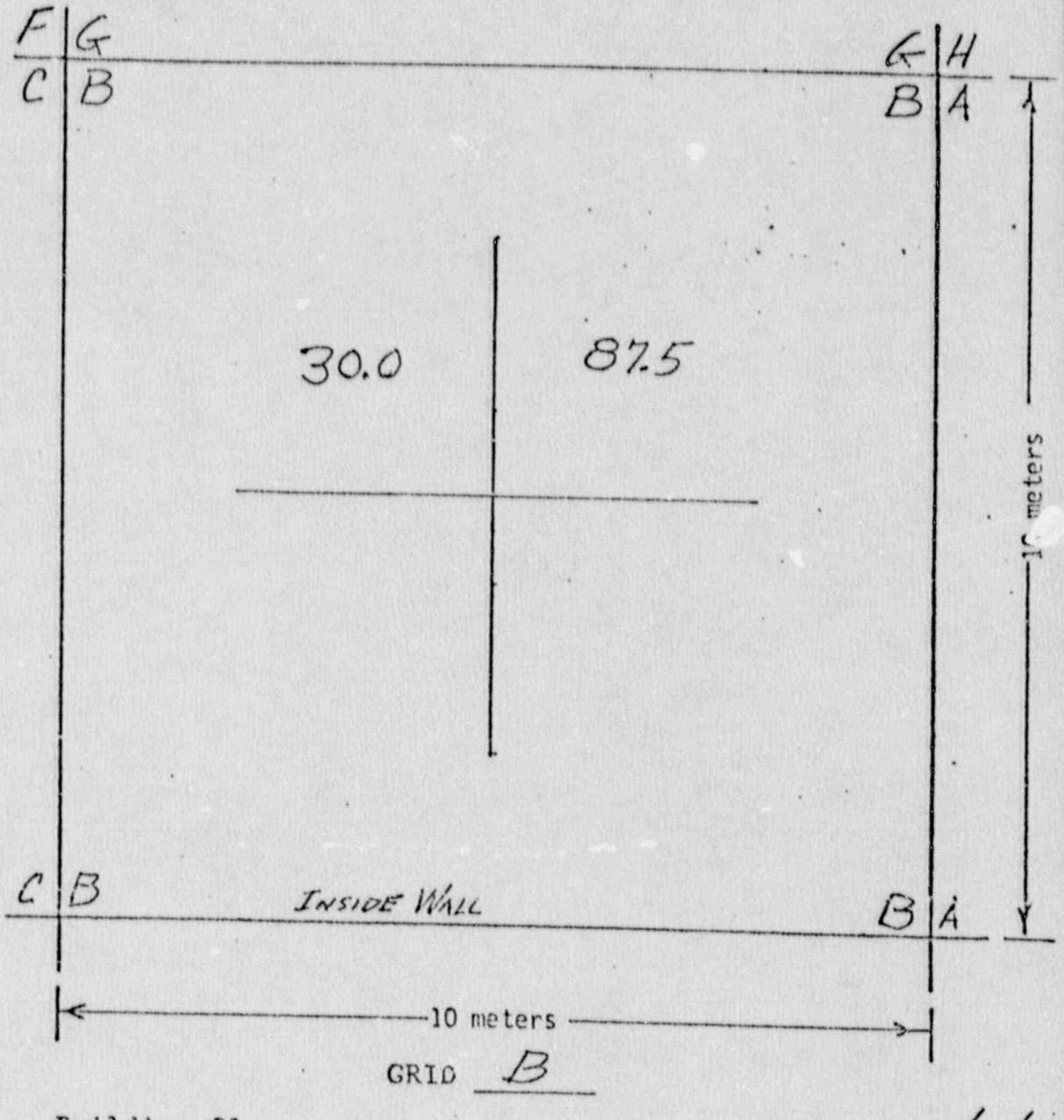
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID B

Building 21

Area 21- A

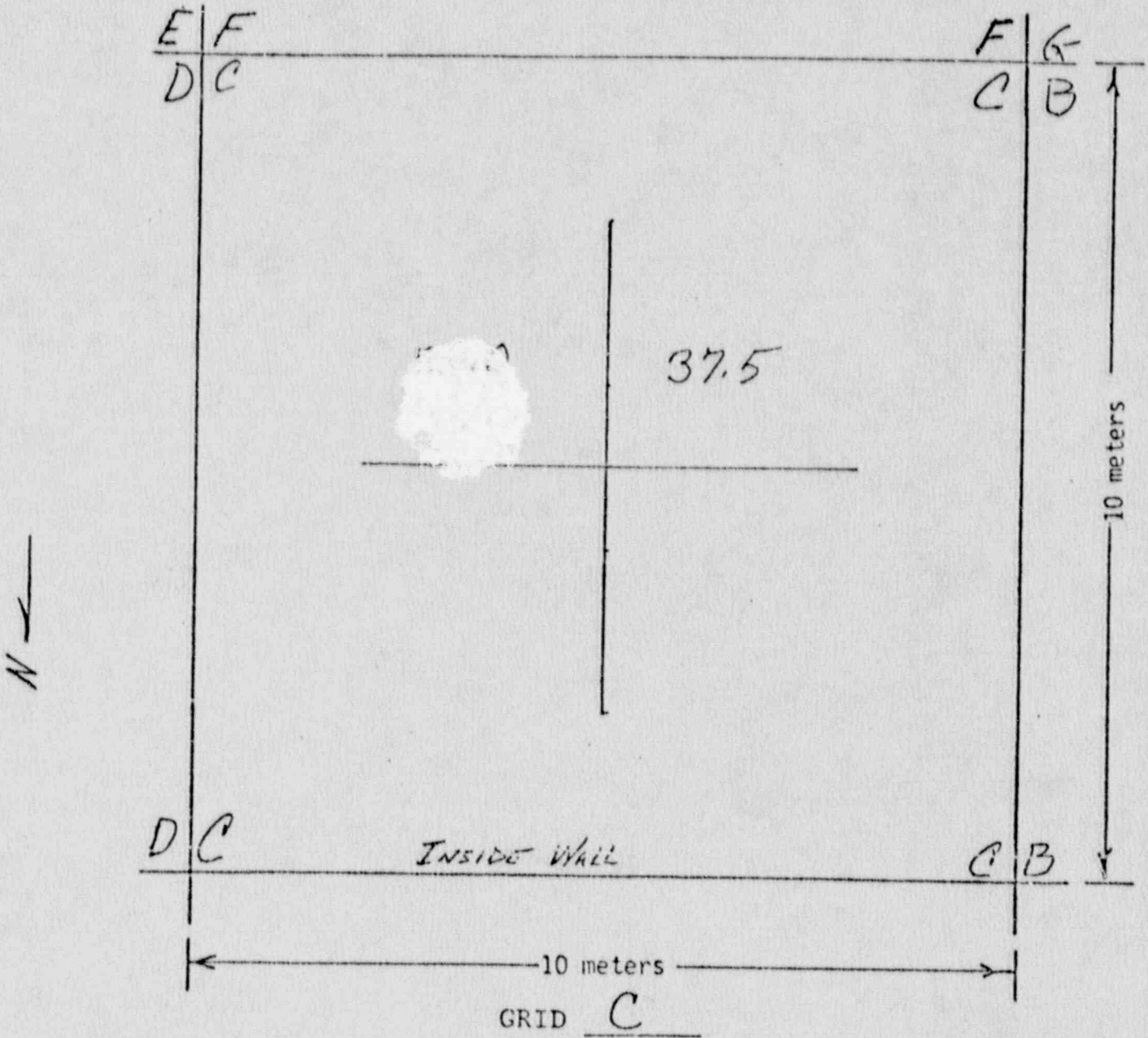
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Bart-Gorman Survey

By:

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID C

Building 21

Area 21- A

McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: D. W. Leigh

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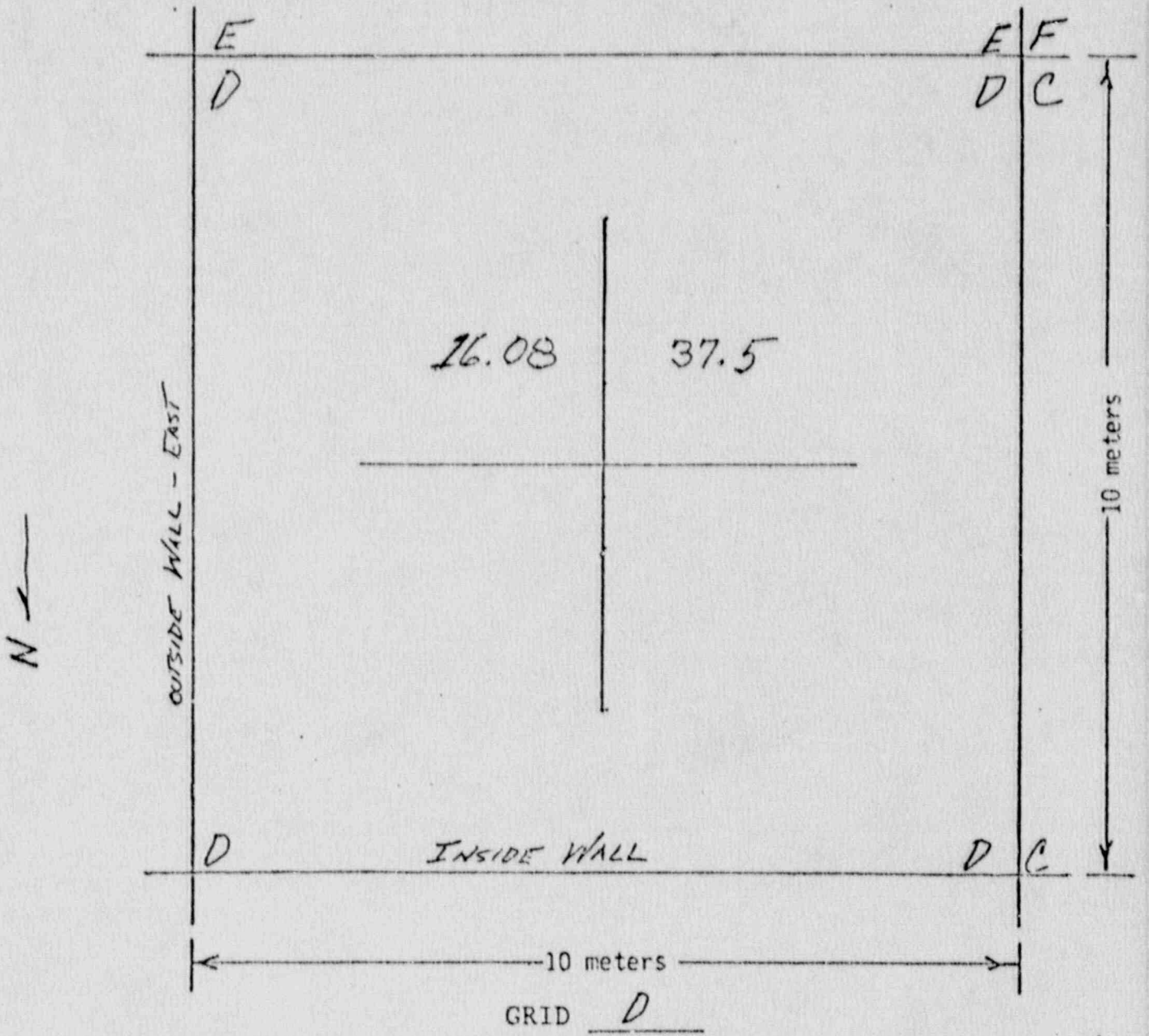
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID D

Building 21

Area 21- A

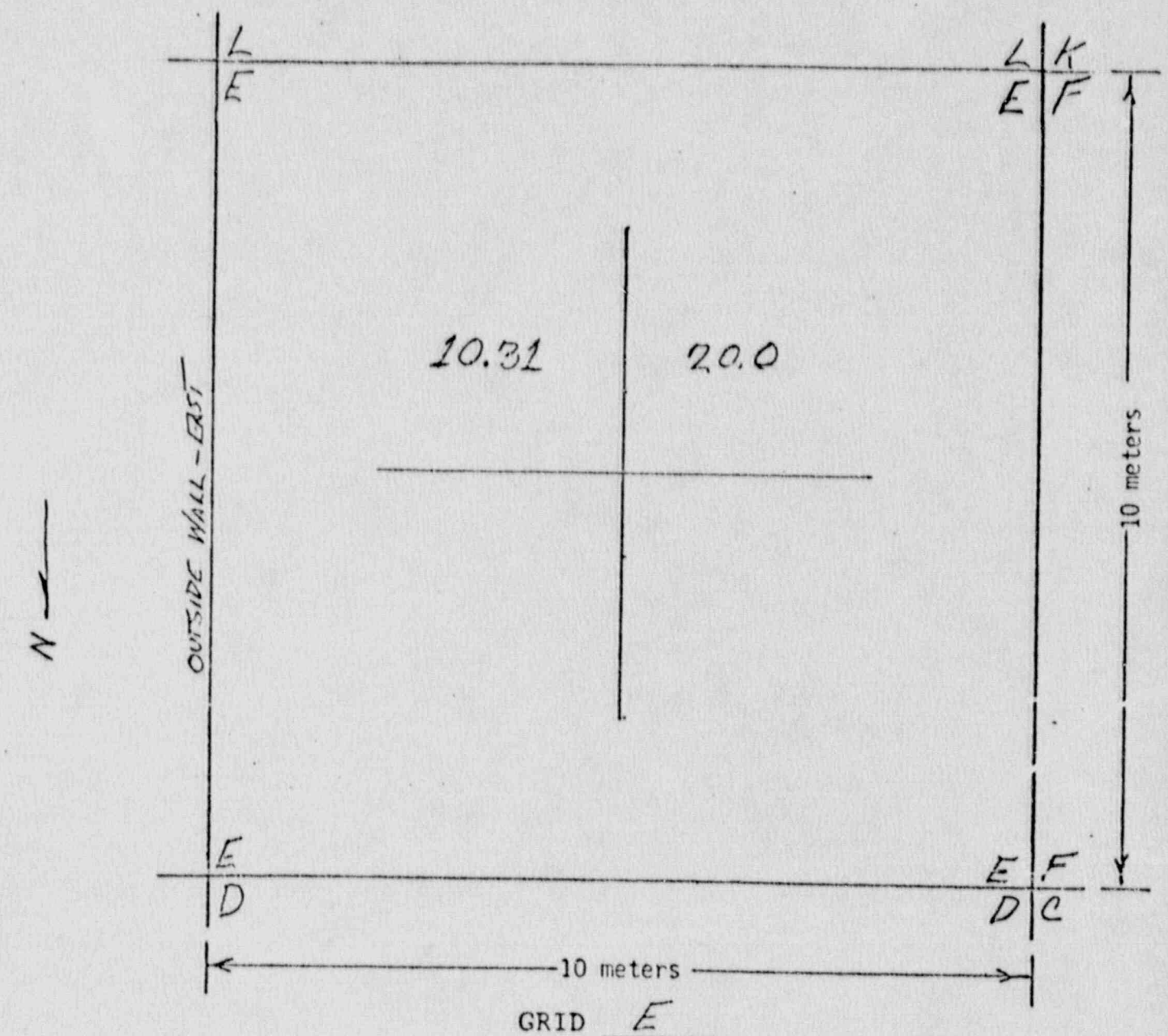
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/77

Beta-Gamma Survey

By: D. W. Leigh
D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID E

Building 21

Area 21- A

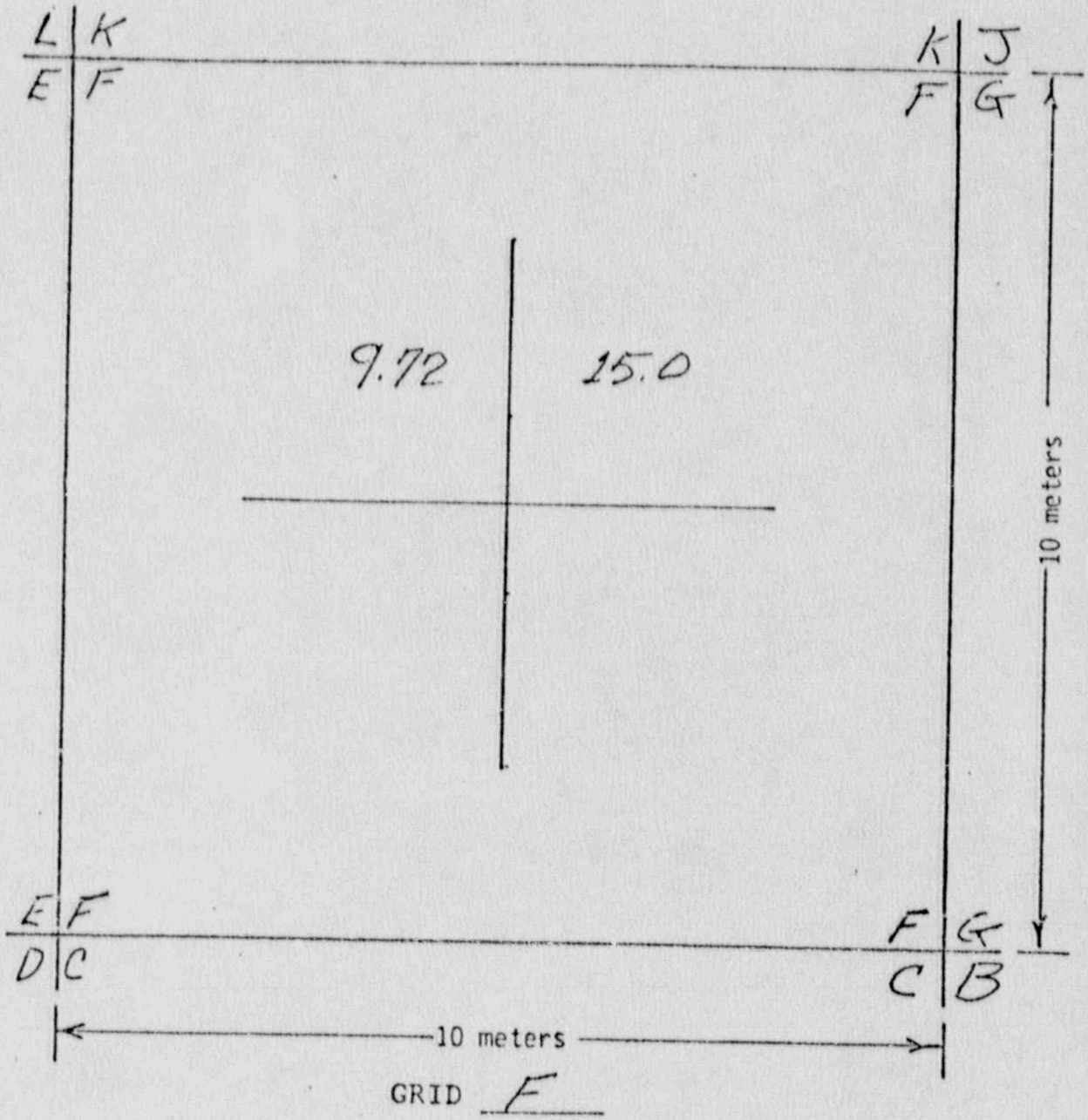
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Boyle - Gauss Survey

By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID F

Building 21

Area 21- A

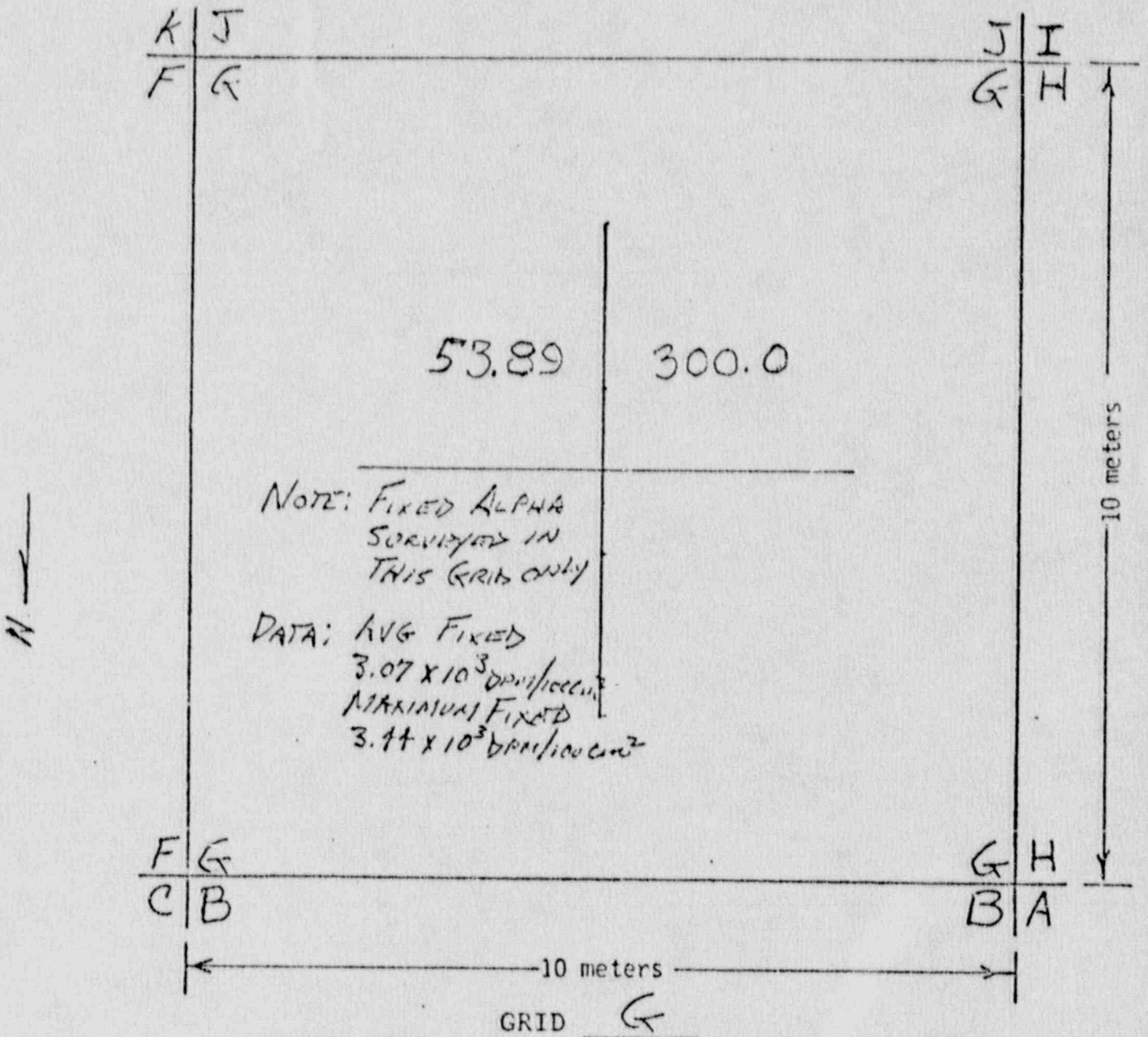
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: [illegible]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID G

Building 21

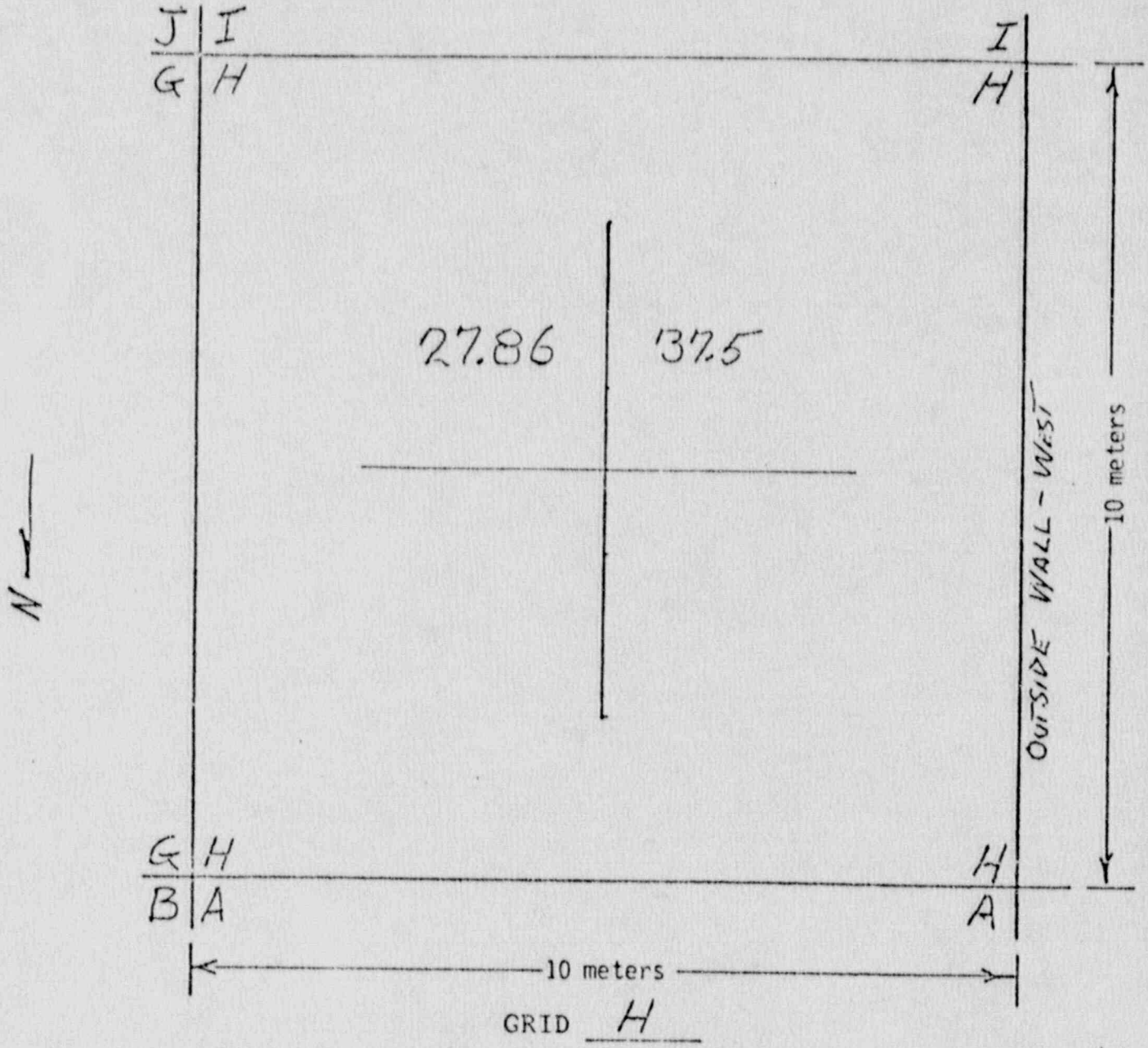
Area 21- A

McGean Chemical Co.
Cleveland, Ohio

Date: 2-19-79
ALPHA - 2-20-79
BETA-GAMMA Survey

By: [illegible]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID H

Building 21

Area 21- A

McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: D. W. Leigh

D. W. Leigh

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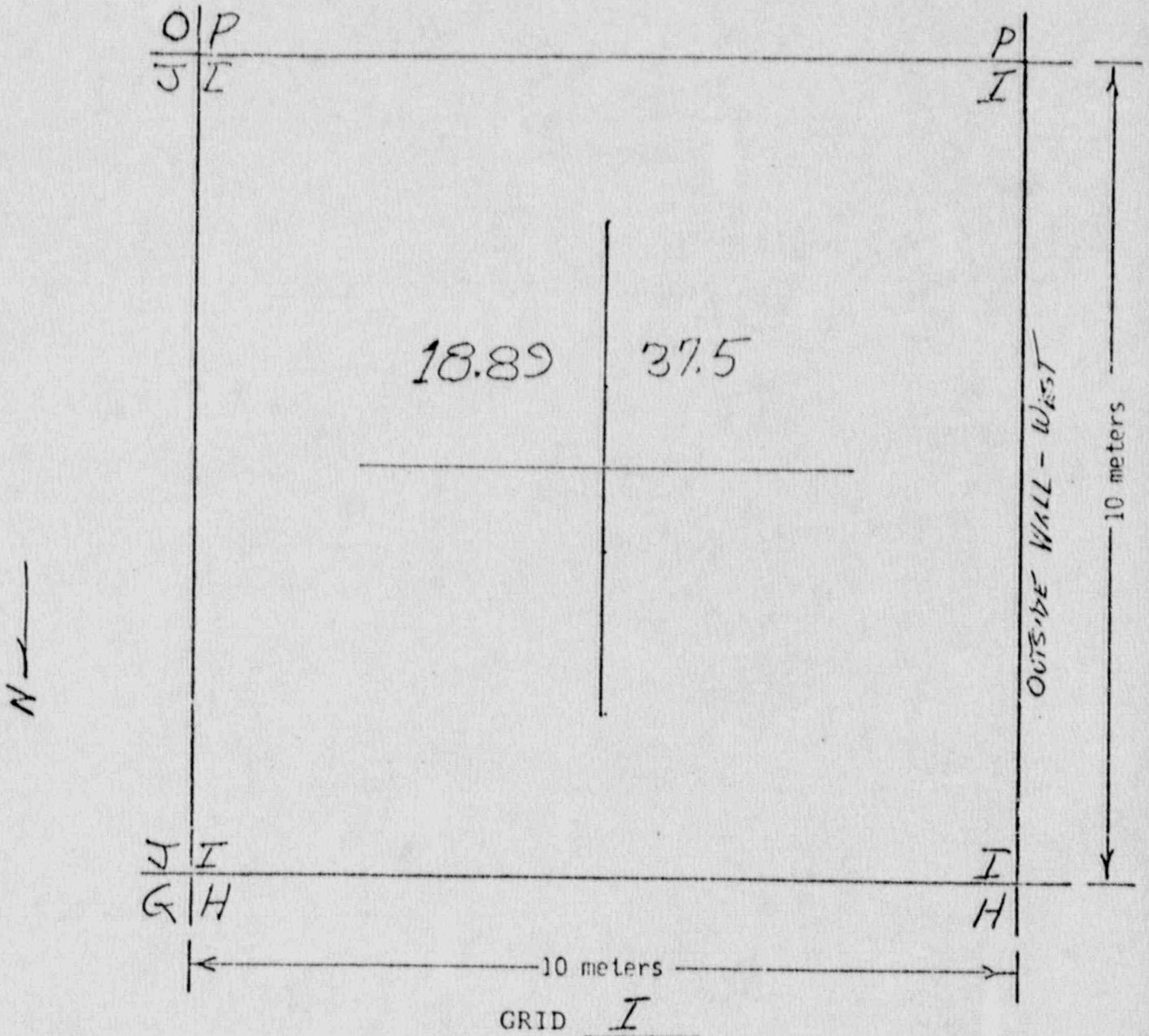
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID I

Building 21

Area 21- A

McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By [signature]

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Nuclear Division
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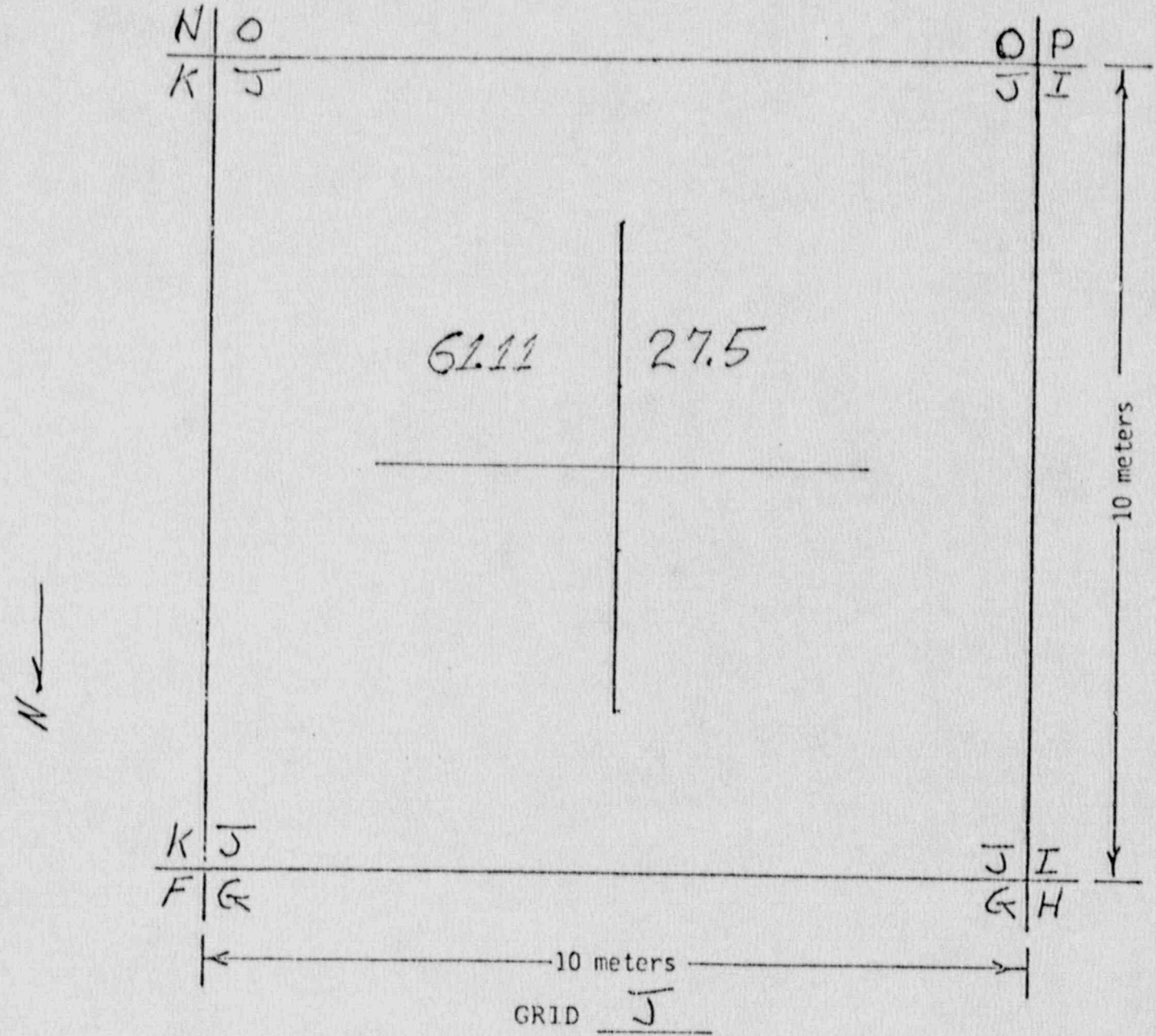

GRID J

Building 21

Area 21- 1

McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By:

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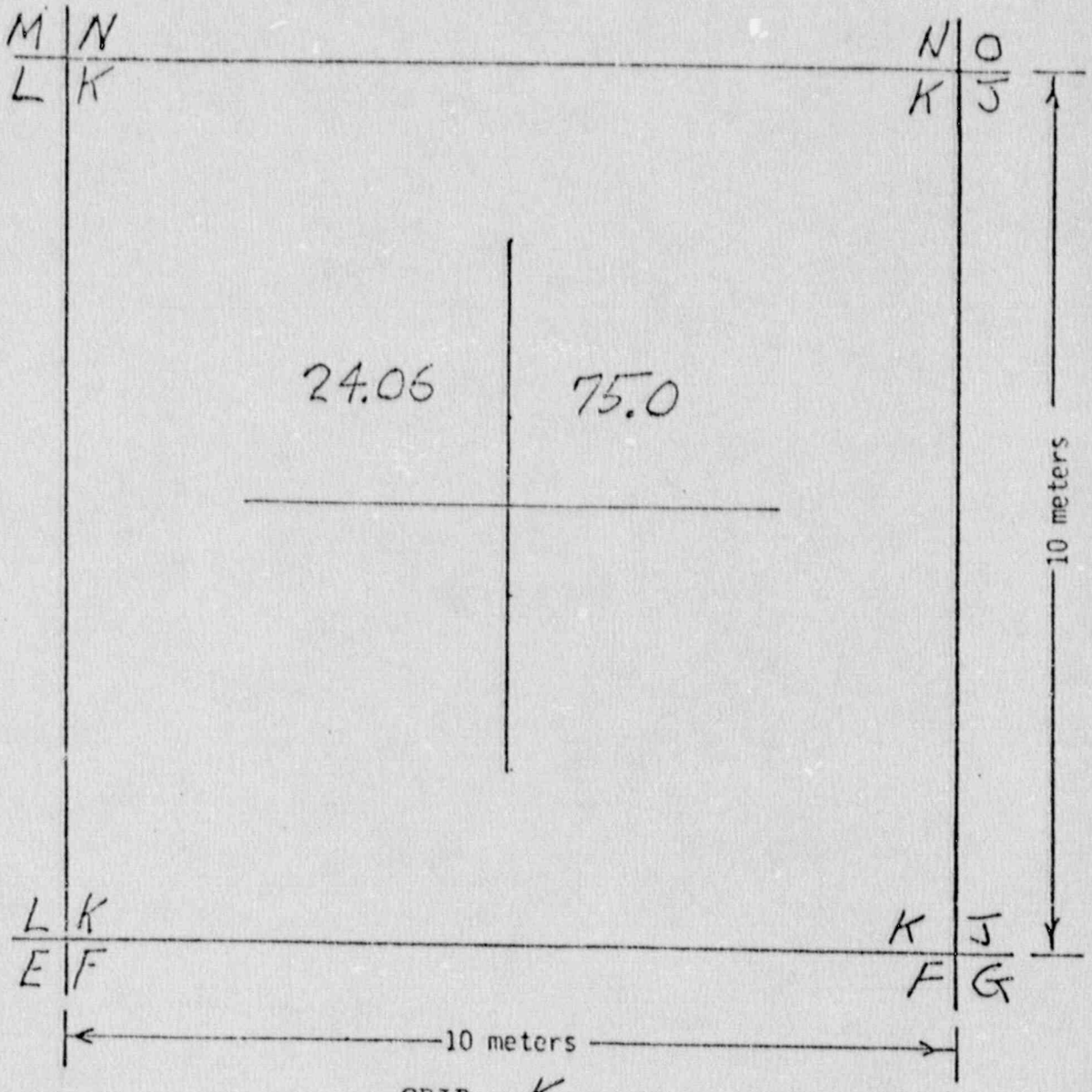

GRID K

Building 21

Area 21- A

McGean Chemical Co.
Cleveland Ohio

Date: 2/19/79

Beta-Gamma Survey

By: [signature]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205

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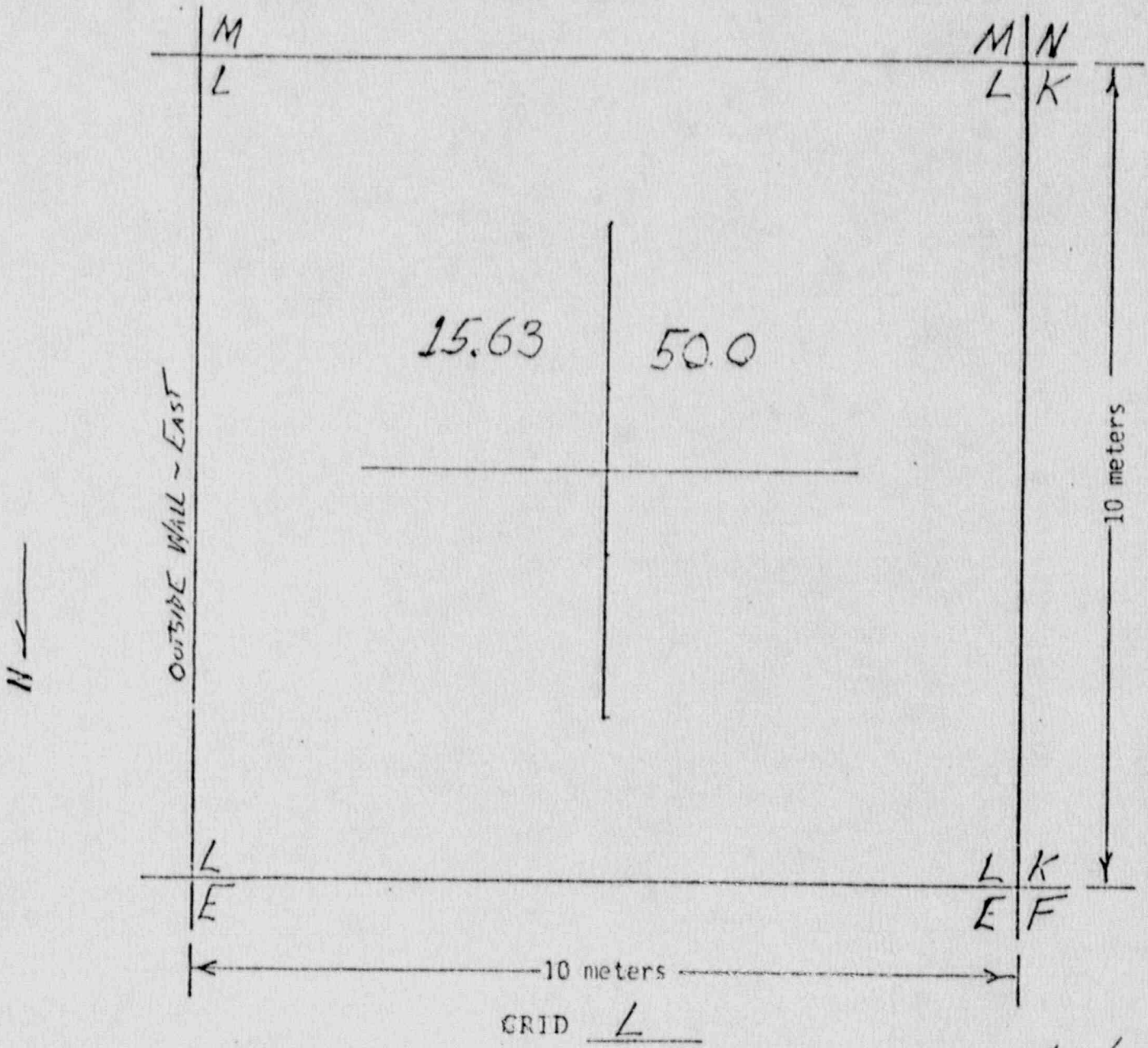


GRID L

Building 21

Area 21- A

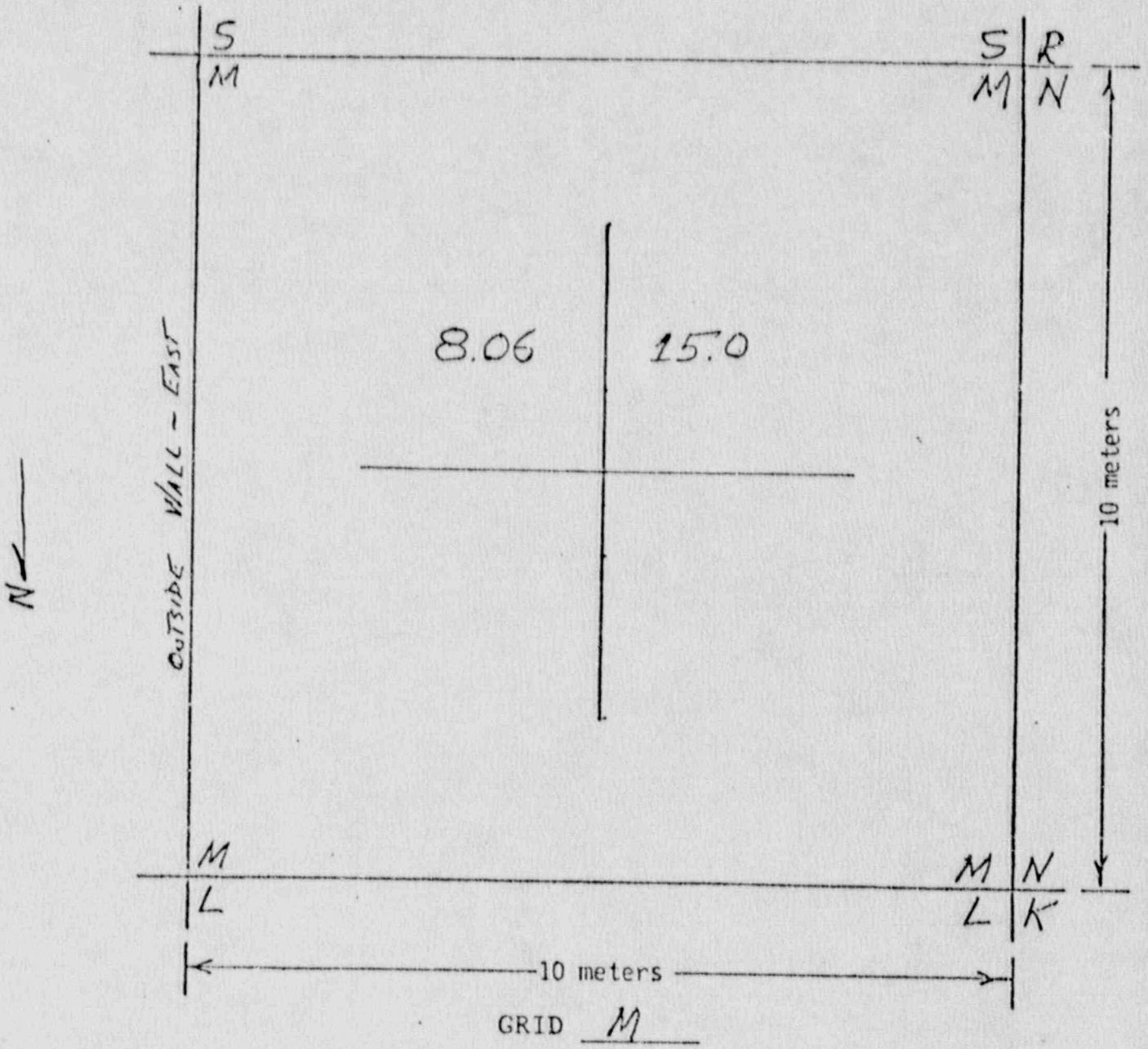
McGean Chemical Co.
Cleveland, Ohio

Date: 7/19/77

Beta-Gamma Survey

By:

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



N

Building 21

Area 21- A

McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By:

NL Industries, Inc.
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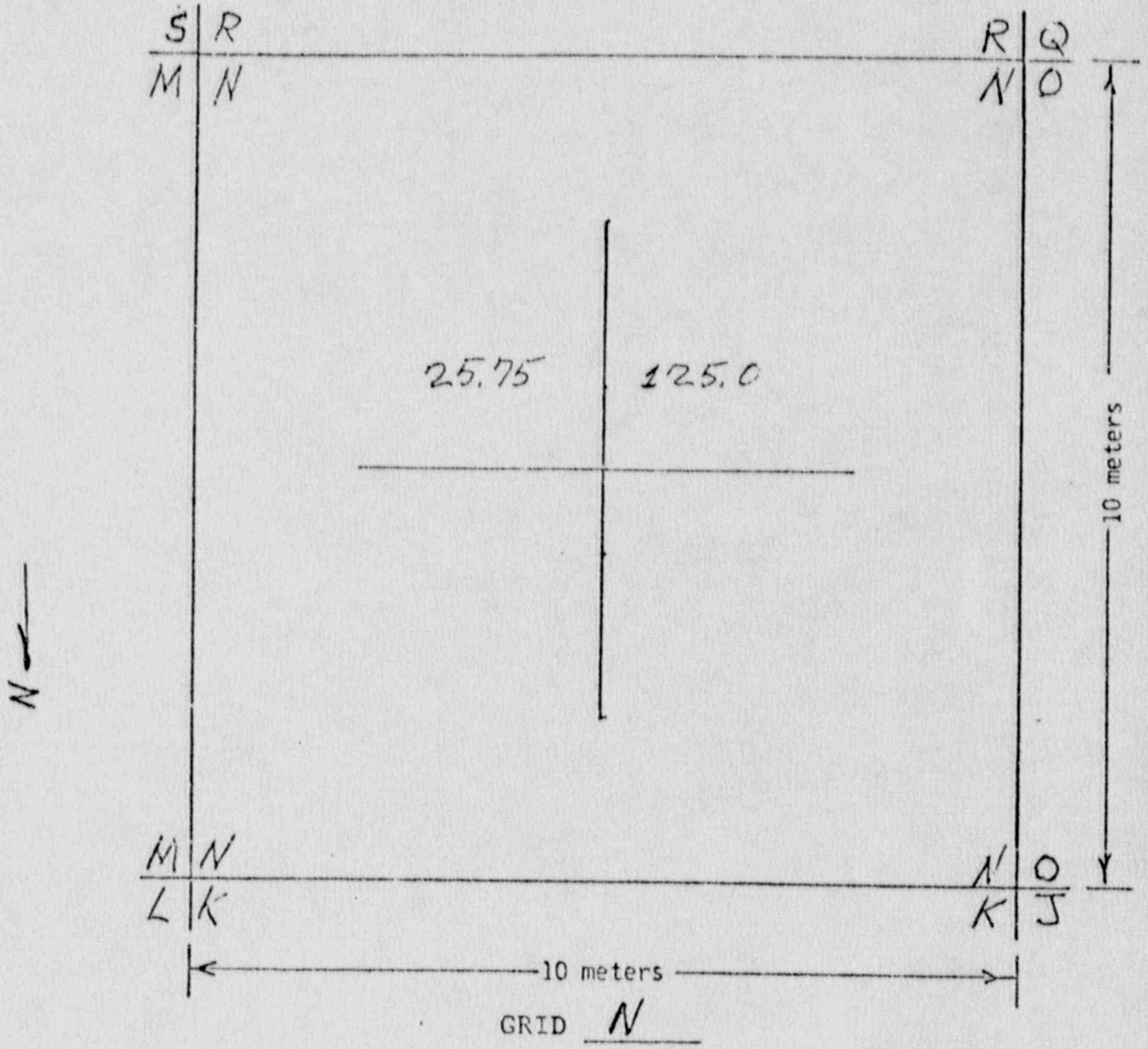
Albany, New York 12205



GRID N

Building 21

Area 21- A

McGean Chemical Co.
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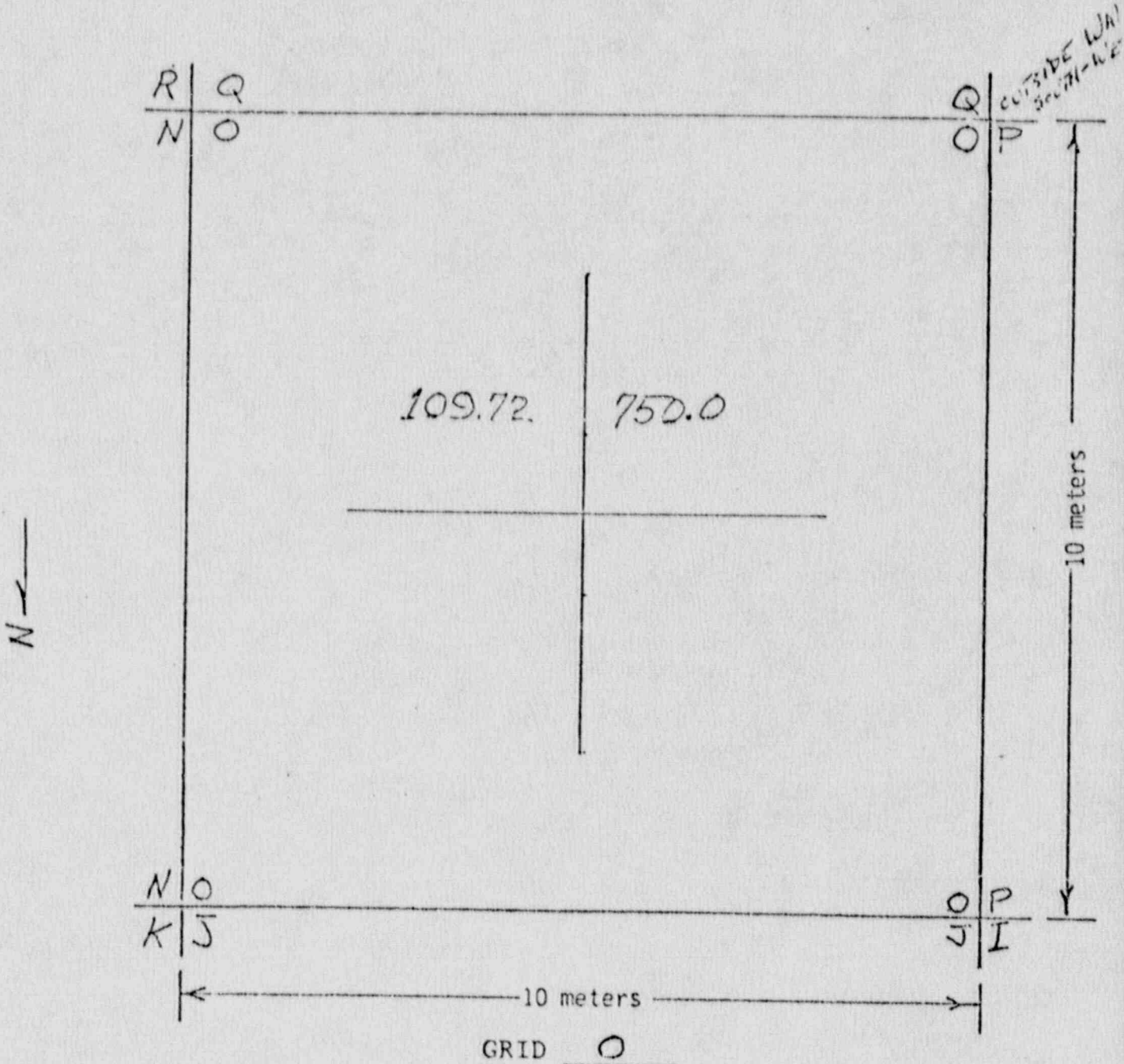


GRID O

Building 21

Area 21- 1

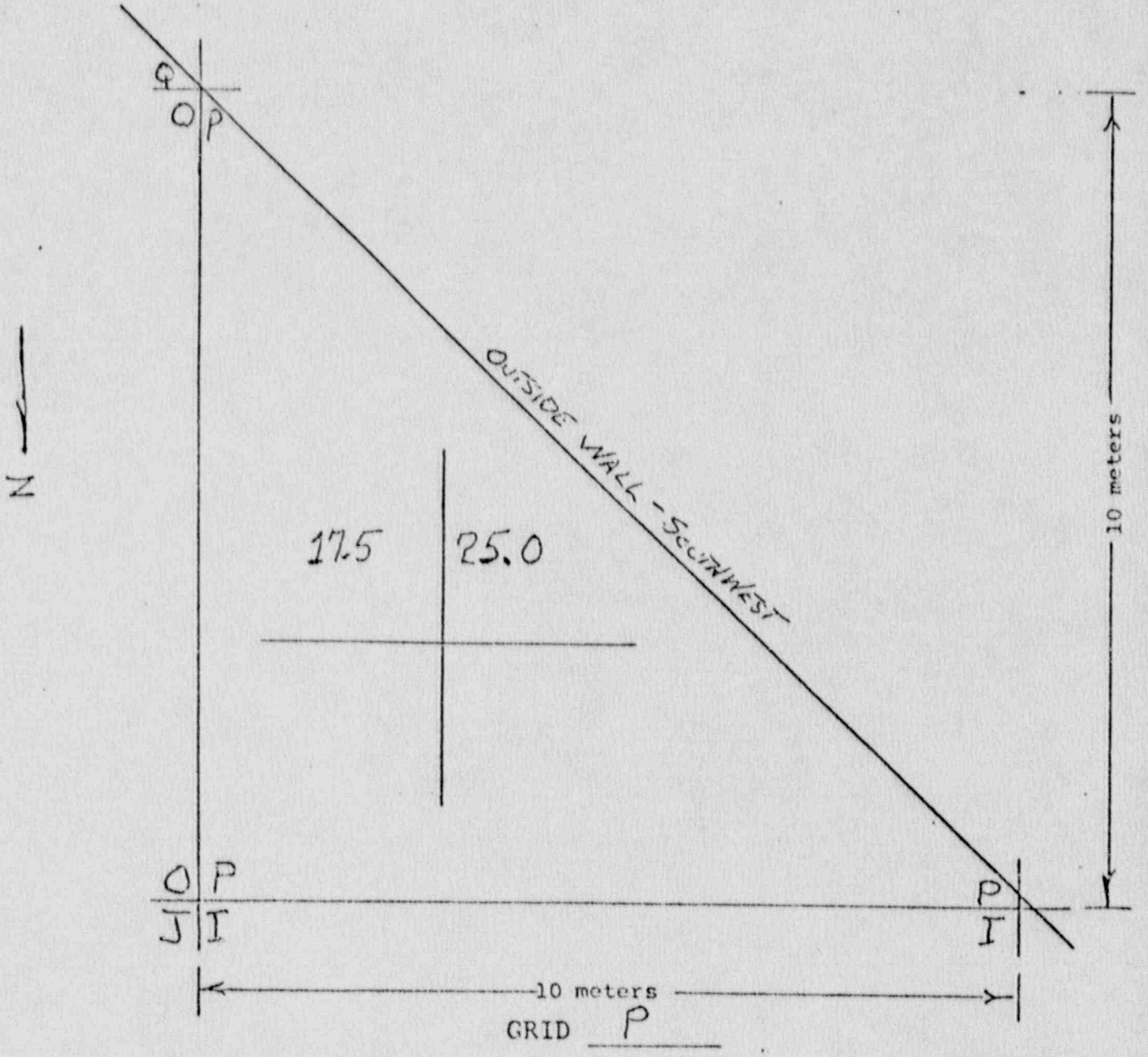
McGean Chemical Co.
Cleveland Ohio

Date: 2/19/89

Beta-Gamma Survey

By: [illegible]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID P

Building 21

Area 21- A

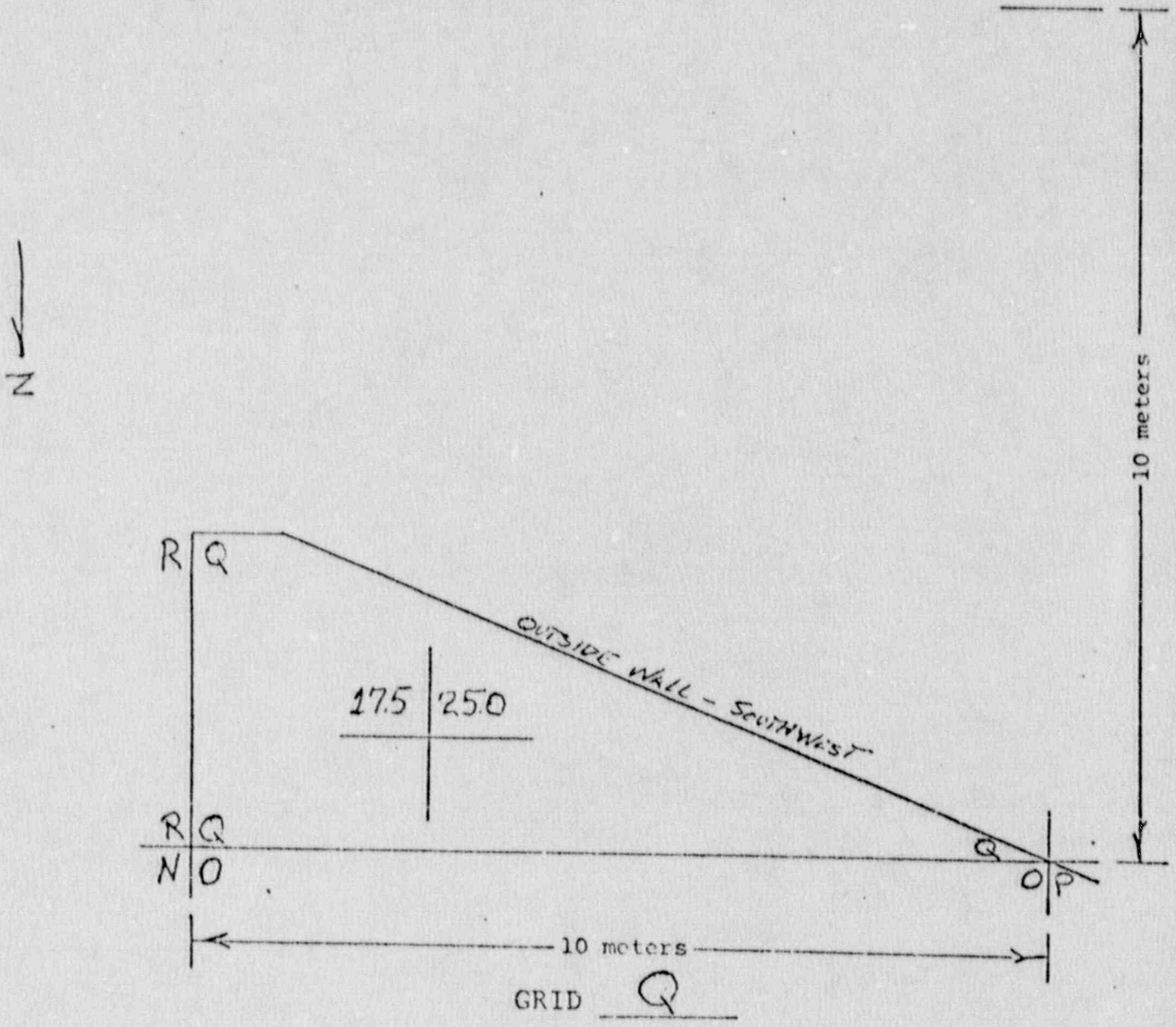
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: D. W. Leigh
D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID Q

Building 21

Area 21- A

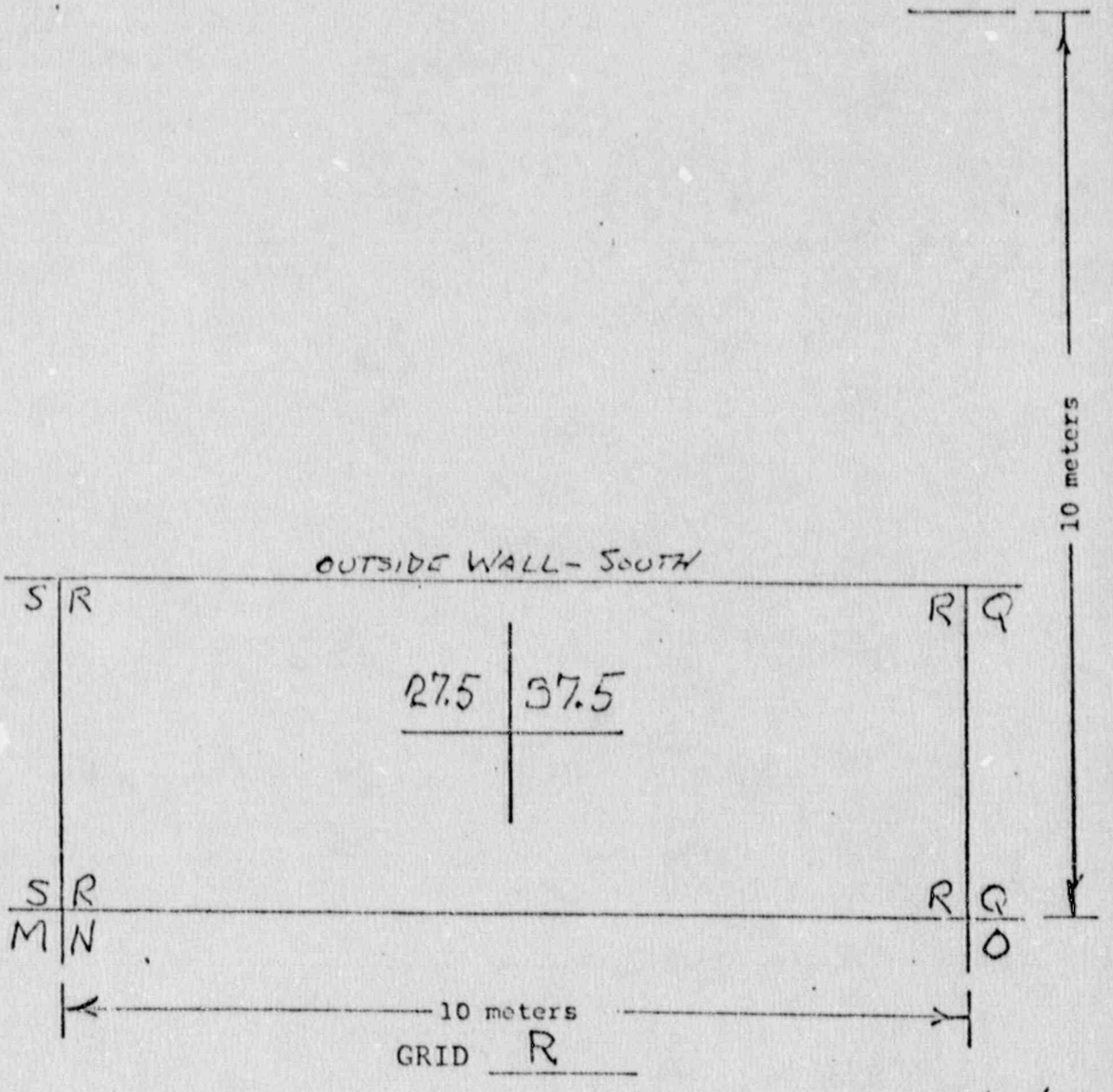
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

BETA-GAMMA Survey

By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



Building 21

Area 21- A

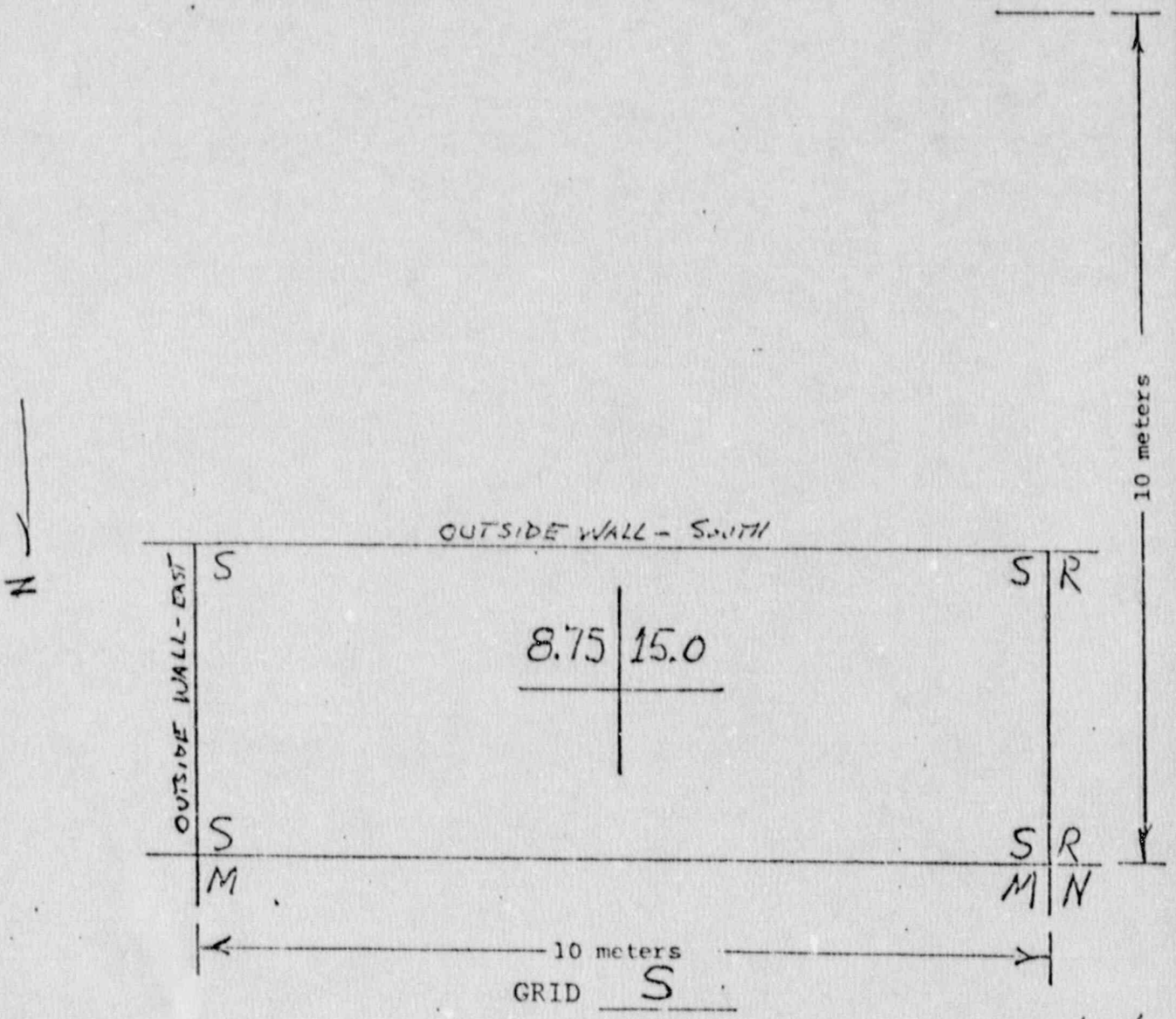
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Surve

By D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID S

Building 21

Area 21- A

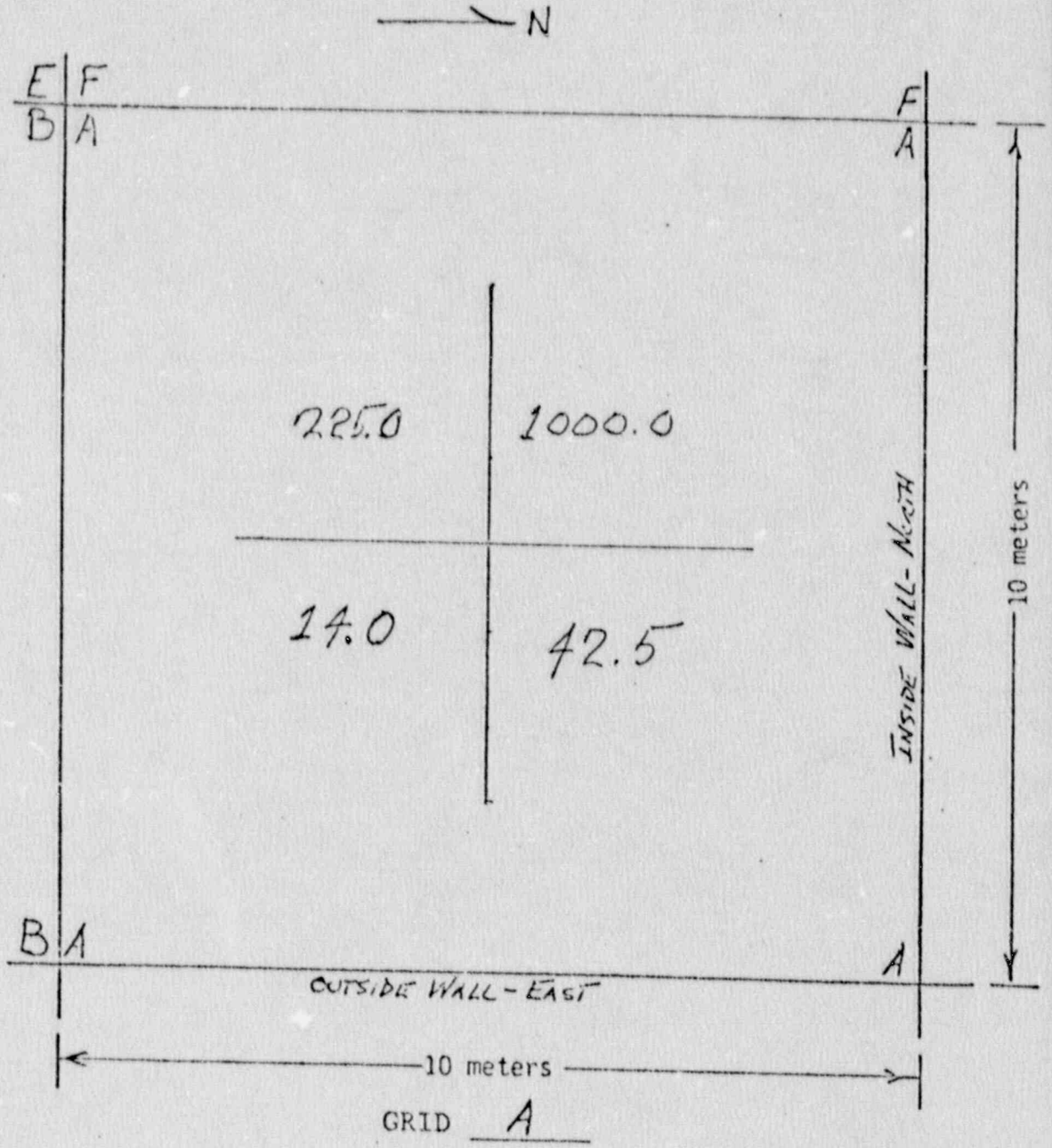
McGean Chemical Co.
Cleveland, Ohio

Date: 2/19/79

Beta-Gamma Survey

By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID A

Building 21

Area 21- B

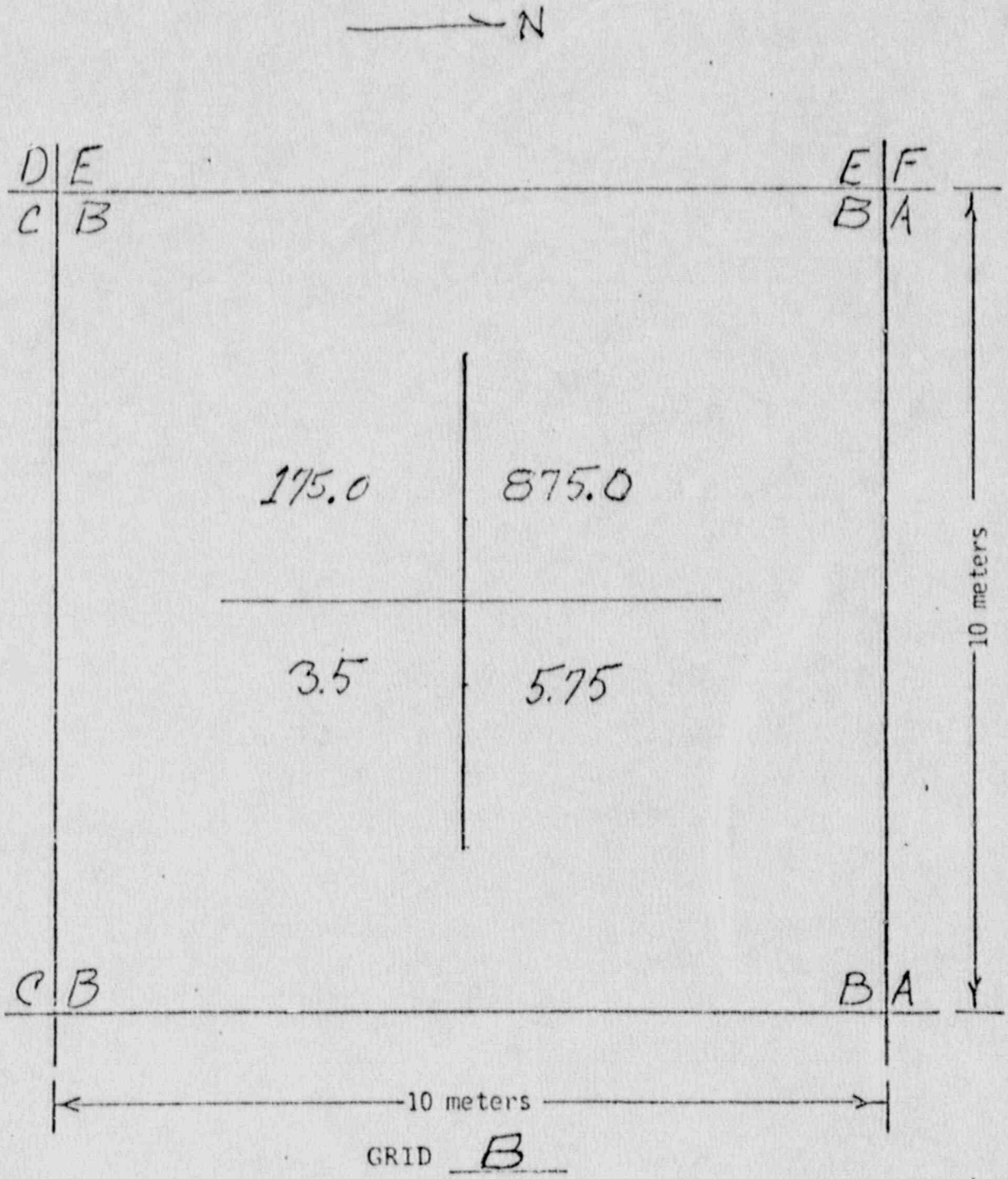
McGean Chemical Co.
Cleveland Ohio

Date: 2/17/79

Beta-Gamma Survey

By

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID B

Building 21

Area 21- B

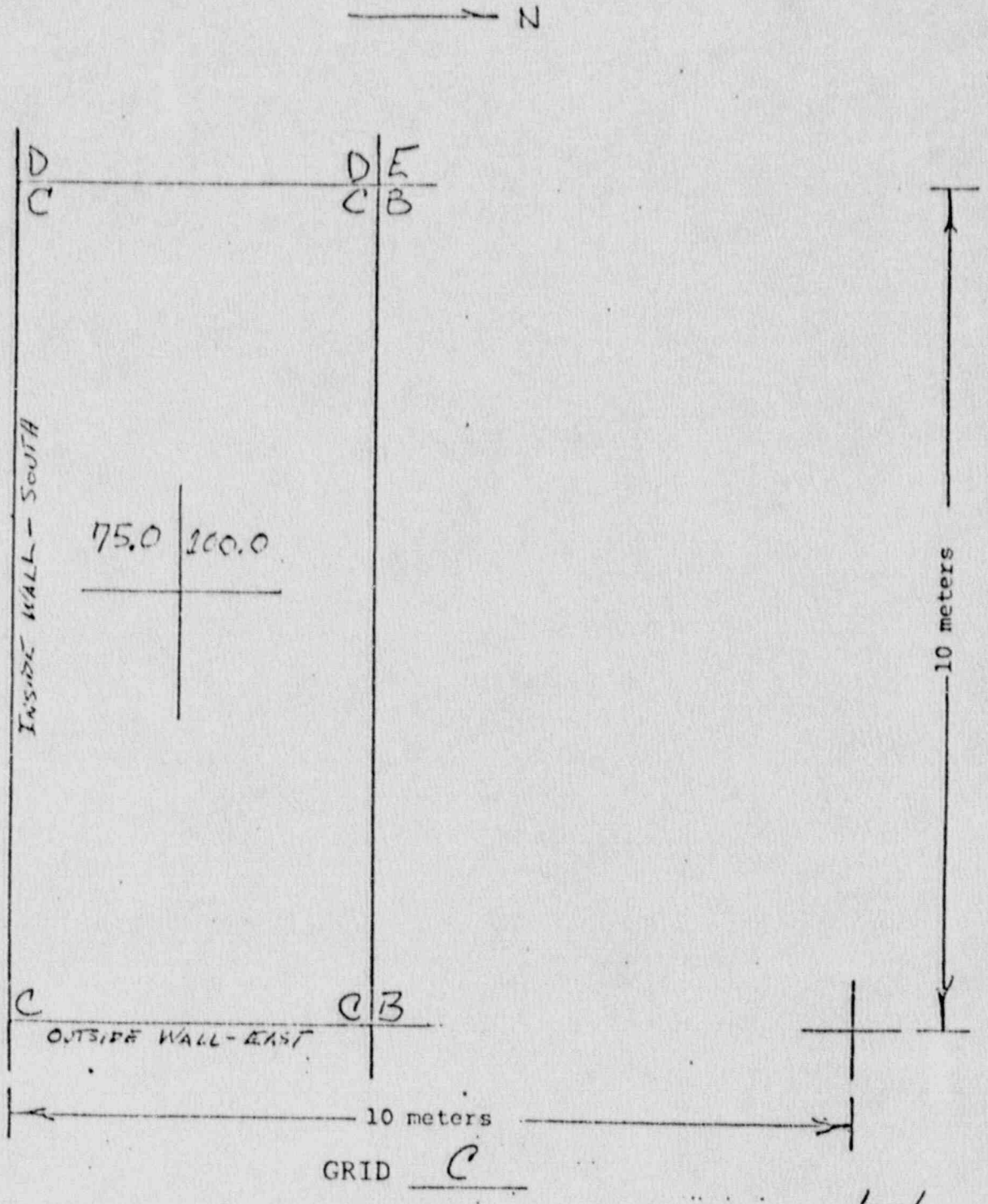
McGean Chemical Co.
Cleveland, Ohio

Date: 2/17/77

Beta-Gamma Survey

By: [signature]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



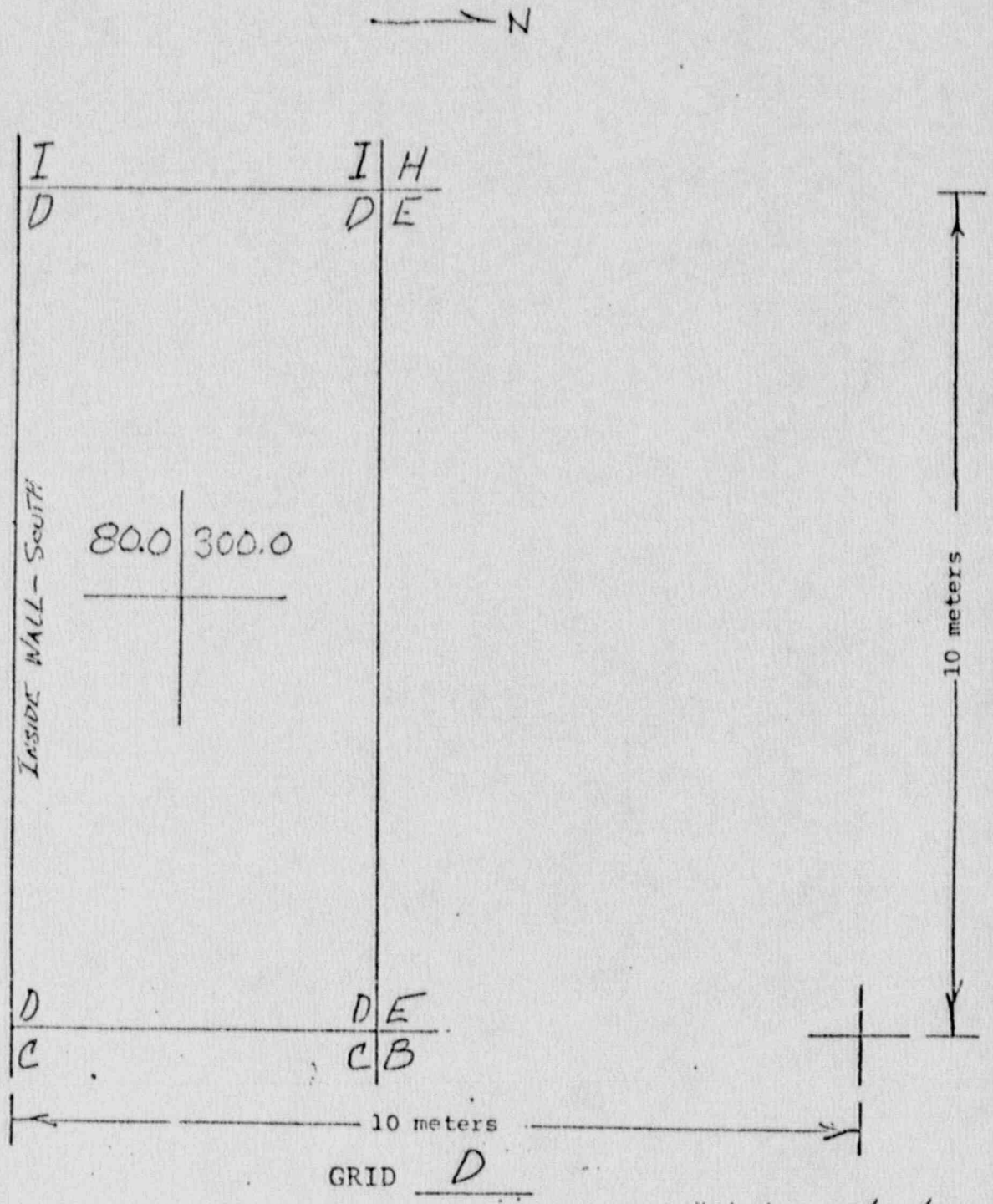
GRID C

Building 21
Area 21- B

McGean Chemical Co.
Cleveland, Ohio

Date: 2/17/79
Beta-Gamma Survey
By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



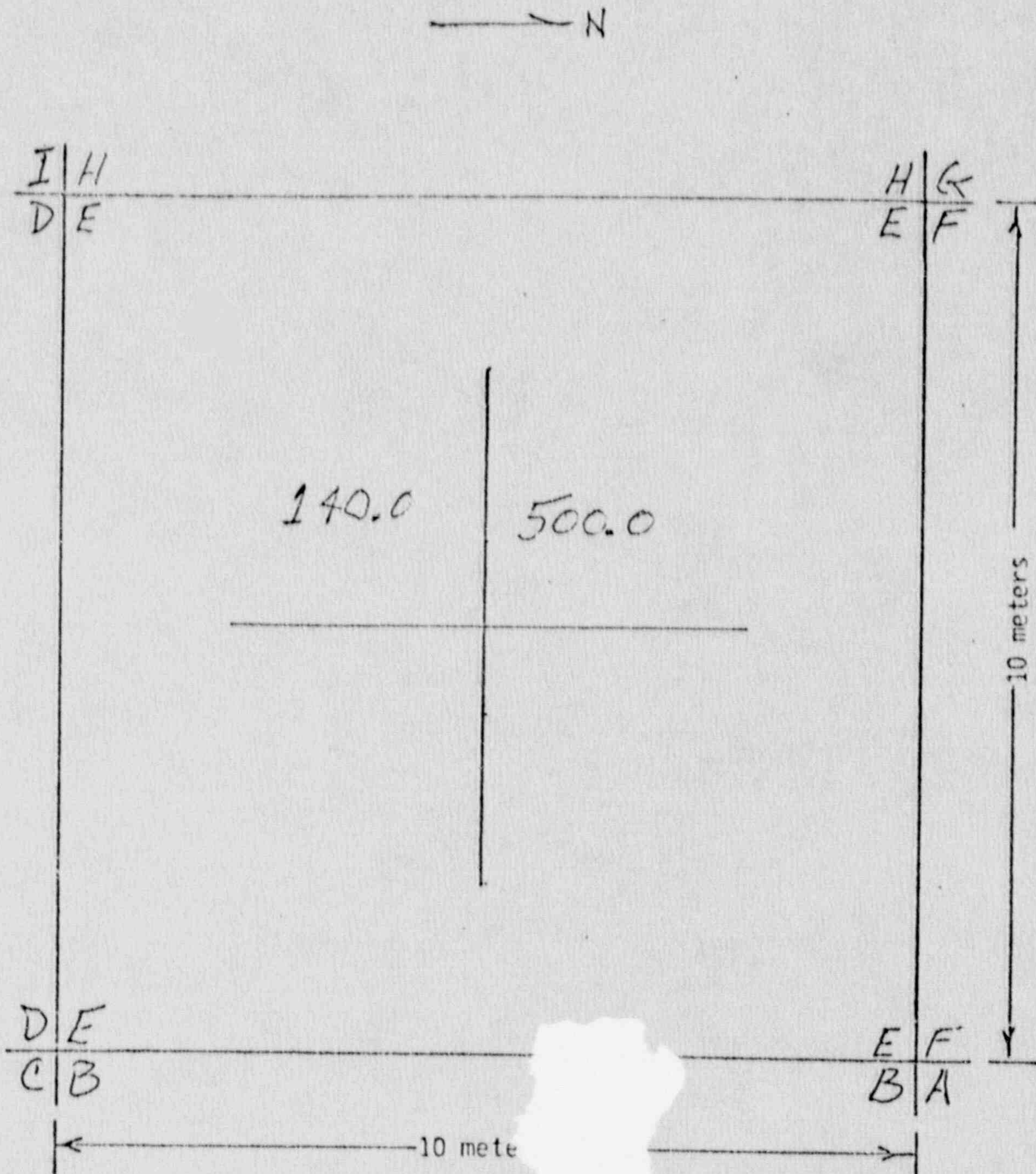
GRID D

Building 21
Area 21- B

McGean Chemical Co.
Cleveland, Ohio

Date: 2/17/77
Beta-Gamma Survey
By: D. W. Leach

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID E

Building 21

Area 21- B

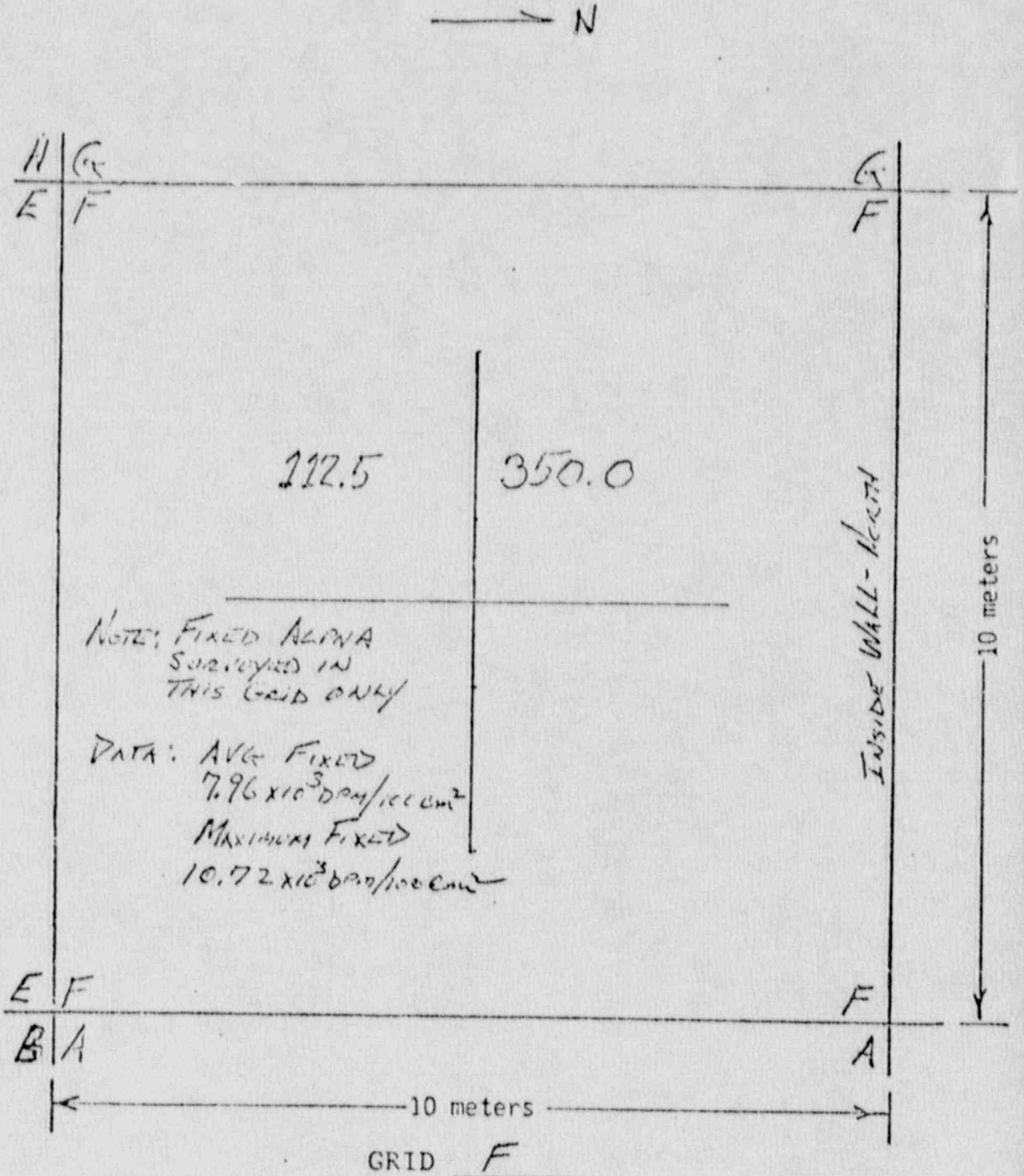
McGean Chemical Co.
Cleveland, Ohio

Date: 2/14/79

Bird-Grant Survey

By: [signature]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID F

Building 21

Area 21- B

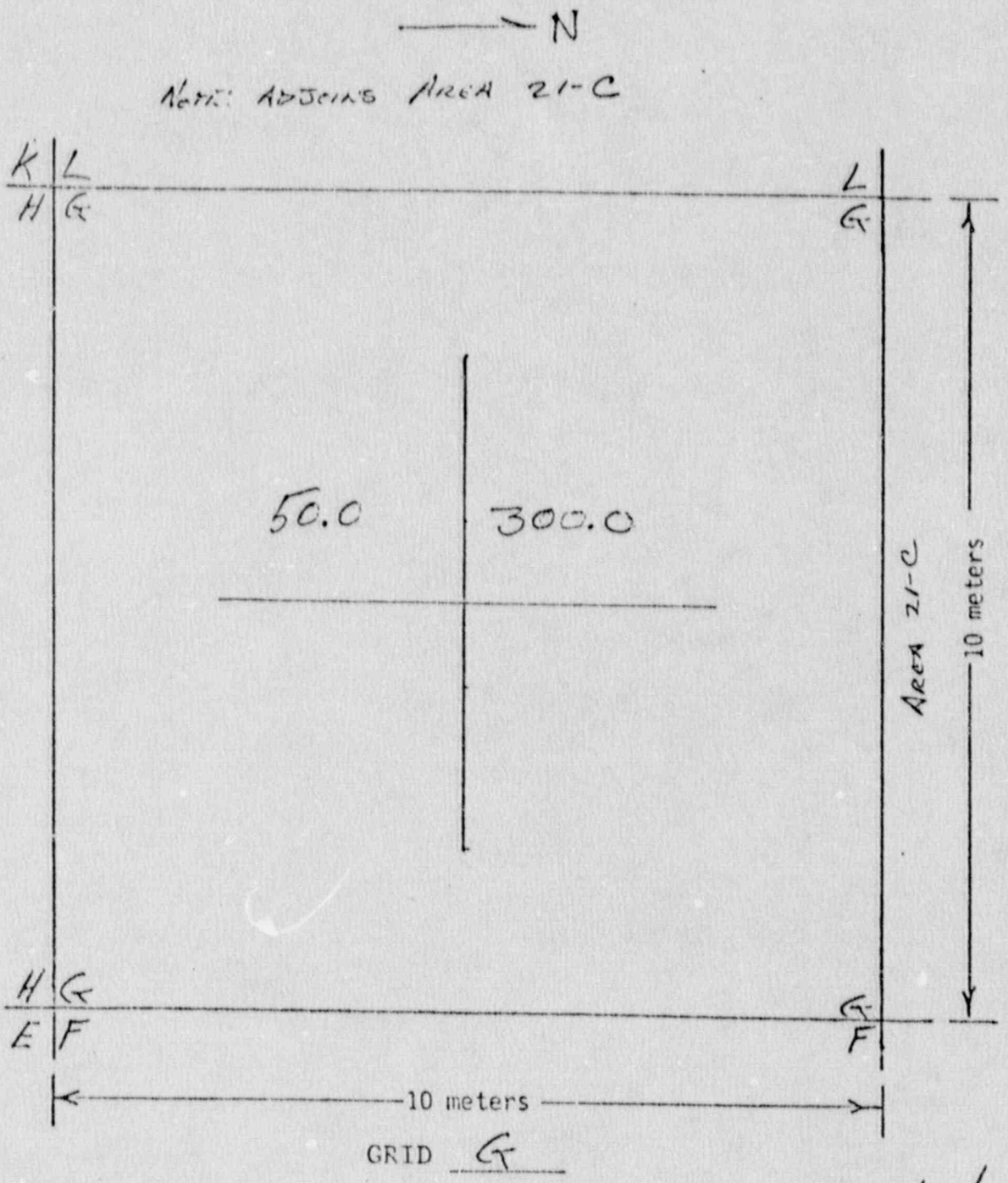
McGean Chemical Co.
Cleveland, Ohio

Date: 2/17 & 2/1. 1979

BETA-GAMMA ALPHA Survey

By: [signature]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



Building 21

Area 21- B

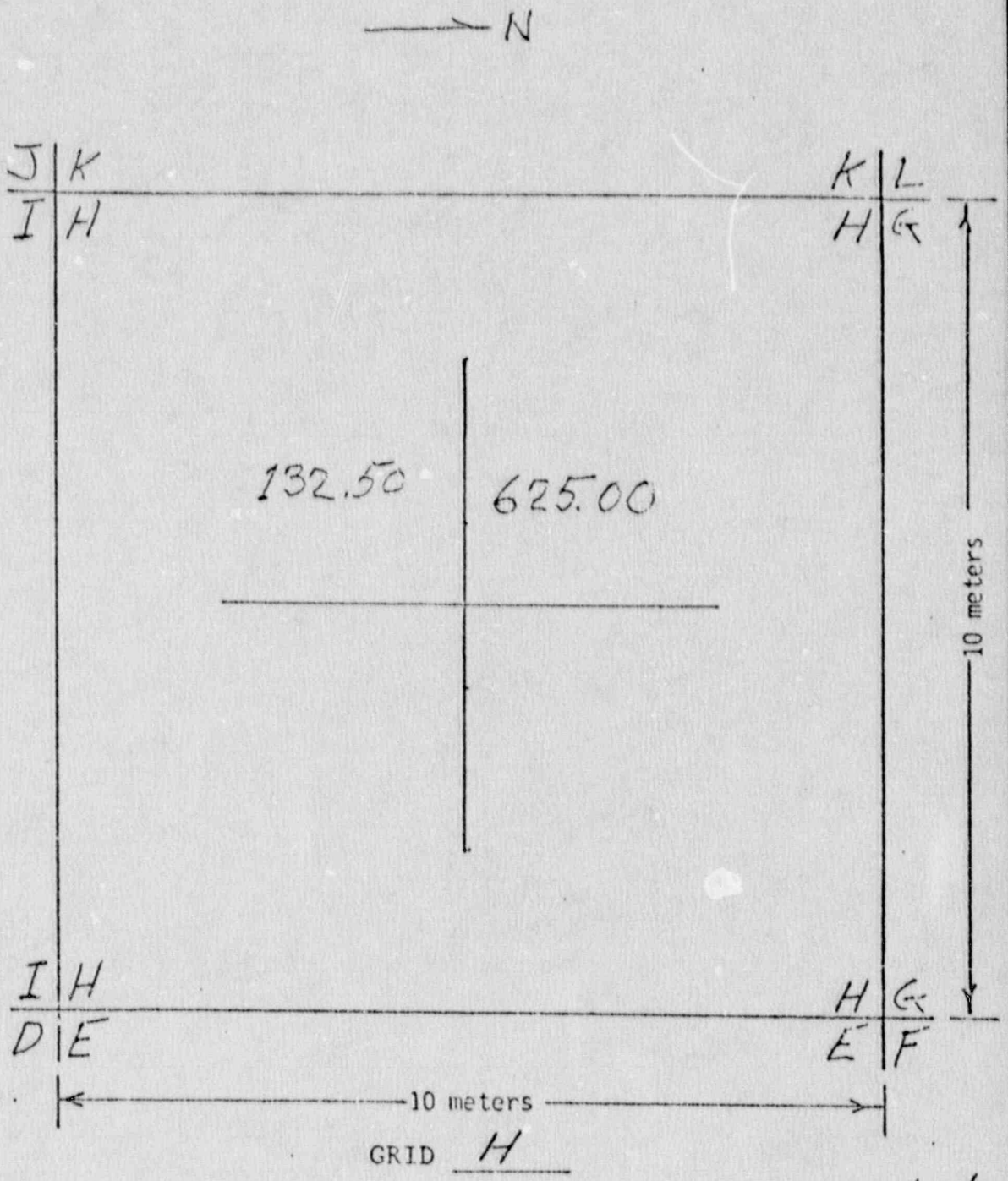
McGean Chemical Co.
Cleveland, Ohio

Date: 2/15/77

Beta-Gamma Survey

By

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID H

Building 21

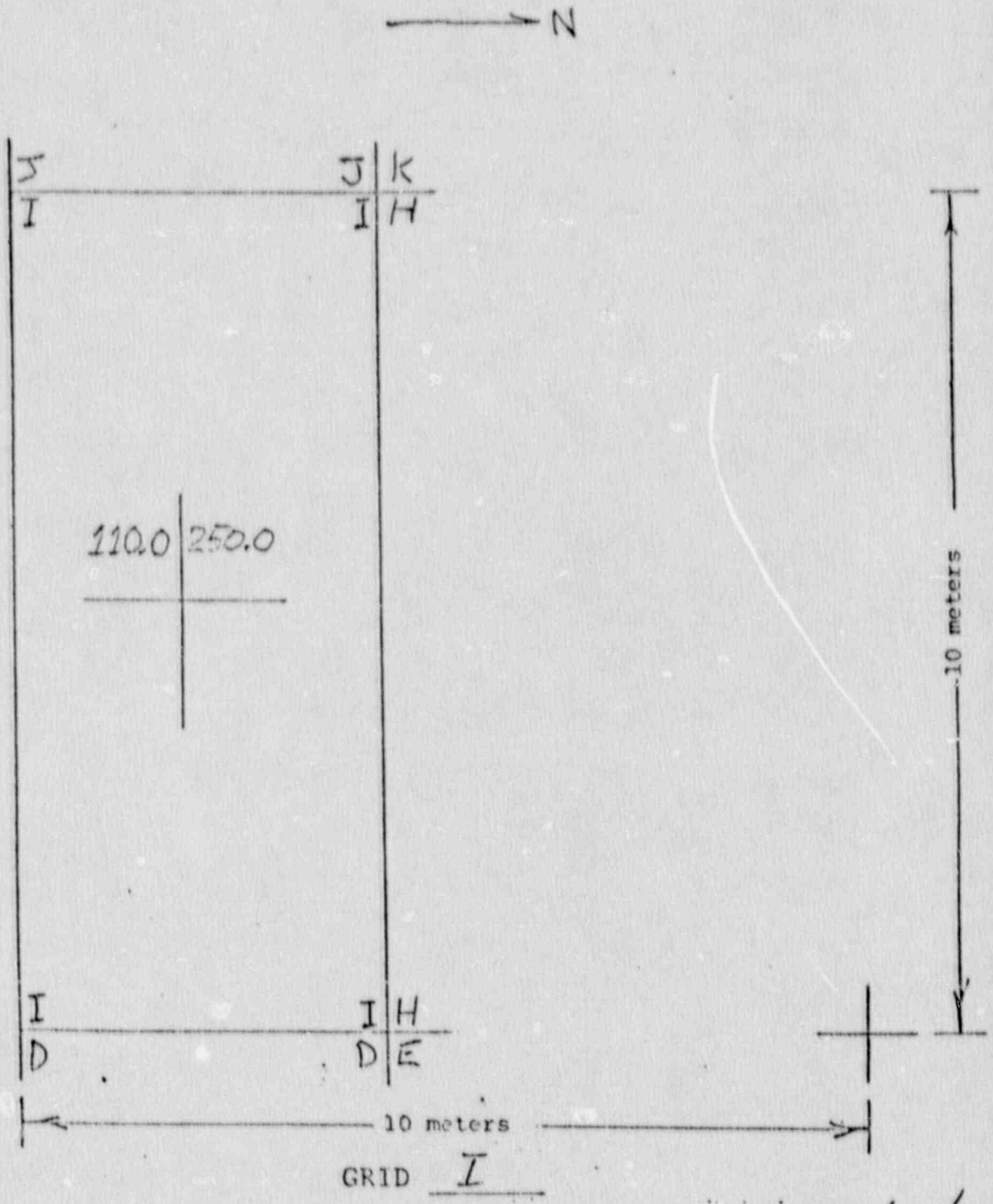
Area 21- B

McGean Chemical Co.
Cleveland, Ohio

Date: 2/18/99

Survey By: [illegible]

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205

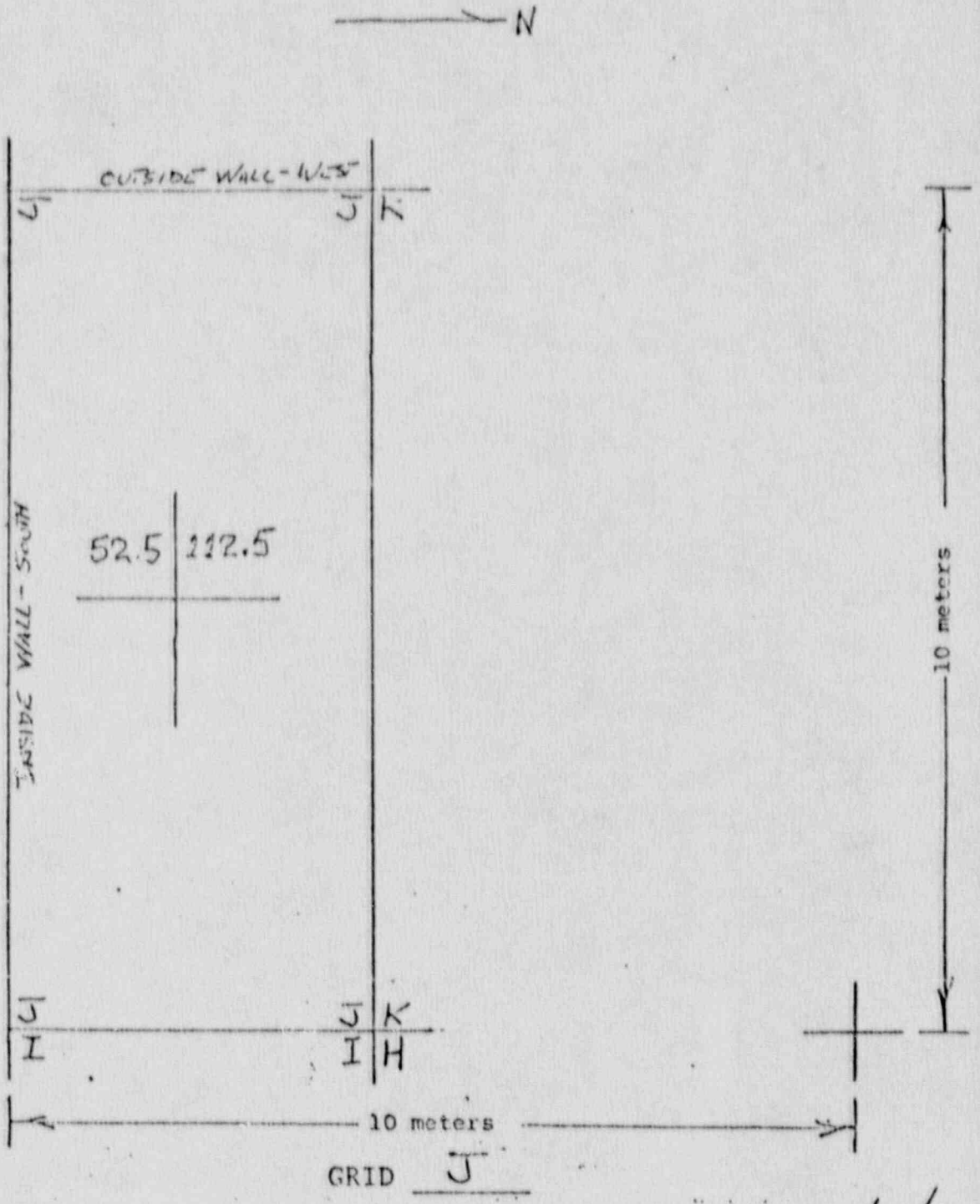


Building 21
Area 21- B

McGean Chemical Co.
Cleveland, Ohio

Date: 2/18/86
Boring Survey
By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



Building 21

Area 21- B

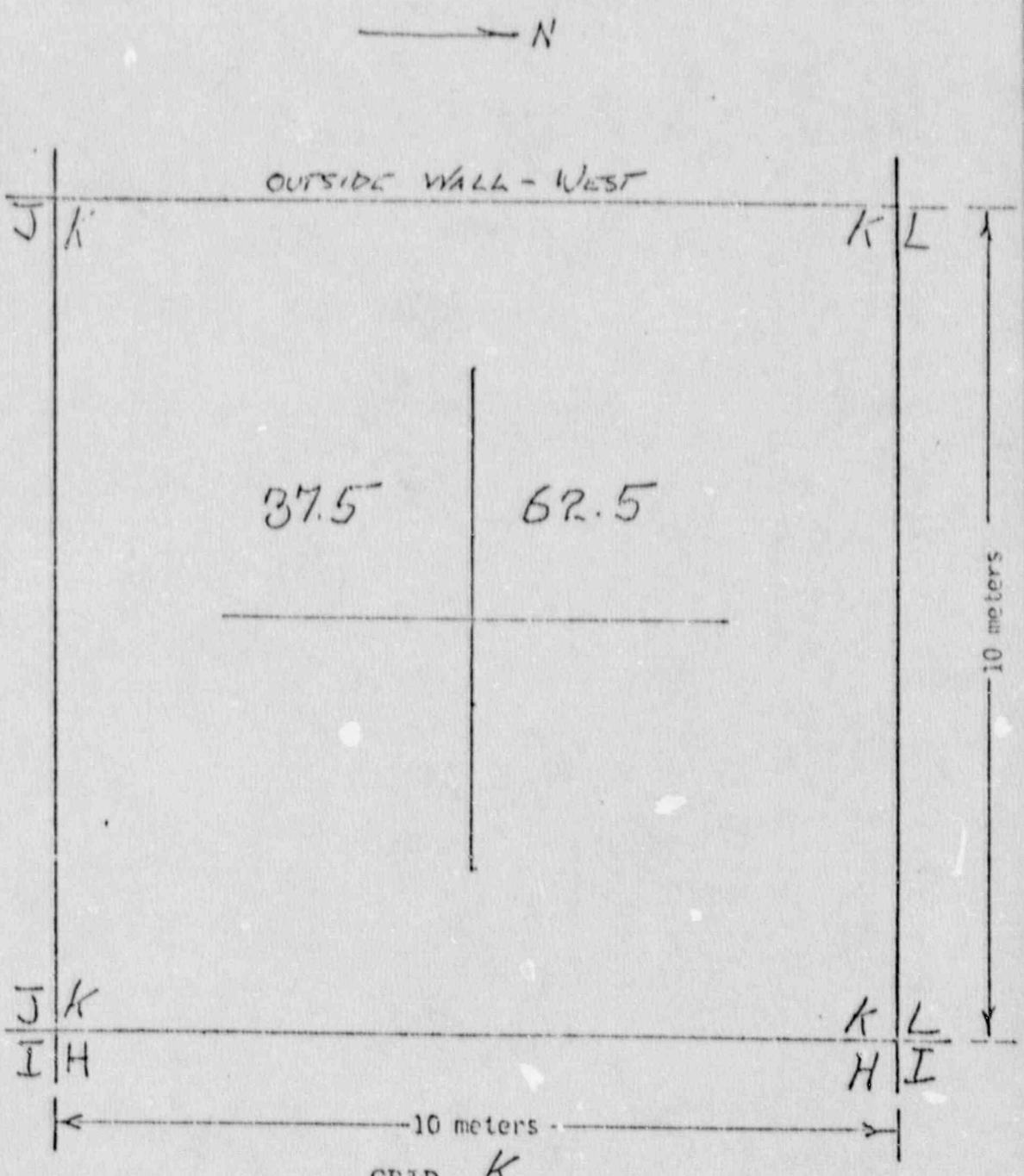
McGean Chemical Co.
Cleveland, Ohio

Date: 2/15/89

Beta-Gamma Survey

By: D. W. Leigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID K

Building 21

Area 21- 13

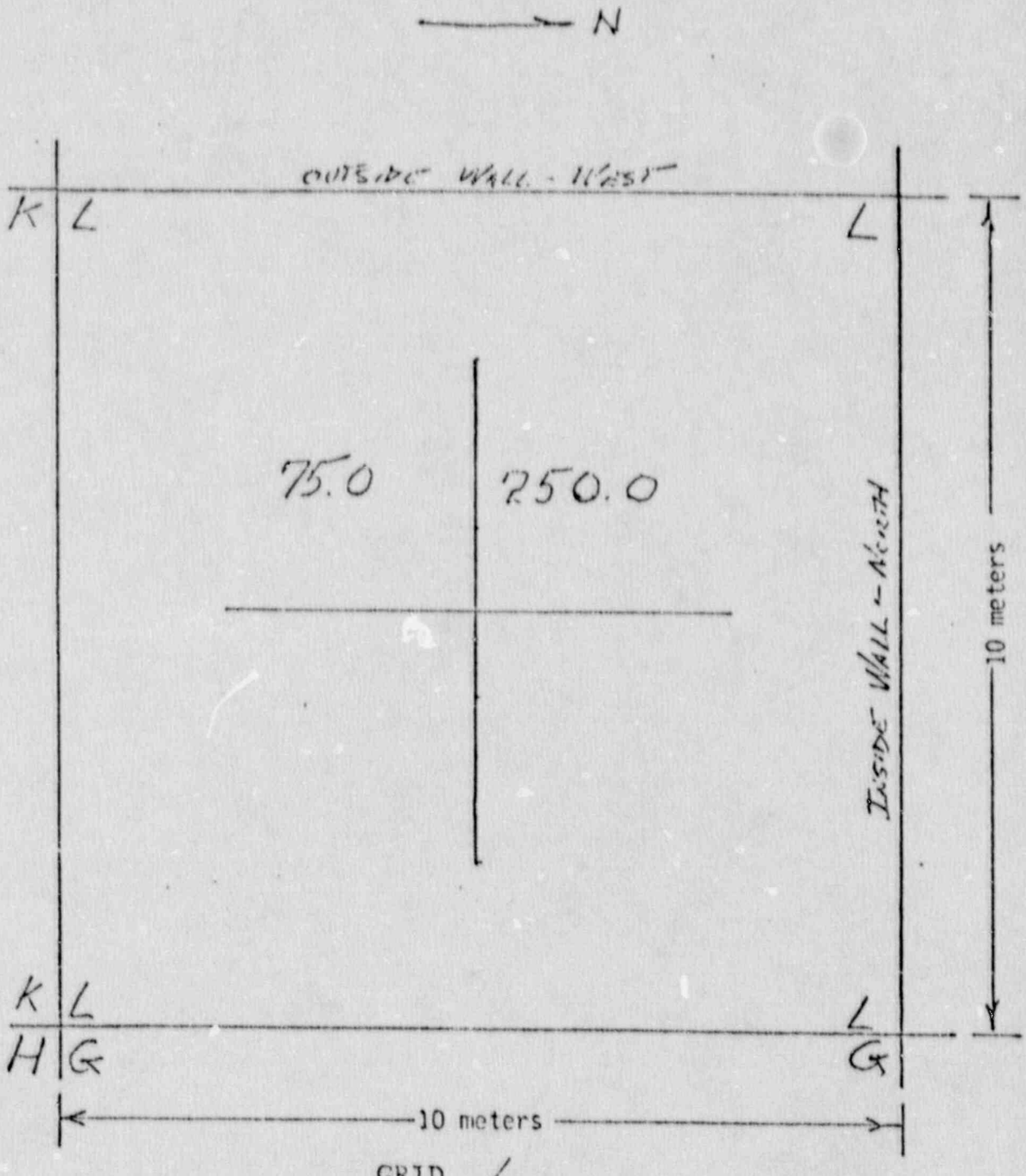
McGean Chemical Co.
Cleveland, Ohio

Date: 2/16/77

Beta-Gamma Survey

By: D. W. Keigh

NL Industries, Inc.
Nuclear Division
1130 Central Avenue
Albany, New York 12205



GRID L

Building 21

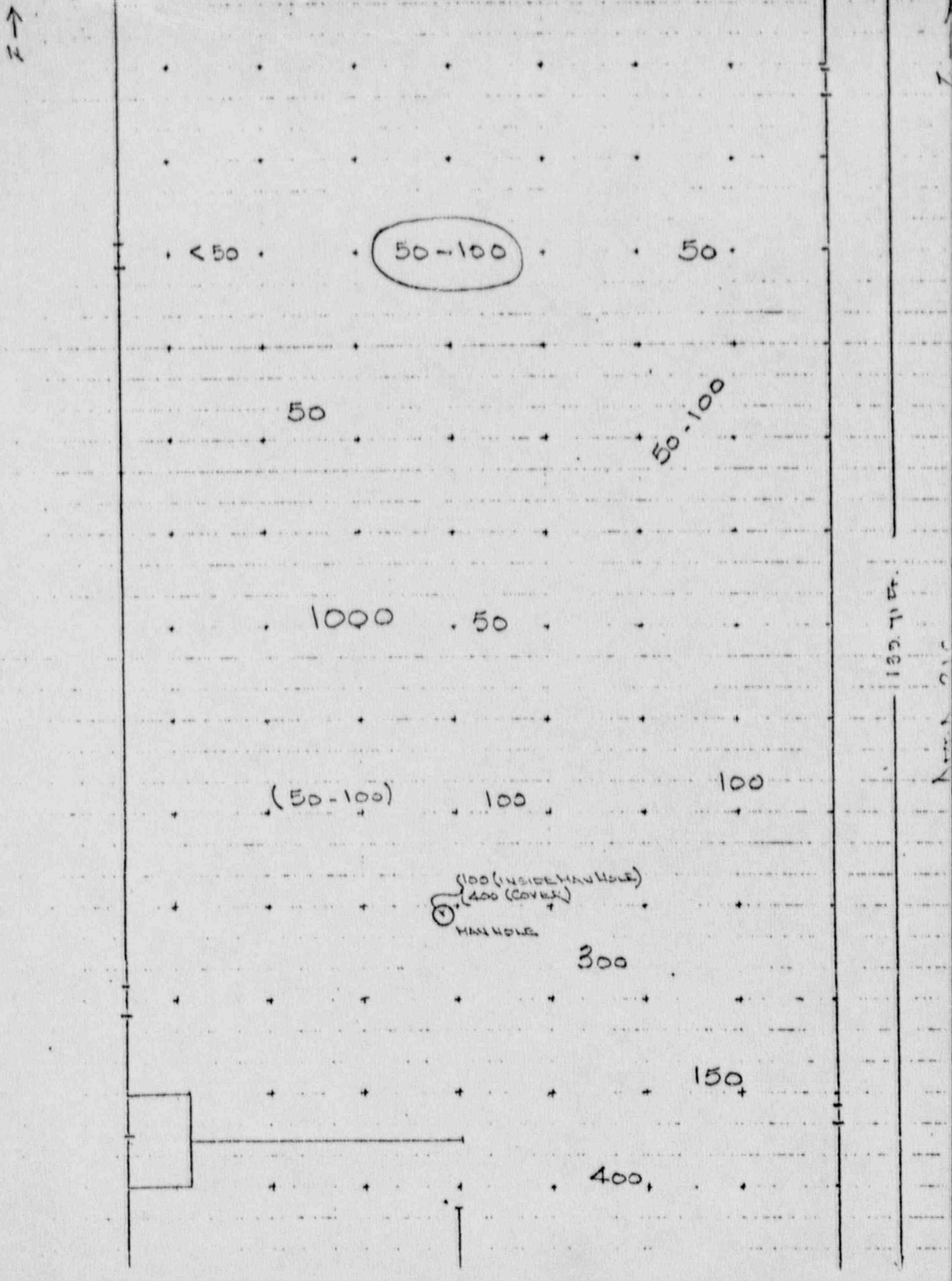
Area 21- B

McGean Chemical Co.
Cleveland, Ohio

Date: 2/15/79

Beta-Gamma Survey

By: [illegible]


N
<50
50-100
50
50
50-100
1000
50
(50-100)
100
100
(100 (INSIDE MANHOLE)
400 (COVER)
MANHOLE
300
150
400
135 ft.

OBJECTIVE CRITERIA

FACILITY RELEASE SPECIFICATIONS

1. The maximum amount of removable (capable of being removed by wiping the surface with a filter paper or other suitable absorbent material) beta-gamma activity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 1,000.

2. The average amount of fixed beta-gamma activity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 5,000.

3. The maximum amount of fixed beta-gamma activity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 15,000.

4. The maximum amount of removable alpha activity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 1,000.

5. The average amount of fixed alpha activity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 5,000.

6. The maximum amount of fixed alpha activity in disintegrations per minute per 100 square centimeters on buildings or equipment should not exceed 15,000.

7. The average and maximum radiation levels associated with surface contamination resulting from Beta-Gamma emitters should not exceed 0.2 MRAD/hr at 1 cm and 1.0 MRAD/hr at 1 cm; respectively, measured through not more than 7 milli per square centimeter of total absorber.

8. Liquid effluents should be held and checked to insure that concentrations are less than 10 CFR 20, Appendix B, Table II limits prior to discharge. Dilution will not be allowed to reduce concentrations in order to discharge.

9. Airborne radioactivity should be controlled at the individual work sites to insure airborne effluents discharged to the environment are less than 10 CFR 20, Appendix B, Table II limits.

10. Excavations in which radioactivity exists shall have the total activity reduced such that the remaining activity is not an internal radiological problem and the resulting dose rates from this activity is not an external radiation problem.

CONTINGENCIES

7. CONTINGENCIES

Contingent Conditions

Certain information can not be accurately quantified at this time.

Building Ceilings. Conditions of the structure preclude measurement of contamination conditions in the clear story areas which are nearly 45 feet from the floor. These areas will be cleaned and carefully evaluated when staging is in place and this work can be accomplished safely.

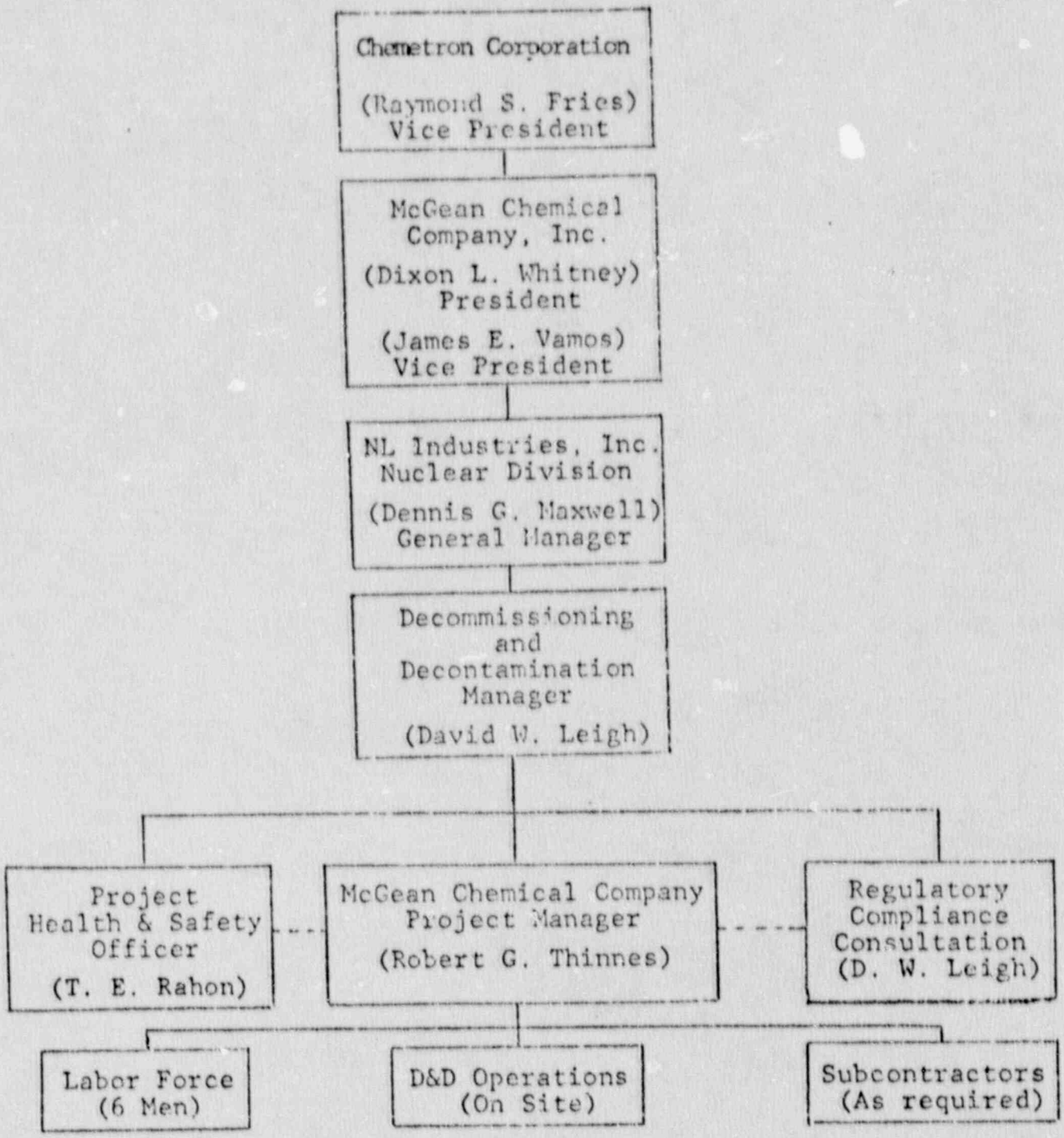
Building Storm Drain. A 10 inch storm drain runs from south to north along an approximate center line of the building and provides drainage for roof drains which run into catch basins which are beneath the floor. Attempts to assess these drains were frustrated by the presence of sediment which has high potential for being the source of the radiation detected in these areas. More accurate measurements will be possible when these sediments have been removed and other potential interfering sources have been eliminated.

Drain Troughs. There are several former drain troughs which carried miscellaneous process liquids and which have been filled with cement. Test areas will be opened with pneumatic hammers and a radiation survey will be performed.

Floors in Area 21-C which were covered with a new concrete floor sometime after the end of manufacturing will require test cores and evaluation of representative cross sections to determine levels of fixed and removable contamination.

APPENDIXES

APPENDIX A


Chemetron Corporation
(Raymond S. Fries)
Vice President
McGean Chemical Company, Inc.
(Dixon L. Whitney)
President
(James E. Vamos)
Vice President
NL Industries, Inc.
Nuclear Division
(Dennis G. Maxwell)
General Manager
Decommissioning and Decontamination Manager
(David W. Leigh)
Project Health & Safety Officer
(T. E. Rahon)
McGean Chemical Company Project Manager
(Robert G. Thinnes)
Regulatory Compliance Consultation
(D. W. Leigh)
Labor Force
(6 Men)
D&D Operations
(On Site)
Subcontractors
(As required)

APPENDIX B

SURVEY INSTRUMENTS

Eberline Model E-140 Count rate meters with an HP 177 probe which was calibrated to Cesium-137 were used to perform the Beta-Gamma Survey.

An Eberline Model PAC-4S with an Alpha Scinfillstion Probe, Model AC-3-7 was used for obtaining the Alpha data in this report.

Smear samples and samples of concrete chips were analized in a gas proportional counting system.

SURVEY TECHNIQUE

All measurements were made at 1 cm from the surface being surveyed.

Beta-Gamma Measurements were taken with the Beta window open.

All data h s been normalized to instrument performance specifications published in the Eberline catalog, dated December, 1977. Efficiency Values for the Beta-Gamma probe were determined by measurement of the detection area and calculated with consideration of window thickness and sensitivity to Cesium-137.

TABLES

ATTACHMENT A

GUIDELINES FOR DECONTAMINATION OF FACILITIES AND EQUIPMENT PRIOR TO RELEASE FOR UNRESTRICTED USE OR TERMINATION OF LICENSES FOR BYPRODUCT, SOURCE, OR SPECIAL NUCLEAR MATERIAL

U.S. Nuclear Regulatory Commission
Division of Fuel Cycle and Material Safety
Washington, D.C. 20555

NOVEMBER 1976

The instructions in this guide in conjunction with Table I specify the radioactivity and radiation exposure rate limits which should be used in accomplishing the decontamination and survey of surfaces or premises and equipment prior to abandonment or release for unrestricted use. The limits in Table I do not apply to premises, equipment, or scrap containing induced radioactivty for which the radiological considerations pertinent to their use may be different. The release of such facilities or items from regulatory control will be considered on a case-by-case basis.

1. The licensee shall make a reasonable effort to eliminate residual contamination.

2. Radioactivity on equipment or surfaces shall not be covered by paint, plating, or other covering material unless contamination levels, as determined by a survey and documented, are below the limits specified in Table I prior to applying the covering. A reasonable effort must be made to minimize the contamination prior to use of any covering.

3. The radioactivty on the interior surfaces of pipes, drain lines, or ductwork shall be determined by making measurements at all traps, and other appropriate access points, provided that contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises,

equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement shall be presumed to be contaminated in excess of the limits.

4. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated with materials in excess of the limits specified. This may include, but would not be limited to, special circumstances such as razing of buildings, transfer of premises to another organization continuing work with radioactive materials, or conversion of facilities to a long-term storage or standby status. Such requests must:

   a. Provide detailed, specific information describing the premises, equipment or scrap, radioactive contaminants, and the nature, extent, and degree of residual surface contamination.

   b. Provide a detailed health and safety analysis which reflects that the residual amounts of materials on surface areas, together with other considerations such as prospective use of the premises, equipment or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

5. Prior to release of premises for unrestricted use, the licensee shall make a comprehensive radiation survey which establishes that contamination is within the limits specified in Table I. A copy of the survey report shall be filed with the Division of Fuel Cycle and Material Safety, USNRC, Washington, D.C. 20555, and also the Director of the Regional Office of the Office of Inspection and Enforcement, USNRC, having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report shall:

   a. Identify the premises.

   b. Show that reasonable effort has been made to eliminate residual contamination.

   c. Describe the scope of the survey and general procedures followed.

   d. State the findings of the survey in units specified in the instruction.

Following review of the report, the NRC will consider visiting the facilities to confirm the survey.

TABLE I
ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDES[a]	AVERAGE[b,c,f]	MAXIMUM[b,d,f]	REMOVABLE[b,e,f]
U-nat, U-236, U-238, and associated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Transuranics, Ra-226, Ra-228.	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-230, Th-228, Pa-231, Ac-227, I-125, I-129			
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm βγ/100 cm^2	15,000 dpm βγ/100 cm^2	1,000 dpm βγ/100 cm^2

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate director for background, efficienty, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived from each such object.

REGULATORY GUIDE
DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 1.86

TERMINATION OF OPERATING LICENSES FOR NUCLEAR REACTORS

A. INTRODUCTION

Section 50.51, "Duration of license; renewal," of 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires that each license to operate a production and utilization facility be issued for a specified duration. Upon expiration of the specified period, the license may be either renewed or terminated by the Commission. Section 50.82, "Applications for termination of licenses," specifies the requirements that must be satisfied to terminate an operating license, including the requirement that the dismantlement of the facility and disposal of the component parts not be inimical to the common defense and security or to the health and safety of the public. This guide describes methods and procedures considered acceptable by the Regulatory staff for the termination of operating licenses for nuclear reactors. The Advisory Committee on Reactor Safeguards has been consulted concerning this guide and has concurred in the regulatory position.

B. DISCUSSION

When a licensee decides to terminate his nuclear reactor operating license, he may, as a first step in the process, request that his operating license be amended to restrict him to possess but not operate the facility. The advantage to the licensee of converting to such a possession-only license is reduced surveillance requirements in that periodic surveillance of equipment important to the safety of reactor operation is no longer required. Once this possession-only license is issued, reactor operation is not permitted. Other activities related to cessation of operations such as unloading fuel from the reactor and placing it in storage (either onsite of offsite) may be continued.

A licensee having a possession-only license must retain, with the Part 50 license, authorization for special nuclear material (10 CFR Part 70, "Special Nuclear Material"), byproduct material (10 CFR Part 30, "Rules of General Applicability to Licensing of Byproduct Material"), and source material (10 CFR Part 40, "Licensing of Source Material"), until the fuel, radioactive components, and sources are removed from the facility. Appropriate administrative controls and facility requirements are imposed by the Part 50 license and the technical specifications to assure that proper surveillance is performed and that the reactor facility is maintained in a safe condition and not operated.

A possession-only license permits various options and procedures for decommissioning, such as mothballing, entombment, or dismantling. The requirements imposed depend on the option selected.

Section 50.82 provides that the licensee may dismantle and dispose of the component parts of a nuclear reactor in accordance with existing regulations. For research reactors and critical facilities, this has usually meant the disassembly of a reactor and its shipment offsite, sometimes to another appropriately licensed organization for further use. The site from which a reactor has been removed must be decontaminated, as necessary, and inspected by the Commission to determine whether unrestricted access can be approved. In the case of nuclear power reactors, dismantling has usually been accomplished by shipping fuel offsite, making the reactor inoperable, and disposing of some of the radioactive components.

Radioactive components may be either shipped offsite for burial at an authorized burial ground or secured

USAEC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the AEC Regulatory staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Published guides will be revised periodically, as appropriate, to accommodate comments and to reflect new information or experience.

Copies of published guides may be obtained by request indicating the division desired to the U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Director of Regulatory Standards. Comments and suggestions for improvements in these guides are encouraged and should be sent to the Secretary of the Commission, U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Chief, Public Proceedings Staff.

The guides are issued in the following ten broad divisions:

1. Power Reactors
2. Research and Test Reactors
3. Fuels and Materials Facilities
4. Environmental and Siting
5. Materials and Plant Protection
6. Products
7. Transportation
8. Occupational Health
9. Antitrust Review
10. General

on the site. Those radioactive materials remaining on the site must be isolated from the pub[illegible]y physical barriers or other means to prevent public access to hazardous levels of radiation. Surveillance is necessary to assure the long term integrity of the barriers. The amount of surveillance required depends upon (1) the potential hazard to the health and safety of the public from radioactive material remaining on the site and (2) the integrity of the physical barriers. Before areas may be released for unrestricted use, they must have been decontaminated or the radioactivity must have decayed to less than prescribed limits (Table I).

The hazard associated with the retired facility is evaluated by considering the amount and type of remaining contamination, the degree of confinement of the remaining radioactive materials, the physical security provided by the confinement, the susceptibility to release of radiation as a result of natural phenomena, and the duration of required surveillance.

C. REGULATORY POSITION

1. APPLICATION FOR A LICENSE TO POSSESS BUT NOT OPERATE (POSSESSION-ONLY LICENSE)

A request to amend an operating license to a possession-only license should be made to the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545. The request should include the following information:

a. A description of the current status of the facility.

b. A description of measures that will be taken to prevent criticality or reactivity changes and to minimize releases of radioactivity from the facility.

c. Any proposed changes to the technical specifications that reflect the possession-only facility status and the necessary disassembly/retirement activities to be performed.

d. A safety analysis of both the activities to be accomplished and the proposed changes to the technical specifications.

e. An inventory of activated materials and their location in the facility.

2. ALTERNATIVES FOR REACTOR RETIREMENT

Four alternatives for retirement of nuclear reactor facilities are considered acceptable by the Regulatory staff. These are:

a. Mothballing. Mothballing of a nuclear reactor facility consists of putting the facility in a state of protective storage. In general, the facility may be left intact except that all fuel assemblies and the radioactive fluids and waste should be removed from the site. Adequate radiation [illegible]nitoring, environmental surveillance, and appropriate security procedures should be established under a possession-only license to ensure that the health and safety of the public is not endangered.

b. In-Place Entombment. In-place entombment consists of sealing all the remaining highly radioactive or contaminated components (e.g., the pressure vessel and reactor internals) within a structure integral with the biological shield after having all fuel assemblies, radioactive fluids and wastes, and certain selected components shipped offsite. The structure should provide integrity over the period of time in which significant quantities (greater than Table I levels) of radioactivity remain with the material in the entombment. An appropriate and continuing surveillance program should be established under a possession-only license.

c. Removal of Radioactive Components and Dismantling. All fuel assemblies, radioactive fluids and waste, and other materials having activities above accepted unrestricted activity levels (Table I) should be removed from the site. The facility owner may then have unrestricted use of the site with no requirement for a license. If the facility owner so desires, the remainder of the reactor facility may be dismantled and all vestiges removed and disposed of.

d. Conversion to a New Nuclear System or a Fossil Fuel System. This alternative, which applies only to nuclear power plants, utilizes the existing turbine system with a new steam supply system. The original nuclear steam supply system should be separated from the electric generating system and disposed of in accordance with one of the previous three retirement alternatives.

3. SURVEILLANCE AND SECURITY FOR THE RETIREMENT ALTERNATIVES WHOSE FINAL STATUS REQUIRES A POSSESSION-ONLY LICENSE

A facility which has been licensed under a possession-only license may contain a significant amount of radioactivity in the form of activated and contaminated hardware and structural materials. Surveillance and commensurate security should be provided to assure that the public health and safety are not endangered.

a. Physical security to prevent inadvertent exposure of personnel should be provided by multiple locked barriers. The presence of these barriers should make it extremely difficult for an unauthorized person to gain access to areas where radiation or contamination levels exceed those specified in Regulatory Position C.4. To prevent inadvertent exposure, radiation areas above 5 mR/hr, such as near the activated primary system of a power plant, should be appropriately marked and should not be accessible except by cutting of welded closures or the disassembly and removal of substantial structures

and/or shielding material. Mea such as a remote-readout intrusion alarm system should be provided to indicate to designated personnel when a physical barrier is penetrated. Security personnel that provide access control to the facility may be used instead of the physical barriers and the intrusion alarm systems.

b. The physical barriers to unauthorized entrance into the facility, e.g., fences, buildings, welded doors, and access openings, should be inspected at least quarterly to assure that these barriers have not deteriorated and that locks and locking apparatus are intact.

c. A facility radiation survey should be performed at least quarterly to verify that no radioactive material is escaping or being transported through the containment barriers in the facility. Sampling should be done along the most probable path by which radioactive material such as that stored in the inner containment regions could be transported to the outer regions of the facility and ultimately to the environs.

d. An environmental radiation survey should be performed at least semiannually to verify that no signficant amounts of radiation have been released to the environment from the facility. Samples such as soil, vegetation, and water should be taken at locations for which statistical data has been established during reactor operations.

e. A site representative should be designated to be responsible for controlling authorized access into and movement within the facility.

f. Administrative procedures should be established for the notification and reporting of abnormal occurrences such as (1) the entrance of an unauthorized person or persons into the facility and (2) a significant change in the radiation or contamination levels in the facility or the offsite environment.

g. The following reports should be made:

(1) An annual report to the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545, describing the results of the environmental and facility radiation surveys, the status of the facility, and an evaluation of the performance of security and surveillance measures.

(2) An abnormal occurrence report to the Regulatory Operations Regional Office by telephone within 24 hours of discovery of an abnormal occurrence. The abnormal occurrence will also be reported in the annual report described in the preceding item.

h. Records or logs relative to the following items should be kept and retained until the license is terminated, after which they may be stored with other plant records:

(1) Environmental surveys,

(2) Facility radiation surveys,

(3) Inspections of the physical barriers, and

(4) Abnormal occurrences.

4. DECONTAMINATION FOR RELEASE FOR UNRESTRICTED USE

If it is desired to terminate a license and to eliminate any further surveillance requirements, the facility should be sufficiently decontaminated to prevent risk to the public health and safety. After the decontamination is satisfactorily accomplished and the site inspected by the Commission, the Commission may authorize the license to be terminated and the facility abandoned or released for unrestricted use. The licensee should perform the decontamination using the following guidelines:

a. The licensee should make a reasonable effort to eliminate residual contamination.

b. No covering should be applied to radioactive surfaces of equipment or structures by paint, plating, or other covering material until it is known that contamination levels (determined by a survey and documented) are below the limits specified in Table I. In addition, a reasonable effort should be made (and documented) to further minimize contamination prior to any such covering.

c. The radioactivity of the interior surfaces of pipes, drain lines, or ductwork should be determined by making measurements at all traps and other appropriate access points, provided contamination at these locations is likely to be representative of contamination on the interior of the pipes, drain lines, or ductwork. Surfaces of premises, equipment, or scrap which are likely to be contaminated but are of such size, construction, or location as to make the surface inaccessible for purposes of measurement should be assumed to be contaminated in excess of the permissable radiation limits.

d. Upon request, the Commission may authorize a licensee to relinquish possession or control of premises, equipment, or scrap having surfaces contaminated in excess of the limits specified. This may include, but is not limited to, special circumstances such as the transfer of premises to another licensed organization that will continue to work with radioactive materials. Requests for such authorization should provide:

(1) Detailed, specific information describing the premises, equipment, scrap, and radioactive contaminants and the nature, extent, and degree of residual surface contamination.

(2) A detailed health and safety analysis indicating that the residual amounts of materials on surface areas, together with other considerations such as the prospective use of the premises, equipment, or scrap, are unlikely to result in an unreasonable risk to the health and safety of the public.

c. Prior to release of the premises for unrestricted use, the licensee should make a comprehensive radiation survey establishing that contamination is within the limits specified in Table 1. A survey report should be filed with the Director of Licensing, U.S. Atomic Energy Commission, Washington, D.C. 20545, with a copy to the Director of the Regulatory Operations Regional Office having jurisdiction. The report should be filed at least 30 days prior to the planned date of abandonment. The survey report should:

(1) Identify the premises;

(2) Show that reasonable effort has been made to reduce residual contamination to as low as practicable levels;

(3) Describe the scope of the survey and the general procedures followed; and

(4) State the findings of the survey in units specified in Table 1.

After review of the report, the Commission may inspect the facilities to confirm the survey prior to granting approval for abandonment.

5. REACTOR RETIREMENT PROCEDURES

As indicated in Regulatory Position C.2, several alternatives are acceptable for reactor facility retirement. If minor disassembly or "mothballing" is planned, this could be done by the existing operating and maintenance procedures under the license in effect. Any planned actions involving an unreviewed safety question or a change in the technical specifications should be reviewed and approved in accordance with the requirements of 10 CFR §50.

If major structural changes to radioactive components of the facility are planned, such as removal of the pressure vessel or major components of the primary system, a dismantlement plan including the information required by §50.82 should be submitted to the Commission. A dismantlement plan should be submitted for all the alternatives of Regulatory Position C.2 except mothballing. However, minor disassembly activities may still be performed in the absence of such a plan, provided they are permitted by existing operating and maintenance procedures. A dismantlement plan should include the following:

a. A description of the ultimate status of the facility

b. A description of the dismantling activities and the precautions to be taken.

c. A safety analysis of the dismantling activities including any effluents which may be released.

d. A safety analysis of the facility in its ultimate status.

Upon satisfactory review and approval of the dismantling plan, a dismantling order is issued by the Commission in accordance with §50.82. When dismantling is completed and the Commission has been notified by letter, the appropriate Regulatory Operations Regional Office inspects the facility and verifies completion in accordance with the dismantlement plan. If residual radiation levels do not exceed the values in Table 1, the Commission may terminate the license. If these levels are exceeded, the licensee retains the possession-only license under which the dismantling activities have been conducted or, as an alternative, may make application to the State (if an Agreement State) for a byproduct materials license.

TABLE I

ACCEPTABLE SURFACE CONTAMINATION LEVELS

NUCLIDE[a]	AVERAGE[b c]	MAXIMUM[b d]	REMOVABLE[b e]
U-nat, U-235, U-238, and associated decay products	5,000 dpm α/100 cm^2	15,000 dpm α/100 cm^2	1,000 dpm α/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1000 dpm/100 cm^2	3000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5000 dpm β-γ/100 cm^2	15,000 dpm β-γ/100 cm^2	1000 dpm β-γ/100 cm^2

[a] Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

ATTACHMENT C

NRC STAFF URANIUM
MILL TAILINGS MANAGEMENT

Background

A major expansion in the uranium industry is taking place. Many times more uranium will be extracted in the upcoming decades than has been extracted so far. This requires that the NRC examine very closely the past problem areas encountered in the uranium industry and take action to assure that they are not repeated.

The first major portion of the industry within the licensing jurisdiction of the NRC is uranium milling. The major problem encountered in past milling operations is the management of tailings generated by the milling process. Although the concentration of radioactivity in the tailings is relatively low, control measures are necessary because of the large quantities involved and because of the long half-life of the parent radionuclides that are present.

The management of mill tailings has received increasing attention and interest in recent years from involved Federal and State agencies and from environmental conservation groups. This interest has resulted from studies carried out during the last decade which have indicated that uranium mill

tailings, if not properly managed and controlled, could present a potential public health hazard. The most vivid example, of course, is the situation that occurred in Grand Junction. The remedial actions determined necessary to correct the misuse of tailings in the construction of homes, schools, and other public structures are continuing at substantial cost to the Federal Government and the State of Colorado.

In addition, final technical resolution and financial responsibility for the disposition of tailings at the 22 "inactive" sites being evaluated by ERDA will further increase public, state, and local as well as congressional concern with prevention of similar problems in the future.

It is incumbent on NRC and the uranium industry to assure that current and future licensed milling operations do not result in similar situations.

Towards this end, the NRC staff has developed performance objectives for an acceptable tailings management program based on the latest technology available.

Position

The staff is of the opinion that an acceptable tailings management program will vary depending on site or region specific parameters, such as geology, hydrology, and meteorology. Viable methods of tailings management for a specific mill location may include classic impoundment behind a dam, deep

mine burial, open pit mine burial, specially excavated pit burial, or even elimination of radioactive waste by process variations.

Considering the many variables involved, the staff will use the following performance objectives to determine the adequacy of proposed site specific tailings management programs.

Siting and Design

1. Locate the tailings isolation area remote from people such that population exposures would be reduced to the maximum extent reasonably achievable.

2. Locate the tailings isolation area such that disruption and dispersion by natural forces is eliminated or reduced to the maximum extent reasonably achievable.

3. Design the isolation area such that seepage of toxic materials into the groundwater system would be eliminated or reduced to the maximum extent reasonably achievable.

During Operations

4. Eliminate the blowing of tailings to unrestricted areas during normal operating conditions.

Post Reclamation

5. Reduce direct gamma radiation from the impoundment area to essentially background.

6. Reduce the radon emanation rate from the impoundment area to about twice the emanation rate in the surrounding environs.

7. Eliminate the need for an ongoing monitoring and maintenance program following successful reclamation.

8. Provide surety arrangements to assure that sufficient funds are available to complete the full reclamation plan.

Implementation

All objectives will be considered and satisfied during the review of proposed tailings management programs for new milling operations.

Current licensee's tailings management programs will be reviewed to determine the best way to apply objectives 4 through 8 to the extent practicable.

During the course of license renewal reviews, the locations of existing tailings areas will be reviewed considering objectives 1 through 3 to determine if sufficient cause exists to require an alternate disposal

location for tailings generated by future milling operations and the relocation of existing tailings at the time of mill decommissioning. 1661

ATTACHMENT D

[7590-01]

NUCLEAR REGULATORY COMMISSION

[10 CFR Parts 30, 40, 50, and 70]

DECOMMISSIONING CRITERIA FOR NUCLEAR FACILITIES

Advance Notice of Proposed Rulemaking

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Advance Notice of Proposed Rulemaking.

SUMMARY: The U.S. Nuclear Regulatory Commission has underway extensive studies intended to provide a data base for developing decommissioning criteria for nuclear facilities. The Commission is considering amending its regulations to provide more specific guidance on decommissioning criteria for production and utilization facility licensees and byproduct, source, and special nuclear material licensees. This notice is to invite advice and recommendations on several questions concerning decommissioning nuclear facilities.

DATES: Comment period expires May 15, 1978.

ADDRESSES: Interested persons are invited to submit written comments and suggestions to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch. Copies of comments received by the Commission may be examined in the Commission's Public Document Room at 1717 H Street, NW., Washington, D.C.

FOR FURTHER INFORMATION CONTACT:

Mr. Robert M. Bernero, Office of Standards Development, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 (phone 301-443-3573).

SUPPLEMENTARY INFORMATION: Present requirements and practices relating to the decommissioning of nuclear facilities are addressed in guides and regulations of the U.S. Nuclear Regulatory Commission. Section 50.33(f) of Title 10, Code of Federal Regulations requires the Nuclear Regulatory Commission (NRC) to determine, prior to the issuance of a license, that an applicant for an operating license is financially qualified to permanently shut down his facility and maintain it in a safe condition. Section 50.82 of Part 50 specifies requirements concerning termination of facility licenses. NRC Regulatory Guide 1.86 describes methods and procedures acceptable to the NRC staff for the termination of operating licenses for reactors. The guide specifies limits which must be met before buildings, structures, and equipment, etc., can be released on an unrestricted basis. The guide also discusses alternatives for reactor retirement, i.e., (1) mothballing, (2) in-place entombment, (3) removal of radioactive components and dismantling, and (4) conversion to a new nuclear system or a fossil fuel system.

Appendix F of Part 50 was amended in 1971 to require an applicant for certain licenses to provide information to enable the Commission to determine whether the applicant is financially qualified to provide for the removal and disposal of radioactive waste. Appendix F also states that a design objective of a fuel reprocessing plant shall be to facilitate decontamination and that the Commission will develop criteria for the extent of decontamination to be required upon decommissioning in consultation with competent groups.

Regulatory Guides dealing with the content and format of applications and environmental reports for uranium mill licenses presently request information on tailings stabilization and associated financial arrangements for assuring that tailings are stabilized. Also, a generic environmental impact statement (EIS) on uranium milling is under preparation. One primary objective of the EIS is to provide an information base for a rulemaking action covering the decommissioning and long-term disposition of mill tailings.

Several enriched uranium fuel fabrication facilities have, in the past, ceased operations. These plants generally have been decontaminated to below limits essentially the same as those specified in Regulatory Guide 1.86. The same holds true for other locations where byproduct, source, and special nuclear material have been used.

In 1975, the NRC initiated studies at Battelle-PNL to provide an information base for developing decommissioning criteria and guidelines for light water reactors and their fuel cycle facilities. These studies will also include waste burial grounds. The studies will evaluate the technology, costs, and the environmental impact (both occupational and public) related to decommissioning. These studies have led to a final report on decommissioning a fuel reprocessing plant in October 1977. A final report on decommissioning a pressurized water reactor is scheduled for May 1978. Other reports are scheduled over the next two years to complete these studies.

In a petition dated July 5, 1977, as supplemented October 7, 1977, the Public Interest Research Group, and others, requested the Commission to initiate rulemaking to promulgate regulations for nuclear power plant decommissioning. The regulations requested by the petitioners would require plant operators to post bonds to be held in escrow, prior to each plant's operations, to ensure that funds will be available for proper and adequate isolation of radioactive material upon each plant's decommissioning. The petitioners state that the regulations should also require that nuclear power plants already in operation establish plans and immediately post bonds, to be held in escrow, to ensure proper decommissioning. The petitioners argue that this arrangement will ensure that the cost of decommissioning is paid for by current beneficiaries and not by future generations.

The Commission is considering development of a more explicit overall policy for decommissioning nuclear facilities and amending its regulations in 10 CFR Parts 30, 40, 50 and 70 to include more specific guidance on decommissioning criteria for production and utilization facility licensees and byproduct, source, and special nuclear material licensees. It is anticipated that the issue raised in the PIRG petition discussed above will be processed separately from the overall policy development. Advice and recommendations on the matter of overall policy development are invited from all interested persons. Specifically, comments are requested on the following questions.

1. Is it desirable to develop more definitive decommissioning criteria for production and utilization facility licensees and byproduct, source, and special nuclear material licensees? If so, should the criteria be in the form of:

A. Potential exposures to individuals;

B. Numerical contamination limit;

C. Other? (Specify)

2. Should detailed decommissioning plans be required prior to the issuance of licenses?

3. Should funding or other surety arrangements be required before the issuance of licenses for all cases? If not, which cases?

4. What are acceptable criteria for residual levels of radioactivity on materials which can be released for unrestricted use?

5. Proposals have been made to maintain reactors, which have been closed, in protective storage for lengthy periods of time to allow for radioactive decay prior to dismantlement. From the standpoint of determining the impact to future generations, what is an acceptable length of time, if any, after a facility operation ceases before the facility should be decommissioned?

6. Should decommissioning criteria extend to buildings, structures, and components which have not been contaminated with radioactive materials?

The Commission has concluded that action to include specific decommissioning criteria and guidelines in its regulations for production and utilization facility licensees and byproduct, source, and special nuclear material licensees would constitute a major Federal action significantly affecting the quality of the human environment and as such will require the preparation of an environmental impact statement pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA). Accordingly, an impact statement(s) will be prepared should the Commission determine it is in the public interest to proceed to amend its regulations as described above.

Dated at Washington, D.C., this 8th day of March, 1978.

For the Nuclear Regulatory Commission.

SAMUEL J. CHILK,
Secretary of the Commission.

[FR Doc. 78-6461 Filed 3-10-78; 8:45 am]

* U. S. GOVERNMENT PRINTING OFFICE : 1978—720-537/66

PART 40

DOMESTIC LICENSING OF SOURCE MATERIAL*

AUTHORITY: Secs. 62, 63, 64, 65, 161, 182, 183, 68 Stat. 932, 933, 948, 953, 954, as amended; (42 U.S.C. 2092, 2093, 2094, 2095, 2201, 2232, 2233); secs. 202, 206 88 Stat. 1244, 1246 (42 U.S.C. 5842, 5846) unless otherwise noted.

Section 40.46 also issued under sec. 184, 68 Stat. 954, as amended; 42 U.S.C. 2234. For the purposes of sec. 223, 68 Stat. 958, as amended, 42 U.S.C. 2273, § 40.41(c) issued under sec. 161b., 68 Stat. 948, 42 U.S.C. 2201(b) and §§ 40.23(c) (3), 40.61 and 40.62 issued under sec. 161o., 68 Stat. 950, as amended, 42, U.S.C. 2201(o).

GENERAL PROVISIONS

§ 40.1 Purpose.

(a) The regulations in this part establish procedures and criteria for the issuance of licenses to receive title to, receive, possess, use, transfer, or deliver* source material and establish and provide for the terms and conditions upon which the Commission will issue such licenses.

(b) The regulations contained in this part are issued pursuant to the Atomic Energy Act of 1954, as amended, (68 Stat. 919) and Title II of the Energy Reorganization Act of 1974 (88 Stat. 1242).

§ 40.2 Scope.

Except as provided in §§ 40.11 to 40.14, inclusive, the regulations in this part apply to all persons in the United States.

§ 40.3 License requirements.

No person subject to the regulations in this part shall receive title to, receive, possess, use, transfer, or deliver* any source material after removal from its place of deposit in nature, except as authorized in a specific or general license issued by the Commission pursuant to the regulations in this part.

§ 40.4 Definitions.

As used in this part:

(a) "Act" means the Atomic Energy Act of 1954 (68 Stat. 919), including all amendments thereto;

(a-1) "Administration" means the Energy Research and Development Administration or its duly authorized representatives.

(b) "Commission" means the Nuclear Regulatory Commission or its duly authorized representatives.

(c) "Government agency" means an executive department, commission, independent establishment, corporation wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government;

(d) "License", except where otherwise specified, means a license issued pursuant to the regulations in this part.

(e) "Person" means (1) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group Government agency other than the Commission or the Administration except that the Administration shall be considered a person within the meaning of the regulations in this part to the extent that its facilities and activities are subject to the licensing and related regulatory authority of the Commission pursuant to section 202 of the Energy Reorganization Act of 1974 (88 Stat. 1244),* any State or any pol

See next page for footnote 6.

* Amended 43 FR 6915.

(c) subdivision, agency, or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and (2) any legal successor, representative, agent or agency of the foregoing.

(f) "Pharmacist" means an individual registered by a state or territory of the United States, the District of Columbia or the Commonwealth of Puerto Rico to compound and dispense drugs, prescriptions and poisons.

(g) "Physician" means an individual licensed by a state or territory of the United States, the District of Columbia or the Commonwealth of Puerto Rico to dispense drugs in the practice of medicine.

(h) "Source Material" means (1) uranium or thorium, or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of (*i*) uranium, (*ii*) thorium or (*iii*) any combination thereof. Source material does not include special nuclear material.

(i) "Special nuclear material" means (1) plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, or (2) any material* artificially enriched by any of the foregoing;

(j) "United States," when used in a geographical sense, includes all territories and possessions of the United States, the Canal Zone and Puerto Rico;

(k) "Unrefined and unprocessed ore" means ore in its natural form prior to any processing, such as grinding, roasting or beneficiating, or refining;

(l) Other terms defined in section 11 of the Act shall have the same meaning when used in the regulations in this part.

(m) "Agreement State" means any State with which the Atomic Energy Commission or the Nuclear Regulatory Commission has entered into an effective agreement under subsection 274b. of the Atomic Energy Act of 1954, as amended.

(n) "Commencement of construction" means any clearing of land, excavation, or other substantial action that would adversely affect the natural environment of a site but does not include changes desirable for the temporary use of the land for public recreational uses, necessary borings to determine site characteristics or other preconstruction monitoring to establish background information related to the suitability of a site or to the protection of environmental values.

(o) "Depleted uranium" means the source material uranium in which the isotope uranium-235 is less than 0.711 weight percent of the total uranium present. Depleted uranium does not include special nuclear material.

§ 40.5 Communications.

Except where otherwise specified in this part, all communications and reports concerning the regulations in this part, and applications filed under them, should be addressed to the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555. Communications, reports, and applications may be delivered in person at the Commission's offices at 1717 H Street NW., Washington, D.C.; or **7920 Norfolk Avenue, Bethesda, Md.

§ 40.6 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

EXEMPTIONS†

§ 40.11 Persons using source material under certain Energy Research and Development Administration and Nuclear Regulatory Commission Contracts.

Except to the extent that Administration facilities or activities of the types subject to licensing pursuant to section 202 of the Energy Reorganization Act of 1974 are involved, any prime contractor of the Administration is exempt from the requirements for a license set forth in sections 62, 63, and 64 of the Act and from the regulations in this part to the extent that such contractor, under his prime contract with the Administration, receives, possesses, uses, transfers, or delivers‡ source material for (a) The performance of work for the Administration at a United States Government-owned or controlled site, including the transportation of source material to or from such site and the performance of contract services during temporary interruptions of such transportation; (b) research in, or development, manufacture, storage, testing or transportation of, atomic weapons or components thereof, or (c) the use or operation of nuclear reactors or other nuclear devices in a United States Government-owned vehicle or vessel. In addition to the foregoing exemptions, and subject to the requirement for licensing of Administration facilities and activities pursuant to section 202 of the Energy Reorganization Act of 1974, any prime contractor or subcontractor of the Administration or the Commission is exempt from the requirements for a license set forth in sections 62, 63, and 64 of the Act and from the regulations in this part to the extent that such prime contractor or subcontractor receives, possesses, uses, transfers, or delivers‡ source material under his prime contract or subcontract when the Commission determines that the exemption of the prime contractor or subcontractor is authorized by law; and that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety.

§ 40.12 Carriers.

Common and contract carriers, freight forwarders, warehousemen, and the U.S. Postal Service are exempt from the regulations in this part and the requirements for a license set forth in section 62 of the Act to the extent that they transport or store source material in the regular course of carriage for another or storage incident thereto.

§ 40.13 Unimportant quantitities of source material.

(a) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses,

*The Administration facilities and activities identified in section 202 are:

(1) Demonstration Liquid Metal Fast Breeder reactors when operated as part of the power generation facilities of an electric utility system, or when operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor.

(2) Other demonstration nuclear reactors, except those in existence on January 19, 1975, when operated as part of the power generation facilities of an electric utility system, or when operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor.

(3) Facilities used primarily for the receipt and storage of high-level radioactive wastes resulting from licensed activities.

(4) Retrievable Surface Storage Facilities and other facilities authorized for the express purpose of subsequent long-term storage of high-level radioactive waste generated by the Administration, which are not used for, or are part of, research and development activities.

*Amended 31 FR 15145.

†Amended 29 FR 14401.

**Amended 34 FR 19546.

‡Amended 43 FR 6915.

transfers, or delivers] source material in any chemical mixture, compound, solution, or alloy in which the source material is by weight less than one-twentieth of 1 percent (0.05 percent) of the mixture, compound, solution or alloy.

(b) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the act to the extent that such person receives, possesses, uses, or transfers] unrefined and unprocessed ore containing source material; provided, that, except as authorized in a specific license, such person shall not refine or process such ore. ‡

(c) Any person is exempt from the regulation in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, or transfers:†

(1) Any quantities of thorium contained in (i) incandescent gas mantles, (ii) vacuum tubes, (iii) welding rods, (iv) electric lamps for illuminating purposes: *Provided*, That each lamp does not contain more than 50 milligrams of thorium, (v) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting: *Provided*, That each lamp does not contain more than 2 grams of thorium, (vi) rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these, or (vii) personnel neutron dosimeters: *Provided*, That each dosimeter does not contain more than 50 milligrams of thorium.

(2) Source material contained in the following products: (i) Glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material; (ii) piezoelectric ceramic containing not more than 2 percent by weight source material; (iii) glassware, glass enamel, and glass enamel frit containing not more than 10 percent by weight source material; but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass, glass enamel or ceramic used in construction;

(3) Photographic film, negatives, and prints containing uranium or thorium;

(4) Any finished product or part fabricated of, or containing tungsten or magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed 4 percent by weight and that the exemption contained in this subparagraph shall not be deemed to authorize the chemical, physical or metallurgical treatment or processing of any such product or part; and

(5) Uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of such counterweights: *Provided*, That:

(i) The counterweights are manufactured in accordance with a specific license issued by the Commission or the Atomic Energy Commission authorizing distribution by the licensee pursuant to this subparagraph;

(ii) Each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "Depleted Uranium";‡

(iii) Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer, and the statement: "Unauthorized Alterations Prohibited";‡ and

(iv) The exemption contained in this subparagraph shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of any such counterweights other than repair or restoration of any plating or other covering.

(6) Uranium used as shielding constituting part of any shipping container which is conspicuously and legibly impressed with the legend "CAUTION—RADIOACTIVE SHIELDING—URANIUM" and which meets the specifications for containers for radioactive materials prescribed by § 178.250, Specification 55, Part 178 of the regulations of the Department of Transportation (49 CFR 178.250).

(7) Thorium contained in finished optical lenses, provided that each lens does not contain more than 30 percent by weight of thorium; and that the exemption contained in this subparagraph shall not be deemed to authorize either:

(i) The shaping, grinding or polishing of such lens or manufacturing processes other than the assembly of such lens into optical systems and devices without any alteration of the lens; or

(ii) The receipt, possession, use, or transfer†

of thorium contained in contact lenses, or in spectacles, or in eyepieces of binoculars or other optical instrument

(8) Thorium contained in a finished aircraft engine part containing nickel-thoria alloy, provided that:

(i) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

(ii) The thorium content in the nickel-thoria alloy does not exceed 4 percent by weight.

(9) The exemptions in this paragraph (c) do not authorize the manufacture of any of the products described.

(d) Any person is exempt from the regulations in this part and from the requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses or transfers† uranium contained in detector heads for use in fire detection units, provided that each detector head contains not more than 0.005 microcuries uranium. The exemption in this paragraph does not authorize the manufacture of any detector head containing uranium.

§ 40.14 Specific exemptions.

(a) The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of this regulation in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

(b) Any person subject to the provisions of §§ 40.31(f) and 40.32(e) may request an exemption from the requirements of those provisions. The Commission may grant an exemption from the provisions of §§ 40.31(f) and 40.32(e) upon considering and balancing the following factors:

(1) Whether conduct of the proposed activities will give rise to a significant adverse impact on the environment and the nature and extent of such impact, if any;

(2) Whether redress of any adverse environmental impact from conducting the proposed activities can reasonably be effected should such redress be necessary;

(3) Whether conduct of the proposed activities would foreclose subsequent adoption of alternatives; and

(4) The effect of delay in conducting such activities on the public interest. During the period of any exemption granted pursuant to this paragraph any activities conducted shall be c

†Amended 43 FR 6915.

‡Deleted 43 FR 6915.

‡The requirements specified in subdivisions (iii) and (iv) of this subparagraph need not be met by counterweights manufactured prior to Dec. 31, 1969: *Provided*, That such counterweights were manufactured under a specific license issued by the Atomic Energy Commission and were impressed with the legend required by § 40.13(c)(5)(ii) in effect on June 30, 1969.

†Amended 37 FR 19546.

obtain such a manner as will minimize or reduce their environmental impact.

General Licenses

§ 40.20 Types of licenses.

Licenses for source material are of two types: general and specific. The general licenses provided in this part are effective without the filing of applications with the Commission or the issuance of licensing documents to particular persons. Specific licenses are issued to named persons upon applications filed pursuant to the regulations in this part.

§ 40.21 General license to receive title to source material.

A general license is hereby issued authorizing the receipt of title to source material without regard to quantity. This general license does not authorize any person to receive, possess, use,† or transfer source material.

§ 40.22 Small quantities of source material.

(a) A general license is hereby issued authorizing use and transfer of not more than fifteen (15) pounds of source material at any one time by persons in the following categories:

(1) Pharmacists using the source material solely for the compounding of medicinals;

(2) Physicians using the source material for medicinal purposes;

(3) Persons receiving possession of source material from pharmacists and physicians in the form of medicinals or drugs;

(4) Commercial and industrial firms and research, educational and medical institutions and Federal, State and local governmental agencies for research, development, educational, commercial or operational purposes;

And provided, That no such person shall pursuant to this general license receive more than a total of 150 pounds of source material in any one calendar year. ‡

(b) Persons who receive, possess, use, or transfer source material pursuant to the general license issued in paragraph (a) of this section are exempt from the provisions of Parts 19, 20, and 21* of this chapter to the extent that such receipt, possession, use or transfer are within the terms of such general license: *Provided, however,* That this exemption shall not be deemed to apply to any such person who is also in possession of source material under a specific license issued pursuant to this part.

§ 40.23 [Deleted 43 FR 6915.]

§ 40.24 [Deleted 43 FR 6915.]

*Amended 42 FR 28891.

†Amended 43 FR 6915.

‡Deleted 43 FR 6915.

§ 40.25 General license for use of certain industrial products or devices.

(a) A general license is hereby issued to receive, acquire, possess, use, or transfer, in accordance with the provisions of paragraphs (b), (c), (d), and (e) of this section, depleted uranium contained in industrial products or devices for the purpose of providing a concentrated mass in a small volume of the product or device.

(b) The general license in paragraph (a) of this section applies only to industrial products or devices which have been manufactured or initially transferred‡ in accordance with a specific license issued‡ pursuant to §40.34(a) or in accordance with a specific license issued‡ by an Agreement State which authorizes manufacture of the products or devices for distribution to persons generally licensed by the Agreement State.

(c)(1) Persons who receive, acquire, possess, or use depleted uranium pursuant to the general license established by paragraph (a) of this section shall file Form NRC 244, "Registration Certificate—Use of Depleted Uranium Under General License," with the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. The form shall be submitted within 30 days after the first receipt or acquisition of such depleted uranium. The registrant shall furnish on Form NRC 244 the following information and such other information as may be required by that form:

(i) Name and address of the registrant;

(ii) A statement that the registrant has developed and will maintain procedures designed to establish physical control over the depleted uranium described in paragraph (a) of this section and designed to prevent transfer of such depleted uranium in any form, including metal scrap, to persons not authorized to receive the depleted uranium; and

(iii) Name and/or title, address, and telephone number of the individual duly authorized to act for and on behalf of the registrant in supervising the procedures identified in paragraph (c)(1)(ii) of this section.

(2) The registrant possessing or using depleted uranium under the general license established by paragraph (a) of this section shall report in writing to the Director of Inspection and Enforcement, any changes in information furnished by him in the Form NRC 244 "Registration Certificate—Use of Depleted Uranium Under General License." The report shall be submitted within 30 days after the effective date of such change.

(d) A person who receives, acquires, possesses, or uses depleted uranium pursuant to the general license established by paragraph (a) of this section:

(1) Shall not introduce such depleted uranium, in any form, into a chemical, physical, or metallurgical treatment or process, except a treatment or process for repair or restoration of any plating or other covering of the depleted uranium.

(2) Shall not abandon such depleted uranium.

(3) Shall transfer or dispose of such depleted uranium only by transfer in accordance with the provisions of § 40.51. In the case where the transferee receives the depleted uranium pursuant to the general license established by paragraph (a) of this section, the transferor shall furnish the transferee a copy of this section and a copy of Form NRC 244. In the case where the transferee receives the depleted uranium pursuant to a general license contained in an Agreement State's regulation equivalent to this section, the transferor shall furnish the transferee a copy of this section and a copy of Form NRC 244 accompanied by a note explaining that use of the product or device is regulated by the Agreement State under requirements substantially the same as those in this section.

(4) Within 30 days of any transfer, shall report in writing to the Director of Inspection and Enforcement the name and address of the person receiving the source material pursuant to such transfer.

(5) [Deleted 43 FR 6915.]

(e) Any person receiving, acquiring, possessing, using, or transferring depleted uranium pursuant to the general license established by paragraph (a) of this section is exempt from the requirements of Parts 20 and 21* of this chapter with respect to the depleted uranium covered by that general license.

§ 40.31 Applications for specific licenses.

(a) Applications for specific licenses should be filed in quadruplicate on Form NRC—2, "Application for Source Material License",‡ with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C., 20555. Application may be filed in person at the Commission's offices at** 1717 H Street NW., Washington, D.C., or 7920 Norfolk Avenue, Bethesda, Md. Information contained in previous applications, statements or reports filed with the Commission may be incorporated by reference, provided that such references are clear and specific.

(b) The Commission may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Commission to determine whether the application should be granted or denied or whether a license should be modified or revoked. All applications and statements shall be signed by the applicant or licensee or person duly authorized to act for and on his behalf.

(c) Applications and documents submitted to the Commission in connection with applications will be made available for public inspection in accordance with the provisions of the regulations contained in Parts 2 and 9 of this chapter.

(d) An application for a license filed pursuant to the regulations in this part will be considered also as an application for licenses authorizing other activities for which licenses are required by the Act: *Provided*, That the application specifies the additional activities for which licenses are requested and complies with regulations of the Commission as to applications for such licenses.

(e) Each application for a source material license, other than a license exempted from Part 170 of this chapter, shall be accompanied by the fee prescribed in § 170.31 of this chapter. No fee will be required to accompany an application for renewal or amendment of a license, except as provided in § 170.11 of this chapter.

(f) An application for a license to possess and use source material for uranium milling, production of uranium hexafluoride, commercial waste disposal by land burial or for the conduct of any other activity which the Commission determines will significantly affect the quality of the environment shall be filed at least 9 months prior to the commencement of construction of the plant or facility in which the activity will be conducted and shall be accompanied by a Environmental Report required pursuant to Part 51*** of this chapter.

§ 40.32 General requirements for issuance of specific licenses.†

An application for a specific license‡ will be approved if:

(a) The application is for a purpose authorized by the Act; and

(b) The applicant is qualified by reason of training and experience to use the source material for the purpose requested in such manner as to protect health and minimize danger to life or property; and

(c) The applicant's proposed equipment, facilities and procedures are adequate to protect health and minimize danger to life or property; and

(d) The issuance of the license will not be inimical to the common defense and security or to the health and safety of the public; and

41 FR 53330 — 41 FR 53330 — 31 FR 4633 — 26 FR 224 — 25 FR 27 — 36 FR 145 — 37 FR 5745 — 36 FR 12731

‡ Amended 43 FR 6915.

**Amended 34 FR 19546.

*Amended 42 FR 28891.

†Amended 41 FR 53330.

***Amended 39 FR 26279.

(c) In the case of an application for a license to possess and use source material for uranium milling, production of uranium hexafluoride, commercial waste disposal by land burial or for the conduct of any other activity which the Commission determines will significantly affect the quality of the environment, the Director of Nuclear Material Safety and Safeguards or his designee, before commencement of construction of the plant or facility in which the activity will be conducted, on the basis of information filed and evaluations made pursuant to Part 51*** of this chapter, has concluded, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. Commencement of construction prior to such conclusion may be grounds for denial of a license to possess and use source material in such plant or facility; and

[41 FR 53339] [37 FR 5745]

(f) The applicant satisfies any applicable special requirements contained in § 40.34.

§ 40.33 [Deleted 43 FR 6915.]

§ 40.34 Special requirements for issuance of specific licenses.

†

(a)* An application for a specific license to manufacture industrial products and devices containing depleted uranium, or to initially‡ transfer such products or devices, for use pursuant to § 40.25 or equivalent regulations of an Agreement State, will be approved if:

(1)* The applicant satisfies the general requirements specified in § 40.32;

(2)* The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, proposed uses, and potential hazards of the industrial product or device to provide reasonable assurance that possession, use, or transfer of the depleted uranium in the product or device is not likely to cause any individual to receive in any period of one calendar quarter a radiation dose in excess of 10 percent of the limits specified in § 20.101(a) of this chapter; and

(3)* The applicant submits sufficient information regarding the industrial product or device and the presence of depleted uranium for a mass-volume application in the product or device to provide reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or device.

[41 FR 53339]

(b)* In the case of an industrial product or device whose unique benefits are questionable, the Commission will approve an application for a specific license under this paragraph only if the product or device is found to combine a high degree of utility and low probability of uncontrolled disposal and dispersal of significant quantities of depleted uranium into the environment.

(c)* The Commission may deny an applicant for a specific license under this paragraph if the end uses of the industrial product or device cannot be reasonably foreseen.

§ 40.35 Conditions of specific licenses issued pursuant to § 40.34.

Each person licensed pursuant to § 40.34‡ shall:

(a)* Maintain the level of quality control required by the license in the manufacture of the industrial product or device, and in the installation of the depleted uranium into the product or device;

(b)* Label or mark each unit to: (1)* identify the manufacturer or initial transferor‡ of the product or device and the number of the license under which the product or device was manufactured or initially transferred‡ the fact that the product or device contains depleted uranium, and the quantity of depleted uranium in each product or device; and (2)* State that the receipt, possession, use and transfer of the product or device are subject to a general license or the equivalent and the regulations of the U.S. NRC or of an Agreement State;

(c)* Assure that the depleted uranium before being installed in each product or device has been impressed with the following legend clearly legible through any plating or other covering: "Depleted Uranium";

[41 FR 53339]

(d)(1)* Furnish a copy of the general license contained in § 40.25 and a copy of Form NRC 244 to each person to whom he transfers source material in a product or device for use pursuant to the general license contained in § 40.25; or

(2)* Furnish a copy of the general license contained in the Agreement State's regulation equivalent to § 40.25 and a copy of the Agreement State's certificate, or alternately, furnish a copy of the general license contained in § 40.25 and a copy of Form NRC 244 to each person to whom he transfers source material in a product or device for use pursuant to the general license of an Agreement State. If a copy of the general license in § 40.25 and a copy of Form NRC 244 are furnished to such person, they shall be accompanied by a note explaining that use of the product or device is regulated by the Agreement State under requirements substantially the same as those in § 40.25; and

(e)(1)* Report to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, all transfers of industrial products or devices to persons for use under the general license in § 40.25. Such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Commission and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such a product or device is transferred to the generally licensed person. If no transfers have been made to persons generally licensed under § 40.25 during the reporting period, the report shall so indicate;

(2)* Report to the responsible Agreement State Agency all transfers of industrial products or devices to persons for use under the general license in the Agreement State's regulation equivalent to § 40.25. Such report shall identify each general licensee by name and address, an individual by name and/or position who may constitute a point of contact between the Agency and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within 30 days after the end of each calendar quarter in which such product or device is transferred to the generally licensed person. If no transfers have been made to a particular Agreement State during the reporting period this information shall be reported to the responsible Agreement State Agency;

(3)* Keep records showing the name, address, and a point of contact for each general licensee to whom he transfers depleted uranium in industrial products or devices for use pursuant to the general license provided in § 40.25 or equiva-

***Amended 39 FR 26279.
†Deleted 43 FR 6915.
*Redesignated 43 FR 6915.
‡Amended 43 FR 6915.

lent regulations of an Agreement State. The records shall be maintained for a period of two years and shall show the date of each transfer, the quantity of depleted uranium in each product or device transferred, and compliance with the report requirements of this section.

41 FR 53330

LICENSES

§ 40.41 Terms and conditions of licenses.

26 FR 284

(a) Each license issued pursuant to the regulations in this part shall be subject to all the provisions of the Act, now or hereafter in effect, and to all rules, regulations and orders of the Commission.

(b) Neither the license nor any right under the license shall be assigned or otherwise transferred in violation of the provisions of the Act.

33 FR 3393

(c) Each person licensed by the Commission pursuant to the regulations in this part shall confine his possession and use of source material to the locations and purposes authorized in the license. Except as otherwise provided in the license, a license issued pursuant to the regulations in this part shall carry with it the right to receive, possess, and use source material. Preparation for shipment and transport of source material shall be in accordance with the provisions of Part 71 of this chapter.

26 FR 284

(d) Each license issued pursuant to the regulations in this part shall be deemed to contain the provisions set forth in sections* 183b.-d., of the Act, whether or not said provisions are expressly set forth in the license.

(e) The Commission may incorporate in any license at the time of issuance, or thereafter by appropriate rule, regulation or order, such additional requirements and conditions with respect to the

*Amended 31 FR 15145.
†Amended 43 FR 6915.

licensee's receipt, possession, use, and transfer of source material as it deems appropriate or necessary in order to:

(1) Promote the common defense and security;

(2) Protect health or to minimize danger to life or property;

(3) Protect restricted data;

(4) Require such reports and the keeping of such records, and to provide for such inspections of activities under the license as may be necessary or appropriate to effectuate the purposes of the Act and regulations thereunder.

§ 40.42 Expiration.

Except as provided in § 40.43(b), each specific license shall expire at the end of the day in the month and year stated therein.**

§ 40.43 Renewal of licenses.

(a) Applications for renewal of a specific license shall be filed in accordance with § 40.31.

(b) In any case in which a licensee, not less than thirty (30) days prior to expiration of his existing license, has filed an application in proper form for renewal or for a new license, such existing license shall not expire until the application for renewal or for a new license has been finally determined by the Commission.

§ 40.44 Amendment of licenses at request of licensee.

Applications for amendment of a license shall be filed in accordance with § 40.31 and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment.

§ 40.45 Commission action on applications to renew or amend.

In considering an application by a licensee to renew or amend his license, the Commission will apply the applicable criteria set forth in §40.32.*

§ 40.46 Inalienability of licenses.

No license issued or granted pursuant to the regulations in this part shall be transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person, unless the Commission shall, after securing full information, find that the transfer is in accordance with the provisions of this Act, and shall give its consent in writing.

§ 40.47 [Deleted 40 FR 8274.]

§ 40.51 Transfer of source material.

(a) No licensee shall transfer source material except as authorized pursuant to this section.

(b) Except as otherwise provided in his license and subject to the provisions of paragraphs (c) and (d) of this section, any licensee may transfer source material:

(1) To the Administration;

(2) To the agency in any Agreement State which regulates radioactive materials pursuant to an agreement with the Commission or Atomic Energy Commission under section 274 of the Act;

(3) To any person exempt from the licensing requirements of the Act and regulations in this part to the extent permitted under such exemption;

(4) To any person in an Agreement State subject to the jurisdiction of that State who has been exempted from the licensing requirements and regulations of that State, to the extent permitted under such exemption;

(5) To any person authorized to receive such source material under terms of a specific license or a general license or their equivalents issued by the Commission or an Agreement State; or

(6) To any person abroad pursuant to an export license issued under Part 110 of this chapter;

(7)† As otherwise authorized by the Commission in writing.

(c) Before transferring source material to a specific licensee of the Commission or an Agreement State or to a general licensee who is required to register with the Commission or with an Agreement State prior to receipt of the source material, the licensee transferring the material shall verify that the transferee's license authorizes receipt of the type, form, and quantity of source material to be transferred.

(d) The following methods for the verification required by paragraph (c) of this section are acceptable:

(1) The transferor may have in his possession, and read, a current copy of the transferee's specific license or registration certificate;

(2) The transferor may have in his possession a written certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of source material to be transferred, specifying the license or registration certificate number, issuing agency and expiration date;

(3) For emergency shipments the transferor may accept oral certification by the transferee that he is authorized by license or registration certificate to receive the type, form, and quantity of source material to be transferred, specifying the license or registration certificate number, issuing agency and expiration date: *Provided*, That the oral certification is confirmed in writing within 10 days;

(4) The transferor may obtain other sources of information compiled by a reporting service from official records of the Commission or the licensing agency of an Agreement State as to the identity of licensees and the scope and expiration dates of licenses and registrations; or

(5) When none of the methods of verification described in paragraphs (d)(1) to (4) of this section are readily available or when a transferor desires to verify that information received by one of such methods is correct or up-to-date, the transferor may obtain and record confirmation from the Commission or the licensing agency of an Agreement State that the transferee is licensed to receive the source material.

RECORDS, REPORTS, AND INSPECTIONS

§ 40.61 Records.

(a) Each person who receives source material pursuant to a license issued pursuant to the regulations in this part shall keep records showing the receipt, transfer,* and disposal of such source material.

(b) Records which are required by the regulations in this part or by license condition shall be maintained for the period specified by the appropriate regulation or license condition. If a retention period is not otherwise specified by regulation or license condition, such records shall be maintained until the Commission authorizes their disposition.

(c)(1) Records of receipt of source material which must be maintained pursuant to paragraph (a) of this section shall be maintained as long as the licensee retains possession of the source material and for five years following transfer,* or disposition of the source material.

(2) [Deleted 43 FR 6915.]

(3) Records of transfer of source material shall be maintained by the licensee who transferred the material until the Commission authorizes their disposition. (4) Records of disposal of source material shall be maintained in accordance with § 20.401 (c) of this chapter. (5) If source material is combined or mixed with other licensed material and subsequently treated in a manner which makes direct correlation of a receipt record with a transfer, export, or disposition record impossible, evaluative techniques such as first-in-first-out may be used for purposes of the

**Amended 37 FR 2122.
*Amended 43 FR 6915.
†Redesignated 43 FR 6915.

records retention requirements of this paragraph.

(c)(1) Records which must be maintained pursuant to this part may be the original or reproduced copy or microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations.

(2) If there is a conflict between the Commission's regulations in this part, license condition, or other written Commission approval or authorization pertaining to the retention period for the same type of record, the retention period specified in the regulations in this part for such records shall apply unless the Commission, pursuant to § 40.14, has granted a specific exemption from the record retention requirements specified in the regulations in this part.

41 FR 18300

§ 40.62 Inspections.

(a) Each licensee shall afford to the Commission at all reasonable times opportunity to inspect source material and the premises and facilities wherein source material is used or stored.

(b) Each licensee shall make available to the Commission for inspection, upon reasonable notice, records kept by him pursuant to the regulations in this chapter.

26 FR 284

§ 40.63 Tests.

Each licensee shall perform, or permit the Commission to perform, such tests as the Commission deems appropriate or necessary for the administration of the regulations in this part, including tests of:

(a) Source material;

(b) Facilities wherein source material is utilized or stored;

(c) Radiation detection and monitoring instruments; and

(d) Other [illegible] used in connection with the utilization or storage of source material.

§ 40.64 Reports.*

(a) Except as specified in paragraph (d) of this section,** each licensee who transfers or receives at any one time 1,000 kilograms or more of uranium or thorium, or any combination thereof, shall complete and distribute a Nuclear Material Transaction Report on Form NRC—741, in accordance with the printed instructions for completing the form. Each licensee who transfers such material shall submit a completed copy of Form NRC—741 to the Commission and three copies to the receiver of the material promptly after the transfer takes place. Each licensee who receives such material shall submit a completed copy of Form NRC—741 to the Commission and to the shipper of the material within ten (10) days after the material is received. The Commission's copies of the reports shall be submitted to the U.S. Energy Research and Development Administration, Post Office Box E, Oak Ridge, TN 37830.

(b) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess at any one time and location more than 1,000 kilograms of uranium or thorium, or any combination thereof shall submit to the Commission within 30 days after September 30† of each year a statement of his source material inventory.

The reports shall be submitted to the U.S. Energy Research and Development Administration, Post Office Box E, Oak Ridge, Tenn. 37830, and shall include the Reporting Identification Symbol (RIS) assigned by the Commission to the licensee.

(c) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess uranium or thorium pursuant to a specific license shall report promptly to the appropriate NRC Regional Office listed in Appendix D of Part 20 of this chapter by telephone and telegraph, mailgram, or facsimile any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of more than 15 pounds of such material at any one time or more than 150 pounds of such material in any one calendar year. The initial report shall be followed within a period of fifteen (15) days by a written report submitted to the appropriate NRC Regional Office which sets forth the details of the incident and its consequences. A copy of such written report shall be sent to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Subsequent to the submission of the written report required by this paragraph, the licensee shall promptly inform the Director of Inspection and Enforcement by means of a written report of any substantive additional information, which becomes available to the licensee, concerning any attempted or apparent theft or unlawful diversion of source material.

(d) The reports described in paragraphs (a), (b), and (c) of this section are not required for:

(1) Processed ores containing less than five (5) percent of uranium or thorium, or any combination thereof, by dry weight;

(2) Thorium contained in magnesium-thorium and tungsten-thorium alloys, provided that the thorium content in the alloys does not exceed 4 percent by weight; or

(3) Chemical catalysts containing uranium depleted in the U^{235} isotope to 0.4 percent or less, provided that the uranium content of the catalyst does not exceed 15 percent by weight.

§ 40.65 Effluent monitoring reporting requirements.

(a) Each licensee authorized to possess and use source material in uranium milling or production of uranium hexafluoride, shall:

(1) Submit a report to the appropriate NRC regional office shown in Appendix D of Part 20 of this chapter, with copies to the Director of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555,† within 60 days after January 1, 1976, and July 1, 1976,† and

within 60 days after January 1 and July 1 of each year thereafter, specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous six months of operation, and such other information the Commission may require to estimate maximum potential annual radiation doses to the public resulting from effluent releases. If quantities of radioactive materials released during the reporting period are significantly above the licensee's design objectives previously reviewed as part of the licensing action, the report shall cover this specifically. On the basis of such reports and any additional information the Commission may obtain from the licensee or others, the Commission may from time to time require the licensee to take such action as the Commission deems appropriate.

Modifications and Revocations of Licenses

§ 40.71 Modification, revocation and termination of licenses.

(a) The terms and conditions of each license shall be subject to amendment, revision, or modification by reason of amendments to the Act, or by reason of rules, regulations, or orders issued in accordance with the Act.

(b) Any license may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under section 182 of the Act, or because of conditions revealed by such application or statement of fact or any report, record, or inspection or other means which would warrant the Commission to refuse to grant a license on an original application, or for violation of, or failure to observe any of, the terms and conditions of the Act, or the license, or of any rule, regulation or order of the Commission.

(c) Except in cases of willfulness or those in which the public health, interest or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of proceedings therefor, facts or conduct which may warrant such action shall have been called to the attention of the licensee in writing and the licensee shall have been accorded opportunity to demonstrate or achieve compliance with all lawful requirements.

(d) The Commission may terminate a specific license upon request submitted by the licensee to the Commission in writing.

Enforcement

§ 40.81 Violations.

An injunction or other court order may be obtained prohibiting any violation of any provision of the Atomic Energy Act of 1954, as amended, or Title II of the Energy Reorganization Act of 1974, or any regulation or order issued thereunder. A court order may be obtained for the payment of a civil penalty imposed pursuant to section 234 of the Act for violation of section 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Act, or section 206 of the Energy Reorganization Act of 1974, or any rule, regulation, or order issued thereunder, or any term, condition, or limitation of any license issued thereunder, or for any violation for which a license may be revoked under section 186 of the Act. Any person who willfully violates any provision of the Act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be

41 FR 16445 35 FR 12795 40 FR 8774 35 FR 12795 40 FR 53230 36 FR 10938 36 FR 10932 35 FR 12795 36 FR 284 40 FR 8774

*Amended by 38 FR 239.
†Amended 42 FR 33265.
**Amended 43 FR 6915.
†Amended 41 FR 21627.

punished by fine or imprisonment or both, as provided by law.

§ 40.90 [Deleted 43 FR 6915.]

NOTE.—The reporting and record keeping requirements contained in this part have been approved by the General Accounting Office under B-180225 (R0120), (R0147), (R0203), (R0[illegible]), (R0040).