DPSTD-85-121
Revised 10/85

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TECHNICAL DATA SUMMARY

# EXTENDED CHARACTERIZATION OF M-AREA SETTLING BASIN AND VICINITY

J. B. PICKETT

RECORDS ADMINISTRATION
R0604153

Approved by:

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Environmental Sciences Division

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PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT DE-AC09-76SR00001

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## APPENDIX H

# LITHOLOGIC AND GEOPHYSICAL LOGS OF MBC-805

## LITHOLOGIC LOG OF MBC-805; CORING NEAR M-AREA SETTLING BASIN

| Sample Interval (ft) | Description |
|---|---|

8 - 10

Alternating bands of red and yellow color; sand; well sorted; round grains appear frosted; compact; very dry.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 10 | 10 | 10 | 20 | 35 | 15 |

18 - 20

Mainly a tan/red color; SM/SC - sand/silt/clay mixture; well-sorted, moist compact; round grains appear frosted.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 15 | 10 | 10 | 15 | 35 | 15 |

28 - 30

Mainly red/purple color-band of lilac color at bottom end. Sand, clay mixture; grains appear frosted; falls apart easily; dry, well sorted.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 10 | | 5 | 10 | 25 | 50 |

38 - 40

Dark red/purple color; SM/SL- sand/silt/clay mixture; well sorted; smooth, rounded, frosted grains.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 5 | 5 | 10 | 25 | 35 | 20 |

| Sample Interval (ft) | Description |
|---|---|

48 - 50

Lilac/grey color; SC/SM-sand/silt/clay mixture; well sorted; smooth, round grains; falls apart easily; moist.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 30 | 5 | 10 | 20 | 30 | 5 |

58 - 60

Tan color; SC/SM - sand/silt/clay mixture; well sorted; smooth, round, clear grains; very moist.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 30 | 5 | 15 | 20 | 30 | |

66 - 68

Yellow/orange color; SC - sand/clay mixture; well-sorted; sub-rounded, clear grains, fairly smooth edges; bedded; falls apart easily.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 10 | 20 | 30 | 15 |

68 - 70

Alternating layers of orange, tan, and light yellow; SC - sand/clay mixture; bedded colors; feels gritty; sub-rounded, smooth grains; pliable; very moist.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 10 | 20 | 30 | 15 |

70 - 72

Orange/brown color; not bedded; pliable; gritty; sub-rounded grains; very moist.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 10 | 20 | 30 | 15 |

| Sample Interval (ft) | Description |
|---|---|

76 - 78

Orange color; SC - sand/clay mixture; bedded feels gritty, well sorted; clear, sub-rounded grains.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 10 | 40 | 20 |

78 - 80

Orange color; SC - sand/clay; bedded; sub-rounded, smooth grains; feels gritty.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 10 | 40 | 20 |

80 - 82

Orange color; SC - sand/clay mixture; well-sorted; sub-rounded to sl. angular, sl. smooth, sl. opaque grains; feels gritty; pliable.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 15 | 35 | 20 |

86 - 88

Orange color with 2-3 1/4 in. white kaolin bands containing pebble size sediments (2-3 mm); SC - sand/clay mixture; smooth, opaque grains; moderately well sorted.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Pebbles | VF | Fine | Med | Coarse |
| 25 | 10 | 5 | 10 | 40 | 10 |

88 - 90

Orange color; SC - sand/clay mixture; fewer pebbles but sub-rounded size; slightly rough opaque grains; feels gritty, sl. pliable.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Pebbles | VF | Fine | Med | Coarse |
| 35 | 5 | 5 | 10 | 35 | 10 |

| Sample Interval (ft) | Description |
|---|---|
| 96 - 98 | Orange color; SC - sand/clay mixture; well-sorted; feels gritty, pliable; opaque grains, sl. smooth grains; no pebbles. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 15 | 50 | 5 |

| Sample Interval (ft) | Description |
|---|---|
| 98 - 100 | Orange color; CL - inorganic clays of low to medium plasticity; compact and consolidated, soapy, slimy feel; no pebbles; well-sorted; opaque and sl. smooth grains. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 60 | | 5 | 15 | 20 | |

| Sample Interval (ft) | Description |
|---|---|
| 105.5 - 106 | Tan color with 10% pebble-size sediments; well-sorted; smooth grains. |
| 106 - 108 | Orange color; SC - sand/clay mixture; very compact, pliable, well-sorted; opaque, sl. smooth grains; feels gritty. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 15 | 35 | 20 |

| Sample Interval (ft) | Description |
|---|---|
| 108 - 110 | Orange color; SC - sand/clay mixture; very compact; slightly pliable; opaque, slightly smooth grains; well-sorted; no pebbles. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 40 | | 5 | 20 | 25 | 10 |

| Sample Interval (ft) | Description |
|---|---|

110 - 112

Orange color; SC - sand/clay mixture; compact, pliable; clear, slightly rough grains; well-sorted; slightly gritty.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 15 | | 5 | 20 | 40 | 20 |

116 - 118

Dark orange color; SC - sand/clay mixture; well-sorted, compact, pliable; opaque, sub-rounded to rough grains; slight kaolin bands (1 mm thick).

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 15 | | 5 | 15 | 35 | 30 |

120 - 122

Tan color; SC - sand/clay mixture; well-sorted, very compact, pliable, slightly gritty; opaque, sub-rounded, slightly rough grains.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 15 | 30 | 25 |

122 - 124

Tan color; SC - sand/clay mixture; well-sorted, very compact, pliable, slightly gritty; sub-rounded, opaque, slightly rough grains.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 15 | 30 | 25 |

126 - 128

Orange color; SC - sand/clay mixture; 0.5 cm streak of clay; well-sorted, compact, pliable; pebbles are very smooth, rounded and white; slightly gritty; opaque, smooth grains.

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Pebbles | VF | Fine | Med | Coarse |
| 25 | 1 | 5 | 15 | 34 | 20 |

| Sample Interval (ft) | Description |
|---|---|
| 128 - 130 | Dark orange color; SC - sand/clay mixture; well-sorted, pliable, dry; opaque, sub-angular grains; sugar-like texture. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 20 | | 15 | 25 | 40 | |

| Sample Interval (ft) | Description |
|---|---|
| 138 - 140 | Dark orange color; SC - sand/clay mixture; well-sorted, compact, pliable, gritty; slightly rough, angular, slightly opaque grains. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 15 | 30 | 25 |

| Sample Interval (ft) | Description |
|---|---|
| 140 - 142 | Yellowish brown; SC - sand/clay mixture; compact, pliable, gritty; rough, angular, opaque grains; coarse grains are 1 to 2 mm. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 30 | 30 | 25 |

| Sample Interval (ft) | Description |
|---|---|
| 148 - 150 | Brownish yellow; SC - sand/clay mixture; compact, pliable, very well- sorted; sugar-like texture; smooth, round, clear grains. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 5 | | 20 | 45 | 15 | |

| Sample Interval (ft) | Description |
|---|---|
| 158 - 160 | Yellowish brown; SC - sand/clay mixture; compact, pliable, very well- sorted; smooth, round, clear grains; majority of grains are medium coarse; moist sample. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 15 | | 10 | 15 | 40 | 20 |

| Sample Interval (ft) | Description |
|---|---|
| 170 - 172 | Orange/tan color; SC - sand/clay mixture; very well-sorted, pliable; round, smooth clear grains; sugar-like texture. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 40 | | 5 | 15 | 40 | |

| | |
|---|---|
| 176 - 178 | Dark orange color; SC - sand/clay mixture; well-sorted, compact; clear, smooth, round, coarse grains are 1-2 mm; lots of drilling mud in the sample. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 20 | | 5 | 10 | 35 | 30 |

| | |
|---|---|
| 186 - 188 | White/tan/orange color of sand; SC - sand/clay mixture; well-sorted; clear, smooth, round grains; compact, pliable; sugar-like texture. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 20 | | 5 | 15 | 40 | 20 |

| | |
|---|---|
| 190 - 192 | Orange/brown color; SC - sand/clay mixture; well-sorted, compact, pliable; clear, smooth, sub-rounded grains, alternate layers of SC (med. size grains) plus sand (coarse grains). |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 25 | | 5 | 10 | 20 | 40 |

| Sample Interval (ft) | Description |
|---|---|
| 200 - 202 | Tan/or red/white color; SC - sand/clay mixture; sugar-like texture; compact, pliable, smooth, round, clear grains. 0.5 in. thick layer of dense clay (grey color) at top of this sample. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 20 | | 10 | 30 | 40 | |

| Sample Interval (ft) | Description |
|---|---|
| 210 - 212 | Alternating layers of white and dark red sand and white plus orange red clay. Sand is predominant. Smooth, round, clear grains; sand has a sugar- like texture; clay feels soapy. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 35 | | 10 | 25 | 30 | |

| Sample Interval (ft) | Description |
|---|---|
| 218 - 220 | Tan/orange color; SC - sand/clay mixture; moderately well-sorted; coarse grains are smooth and sub-round to sub-angular; very clear grains. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 15 | | 5 | 5 | 25 | 50 |

| Sample Interval (ft) | Description |
|---|---|
| 226 - 228 | Dark and light brown color; SC - sand/clay mixture; wet sample; coarse grains are very clear, rough and angular; moderately well-sorted. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 15 | | 5 | 10 | 30 | 40 |

| Sample Interval (ft) | Description |
|---|---|
| 236 - 238 | Dark grey color; CL - inorganic clays of low to medium plasticity; moist sample; compact, feels soapy; round, smooth, clear grains. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 90 | 10 | | | | |

| Sample Interval (ft) | Description |
|---|---|
| 240 - 242 | Grey color; CL - inorganic clays of low to medium plasticity; moderately well-sorted; coarse grains are very clear, rough and angular; coarse grains are abundant. |

| | | % Sand | | | |
|---|---|---|---|---|---|
| % Clay | % Silt | VF | Fine | Med | Coarse |
| 35 | | 5 | 5 | 20 | 35 |

COMPU-LOG V8L0 PLOT 12-21-84

P. S. I.

M SRP

HOLE DIAMETER : 05.5

PROBE # 9055A = 235

DATA V8L1 TRUCK # 7915

R. MILLER APPL.#3 J

CENTURY GEOPHYSICAL CORPORATION

Tulsa, Oklahoma

COMPANY P.S.I.

BOREHOLE

AREA M-SRP

ELEVATION

COUNTY AIKEN

STATE S.C.

SECTION TOWNSHIP RANGE

## HOLE DATA

| | | | |
|---|---|---|---|
| TOTAL DEPTH — DRILLER | 242.5' | BIT SIZE | 5.5" |
| TOTAL DEPTH — LOGGER | 235' | CASING — TYPE & SIZE | — |
| TOTAL FOOTAGE LOGGED | 235' | CASING DEPTH | — |
| LOGGING SPEED | | BOREHOLE FLUID | $H_2O$ |
| REFERENCE LEVEL | G.L. | FLUID RESISTIVITY | • °F |
| PROBE NO. | 9055-235, | SOFTWARE LEVEL | V8.1 A |
| 9071-845, KUT-261, 9031-430 | | SCALE SELECTION | OPERATOR / CLIENT |

REMARKS:

BOREHOLE

DATE 12-21-84

UNIT/OPERATOR 7915/R. MILLER

FIELD OFFICE EVANSVILLE

## EQUIPMENT DATA

NATURAL GAMMA

DENSITY

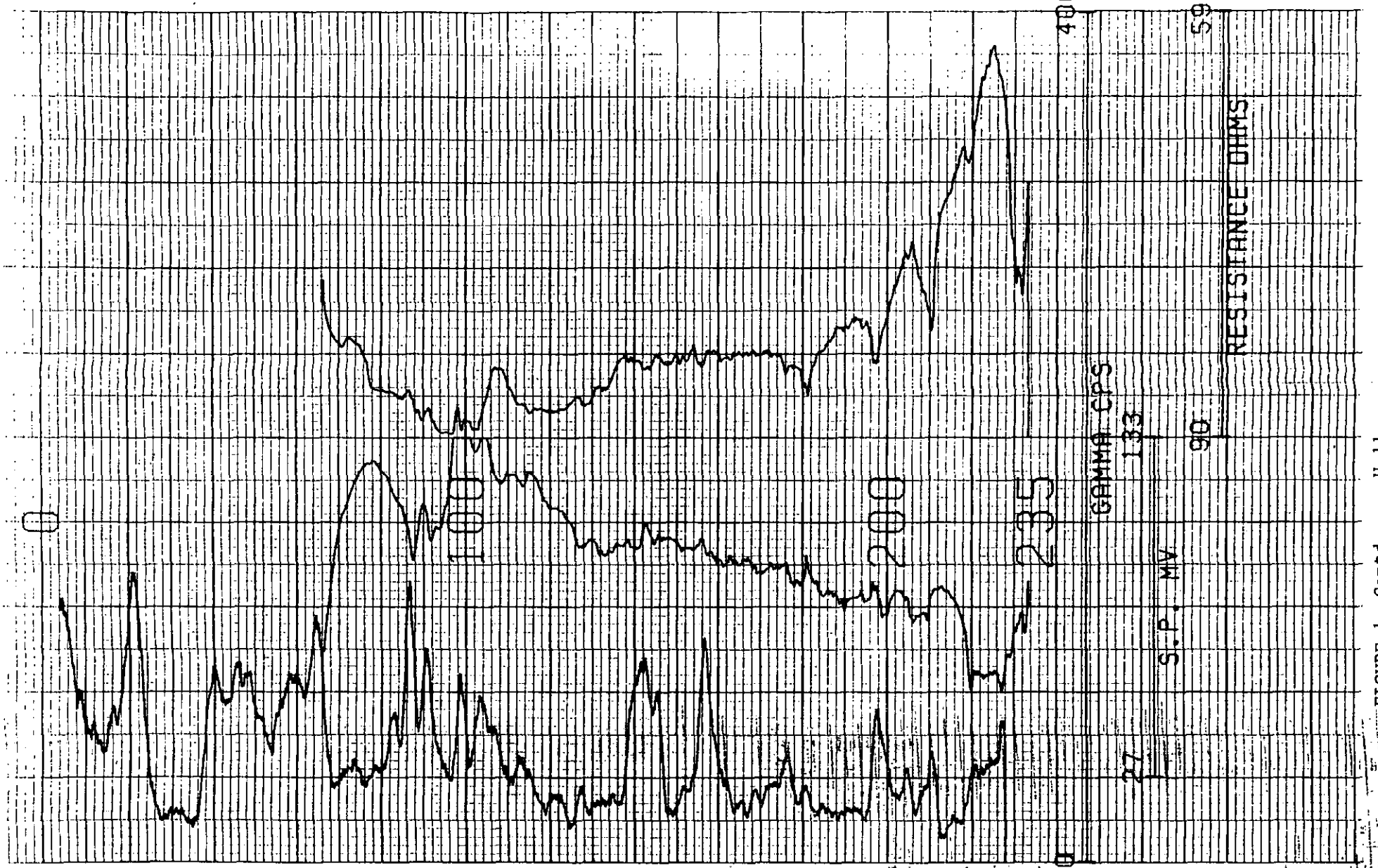
NEUTRON

FIGURE 1. H-10

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022




381

FIGURE 1, Contd

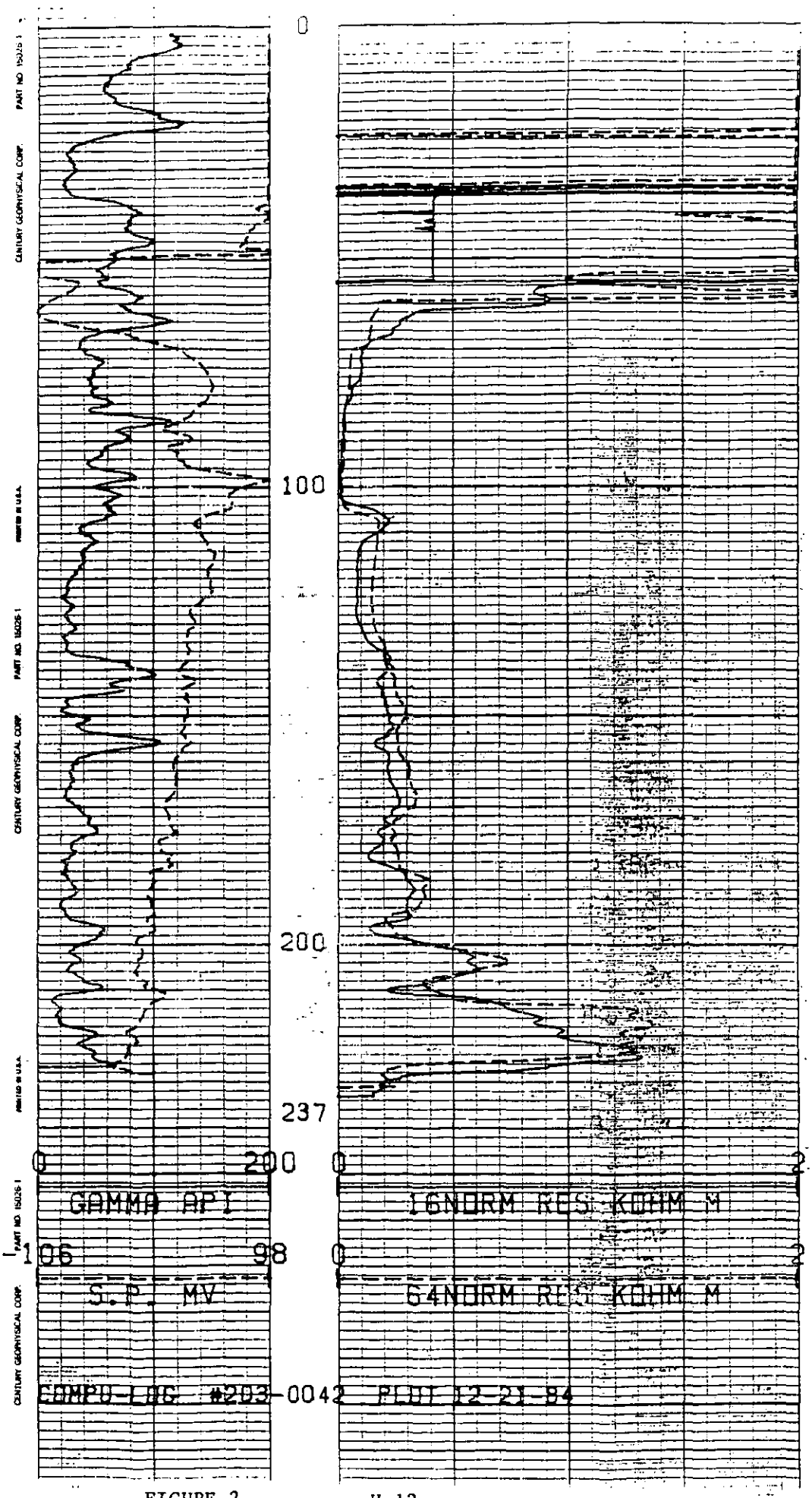

0
100
200
237
0
200
GAMMA API
0
2
16NORM RES KOHM M
106
98
S.P. MV
0
2
64NORM RES KOHM M
COMPU-LOG #203-0042 FLUI 12-21-84

FIGURE 2.

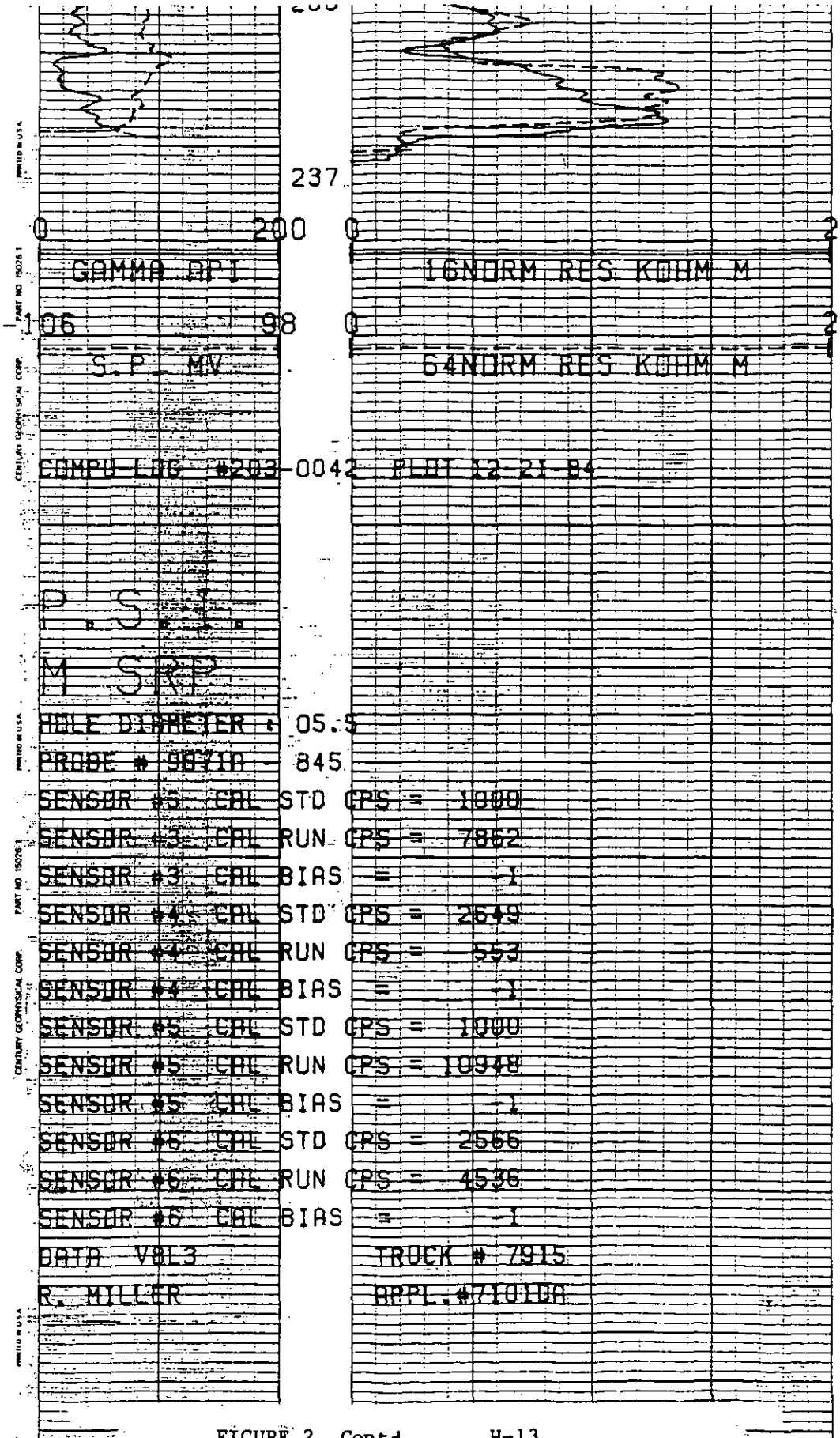
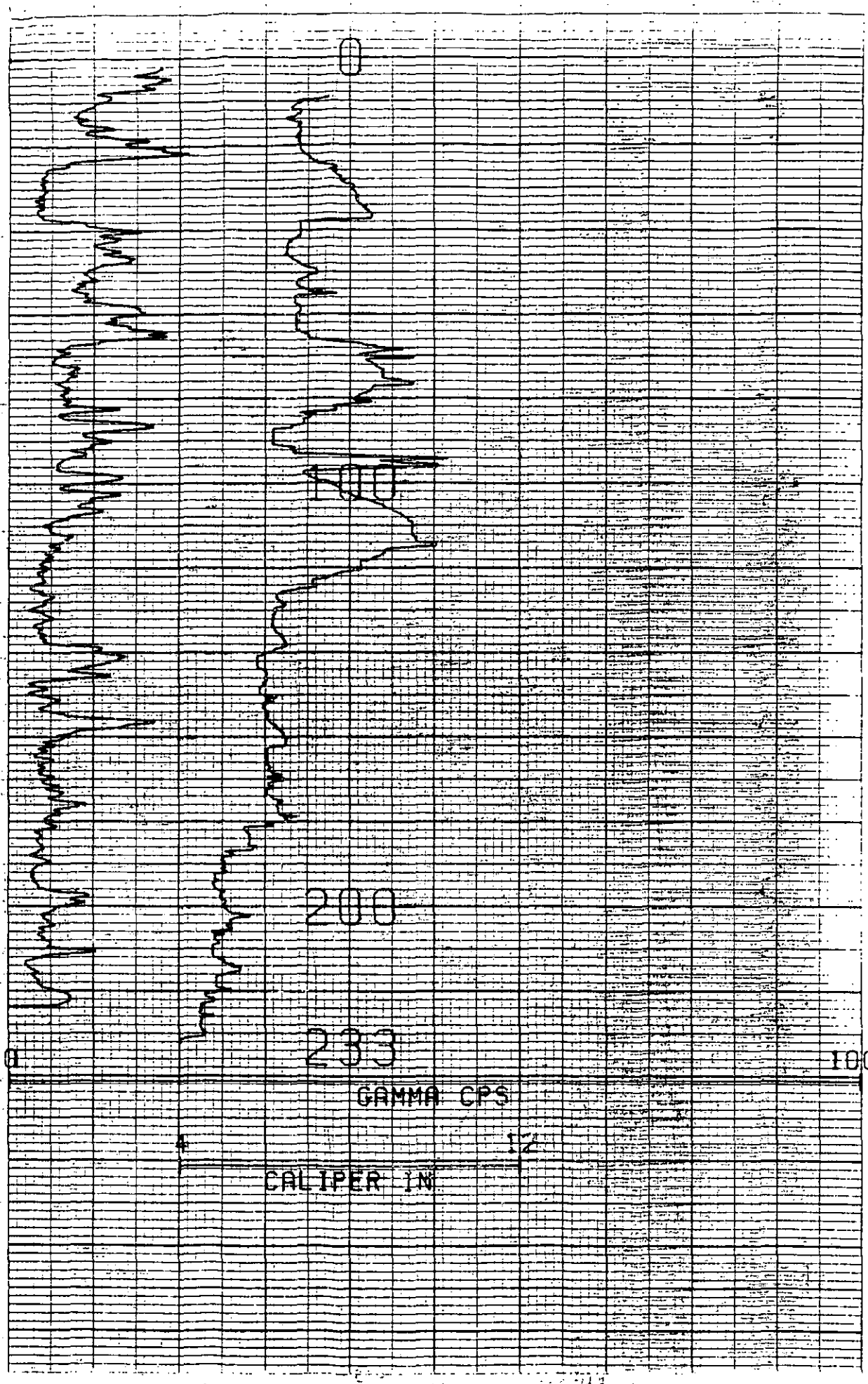



FIGURE 2, Contd H-13




CENTURY GEOPHYSICAL CORP. PART NO. 786-0022

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022

FIGURE 3.

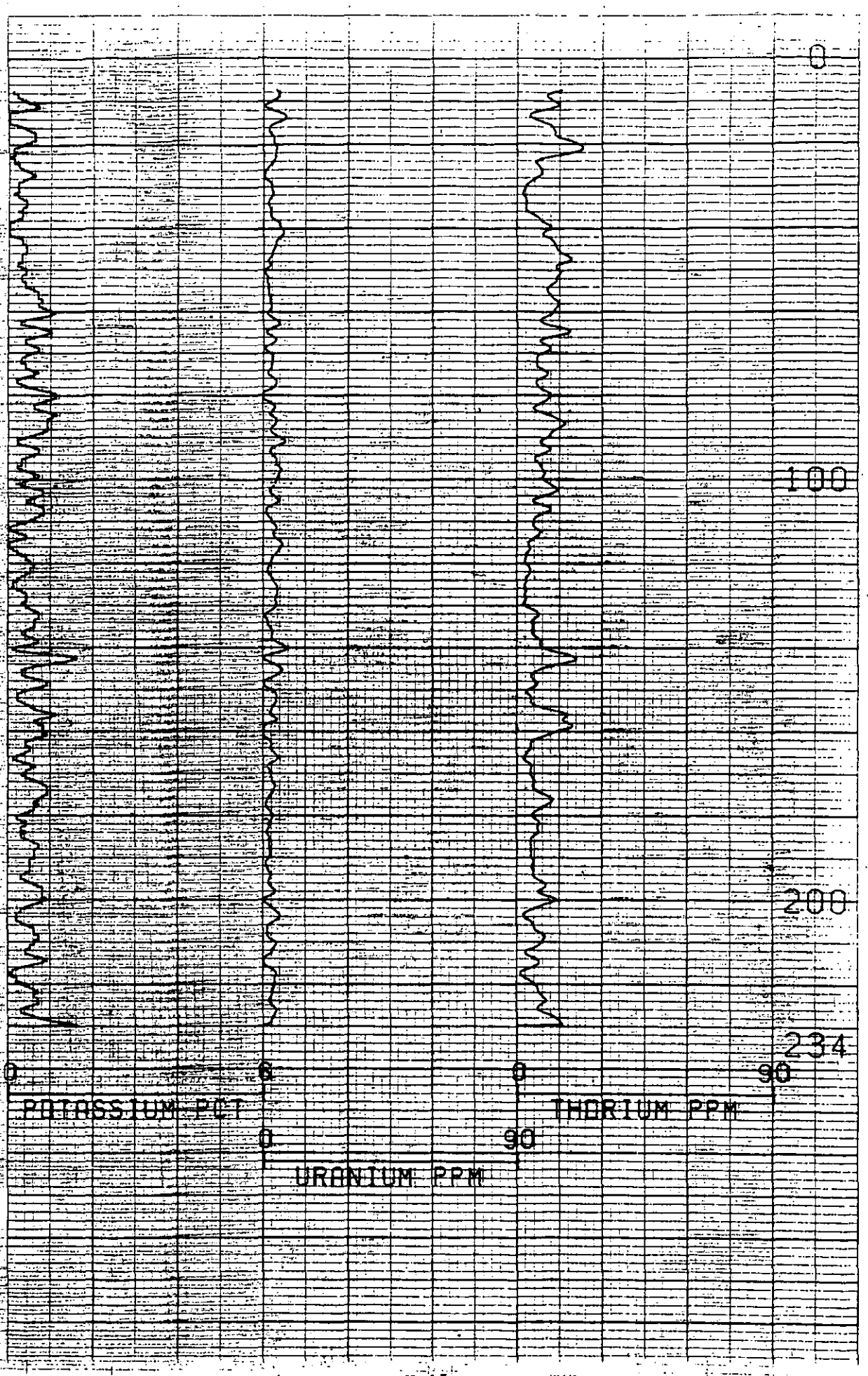

CENTURY GEOPHYSICAL CORP. PART NO. 786-0022
0
100
200
234
0
6
POTASSIUM-PCT
0
URANIUM PPM
0
90
THORIUM PPM
90
CENTURY GEOPHYSICAL CORP. PART NO. 786-0022

FIGURE 4.

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## 1.0 INTRODUCTION

This Technical Data Summary presents the results of an extended characterization of the Savannah River Plant (SRP) M-Area settling basin and its vicinity. The objective of this extended characterization program was to provide sufficient information to allow preparation of a closure plan for the M-Area Hazardous Waste Management Facility. The Closure Plan[1] is to be transmitted to the South Carolina Department of Health and Environmental Control (SCDHEC) pursuant to pertinent state and federal regulations for closure of hazardous waste facilities.

The specific objectives of the extended characterization program were to confirm the results of previous studies[1,2,3] conducted on the M-Area settling basin and its vicinity, and to provide additional details to support the development of an environmentally acceptable closure plan. This characterization program was specifically limited to analyses of the soils, sludge, and liquids underneath and immediately adjacent to the M-Area settling basin, the process sewer line from M Area to the basin, an engineered overflow ditch, a natural seepage area, and Lost Lake (a Carolina Bay). No analyses of groundwater underlying these areas were made as a part of this study, as these studies are being conducted under separate programs.[4-7]

## 1.1 References


1. W. P. Colven and J. B. Pickett. Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plant. DPSPU-84-11-11, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (Revised July 1985).

2. G. J. Hollod. Physical and Chemical Characteristics of the M-Area Settling Basin. DPST-82-722, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (September 1982).

3. G. J. Hollod, I. W. Marine, H. W. Bledsoe, and J. P. Ryan. Metals and Organics in the Soil Beneath the M-Area Settling Basin. DPST-82-721, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (July 1982).

4. E. J. Christensen and D. E. Gordon, editors and compilers. Technical Summary of Groundwater Quality Protection Program at Savannah River Plant, Volume I - Site Geohydrology, Solid and Hazardous Wastes. E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (December 1983).

5. D. E. Gordon, compiler. Preliminary Technical Data Summary, M-Area Groundwater Cleanup Facility. DPSTD-82-69, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (October 1982).

6. C. F. Muska, R. Lorenz, L. F. Boone, and W. P. Colven. Groundwater Quality Assessment Plan for M Area. E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (June 1985).

7. Groundwater Remedial Action Treatment Facilities, Engineering Report to the South Carolina Department of Health and Environmental Control. Department Work Request 862413, Project S-2583, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (March 16, 1984).

## 2.0 SUMMARY AND CONCLUSIONS

The Savannah River Plant M-Area settling basin, an unlined surface impoundment, has received process effluents from the M-Area fuel and target fabrication facilities since 1958. The waste effluents have contained metal degreasing agents (chlorinated hydrocarbons), acids, caustics, and heavy metals. Liquids from the settling basin have overflowed down an engineered ditch to a natural seepage area, and then to Lost Lake. The M-Area settling basin was removed from service July 16, 1985. The specific closure plan details are discussed in the "Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plant."[1]

An analysis of the data supports the following conclusions:

- The majority of the heavy metal and organic contaminants in the M-Area settling basin are present in a two-foot-thick layer of gelatinous sludge at the bottom of the basin, and in the top two feet of soil underlying the basin.

- The current data confirms the previous results[2] that most of the heavy metals have migrated no deeper than the top two feet of soil underlying the basin. The current data indicate that uranium (to concentrations as high as 50 to 100 ppm) and nickel (concentrations as high as 30 to 50 ppm) have migrated to a depth of six feet underneath the basin.

- The 1985 study found very little chlorinated hydrocarbon contamination in the top six feet of soil underlying the basin, which is in dramatic contrast to the results from the previous 1982 study.[2] The previous data defined concentrations of tetrachloroethylene as high as 2000 µg/g (ppm) in the three to four feet of soil at the bottom of the basin (soil samples from five separate locations gave tetrachloroethylene concentrations as high as 297, 19, 2, 1,370, and 2,040 µg/g, respectively, in 1982). The highest tetrachloroethylene concentration which was detected in the 1985 study was 24 µg/g from an upper one foot soil sample from one of four locations sampled. Trichloroethylene and 1,1,1-trichloroethane were detected in only one of the 24 samples (at concentrations of 0.248 and 0.027 µg/g, respectively). This indicates that very significant amounts of leaching of the chlorinated hydrocarbons has occurred in the intervening three years.

- Soil cores taken immediately adjacent to the basin (one core on each side of the basin, at a distance of 12, 12.5, 13, and 20 feet from the water in the basin, respectively) show no evidence of horizontal movement of inorganic or organic contaminants.

- Soil cores taken immediately underneath the process sewer line, at locations which were believed to be underneath cracks or leaks in the line, showed evidence of very low levels of heavy metal contamination. The heavy metal contamination did not extend deeper than two feet underneath the sewer line and did not extend wider than one foot to either side of the sewer line. A few soil samples beneath the sewer line did show high chlorinated hydrocarbons (as high as 750 µg/g).

- Analyses of the sludge layer at the bottom of the overflow ditch and in the seepage area indicated that its chemical makeup is very similar to the sludge at the bottom of the settling basin. This gelatinous, hydroxide sludge (wherever present) contains the highest concentrations of heavy metals and organic chemicals, as compared to any other soil or liquid samples from the M-Area basin or vicinity.

- Analyses of the soil underlying the overflow ditch indicate that the heavy metals nickel and uranium have migrated vertically in similar concentrations vs. the soil underneath the settling basin. Lead was found to have moved vertically in slightly higher concentrations than in the soil beneath the basin (10 to 20 µg/g vs. 5 to 10 µg/g at similar depths). The remainder of the heavy metals and organics were almost completely retained in the top two feet of soil.

- The analyses of the soils underlying the standing water in the seepage area indicated that an area of soil approximately 80 to 100 feet wide (immediately adjacent to the overflow ditch) contained higher concentrations of heavy metals and organics than did the rest of the seepage area. The concentrations of heavy metals in the soil samples decreased continuously as the samples were taken closer to the outlet of the seepage area into Lost Lake.

- No material similar to the gelatinous sludge found in the basin, ditch, or seepage area was found in Lost Lake.

- The soils underlying the standing water of Lost Lake were found to be contaminated with low levels of heavy metals. The concentration levels slightly exceed the M-Area reference background levels for Cu, Pb, Ni, U, and Zn in the upper six inches of soil, but the concentration levels were generally in the same range as background levels from the other SRP, or southeastern U.S. comparison data.

- No chlorinated hydrocarbons were detected in the Lost Lake soil samples in this study.

This document presents the results of the extended characterization program. Details of the sample acquisition, handling, shipping, and analysis were provided by Envirodyne Engineers, Inc., the contractor who acquired and analyzed the samples. This Technical Data Summary is intended to be a companion volume to the M-Area Closure Plan and provides all the raw data which were summarized in the Closure Plan.

## 2.1 References


1. W. P. Colven and J. B. Pickett. Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plant. DPSPU-84-11-11, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (Revised July 1985).

2. G. J. Hollod, I. W. Marine, H. W. Bledsoe, and J. P. Ryan. Metals and Organics in the Soil Beneath the M-Area Settling Basin. DPST-82-721, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (July 1982).

## 3.0 DESCRIPTION AND LOCATION OF THE M-AREA SETTLING BASIN

### 3.1 Description

The M-Area settling basin is an unlined, surface impoundment constructed in 1958 to settle out and contain uranium and other heavy metals discharged from aluminum forming/metal finishing type operations. Since surface water flows from this basin, it is classified as a settling basin versus a seepage basin. M-Area has three production buildings (313-M, 320-M and 321-M) and two support laboratories (320-M and 322-M) which discharge wastewater to the settling basin. Aluminum is a major raw material for each of these buildings, which produce target and fuel assemblies for SRP nuclear reactors. Metal finishing is conducted in all buildings and the wastewater generated by M Area is similar to those produced by commercial aluminum forming and metal finishing industries.

Liquids overflow from the basin through a ditch to a natural seepage area and a Carolina Bay known as Lost lake. Originally dry, both of these areas currently have free standing water as a result of basin overflows. There are no surface outlets from Lost Lake or the natural seepage area. Therefore, all liquids entering these areas either seep into the ground or evaporate.

### 3.2 Location

A South Carolina map is presented in Figure 3-1 pinpointing the location of the Savannah River Plant. Figure 3-2 shows the location of the A and M Areas in relation to the plant boundaries. Also, a map showing the location of the settling basin and Lost Lake is presented in Figure 3-3.

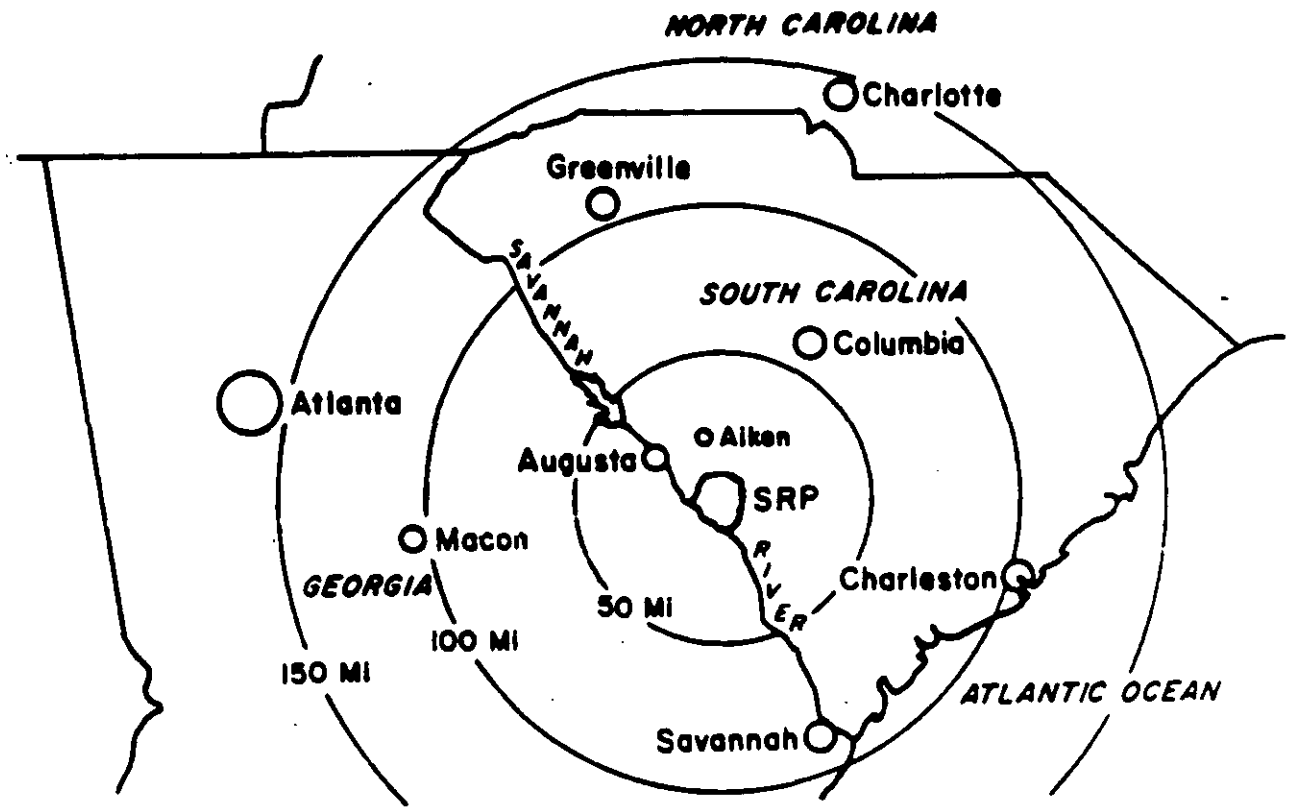



FIGURE 3-1. Location of SRP Relative to Surrounding Population Centers

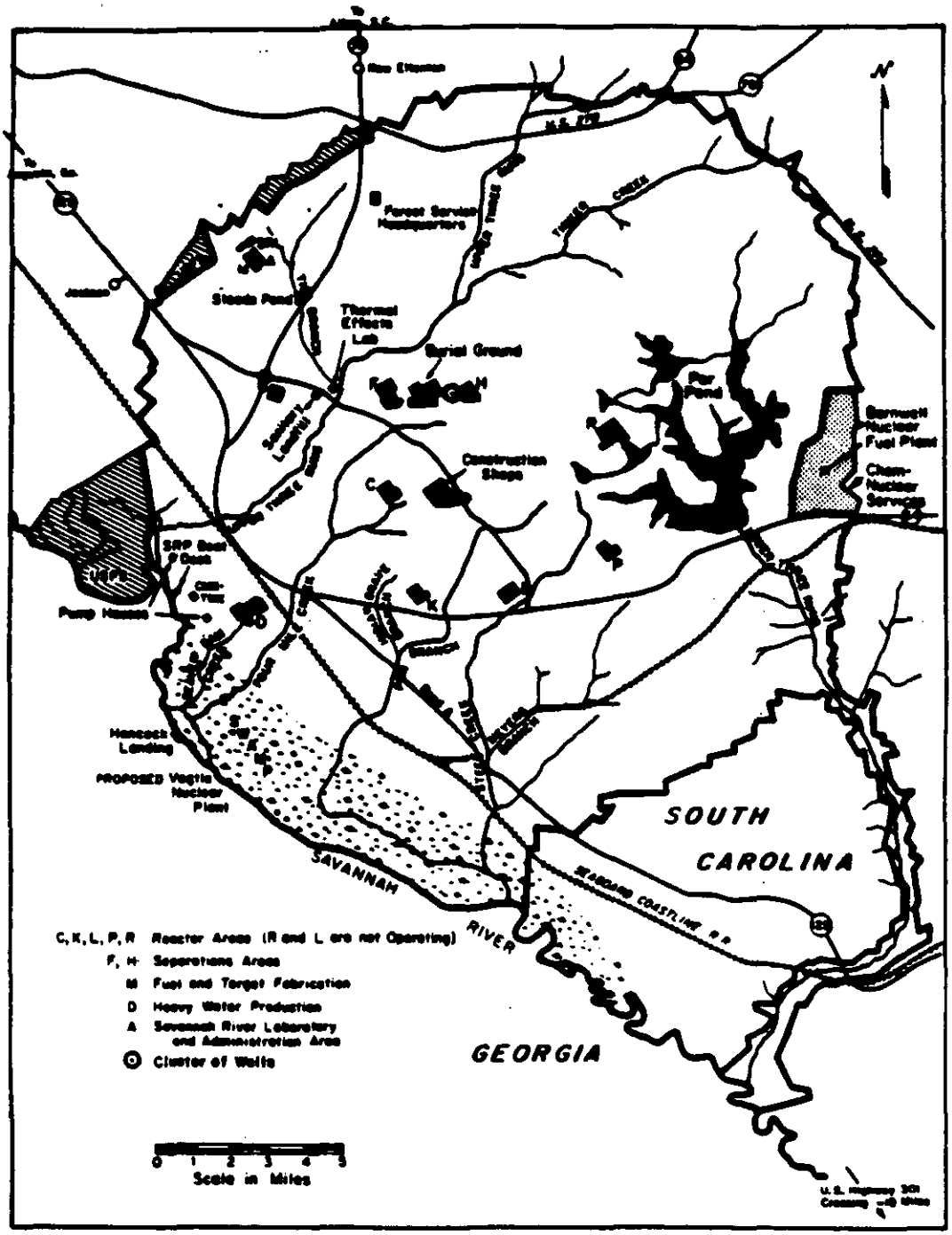



FIGURE 3-2. Site Map of the Savannah River Plant

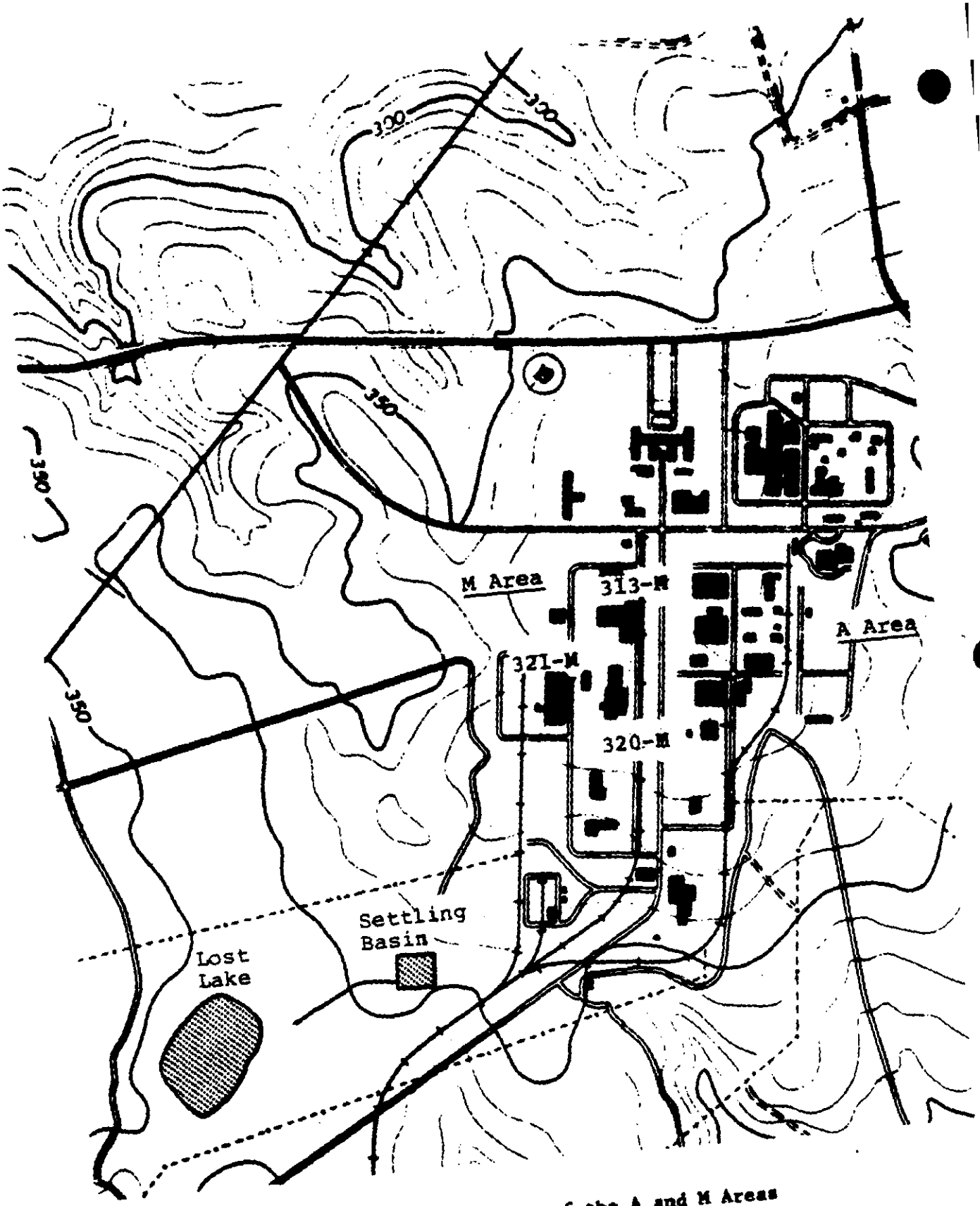



FIGURE 3-3. Site Map of the A and M Areas

## 4.0 SPECIFIC DATA ON M-AREA BASIN AND VICINITY

### 4.1 Construction Details

#### 4.1.1 Settling Basin

A diagram showing the original construction details for the basin is presented in Figure 4-1. Dimensions at the top of the berm were 331 feet x 279 feet. The sides slope inward at about a 20° angle giving bottom dimensions of ~280 feet x 230 feet. Depth to the top of the berm constructed was ~17 feet. The total original liquid capacity of the basin, allowing for a 2 foot freeboard, was just under 8,000,000 gallons. Since the basin was intended to act as a seepage basin, the basin was left in its natural condition when excavation was completed.

Liquids flowing into the basin enter through an underground sewer on the North side ~50 feet from the east side. Both the inlet and overflow were lined with rip-rap at the time of construction to reduce erosion (Figure 4-1).

Surrounding the basin perimeter is a three-strand barbed wire fence to prevent entrance by unauthorized personnel. Oil booms are located at the inlet and outlet to capture and recover accidental grease/oil spills from M-Area processes.

Combination flow metering/proportional samplers are located at the inlet and outlet of the basin. A piezoelectric flowmeter inserted through a manhole into the inlet process sewer is used to measure the rate of inflowing liquids. Representative grab and 24-hour samples can be obtained with the proportional sampling device.

Basin overflow liquids are measured with a standard weir. Weir levels and samples are collected and recorded using a USGS sampling station.

#### 4.1.2 Overflow Ditch

The overflow ditch receives liquids from the basin, transporting them to the natural seepage area and Lost Lake. Originally, the ditch was ~8-feet wide at the bottom with two to one side slope. The first 70 feet of the ditch drop off at a 10% slope. The remaining 850 feet has a 0.3% slope to about 344 feet above sea level. Location and dimensions are also shown on Figure 4-1.

### 4.1.3 Natural Seepage Area

Near the discharge of the ditch lies a natural seepage area approximately three acres in area. An estimated 50% of all liquids which overflowed from the basin seeped into the ground in this area. Vegetation in the seepage area was never cleared and the exact boundary is unknown. A boundary occurring approximately at the 342-foot contour has been determined based on the high water mark and is shown on Figure 4-2.

### 4.1.4 Lost Lake

Lost Lake is a natural Carolina Bay of ~10 to 25 acres depending on water level. Prior to construction of the settling basin, Lost Lake was dry except during heavy precipitation periods. Since diversion of process effluents from M Area to the basin in 1958, water has accumulated in Lost Lake. Water levels in Lost Lake have varied widely as a result of increases in process discharges and rainfall. Lost Lake has no outlet, therefore all liquids entering the area either seep into the ground or evaporate. The high water level mark is estimated to be at the 340-foot contour on Figure 4-2.

### 4.1.5 Inlet Process Sewer

Discharges from M-Area processes were carried to the basin via a 30-inch-diameter underground clay tile process sewer line (VCP) shown on Figure 4-3. Each process building has leader sewer lines ranging from 6 to 12 inches diameter which intersect the 30-inch line at manhole 1A on Figure 4-3. The process sewer line to the M-Area basin is approximately 2000 feet long and was installed ~8 feet below grade with a slope of 0.03%. Many cracks and misalignments were discovered in 1981. As a result the sewer was lined with a 12-inch PVC liner in December 1983.

### 4.1.6 Topography, Geology, and Hydrology

The topography, geology, and hydrology of the M-Area basin and vicinity are discussed in References 1 through 4, with a detailed discussion in the companion volume to this report (M-Area Settling Basin Closure Plan, Ref. 5).

## 4.2 References


1. C. W. Cooke. "Geology of the Coastal Plain of South Carolina." U.S. Geological Survey Bulletin 867 (1936).

2. G. E. Siple. "Geology and Groundwater of the Savannah River Plant and Vicinity, South Carolina," U.S. Geological Survey Water Supply Paper 1841 (1967).

3. E. J. Christensen and D. E. Gordon. Technical Summary of Groundwater Quality Protection Program at Savannah River Plant, Volume I – Site Geohydrology, Solid and Hazardous Wastes. E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (December 1983).

4. D. E. Gordon, Compiler. Preliminary Technical Data Summary, M-Area Groundwater Cleanup Facility. DPSTD-82-69, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (October 1982).

5. W. P. Colven and J. B. Pickett. Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plant. DPSPU-84-11-11, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (Revised July 1985).

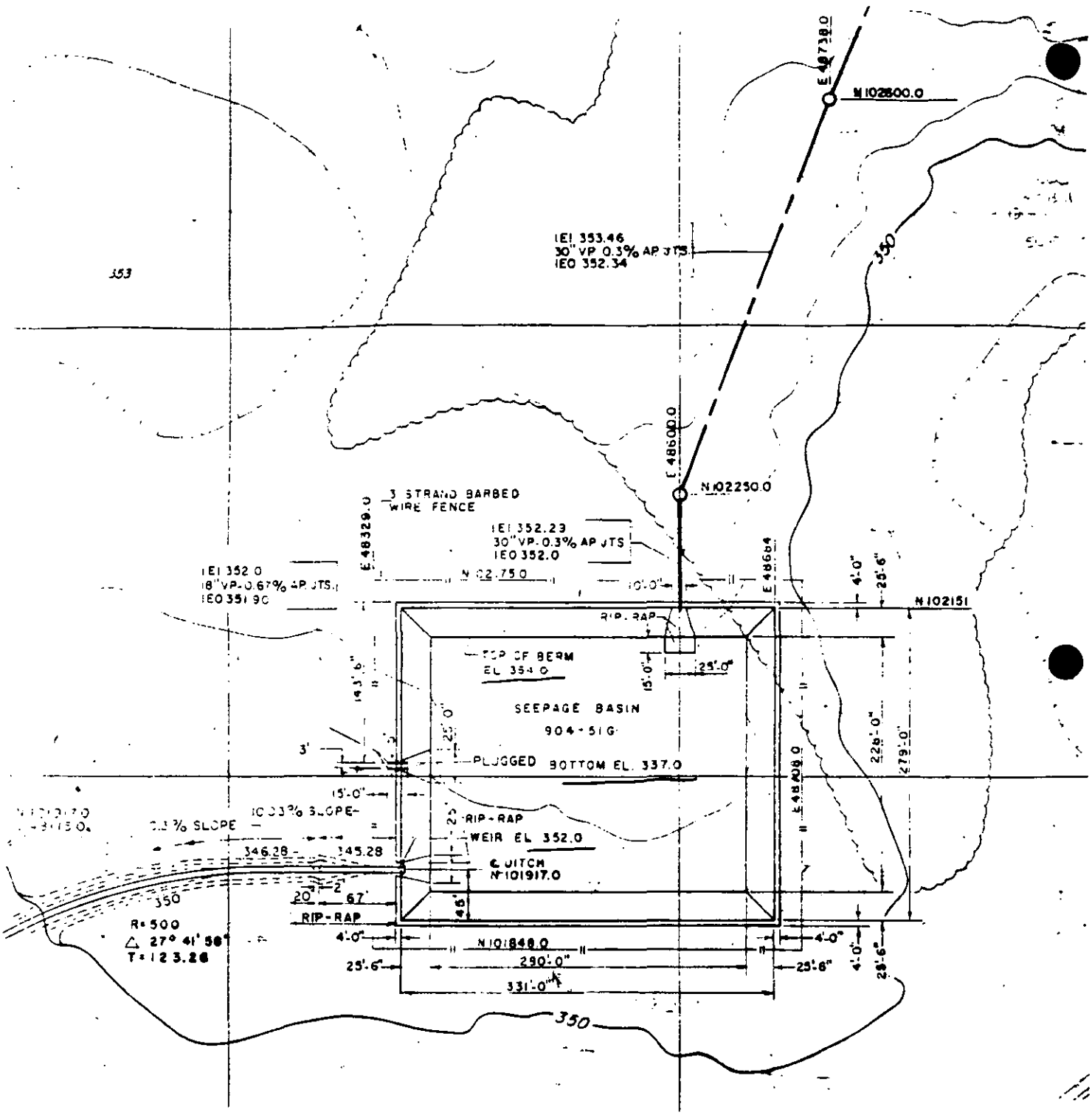



**FIGURE 4-1. Original Construction Blueprint for M-Area Settling Basin** (Reference: Topographic Map, Savannah River Plant, Map 3302, Sheet 1122, SRP Map Sheet Index 5M5-G-121)

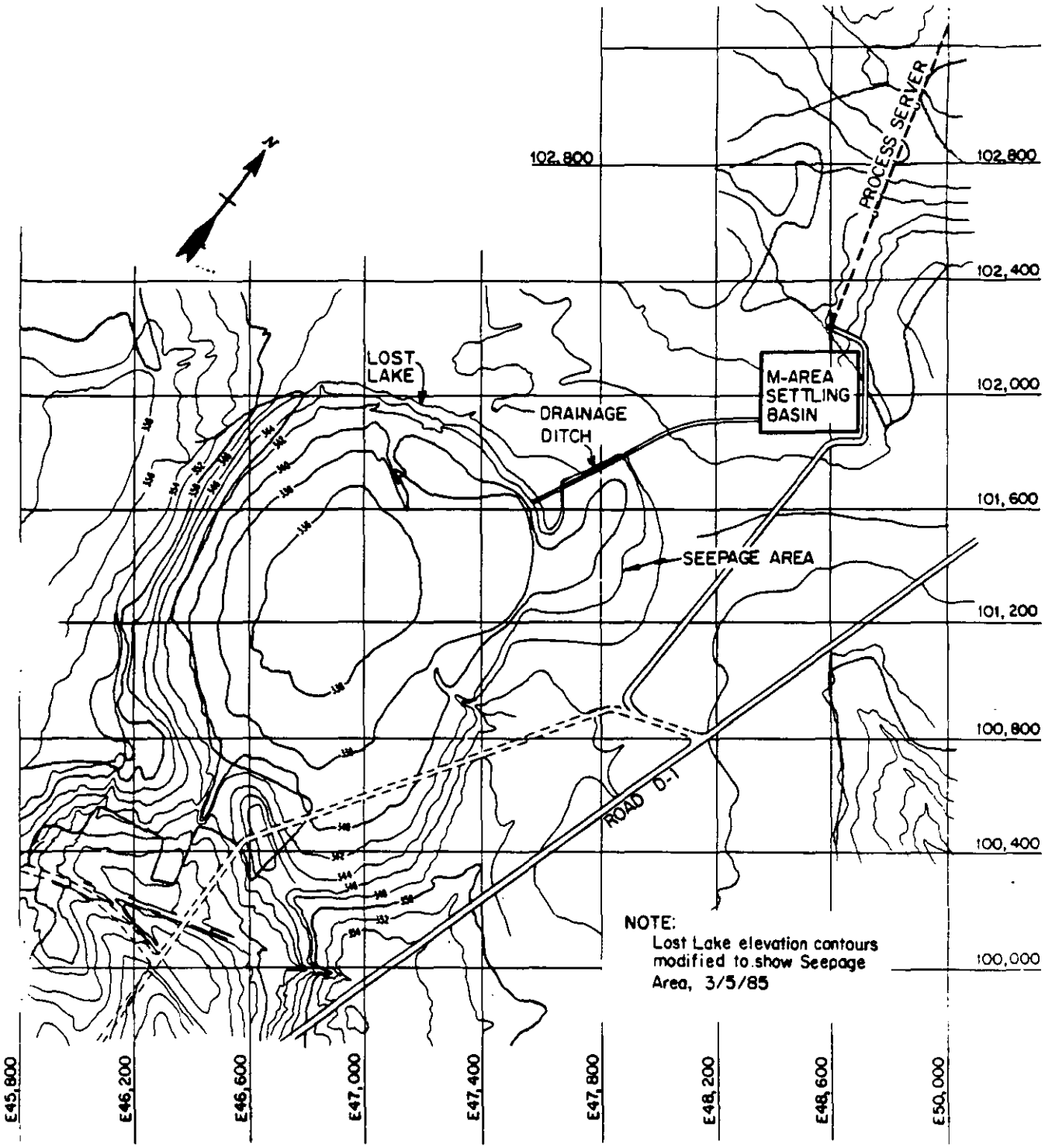



**FIGURE 4-2. Topographic Map of the Natural Seepage Area and Lost Lake**

Note: Redrawn from Map 3302,
Sheets 1112 and 1092
SRP map sheet index
5M5-G-121

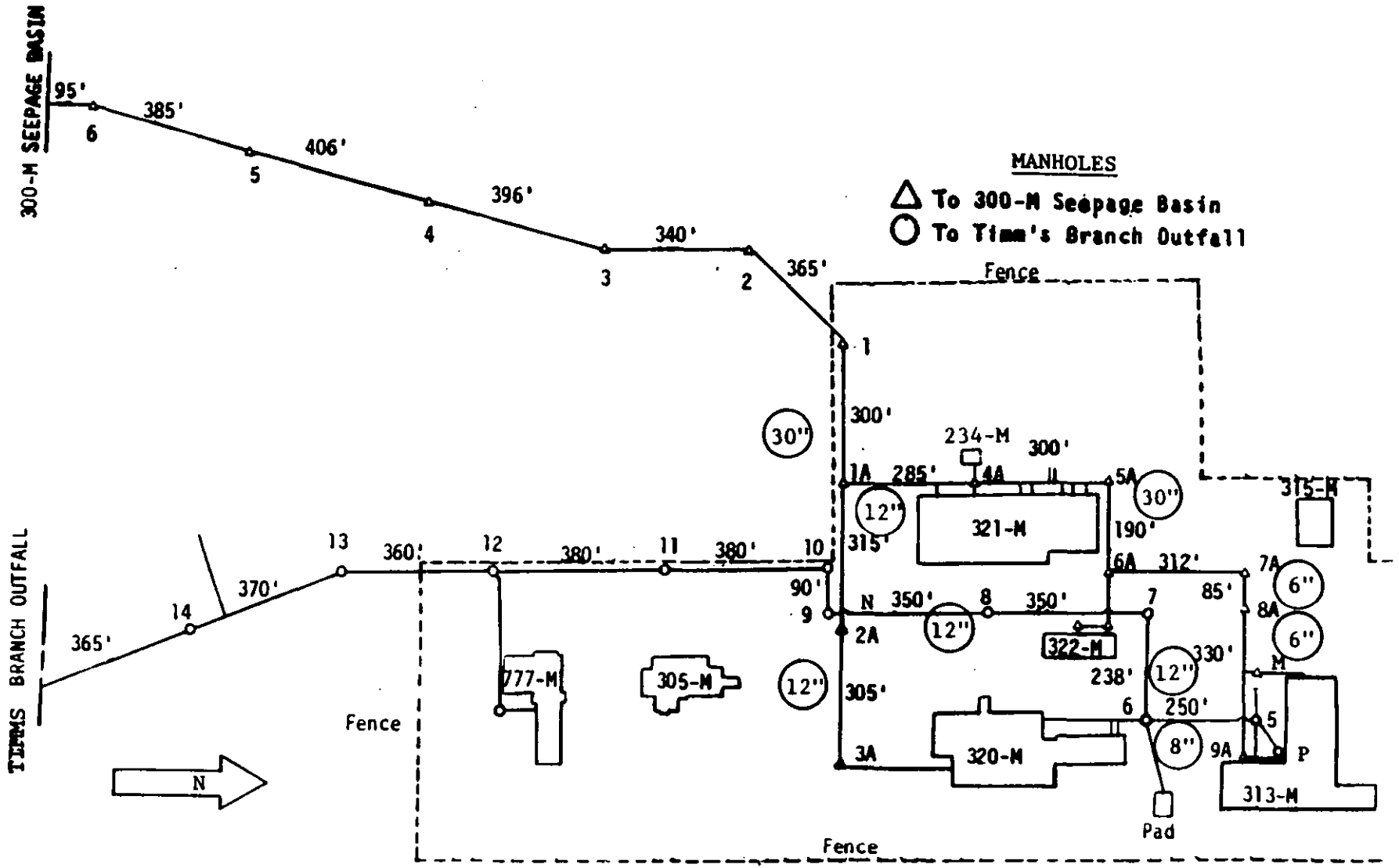



FIGURE 4-3. Location of 300-M Area Process Sewer Lines Between Process Buildings and Settling Basin and A-14 Outfall

## 5.0 EXTENDED CHARACTERIZATION OF M-AREA SETTLING BASIN AND VICINITY (1985)

The extended characterization program for the M-Area basin and vicinity was initiated in November 1984, and completed in March 1985. The data collected during this characterization is the basis for this report.

Data from previous investigations[1,2] indicated that heavy metals discharged to the M-Area basin had migrated no deeper than approximately two feet in the soil at the bottom of the basin. A very limited number of analyses indicated that a gelatinous sludge at the bottom of the basin might contain higher concentrations of heavy metals and organics than were present in the soil.[3] Only a few samples had been collected in the seepage area and Lost Lake, which indicated lower concentrations of heavy metals or organics in those areas versus the settling basin. Additional information was required to prepare a closure plan pursuant to state and federal regulations. Additional data were identifed as needed in the following areas:

- Soil beneath the process sewer line.
- Confirm previous data on movement of contaminants in the soil at the bottom of the basin.
- Characterize the gelatinous sludge in the basin, overflow ditch, and seepage area.
- Define if contaminants had moved laterally in the soil next to the basin.
- Define the areal and vertical extent of heavy metal and organic movement in the soil at the bottom of the ditch and the seepage area.
- Determine the areal extent of contamination in the Lost Lake area.
- Confirm the previous data which indicated little downward vertical movement of contaminants in the soil beneath the waters of Lost Lake.
- Analyze sufficient uncontaminated soil samples from the M-Area basin and Lost Lake vicinities to provide background reference concentrations for inorganic and organic constituents.

An initial program to obtain the additional data was prepared in July 1984. This program was subsequently modified, based on the comments and recommendations of an outside consulting firm[4,5]

(Black and Veatch, Engineers-Architects, Kansas City, MO). The above two references are attached to this report as Appendix A.

A proposal to obtain and analyze the samples was submitted to several environmental contractors and the contract was awarded to Envirodyne Engineers, Inc., of St. Louis, MO. The final specifications for obtaining and analyzing the samples from M Area and vicinity are shown in Appendix B of this report.

### 5.1 Vadose Zone and/or Groundwater Studies

Those chlorinated hydrocarbons which have reached the groundwater in the vicinity of the M-Area HWMF are being addressed and cleaned up by the M-Area Groundwater Remedial Action Project (S-2583).[6] The State of South Carolina issued an operating permit (No. 10,253) for the groundwater cleanup facility in April 1985. A leach field to flush the degreasing solvents from the vadose zone underneath the basin is discussed in the closure plan.[3]

No additional data with respect to potential contamination of the groundwater in the vicinity of the M-Area settling basin or Lost Lake were generated during this program. Previous work on the chlorinated hydrocarbon contamination of the groundwater is given in References 7 through 9.

### 5.2 Collection of Soil, Sediment, and Sludge Samples

A number of different techniques were employed to obtain the samples from the various areas. These procedures are summarized below, and a detailed account is given in Appendix C, "Envirodyne Engineers, Inc., Field Report." An overall view of the sample locations are shown in Figure 5-1.

#### 5.2.1 Process Sewer

Three locations along the process sewer from M Area to the settling basin were sampled. One location was in the immediate vicinity of the manhole closest to M-Area basin (M.H. No. 6). The other two locations were 207 and 455 feet toward M Area from M.H. No. 6, respectively. The two locations along the sewer line were chosen by utilizing a soil gas detection instrument to analyze for the presence of organic vapors. The locations with the highest organic vapor levels, in the surface soil above the sewer pipe, were chosen for core sampling. The details of the soil gas survey are given in Appendix D.

In order to sample the soils below the sewer pipe, the soil above the sewer pipe was first excavated. The soil was then sampled in one foot increments to a depth of six feet using a hand auger. At one location, two cores were taken immediately adjacent to, and slanting underneath each side of the sewer pipe. Four other cores (two on each side) were taken at one foot and two foot distances from the pipe. The second location was sampled similarly. In addition, four soil cores were taken adjacent to manhole No. 6. A schematic drawing of the process sewer line sample locations is given in Figure 5-2.

### 5.2.2 Settling Basin

The soil, sludge, and liquid samples from the basin were taken from a modified jon boat furnished by Envirodyne Engineers. In order to determine the location of various liquid, sludge, and soil samples in the basin, the surface of the basin was subdivided into 70 small sections, each approximately 33 x 38 feet in dimension. The specific sample locations were determined using a random number generating program.

#### Liquid

The liquid in the basin was resampled to confirm the concentration levels of dissolved materials (compared to the previous Hollod study).[1] The chemocline was redetermined, using portable instrumentation to measure pH, conductivity, temperature, dissolved oxygen, and turbidity. Liquid samples were also obtained for total suspended solids, at one foot intervals to the bottom of the basin, at three locations. The data indicated that a chemocline at a depth of about four feet was still present, similar to that found in 1982[1] (Figure 5-3). The liquid samples for chemical analysis were therefore taken at depths of two and eight feet to provide representative samples of the two different liquid strata. The samples were taken with a small "Master Flex" pump. The 18 liquid samples were divided into six above and 12 below the chemocline, corresponding to the relative volumes of the two liquid strata. The basin liquid sampling locations are indicated in Figure 5-4, with the detailed sampling locations shown in Appendix C.

#### Sludge at the Bottom of the M-Area Basin

The sludge layer at the bottom of the M-Area basin was analyzed at eight locations. The sludge samples were taken with a clear plexiglass tube, which was driven into the soil beneath the sludge until a plug was formed.

The thickness of the sludge ranged from 0.5 to 3.0 feet, averaging approximately two feet thick. The thickest area was found near the process sewer inlet and the center of the basin, and thinner around the edges of the basin. The sludge sampling locations are indicated in Figure 5-4.

**Soil Underlying the M-Area Basin**

The soil samples were collected using 2-inch-diameter stainless steel Shelby tubes, which were driven into the soil/sediments to a depth of six feet. The samples were removed from the Shelby tubes by a "Soiltest" hand extruder and segregated for analysis. The soil sample locations are shown in Figure 5-4.

**Soil Next to Basin**

Four soil cores were collected immediately adjacent to the basin to determine if any horizontal migration of inorganic or organic materials had occurred in the soil next to the liquid in the basin. The cores were drilled in the berm of the basin as close to water as possible. The locations are indicated in Figure 5-4, and the horizontal distance to the edge of the water is given below:

| Core Identification | Distance to Edge of Water in Basin (ft) |
|---|---|
| MBC-301 | 12 |
| MBC-302 | 12.5 |
| MBC-303 | 20 |
| MBC-304 | 14 |

The cores were sampled and analyzed at five-foot intervals to a depth of 15 feet, then analyzed in one foot increments for the next six feet.

**Reference Soil Core Samples**

Two soil cores were obtained with a drill rig at distances of ~150 feet on either side of the basin, to provide background reference concentration data. The cores were drilled 20 feet deep, and sampled in 2-foot increments, using a split spoon sampler.

### 5.2.3 Overflow Ditch

Sixteen locations were sampled along the overflow ditch, from the end of the overflow weir rip-rap to the confluence of the ditch with Lost Lake. Eight of the cores were taken along the centerline of the ditch at about 100-foot intervals, while at two locations a 12-foot traverse was made involving four cores, four and six feet on each side of the centerline.

The overflow ditch contained a gelatinous sludge material similar to the sludge at the bottom of the basin. Therefore, the centerline locations were sampled for sludge and soil. The soil samples (both centerline and edge) were collected in the top six inch segment, and three one-foot segments, to a total depth of 3.5 feet. The sludge samples in the overflow ditch were under only six to 12 inches of water, so these were obtained by scooping into an appropriate container and decanting the surface liquid. The soil samples were obtained using a hand auger or hand-driven Shelby tubes. The sample locations are shown in Figure 5-5. A detailed drawing of the sample locations is given in Appendix C.

### 5.2.4 Seepage Area

Eighteen locations in the seepage area were sampled (Figure 5-5. The sludge and approximately 12 inches of the underlying soil were sampled.

The 18 sample locations were determined using two transects to cover the entire seepage area, with additional samples close to the overflow ditch and to Lost Lake. The two deep (6 foot) cores were selected close to the overflow ditch, where the surface water flow and depth of sludge suggested that significant contamination might occur. The sample acquisition procedures were the same as in the overflow ditch.

### 5.2.5 Lost Lake

Sampling in Lost Lake was conducted using a grid outline, with the soil underlying the normal water line of Lost Lake being sampled approximately two times per acre. The soil above the normal water line was sampled approximately once per acre.

The soils were sampled in two increments, the top 6 inches and the next 12 inches. Based on visual observations of the standing high water, and on the fact that when the high water recedes a faint white deposit is left behind, the high water mark occurs at approximately the 340 mean sea level (MSL) contour. The normal water coverage and sample frequency is outlined below:

| Elevation Contour (ft) | Description | No. of Sample Locations |
|---|---|---|
| 342-340 | Above high water mark | 4 |
| 340-338 | Occasionally wet | 5* |
| 338-336 | Usually wet | 10 |
| <336 | Almost always wet | 7 |

* An additional five, 0.5-foot soil samples were taken in the 340-338 contour zone to analyze the residual white deposit. The 0.5 foot samples were subdivided into an upper 0.1, and two 0.2 foot samples. These sample locations are shown in Figure 5-6.

The top 6-inch soil sample underlying the water of Lost Lake was labeled a "sludge" sample in the sampling scheme and in Figure 5-6 (Lost Lake sampling locations). However, the top layer underlying Lost Lake was not similar to the sludge of the seepage area, overflow ditch, or basin. This material had a high solids content (~90%) and was similar to the soil increment from 0.5 to 1.5 feet deep.

The samples from the dry shore areas of Lost Lake were obtained with a hand auger. The soil samples below the water surface were taken with a hand driven Shelby tube, using a small boat to reach the sample locations. The water in Lost Lake was one to two feet deep during the sample period.

Two additional reference background soil cores, each 10 feet deep, were obtained with a drill rig, approximately 150 feet from the shore of Lost Lake. The sample locations are shown in Figure 5-6.

## 5.3 Discussion of Results

The extended characterization program addressed the inorganic and organic constituents in the basin liquid, in the soil and sludge at the bottom of the settling basin, in the soil of the overflow area, Lost Lake, and in the soil underneath the process sewer. Soil samples were also taken next to the settling basin, to depths of ~20 feet, to determine if any horizontal movement of contaminants had occurred. In addition, four soil cores were taken (two near the basin, two near Lost Lake) to determine M-Area reference background concentration levels of the inorganic and organic constituents.

The results of these analyses are discussed in this chapter. Since the primary objective of the extended characterization is to provide the data required to define the necessary cleanup and closure actions for the M-Area basin and vicinity, the main emphasis of this discussion is concerned with the levels and extent of heavy metal and organic contamination. The data for each segment were summarized and were compared to three separate soil concentration "reference background" compilations. The three "reference background" data bases were 1) M-Area reference background, which was based on the analyses of four soil cores from the immediate M Area, 2) SRP reference background, which was based on the analyses of soil types representative of the central SRP reservation, and 3) southeastern reference background, which was based on constituent concentrations in the upper soil horizons in the southeastern states.

All of the analytical data generated during this program has been compiled into a series of tables, which are presented in Chapter 6 of this report.

### 5.3.1 Analysis of Samples

The analytical determinations for the extended characterization program were subdivided into a number of categories, which are summarized below and detailed in Appendix B.

| Type | Description |
|---|---|
| A | Physical parameters, such as density, pH, % solids, and conductivity, determined on all liquid or sludge samples. |
| B | A "full" inorganic analysis, including many heavy metals and other constituents not expected to be present in the M-Area basin and environment. |
| C | A full organic scan per Appendix VIII, 40 CFR 261. Since analytical methods for all Appendix VIII compounds have not been specified by the EPA, the samples were tested by a GC/MS technique. The organic compounds detected and not detected (with detection limits) are shown in Tables 6-5 and 6-11 of this report. |
| D | An organic scan for priority pollutant volatile organics. |
| E | A reduced inorganic elemental scan, limited to those compounds which might be expected to be present above background in the M-Area system. |

The full inorganic (Type B) and Appendix VIII (Type C) scan analyses were determined on 22 representative samples of liquid, sludge, and soil from various parts of the system (process sewer, basin, overflow ditch, seepage area, Lost Lake, and background cores).

The sample and analysis scheme is shown in Appendix B. The analytical procedures and techniques are given in the Envirodyne report "M-Area Settling Basin Laboratory Data Report,"[10] which is attached as Appendix E. The quality assurance and quality control (QC) procedures employed by Envirodyne Engineers are given in Reference 11.

### 5.3.2 Process Sewer

Summaries of the organic and inorganic soil analyses are presented in Tables 5-1 and 5-2, respectively. Only those constituents which were found to be in excess of the M-Area "reference background" (Table 5-9) or laboratory blank concentrations are shown in the summary tables. The M-Area reference background levels for organics are included in Table 5-1. The M-Area reference background, SRP background levels, and regional southeastern USA inorganic concentration levels are included for comparison purposes in the inorganic summary table (Table 5-2). This comparison approach is also used in the discussions of each segment of the M-Area study. All of the organic analyses of the soil samples are given in Tables 6-7, 6-8, and 6-9. The inorganic analyses are given in Tables 6-2 and 6-3.

Two halogenated hydrocarbons and one phthalate compound were found in elevated levels (above background or laboratory blank analyses) in the soil beneath the process sewer line (Table 5-1). The data indicate that significant levels of tetrachloroethylene had leaked through the cracked pipe and soaked into the soil. For example, one soil sample three feet below the sewer line exhibited a level of 764,500 µg/g (ppb) of tetrachloroethylene. The other two compounds [bis(2-ethylhexyl)phthalate and 1,1,1-trichloroethane] were found at concentrations as high as 7040 and 990 µg/g (ppb), respectively. This confirmed the hypothesis that the cracked sewer pipe was a significant source of contamination of the chlorinated hydrocarbons to groundwater. The sample locations directly under the pipe (MBC 407 and 408, and MBC 412 and 413 on Figure 6-7) exhibited the highest levels of contamination. The soil cores one foot to each side of the pipe, in general, had concentrations of organics at or below the analytical detection limits.

The inorganic constituents exhibited a similar pattern (Table 5-2). Lead, nickel, and uranium were found to be present in the upper two feet of soil under the sewer at concentrations slightly above the M-Area reference background. The concentration of zinc was slightly above the M-Area reference average, but the determinations fell within the M-Area reference background range. In conclusion, the heavy metals, lead, nickel, and uranium have leaked through cracks in the process sewer pipe into the soil, but

at relatively low concentrations. The data indicate that the inorganic constituents have moved no more than one to two feet in a downward direction. The data also show no significant evidence of horizontal movement.

### 5.3.3 Settling Basin

#### Liquid

The results of heavy metal analyses for the basin liquid are summarized in Table 5-3. The results of three liquid samples from Lost Lake are also included in Table 5-3. All of the inorganic and organic analyses for liquids are given in Tables 6-10 and 6-11, respectively. The current 1985 data confirm that the heavy metal concentrations are usually higher in the lower 10 feet of liquid in the basin. A more extensive listing of the analytical results and a chemical inventory is given in Table 5-4.

It is interesting to note that the concentrations of only two heavy metals (cadmium and lead) exceeded the EPA primary drinking water maximum contaminant levels.

Four chlorinated hydrocarbons were detected in the liquid in the settling basin. The relatively high (23 to 0.15 mg/L - ppm) levels of 1,1,1-trichloroethane reflect the fact that it is still being used as a degreasing agent in the M-Area production facilities. The lower levels of tetra- and trichloroethylenes probably reflect continued leaching of residual amounts from the soil or sludge in the basin. A dichlorinated hydrocarbon (1,1-dichloroethylene) which was detected may be a decomposition product of 1,1,1-trichloroethane or an impurity in the as-received material.

The chemocline in the M-Area basin was redetermined twice during the extended characterization study. The data are plotted in Figures 5-7 and 5-8, and indicate that the chemocline defined by Hollod in 1982[1] is still in existence.

#### Soil Underlying the M-Area Basin

Four six-foot-deep soil cores were taken and analyzed from the soil at the bottom of the basin. The previous study (Hollod, 1982)[2] had analyzed the soil to a depth of 15 feet, and the analyses had indicated that the heavy metals had reached background levels in the upper two feet of soil. The sample locations of the four cores taken during the extended characterization are indicated in Figure 5-4. The average concentration levels of inorganic and chlorinated hydrocarbons in the upper 2 feet of soil are shown in Table 5-4.

Two organic phthalates were also found in the soil beneath the basin (Table 5-1). These phthalate compounds probably originate from the metal forming operations in M Area, as organic phthalates are commonly used as defoaming agents, pump lubricants, and degreasing solutions.

The concentration levels determined in this study of the inorganic and heavy metals in the soils beneath the basin are similar in most cases to the results of the 1982 study.[2] The 1985 data confirmed that the heavy metals reached background levels in approximately 2 feet, with the exception of uranium and nickel. Concentrations of uranium as high as 80 to 100 µg/g were detected in two of the four sample locations, at a depth of 5 to 6 feet. Nickel was detected at concentration levels of 30 to 60 µg/g at the 5 to 6 foot depth (in two locations).

The 1985 chlorinated hydrocarbons analysis results differed dramatically from the previous 1982 study. In 1982, concentration levels of tetrachloroethylene as high as 2,000,000 ng/g (ppb) were found in the upper 3 foot soil samples. At two locations in the 1982 study, the tetrachloroethylene concentrations ranged from 10,000 to 50,000 ng/g (ppb) at soil depths as deep as 15 feet. In the 1985 study, the highest tetrachloroethylene concentration was 24,100 ng/g (in one 0 to 1.0 foot sample at location 207). The average tetrachloroethylene concentration in the upper 2 feet of soil (four determinations) was 1000 ng/g. Neither tetrachloroethylene, trichloroethylene, nor 1,1,1-trichloroethane were detected above detection limits in any soil sample from 2 to 6 feet deep. It is concluded that a significant leaching of the chlorinated hydrocarbons from the soil beneath the basin has occurred in the intervening period since 1982.

**Sludge at the Bottom of the Basin**

The sludge layer is primarily composed of metallic, hydroxide, and phosphate precipitates, and biogenic organic sediments. The gelatinous sludge is approximately 6% wt % solids and contains approximately 30% aluminum hydroxide [$Al(OH)_3$], 8% organic carbon, and 3% phosphate on a dry weight basis. The sludge also contains the major inventories of iron, nickel, chrome, and uranium in the basin (Table 5-4). A number of organic compounds (such as heptadecane and hexanedioic acid) are also present in significant amounts in the sludge, but were not detected at any other sample locations (Table 5-1). The total inventory of chlorinated hydrocarbons is approximately 1 kg in the sludge, compared to approximately 80 kg dissolved in the liquid in the basin.

### Soil Cores Adjacent to the Basin

The soil analyses, which were sampled in 5-foot increments down to 15 feet below the surface of the berm, and then in one-foot increments to a total depth of 21 feet, showed no indication of inorganic or organic concentration levels above the M-Area reference background levels. The data showed no evidence of inorganic or chlorinated hydrocarbon contamination in the soil samples. In conclusion, the data shows that no significant horizontal movement of the materials in M-Area basin has occurred in the soils immediately adjacent to the basin liquids. The raw data are given in Tables 6-2, 6-7, and 6-8.

## 5.3.4 Overflow Ditch and Adjacent Seepage Area

### Soil in the Overflow Ditch

Evaluation of the inorganic analyses in the soils beneath the overflow ditch, and in the soil underneath a portion of the seepage area (approximately 80 feet into the seepage area) indicated similar concentration levels to about the same depth in these two areas. Therefore, the soil analyses of these two areas were grouped together. Those heavy metals found to have concentration levels which were above the M-Area reference levels are shown in Table 5-5. Chromium and copper were higher than M-Area reference levels in the top 6 inches, and then similar to M-Area reference levels in the deeper soil samples. Lead and zinc concentrations are higher than the M-Area reference levels, but are similar to or less than the SRP and southeastern reference levels. Nickel and uranium concentrations in the soil cores exceeded all three reference background levels, to as deep as they were tested (3.5 feet).

Low levels of organic contamination were found in the top 6 inches of the soils along the overflow ditch. The levels dropped to below detection limits in the deepest (2.5 to 3.5 foot) samples (Table 5-1).

### Sludge in the Overflow Ditch

The chemical makeup of the sludge in the ditch is similar to that of the sludge in the basin (Table 5-6). The concentration levels of the heavy metals are usually lower, especially with respect to nickel and uranium. The concentrations of organic materials (Table 5-1) are also significantly lower compared to the basin sludge (5 to 10 times lower in most instances).

### Soil Underlying Seepage Area

A summary of the heavy metals found in the soils underlying the seepage area with average concentration levels above the M-Area reference background is given in Table 5-7. Zinc and magnesium concentrations are higher than the M-Area reference background levels, but similar to the average and range of the SRP reference background. The manganese concentration in the top foot of soil is higher than the M-Area and SRP reference levels, but less than the southeastern USA reference level. Nickel and uranium concentration levels in the top foot exceed the M-Area reference background levels. However, the nickel concentration level is less than the SRP reference level below a soil depth of 2.5 feet. Uranium was generally below the detection limit at soil depths less than 3.5 feet. The raw data is shown in Tables 6-2 and 6-3.

The organic contaminant concentration levels in the seepage area soil (top 12 inches) were very low (Table 6-8). Tetrachloroethylene was detected only once (at 19 ng/g) in the seepage area soils. Trichloroethylene and 1,1,1-trichloroethane were not detected in the seepage area soils.

### Sludge

The sludge in the seepage area was similar in composition to that found in the overflow ditch and settling basin. The sludge ranged from 0.25 to 1.1 feet in depth, with the deeper depths close to the overflow ditch. The heavy metal analyses are shown in Table 5-6 and are similar to the concentration levels of the overflow ditch sludge (especially nickel and uranium). The concentration levels of the organic contaminants in the seepage area sludge were similar to the levels in the overflow ditch sludge (Table 5-1). All of the raw data for inorganic analyses is given in Tables 6-3 and 6-4.

## 5.3.5 Lost Lake

The concentration levels of the inorganic constituents are discussed according to the various contour elevations around Lost Lake. Those heavy metal concentrations above the M-Area reference background are given in Table 5-8. The organic materials detected above background in the Lost Lake area are shown in Table 5-1. The only organic chemical detected at significant levels was bis(2-ethylhexyl)phthalate. All of the inorganic analyses are given in Tables 6-2 and 6-3. The organic analyses data are given in Tables 6-7, 6-8, and 6-9.

### 342-340 Contour (Above High Waste Mark)

The concentration levels confirmed the hypothesis that this area had probably never been covered by standing water from Lost Lake, in that all analyte concentration levels were similar to the M-Area reference background levels. Concentration levels for a number of heavy metals are shown in Figures 6-10 through 6-19.

### 340-338 Contour (Occasionally Wet)

All of the inorganic concentration levels of the samples taken from 0-0.5, 0.5-1.5, and 1.5 to 2.5 feet deep in the 338-340 contour zone were equal to or less than the M-Area background reference levels. However, the shallow (6 inch) soil samples taken in the areas of residual white deposits indicated some slightly elevated concentrations of Ni, Pb, U, and $PO_4$ in the top most increment (0 to 0.1 foot) of the soil samples. The concentrations of inorganic analytes in the 0.1 to 0.3 and 0.3 to 0.5 foot increments were similar to M-Area reference background levels. No organic analyses were performed on the soil samples from these five locations. It was hypothesized that the white deposit might be a soluble salt, which was precipitated out as the water of Lost Lake periodically retreated and evaporated. However, the levels of sodium and nitrate (the most obvious choices) were no higher than other soil samples in the 340 to 338 zone. The data for those inorganic materials in the 0 to 0.1 foot increment which exceeded the M-Area reference background levels are given below:

| | Concentration (µg/g) | | | |
|---|---|---|---|---|
| Identification | Ni | Pb | U | $PO_4$ |
| MBC-729 | 3.5 | 6.8 | <10 | 139 |
| MBC-730 | 19.0 | 5.3 | 41.3 | 396 |
| MBC-731 | 3.9 | 5.6 | 14.4 | 105 |
| MBC-732 | 2.6 | 8.7 | <10 | 105 |
| MBC-733 | 3.5 | 5.6 | 11.2 | 289 |
| M-Area Reference Background Levels | | | | |
| average | ~2.1 | ~32 | <10 | 150 |
| range | <2.0-4.0 | <2.0-7.2 | <10-<10 | 80-330 |

### 338-336 Contour (Usually Wet)

Lead and manganese concentrations are slightly above the M-Area reference background levels in the top 6 inches of soil, but are equivalent to the M-Area reference background concentrations in the 0.5 to 1.5 foot depth (Table 5-8). Barium, copper, nickel, and zinc are slightly higher than the M-Area reference concentrations

in both the 0 to 0.5 and 0.5 to 1.5 foot depth samples. However, the concentrations in the lower 0.5 to 1.5 foot samples are less than or equal to the SRP and southeastern regional USA reference background concentrations. Uranium in the 0 to 0.5 foot level was almost always less than the 10 μg/g detection limit, and always less than the detection limit in the 0.5 to 1.5 foot level.

**Less Than 336 Contour (Almost Always Wet)**

The area of Lost Lake at elevation less than 336 are usually wet and show the highest levels of inorganic contamination in the Lost Lake system. Lead and manganese have slightly higher concentrations in the <336 contour compared to the 336-338 contour, at both the 0 to 0.5 and 0.5 to 1.5 depths. However, the lead and manganese concentrations in the 0.5 to 1.5 foot level are less than the SRP and southeastern reference background concentrations. Similarly, barium, copper, nickel, and zinc in the 0.5 to 1.5 foot level, while higher than the M-Area reference background, are less than the SRP and southeastern USA reference background concentrations. Uranium, in the <336 contour area (at 0 to 0.5 and 0.5 to 1.5 foot levels) was below the detection limit of 10 μg/g. The concentration levels for Cu, Pb, $NO_3$, Ni, and Zn are depicted in Figures 6-10 through 6-19.

### 5.3.6 M-Area Reference Background Determinations

A total of four soil cores were analyzed in the M-Area basin and Lost Lake areas to determine M-Area reference background concentrations. Two 10-foot-deep cores (MBC-801 and 802) were obtained above the high water mark near Lost Lake (Figure 5-6). These cores were divided into 2 foot fractions and analyzed. Similarly, two 20-foot-deep soil cores were obtained approximately 150 feet from the M-Area basin (Figure 5-4). These were also split into 2 foot segments and analyzed. The sample fractions from all four locations were similar in texture and color, having clay (25-45%), silt (10-25%), and sand (~40-50%). The inorganic elemental analyses were similar for all samples, except for Al, K, Mg, and Mn, which had slightly higher concentrations in the 0-2 foot level in the two cores near the M-Area basin. Based on the similarity in soil appearance and chemical composition, the M-Area reference background levels were calculated by averaging results from all four cores. The averages and ranges are given in Table 5-9. A set of background concentration levels determined by Hollod in 1982[2] are included in Table 5-9 for comparison.

Another data base was utilized to obtain a second set of soil background reference concentrations. This was based on data obtained by U.S. Department of Agriculture, Southeastern Forest Experiment Station. The objective of the USDA study was to determine the impact of utilizing commercial sewage sludge as a fertilizer on southeastern pine forests, especially with respect to the potential buildup of trace elements from the sludge. Therefore, three to four different soil types in the central portion of the SRP reservation were extensively analyzed before the sludge was applied.[12] These "SRP background reference" concentrations were almost always higher than the M-Area reference background concentrations.

The SRP reference concentrations were also similar to the average of six other studies compiled by the U.S. Geological Survey.[13] These six studies included two cultivated and two uncultivated plow zone soil studies in central/south-central and northern Georgia, and two "A" horizon soil studies from Kentucky.

These various inorganic background reference concentrations demonstrate that the surface soils in the overflow ditch, seepage area, and Lost Lake contain heavy metals at or above the M-Area reference background. However, below the 3-4 foot depth in the ditch and seepage area, and below approximately 1 foot deep in soils under Lost Lake, the concentrations of all heavy metals reach concentration averages and ranges which are very similar to the M-Area vicinity, SRP site, and southeastern USA averages.

### 5.3.7 1985 Combined Influent/Effluent Analysis

In March through May of 1985, the influent to and effluent from the settling basin were sampled and analyzed on a weekly basis for ten weeks. Each week a three-day composite sample was collected for inorganic analyses. A grab sample was collected for organic scans on the third day. The samples were collected at the manhole inlet to the basin, and in the overflow ditch past the rip-rap weir.

Samples from the first week were fully analyzed (Types A, B, and C analyte categories in Appendix A). Samples from the remaining nine weeks were analyzed for volatile organics and a limited inorganic scan (Types A, D, and E analyte categories in Appendix A).

Results from nine of the ten week sampling periods are summarized in Table 5-11. A complete listing is provided in Tables 6-13 and 6-14. It should be pointed out that direct comparison of effluent vs. influent concentrations on any given sample date should not be made, due to the residence time of the materials in the basin. Averaging of the results over a long period of time

(9 to 10 weeks) should allow a valid comparison. Table 5-11 also shows a calculated removal efficiency for the settling basin based on the average concentration for each constituent over the nine-week period. These results confirm that, for the most part, the heavy metal constituents Ni, Pb, Cu, Cr, Fe, and Zn were retained in the basin (~80% efficiency). Mercury levels for the most part were at or below the detection limit of 0.2 µg/L in both the influent and effluent. Other key results are highlighted below.

- Nitrate concentrations in the overflow were significantly lower than in the influent. The reverse was observed in 1982.[20]

- Conductivity and TDS were both lower in the effluent than the influent, contrary to what was observed in 1982.

- Although the levels were low (3.5 to 185 mg/L) uranium was apparently not settled out in the basin during this sampling period, possibly due to the high pH of the water which would tend to dissolve uranium.

- Residual degreaser solvents trichloroethylene and tetrachloroethylene were detected at concentrations slightly above the detection limit of 5 µg/L in both the influent and effluent. Since these degreasers are no longer used, sources for these compounds are most likely the process sewer line, sludge, and soil at the bottom of the basin. 1,1,1-trichloroethane, which is still used in M-Area processes, was found at an average concentration at approximately 150 ppb in both streams. Although somewhat higher concentration levels were measured in 1985 compared to 1982,[3] there is no statistical difference in organic concentration between the two sampling periods.

- In general, inorganic concentration levels in the influent are factors of two to three higher than levels measured in previous studies,[3] which is due to the reduced fluid flow rates from the M-Area processes.

- Waters overflowing the basin have relatively low concentrations of hazardous constituents (Pb, Hg, Ni, Cr, U, chlorocarbons).

## 5.4 Waste Inventory

### 5.4.1 Settling Basin

A summary of the major inorganic and organic materials in the M-Area basin is given in the following table; a detailed inventory is shown in Table 5-4. This summary includes the materials in the liquid, the sludge layer, and the soil beneath the basin, and is based on data from the 1985 extended characterization program.

**Summary of Major Inorganic and Organic Chemicals in M-Area Basin**

| | Approximate kg | | | |
|---|---|---|---|---|
| | Liquid | Sludge | Soil* | Total |
| $NO_3$ (as N) | 9,100 | 1,550 | 200 | 10,950 |
| $PO_4$ | 2 | 5,800 | 2,050 | 7,850 |
| $SO_4$ | 1,460 | 175 | 80 | 1,700 |
| Cl | 2,100 | 80 | 360 | 2,540 |
| Na | 44,200 | 9,600 | 6,050 | 60,000 |
| Al | 14,600 | 22,300 | 17,650 | 54,500 |
| Ni | 4.2 | 3,585 | 53 | 3,640 |
| U | 50 | 3,915 | 885 | 4,850 |
| Pb | 6 | 95 | 55 | 155 |
| Trichloroethylene | 3.7 | 0.04 | 0.11 | 3.8 |
| Tetrachloroethylene | 1.8 | 0.91 | 5.42 | 8.1 |
| 1,1,1-trichloroethane | 74 | 0.16 | <0.11 | 74 |

* Total kg in soil shown were calculated without subtracting background soil concentrations. Soil inventory based on a 2-foot depth for all components except uranium (6 feet deep).

The analyses from the recently completed extended characterization program indicate significantly lower levels of halogenated organic contamination in the soils at the bottom of the basin than determined in the 1982 study. For example, the highest concentration of tetrachloroethylene recently determined was 24 µg/g (ppm) - in only one soil sample. The 1982 study found levels of tetrachloroethylene as high as 2000 µg/g, with many soil fractions ranging from 50 to 500 µg/g. Since the current study only tested the soils to a depth of 6 feet vs. a depth of 15 feet previously, the data are not directly comparable. However, these data do indicate that a significant leaching of the chlorinated hydrocarbons has occurred in the soils under the basin in a period of only three years.

### 5.4.2 Overflow Ditch, Seepage Area, and Lost Lake

The initial characterization conducted in 1982,[3] indicated lower amounts of inorganic and organic contamination in the seepage area and Lost Lake than in the settling basin. The inorganic materials and heavy metals were found to be mostly concentrated in the top 6 inches of sediments at the bottom of the seepage and Lost Lake areas. The extended characterization confirmed this finding with only a few exceptions. An estimated total inventory of the major inorganic materials in the seepage area and Lost Lake based on the extended characterization is given below. A inventory summary of the overflow areas is provided in Table 5-10. Detailed calculations are shown in Table 6-12.

**Summary of Major Heavy Metals in Overflow Ditch, Seepage Area, and Lost Lake (kg)**

| Heavy Metals | Overflow Ditch* | Seepage Area** | Lost Lake† | Total | Approximate Background†† |
|---|---|---|---|---|---|
| Ni | 260 | 967 | 195 | 1420 | 100 |
| U | 504 | 1220 | 360 | 2080 | 100 |
| Pb | 55 | 44 | 245 | 344 | 150 |

* Sludge and soil (6 feet deep) 0.70 acres

** Sludge and soil (2 feet deep) 2.5 acres

† Lost Lake, 2 inches deep (8 acres), 6 inches deep (11 acres), 1 foot deep (6 acres)

†† Approximate total background inventory in same volume of soil.

The total uranium inventory in the basin, seepage, and Lost Lake areas can therefore be estimated to be approximately 6900 kg (Table 6-12). This estimate of uranium inventory can be compared to that calculated from data collected by the Health Protection Department of E. I. du Pont de Nemours and Company, which has monitored the radioactive effluents to M-Area basin since 1974.[14] The yearly totals and total kg through 1982 are shown below.

**Uranium-235, 238 Discharge to M-Area Settling Basin**

| Year | mCi | kg |
|---|---|---|
| 1974 | 2.2 | 6 |
| 1975 | 18.9 | 60 |
| 1976 | 8.9 | 27 |
| 1977 | 14.3 | 42 |
| 1978 | 58.3 | 180 |
| 1979 | 60.5 | 180 |
| 1980 | 97.0 | 300 |
| 1981 | 99.8 | 300 |
| 1982 | 205.3 | 615 |
| 1983 | 409.0 | 1227 |
| Total | 974.2 | ~2937 |

The difference between the extended characterization inventory (6,900 kg) and the Health Protection estimate is attributed to uranium discharges prior to 1974 and after 1983, and to possible inaccuracies in measured flow rate, and to the fact that a limited number of analyses have been applied to large volumes of soil to calculate a theoretical inventory.

## 5.5 Action Based on Extended Characterization Program

The results of this study were used to determine the extent (area and depth) to which soil in the overflow ditch, seepage area, and Lost Lake areas have been contaminated.

After evaluation of these data, in comparison to the previously discussed reference background concentration data, a plan was devised to remove the contaminated soils to levels approaching the M-Area reference background concentration levels for almost all of the possible contaminants. In a few cases, the residual constituent soil concentration may be higher than the M-Area reference concentration, but are equal to less than the SRP or southeastern reference concentration levels. The plan is discussed in the "Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plant."[3]

## 5.6 References


1. G. J. Hollod. Physical and Chemical Characteristics of the M-Area Settling Basin. DPST-82-722, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (September 1982).

2. G. J. Hollod, I. W. Marine, H. W. Bledsoe, and J. P. Ryan. Metals and Organics in the Soil Beneath the M-Area Settling Basin. DPST-82-721, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (July 1982).

3. W. P. Colven and J. B. Pickett. Closure Plan for the M-Area Settling Basin and Vicinity at the Savannah River Plant. DPSPU-84-11-11, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (Revised July 1985).

4. L. T. Schaper to J. B. Pickett. "Review of Characterization Program for M-Area Settling Basin and Contiguous Areas." Black and Veatch, Engineers-Architects, Kansas City, MO (July 23, 1984).

5. L. T. Schaper, Letter to J. B. Pickett. "Concurrance with the Sampling and Analysis Plan for M-Area Basin." Black and Veatch, Engineers-Architects, Kansas City, MO (September 24, 1984).

6. Groundwater Remedial Action Treatment Facilities, Engineering Report to the South Carolina Department of Health and Environmental Control. Department Work Request 862413, Project S-2583, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (March 16, 1984).

7. E. J. Christensen and D. E. Gordon, editors and compilers. Technical Summary of Groundwater Quality Protection Program at Savannah River Plant, Volume I - Site Geohydrology, Solid and Hazardous Wastes. DPST-83-829, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (December 1983).

8. D. E. Gordon, compiler. Preliminary Technical Data Summary, M-Area Groundwater Cleanup Facility. DPSTD-82-69, E. I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, SC (October 1982).

9. C. F. Muska, R. Lorenz, L. F. Boone, and W. P. Colven. Groundwater Quality Assessment Plan for M-Area. E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (June 1985).

10. Envirodyne Engineers, Inc., report to E. I. du Pont de Nemours and Company. M-Area Settling Basin Laboratory Data Report, Envirodyne Engineers, Inc., St. Louis, MO (received 4/2/85).

11. Envirodyne Engineers, Inc., report to E. I. du Pont de Nemours and Company. M-Area Settling Basin QC Plan. Envirodyne Engineers, Inc., St. Louis, MO (received 12/15/84).

12. C. G. Wells, W. H. McKee, Jr., E. J. Christensen, G. J. Hollod, and C. Davis. Elemental Cycling in Southern Pine Plantations with Nutrient and Heavy Metal Amendments. Annual Report, FY-1982, USDA, Southeastern Forest Experiment Station, Asheville, NC (1983).

13. J. J. Conner and H. T. Shacklette. Background Geochemistry of Some Rocks, Soils, Plants, and Vegetables in the Conterminous United States — Geological Survey Professional Paper 574-F. U.S. Government Printing Office, Washington, DC (1975).

14. C. Ashley, C. C. Zeigler, and P. A. Culp. Releases of Radioactivity at the Savannah River Plant: 1954 through 1980. DPSPU-81-25-1, E. I. du Pont de Nemours and Company, Savannah River Plant, Aiken, SC (1981).

**TABLE 5-1**

**Summary of Organic Concentration Levels in Soils, Sludge, and Liquids of the M-Area Settling Basin and Vicinities (1985)***

| | Sample Depth (ft) | Average Concentration (ng/g) | No. of Samples | M-Basin Area Reference or Detection Limit (ng/g) |
|---|---|---|---|---|
| **Process Sewer Soil** | | | | |
| Bis (2-ethylhexyl)phthalate | 1† | 7040 | (1) | <150 |
| | 5 | 900 | (1) | |
| Tetrachloroethylene | 1 | 1290 | (10) | <10 |
| | 3 | 76,650 | (10) | |
| | 5 | 7180 | (10) | |
| 1,1,1-trichloroethane | 1 | 73 | (10) | <20 |
| | 3 | 143 | (10) | |
| | 5 | 200 | (10) | |
| **Settling Basin Soil** | | | | |
| Bis (2-ethylhexyl)phthalate | 4† | 960 | (1) | <150 |
| Di-n-octyl phthalate | 4 | 970 | (1) | 100-140 |
| Toluene | 0 | ~11.3** | (4) | <10 |
| | 1 | ~10.3 | (4) | |
| | 2 | ~12.5 | (4) | |
| | 3 | ~11.8 | (4) | |
| | 4 | ~10.3 | (4) | |
| | 5 | <10.0 | (4) | |
| Tetrachloroethylene | 0 | 6141 | (4) | <10 |
| | 1 | 276 | (4) | |
| | 2 | <10 | (4) | |
| | 3 | <10 | (4) | |
| | 4 | <10 | (4) | |
| | 5 | <10 | (4) | |

† Depth beneath sewer pipe; only the 10 sample locations along the sewer line averaged.

* Only those organic compounds which were found to be greater than reference background levels are shown in this table.

** All averages calculated using < detection limit values as if they were equal to the detection limit (e.g., <10 = 10).

† Depth below sludge/soil interface at bottom of basin.

TABLE 5-1, Contd

| | Sample Depth (ft) | Average Concentration (ng/g) | No. of Samples | M-Basin Area Reference or Detection Limit (ng/g) |
|---|---|---|---|---|
| **Settling Basin Sludge** | | | | |
| Bis (2-ethylhexyl)phthalate | - | 19,700 | (2) | <150 |
| Chlorotoluene | - | 77 | (1) | - |
| Dichlorobenzenes | - | 126 | (2) | - |
| Saturated hydrocarbons | - | 11,220 | (1) | - |
| Heptadecane | - | 76,300 | (2) | - |
| Di-n-butyl phthalate | - | 1100 | (2) | 100-250 |
| Hexanedioic acid, dioctylester | - | 47,100 | (1) | - |
| Tetrachloroethylene | - | 4190 | (8) | <10 |
| Trichloroethylene | - | 190 | (8) | <10 |
| 1,1,1-trichloroethane | - | 825 | (8) | <20 |
| 2-hexadecen-1-ol-3,7,11,15-tetramethyl | - | 176,000 | (1) | - |
| 2-propyl decane | - | 4940 | (1) | - |
| 2,5-dimethyl heptane | - | 4330 | (1) | - |
| 3-licosene | - | 2400 | (1) | - |
| 6-cyclohexyldodecane | - | 5430 | (1) | - |
| Toluene | - | ~17 | (8) | <10 |
| Pentadecane | - | 12,500 | (1) | - |

**TABLE 5-1, Contd**

| | Sample Depth (ft) | Average Concentration (ng/g) | No. of Samples | M-Basin Area Reference or Detection Limit (ng/g) |
|---|---|---|---|---|
| **Settling Basin Liquid** | | | | |
| Tetrachloroethylene | 2 | 23 | 6 | <5 |
| | 8 | 80 | 12 | |
| Trichloroethylene | 2 | 60 | 6 | <5 |
| | 8 | 152 | 12 | |
| 1,1,1-trichloroethane | 2 | 6950 | 6 | <5 |
| | 8 | 640 | 12 | |
| 1,1-dichloroethylene | 2 | 78 | 6 | <5 |
| | 8 | 45 | 12 | |
| **Overflow Ditch Soil** | | | | |
| Bis (2-ethylhexyl)phthalate | 0.5 | 2530 | (1) | <150 |
| Tetrachlorobiphenyl | 0 | 7250 | (1) | - |
| Pentachlorobiphenyl | 0 | 11,600 | (1) | - |
| Di-n-octyl phthalate | 0 | 820 | (1) | 100-140 |
| Hexachlorobiphenyl | 0 | 3110 | (1) | - |
| Toluene | 0 | ~13.2 | (15) | <10 |
| | 0.5 | ~10.6 | (15) | |
| | 1.5 | ~10.4 | (15) | |
| | 2.5 | <10 | (15) | |
| Tetrachloroethylene | 0 | ~97.5 | (15) | <10 |
| | 0.5 | ~26.9 | (15) | |
| | 1.5 | ~20.7 | (15) | |
| | 2.5 | ~11.4 | (15) | |
| Trichloroethylene | 0 | ~30.6 | (15) | <10 |
| | 0.5 | ~18.2 | (15) | |
| | 1.5 | ~18.2 | (15) | |
| | 1.5 | ~11.1 | (15) | |
| | 2.5 | <10 | (15) | |
| 1,1,1-trichloroethane | 0 | ~100 | (15) | <20 |
| | 0.5 | ~24.5 | (15) | |
| | 1.5 | ~20.1 | (15) | |
| | 2.5 | <20 | (15) | |

TABLE 5-1, Contd

| | Sample Depth (ft) | Average Concentration (ng/g) | No. of Samples | M-Basin Area Reference or Detection Limit (ng/g) |
|---|---|---|---|---|
| **Overflow Ditch Sludge** | | | | |
| Bis (2-ethylhexyl)phthalate | - | 4280 | (1) | <150 |
| Tetrachlorobiphenyl | - | 3130 | (1) | - |
| Pentachlorobiphenyl | - | 9160 | (1) | - |
| Tetrachloroethylene | - | ~70 | (8) | <10 |
| 1,1,1-trichloroethane | - | ~113 | (8) | <20 |
| **Seepage Area Soil** | | | | |
| Bis (2-ethylhexyl)phthalate | 0 | 3060 | (1) | <150 |
| Methylene chloride | 0 | 83 | (20) | 54 |
| | 0.5 | 94 | (2) | |
| | 1.5 | 86 | (2) | |
| | 2.5 | 99 | (2) | |
| | 3.5 | 97 | (2) | |
| | 4.5 | 98 | (2) | |
| | 5.5 | 73 | (2) | |
| Toluene | 0 | ~12.6 | (20) | <10 |
| | 0.5 | ~11.0 | (2) | |
| | 1.5 | <10 | (2) | |
| | 2.5 | <10 | (2) | |
| | 3.5 | <10 | (2) | |
| | 4.5 | <10 | (2) | |
| **Seepage Area Sludge** | | | | |
| Bis (2-ethylhexyl)phthalate | - | 2680 | 1 | <150 |
| Methylene chloride | - | 103 | 17 | 54 |
| Tetrachlorobiphenyl | - | 600 | 1 | - |
| Pentachlorobiphenyl | - | 300 | 1 | <100 |
| Di-n-butylphthalate | - | 470 | 1 | <100-250 |
| Tetrachloroethylene | - | ~20 | 17 | <10 |
| 1,1,1-trichloroethane | - | ~150 | 17 | <20 |

**TABLE 5-1, Contd**

| | Sample Depth (ft) | Average Concentration (ng/g) | No. of Samples | M-Basin Area Reference or Detection Limit (ng/g) |
|---|---|---|---|---|
| **Lost Lake Soil** | | | | |
| Bis (2-ethylhexyl)phthalate | 0 | 9328 | (1) | <150 |
| | 0.5 | 8920 | (1) | |
| Methylene chloride | 0.0 | 97 | (28) | 54 |
| | 0.5 | 42 | (15) | |
| | 1.5 | 58 | (8) | |
| Toluene | 0 | ~11.6 | (28) | <10 |
| | 0.5 | ~10.2 | (13) | |
| | 1.5 | <10 | (8) | |

**TABLE 5-2**

**Soil Inorganic Concentration Levels Beneath the Process Sewer Line vs. Background Levels (1985)**

| Parameter | Sample Depth (ft below bottom of sewer) | Concentration (µg/g) Process Sewer Average | Process Sewer Range | Background Levels M-Basin Area* Average | M-Basin Area* Range | SRP** Average | SRP** Range | Southeastern USA*** Average | Southeastern USA*** Range |
|---|---|---|---|---|---|---|---|---|---|
| Pb | 0.1.0 | ~4.8 | <2.0-16.4 | ~3.2 | <2.0-7.2 | 5.0 | <1-20 | 13 | 2.8-26 |
| | 1.0-2.0 | ~5.7 | <2.0-23.2 | | | | | | |
| | 2.0-3.0 | ~3.4 | <2.0-7.9 | | | | | | |
| | 3.0-4.0 | ~2.7 | <2.0-5.1 | | | | | | |
| Ni | 0-1.0 | ~3.7 | <1-12.2 | ~2.1 | <2.0-4.0 | 14 | 6-42 | 10 | 2.8-18 |
| | 1.0-2.0 | 4.6 | 1-31.8 | | | | | | |
| | 2.0-3.0 | 2.0 | 1-7.9 | | | | | | |
| | 3.0-4.0 | <2.0 | <1-2.4 | | | | | | |
| U | 0-1.0 | ~14.7 | <10-49.9 | <10 | <10-<10 | 2.0 | 1.6-5.5 | - | - |
| | 1.0-2.0 | ~14.7 | <10-55.1 | | | | | | |
| | 2.0-3.0 | <10.0 | <10-<10 | | | | | | |
| | 3.0-4.0 | <10.0 | <10-<10 | | | | | | |
| Zn | 0-1.0 | ~3.9 | <1-6.2 | ~2.4 | <1.0-6.6 | 12 | 5-37 | 30 | <25-64 |
| | 1.0-2.0 | ~3.2 | <1-5.4 | | | | | | |
| | 2.0-3.0 | ~3.5 | <1-6.2 | | | | | | |
| | 3.0-4.0 | ~3.0 | <1-7.3 | | | | | | |

* M-Basin reference background concentration levels, Table 5-9.

** "Elemental Cycling in Southern Pine Plantations with Nutrient and Heavy Metal Amendments, Annual Report FY-1982," USDA, Southeastern Forest Experiment Station (Ref. 12).

*** Georgia plow zone and "A" Horizon, Georgia and Kentucky (Ref. 13).

† All averages calculated using < detection limit values equal to the detection limit.

**TABLE 5-3**

**Metallic Concentration Levels in Settling Basin and Lost Lake Liquids (1985)**

| Parameter | Sample Depth (ft) | Average Concentration (mg/L) Settling Basin | Lost Lake | EPA Primary Drinking Water Maximum Contaminant Levels (mg/L) |
|---|---|---|---|---|
| Ba | 2 | 0.004* | 0.004* | 1.0 |
| | 8 | 0.004* | | |
| Cd | 2 | 0.003 | 0.002 | 0.010 |
| | 8 | 0.014 | | |
| Cr | 2 | 0.004 | 0.004 | 0.050 |
| | 8 | 0.004 | | |
| Cu | 2 | 0.012 | 0.004 | |
| | 8 | 0.148 | | |
| Pb | 2 | 0.042 | 0.007 | 0.050 |
| | 8 | 0.223 | | |
| Mg | 2 | 0.300 | 0.155 | - |
| | 8 | 0.101 | | |
| Mn | 2 | 0.005 | 0.032 | - |
| | 8 | 0.019 | | |
| Hg (µg/L) | 2 | 0.717 | 0.230 | 2.00 |
| | 8 | 0.445 | | |
| Ni | 2 | 0.029 | 0.011 | - |
| | 8 | 0.165 | | |
| U | 2 | 1.4 | 0.27 | - |
| | 8 | 1.8 | | |
| Zn | 2 | 0.003 | 0.003 | - |
| | 8 | 0.008 | | |

* One analysis only. All other elements were analyzed six times at the 2 foot depth, and 12 times at the 8 foot depth. Lost Lake averages based on 3 determinations.

TABLE 5-4

**Average Concentrations and Total Inventory of Inorganics and Chlorinated Hydrocarbons in M-Area Settling Basin (1985)**

| | Concentration | | | | Inventory (kg)** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Liquid (mg/L) and Sludge (µg/g)* | | | Soil (µg/g) | Liquid and Sludge | | | | Soil |
| Constituent | Top 4 ft | Lower 10 ft | Sludge, 2 ft | Depth = 2 ft (U = 6 ft) | Top 4 ft | Lower 10 ft | Total | Sludge | Depth = 2 ft (U = 6 ft) |
| $NO_3$ (as N) | 174 | 351 | 7,130 | 35.5 | 1,390 | 7700 | 9,190 | 1,547 | 192 |
| $PO_4$ | 0.02 | 0.07 | 26,785 | 378 | 0.2 | 1.4 | 1.6 | 5,812 | 2,050 |
| $SO_4$ | 10.0 | 63 | 800 | 15.0 | 8.1 | 1,380 | 1,460 | 174 | 81.3 |
| Cl | 20.2 | 87.8 | 364 | 65.9 | 161 | 1,770 | 1,931 | 79 | 357 |
| F | 0.75 | 6.5 | <50 | 4.3 | 6.0 | 131 | 137 | | |
| B | <1.0 | 1.65 | 95 | 3.0 | <8.0 | 33.3 | <41.3 | | |
| $NH_4$ (as N) | 1.10 | 5.47 | 0.94 | 11.3 | 8.8 | 110 | 119 | 0.5 | 61.3 |
| Na | 531 | 1,815 | 44,226 | 1,116 | 4300 | 39,900 | 44,200 | 9,600 | 6,050 |
| K | 0.97 | 2.28 | 170 | 41.4 | 7.7 | 46.0 | 53.7 | 36.8 | 224 |
| Al | 151 | 609 | 102,880 | 3,256 | 1,200 | 13,400 | 14,600 | 22,324 | 17,650 |
| Fe | 0.048 | 0.195 | 5,900 | 13,407 | 0.38 | 3.9 | 4.3 | 1,280 | 72,670 |
| Cu | 0.012 | 0.148 | 231 | 2.5 | 0.10 | 3.0 | 3.1 | 50.1 | 13.6 |
| Ni | 0.029 | 0.165 | 16,520 | 9.7 | 0.23 | 3.3 | 3.5 | 3,585 | 52.8 |
| Zn | 0.003 | 0.008 | 230 | 3.5 | 0.02 | 0.16 | 0.18 | 50.0 | 18.7 |
| U | 1.4 | 1.8 | 18,000 | 54.4 | 11.2 | 36.3 | 47.5 | 3,900 | 885 |
| Pb | 0.042 | 0.223 | 440 | 10.1 | 0.33 | 4.5 | 4.8 | 95.7 | 54.6 |
| Hg (µg/L) | 0.717 | 0.445 | 1.3 | <0.20 | 0.006 | 0.009 | 0.015 | 0.3 | 1.1 |
| As | <0.001 | 0.001 | 0.13 | 0.13 | 0.008 | 0.02 | 0.03 | 0.03 | 0.7 |
| Cd | 0.003 | 0.014 | 2.3 | 1.0 | 0.02 | 0.28 | 0.30 | 0.6 | 5.4 |
| Cr | 0.004 | 0.004 | 110 | 14.7 | 0.03 | 0.08 | 0.11 | 240 | 79.6 |
| Ag | 0.001 | 0.004 | 5.5 | 0.06 | 0.008 | 0.08 | 0.10 | 1.2 | 0.3 |
| Ba | 0.004 | 0.004 | 157 | 2.55 | 0.03 | 0.08 | 0.10 | 34.1 | 13.8 |
| Mn | 0.005 | 0.019 | 104 | 13.1 | 0.04 | 0.38 | 0.42 | 22.7 | 71.2 |
| % Solids | - | - | 6.0 | - | - | - | - | - | - |
| Trichloroethylene | 0.060 | 0.150 | 0.19 | 0.020 | 0.48 | 3.2 | 3.7 | 0.04 | 0.11 |
| Tetrachloroethylene | 0.023 | 0.079 | 4.2 | 1.000 | 0.18 | 1.6 | 1.8 | 0.91 | 5.42 |
| 1,1,1-trichloroethane | 6.950 | 0.640 | 0.74 | 0.020 | 60 | 14 | 74 | 0.16 | <0.11 |

* µg/g of dried sludge

** Densities of liquid, dried sludge, and soil used were, respectively; 1.0, 1.0, and 1.5 g/cc

Calculations: Total liquid volume in basin ≅ $8 \times 10^6$ gallons
Top 4 feet = $8 \times 10^6$ gallons x 3.78 L/gal x 4/14 = $8.6 \times 10^6$ L
Bottom 10 feet = $21.6 \times 10^6$ L
Total sludge in basin equaled 2 feet x 6% solids = 217,000 kg
Total soil (2 feet deep) equaled 5,420,000 kg

**TABLE 5-5**

**Soil Inorganic Concentration Level Beneath the Overflow Ditch and Adjacent Seepage Area vs. Background Levels (1985)**

| | | Concentration (µg/g) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Background Levels | | | | | |
| | Sample | O.D. & Adjacent S.A. | | M-Basin Area* | | SRP** | | Southeastern USA*** | |
| Parameter | Depth (ft) | Average | Range | Average | Range | Average | Range | Average | Range |
| Ba | 0-0.5 | 16.8† | | 10.4 | 9.7-12.2 | - | - | 225 | 63-350 |
| | 0.5-1.5 | 66.6† | | | | | | | |
| Cr | 0.05 | 42.8 | 4.3-382 | 26.7 | 11.3-54.9 | 1 | - | 38 | 11-60 |
| | 0.5-1.5 | 16.3 | 6.8-24.5 | | | | | | |
| | 1.5-2.5 | 18.5 | 10.2-29.1 | | | | | | |
| | 2.5-3.5 | 18.3 | 10.2-30.8 | | | | | | |
| Cu | 0-0.5 | ~34.0†† | <2-330 | <2.0 | <2.0-<2.0 | 6 | 1-20 | 18 | 9-36 |
| | 0.5-1.5 | ~2.2 | <2-4.1 | | | | | | |
| | 1.5-2.5 | ~2.1 | <2-2.7 | | | | | | |
| | 2.5-3.5 | ~3.1 | <2-6.3 | | | | | | |
| Pb | 0-0.5 | ~66.1 | <2.0-486 | ~3.2 | <2.0-7.2 | 5.0 | <1-20 | 13 | 2.8-26 |
| | 0.5-1.5 | ~8.4 | <2.0-39.7 | | | | | | |
| | 1.5-2.5 | ~6.9 | <2.0-18.2 | | | | | | |
| | 2.5-3.5 | ~7.8 | <2.0-23.0 | | | | | | |
| Mg | 0-0.5 | 237 | 63.6-1698 | 70.2 | 28-167 | 96 | 50-450 | 160 | 25-250 |
| | 0.5-1.5 | 99 | 41.7-267 | | | | | | |
| | 1.5-2.5 | 81.2 | 39.4-200 | | | | | | |
| | 2.5-3.5 | 73.2 | 43.6-152 | | | | | | |
| Mn | 0-0.5 | 204 | 21.0-793 | 38.7 | 8.0-249 | 160 | 60-325 | 250 | 100-410 |
| | 0.5-1.5 | 126 | 22.0-712 | | | | | | |
| | 1.5-2.5 | 60.0 | 20.0-226 | | | | | | |
| | 2.5-3.5 | 40 | 16.5-92.2 | | | | | | |
| Ni | 0-0.5 | 670 | 5.9-8010 | ~2.1 | <2.0-4.0 | 14 | 6-42 | 10 | 2.8-18 |
| | 0.5-1.5 | ~18.1 | <2.0-87.2 | | | | | | |
| | 1.5-2.5 | ~16.3 | <2.0-42.8 | | | | | | |
| | 2.5-3.5 | 25.1 | 3.7-104 | | | | | | |
| U | 0-0.5 | ~849 | <10-8045 | <10 | <10-<10 | 2.0 | 1.6-5.5 | - | - |
| | 0.5-1.5 | ~30.6 | <10-174 | | | | | | |
| | 1.5-2.5 | ~27.0 | <10-110 | | | | | | |
| | 2.5-3.5 | ~32.5 | <10-84.2 | | | | | | |
| Zn | 0-0.5 | 20.8 | 5.9-160 | ~2.4 | <1.0-6.6 | 12 | 5-37 | 30 | <25-64 |
| | 0.5-1.5 | 7.1 | 2.6-12.1 | | | | | | |
| | 1.5-2.5 | 9.5 | 2.5-55.6 | | | | | | |
| | 2.5-3.5 | 5.8 | 2.7-8.7 | | | | | | |

* M-Basin reference background concentration levels, Table 5-9.

** "Elemental Cycling in Southern Pine Plantations with Nutrient and Heavy Metal Amendments, Annual Report FY-1982," USDA, Southeastern Forest Experiment Station (Ref. 12).

*** Georgia plow zone and "A" Horizon, Georgia and Kentucky (Ref. 13).

† Three analyses only

†† All averages calculated using < detection limit numbers equal to the detection limit (e.g., <2.0 = 2.0 to calculate average).

TABLE 5-6

**Metallic Analyses of Sludge in M-Area Settling Basin and Overflow Areas (1985)**

| | Concentration (µg/g)* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Settling Basin | | | Overflow Ditch | | | Seepage Area | | |
| Parameter | Average | No.** | Range | Average | No.** | Range | Average | No.** | Range |
| Ba | 157 | 2 | 121-193 | 139 | 1 | - | 69 | 1 | - |
| Be | 3.7 | 2 | 3.1-4.3 | 1.6 | 1 | - | <1.0 | 1 | - |
| Cd | ~2.3*** | 8 | <1.0-3.8 | ~2.0 | 8 | <1.0-2.8 | ~2.4 | 17 | <1.0-3.8 |
| Cr | 110 | 8 | 62.4-282 | 122 | 7 | 37-200 | 36.8 | 17 | 8.1-120 |
| Cu | 231 | 8 | 90-436 | 146 | 8 | 90-211 | 82.2 | 17 | 23-187 |
| Pb | 441 | 8 | 131-926 | 280 | 8 | 125-711 | 110 | 17 | 24-287 |
| Mg | 4290 | 8 | 800-10,190 | 2370 | 8 | 1060-3400 | 1740 | 17 | 422-3160 |
| Mn | 105 | 8 | 38-220 | 83 | 8 | 43-116 | 205 | 17 | 32.3-460 |
| Hg | 1.32 | 8 | 0.47-1.80 | 4.0 | 8 | 1.1-11.9 | 0.82 | 17 | 0.31-1.85 |
| Ni | 16,520 | 8 | 3290-33,980 | 6080 | 8 | 468-8700 | 5816 | 17 | 2000-10,400 |
| U | 18,000 | 8 | 2300-47,500 | 6800 | 8 | 3900-12,100 | 4300 | 16 | 770-7800 |
| Zn | 230 | 8 | 53-479 | 87 | 8 | 51-118 | 68.4 | 17 | 27.5-133 |

* µg/g of dried sludge

** Number of analyses

*** All averages calculated using < detection limits equal to the detection limit.

TABLE 5-7

**Soil Inorganic Concentration Levels Beneath the Seepage Area vs. Background Levels (1985)**

| | | Concentration (µg/g) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Background Levels | | | | | |
| | Sample | Seepage Area | | M-Basin Area* | | SRP** | | Southeastern USA*** | |
| Parameter | Depth (ft) | Average | Range | Average | Range | Average | Range | Average | Range |
| Pb | 0-0.5 | ~3.2† | <2.0-7.1 | ~3.2 | <2.0-7.2 | 5.0 | <1-20 | 13 | 2.8-26 |
| Mg | 0-1.0 | 123.9 | 61.8-225 | 70.2 | 28-167 | 96 | 50-450 | 160 | 25-250 |
| Mn | 0-1.0 | 215 | 100-432 | 38.7 | 8.0-249 | 160 | 60-325 | 250 | 100-410 |
| Ni | 0-1.0 | ~52.7† | <2.0-122 | ~2.1 | <2.0-4.0 | 14 | 6-42 | 10 | 2.8-18 |
| U | 0-1.0 | ~74.3† | <10-147 | <10 | <10-<10 | 2.0 | 1.6-5.5 | - | - |
| Zn | 0-1.0 | 5.7 | 2.2-8.8 | ~2.4 | <1.0-6.6 | 12 | 5-37 | 30 | <25-64 |

* M-Basin reference background concentration levels, Table 5-9.

** "Elemental Cycling in Southern Pine Plantations with Nutrient and Heavy Metal Amendments, Annual Report FY-1982,"USDA, Southeastern Forest Experiment Station (Ref. 12).

*** Georgia plow zone and "A" Horizon, Georgia and Kentucky (Ref. 13).

† Averages calculated assuming < detection limit numbers were equal to the detection limit.

TABLE 5-8

Soil Inorganic Concentration Levels Beneath Lost Lake vs. Background Levels (1985)

| | | Concentration (µg/g) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lost Lake Contour | | | | Background Levels | | | | | |
| | Sample | 338-336 | | <336 | | M-Basin Area* | | SRP** | | Southeastern USA*** | |
| Parameter | Depth (ft) | Average | Range | Average | Range | Average | Range | Average | Range | Average | Range |
| Ba | 0-0.5 | 119† | | 224† | | 10.4 | 9.7-12.2 | - | - | 225 | 63-350 |
| | 0.5-1.5 | 168† | | 144† | | | | | | | |
| Cu | 0-0.5 | 6.6 | 2.5-9.9 | 12.4 | 8.8-14.5 | <2.0 | <2.0-22.0 | 6 | 1-20 | 18 | 9-36 |
| | 0.5-1.5 | ~8.4†† | <2.0-14.8 | 11.6 | 7.6-17.2 | | | | | | |
| Pb | 0-0.5 | 7.0 | 3.2-11.8 | 17.1 | 5.6-40.1 | ~3.2 | <2.0-7.2 | 5.0 | <1-20 | 13 | 2.8-26 |
| | 0.5-1.5 | 4.3 | 2.2-9.8 | 5.1 | 2.9-8.3 | | | | | | |
| Mg | 0-0.5 | 161 | 64.0-271 | 310 | 275-364 | 70.2 | 28-167 | 96 | 50-450 | 160 | 25-250 |
| | 0.5-1.5 | 199 | 85.0-342 | 235 | 181-302 | | | | | | |
| Mn | 0-0.5 | 70.5 | 8.1-212 | 191 | 41.3-348 | 38.7 | 8.0-249 | 160 | 60-325 | 250 | 100-410 |
| | 0.5-1.5 | 48.6 | 6.2-103 | 103 | 26.2-228 | | | | | | |
| Ni | 0-0.5 | ~9.4 | <2.0-32.2 | 8.5 | 6.6-10.5 | ~2.1 | <2.0-4.0 | 14 | 6-42 | 10 | 2.8-18 |
| | 0.5-1.5 | 5.4 | 2.7-11.1 | 5.8 | 4.3-8.9 | | | | | | |
| U | 0-0.5 | ~14.2†† | <10-45.0 | <10.3†† | <10-12 | <10 | <10-<10 | 2.0 | 1.6-5.5 | - | - |
| | 0.5-1.5 | <10.0 | <10-<10 | <10.0 | <10-<10 | | | | | | |
| Zn | 0-0.5 | 6.8 | 2.1-13.8 | 14.2 | 9.4-21.2 | ~2.4 | <1.0-6.6 | 12 | 5-37 | 30 | <25-64 |
| | 0.5-1.5 | 5.5 | <1.0-10.6 | 7.7 | 4.3-11.5 | | | | | | |

* M-Basin reference background concentration levels, Table 5-9.

** "Elemental Cycling in Southern Pine Plantations with Nutrient and Heavy Metal Amendments, Annual Report FY-1982," USDA, Southeastern Forest Experiment Station (Ref. 12).

*** Georgia plow zone and "A" Horizon, Georgia and Kentucky (Ref. 13).

† Three analyses only

†† Averages calculated assuming < detection limit numbers were equal to the detection limit.

**TABLE 5-9**

**Inorganic Background Reference Concentration Levels**

| Constituent | M Area (µg/g) Reference* Background (1985) Avg. | No. | Range | Hollod** Study (1982) Avg. | No. | Range | SRP (µg/g) SPES Nutrient Cycling Studies*** Avg. | No. | Range | Southeastern USA† (µg/g) Avg. | No. | Range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ag | <1.0 | 2 | - | - | | | - | | | <0.5 | 1 | - |
| Al | 8239 | 31 | 2430-26,210 | 1,700 | 8 | 700-2,200 | 13,000 | 19 | 7,000-24,000†† | 25,000 | 6 | 900-46,000 |
| As | 2.7 | 3 | 2.6-2.8 | - | | | - | | | 5.4 | 1 | - |
| Ba | 10.4 | 3 | 9.7-12.2 | - | | | - | | | 225 | 6 | 63-350 |
| Ca | 93.9 | 31 | 27.5-380 | - | | | 108 | 90 | 50-500 | 1400 | 6 | 800-2600 |
| Cd | <1.0 | 31 | <1.0-<1.0 | - | | | 1 | 2 | - | <1 | 1 | - |
| Cl | 10.8 | 27 | 3.1-19.5 | - | | | - | | | - | | |
| Cr | 26.7 | 31 | 11.3-54.9 | - | | | 1 | 2 | - | 38 | 6 | 11-60 |
| Cu | <2.0 | 31 | <2.0-<2.0 | 1.2 | 8 | 0.9-1.9 | 6 | 90 | 1-20 | 18 | 6 | 9-36 |
| Fe | 22,250 | 31 | 5015-43,685 | 11,000 | 8 | 1500-17,500 | 1200 | 90 | 200-2000 | 15,000 | 5 | 500-21,000 |
| Hg | ~0.20†† | 28 | <0.20-0.21 | - | | | - | | | 0.10 | 1 | - |
| K | 61.4 | 32 | 40-134 | 20 | 8 | 12-26 | 180 | 90 | 50-600 | 10,000 | 6 | 800-12,000 |
| Mg | 70.2 | 31 | 28-167 | - | | | 96 | 90 | 50-450 | 160 | 6 | 25-250 |
| Mn | 38.7 | 31 | 8.0-249 | - | | | 160 | 90 | 60-325 | 250 | 4 | 100-410 |
| Na | 79.0 | 31 | 70-124 | 70 | 8 | 30-120 | 110 | 19 | 85-185†† | 220 | 4 | <200-2500 |
| $NH_4$ (as N) | ~2.0†† | 28 | <1.5-6.6 | - | | | 10 | 20 | 5-21 | - | | |
| Ni | ~2.12†† | 31 | <2.0-4.0 | 0.65 | 8 | 0.2-1.2 | 14 | 90 | 6-42 | 10 | 6 | 2.8-18 |
| $NO_3$ (as N) | ~0.66†† | 27 | <0.56-3.34 | - | | | 3 | 20 | 1-26 | - | | |
| Pb | ~3.21†† | 31 | <2.0-7.2 | 3.4 | 8 | 1.2-5.3 | 5.0 | 90 | <1-20 | 13 | 6 | 2.8-26 |
| $SO_4$ | 6.0 | 2 | 5.6-6.3 | - | | | - | | | - | | |
| $PO_4$ | 150 | 29 | 90-220 | - | | | - | | | 750 | 6 | 200-1200 |
| U | <10.0 | 31 | <10-<10 | <0.2 | 8 | <0.2-<0.2 | 2.0 | 19 | 1.6-5.5 | - | | |
| Zn | ~2.41†† | 31 | <1.0-6.6 | 0.9 | 8 | 0.4-1.7 | 12 | 90 | 5-37 | 30 | 6 | <25-64 |

* Average concentration and range determined from four test cores; 2 cores close to M-Area basin (20 ft deep), 2 cores close to Lost Lake (10 ft deep). No. refers to number of analyses.

** Background concentrations of metals in soil cores collected near M Area, DPST-82-721 (Ref. 2). No. refers to number of analyses.

*** "Elemental Cycling in Southern Pine Plantations," Orangeburg, Fuquay, and Dothan series soil types (Ref. 12). No. refers to number of analyses.

† Background Geochemistry, Georgia plow zone and "A" Horizon, Georgia and Kentucky (Ref. 13). No. refers to number of studies.

†† All averages calculated using < detection limits as if they were equal to the detection limit.

TABLE 5-10

**Inventory (kg) of Inorganic Materials in Overflow Ditch, Seepage Area, and Lost Lake (1985)***

| Area | Overflow Ditch | | Seepage Area | | | Lost Lake | | |
|---|---|---|---|---|---|---|---|---|
| | Soil | Sludge | Soil | | Sludge | Soil | | |
| | | | Nearest to Ditch | Remainder | | 338-340 | 338-336 | <336 |
| Depth (ft) | 6 | - | 6 | 2 | - | 0.17 | 0.50 | 1.0 |
| Area (acres) | 0.25 | 0.25 | 0.45 | 2.5 | 2.9 | 8.0 | 10.8 | 6.2 |
| kg material (x $10^6$) | 2.06 | 0.013 | 5.0 | 9.2 | 0.11 | 2.26 | 12.7 | 14.5 |
| Parameter | | | | | | | | |
| Silver | 3.1 | 0.19 | - | - | 1.20 | 2.3 | 13 | 15 |
| Aluminum | 20700 | 1201 | 53200 | 109400 | 8051 | 19,000 | 150600 | 351600 |
| Arsenic | 1.2 | - | - | 12 | 0.01 | 0.3 | 2 | 2 |
| Barium | 100 | 1.85 | - | 481 | 7.45 | 194 | 1511 | 2800 |
| Calcium | 1250 | 506 | 3980 | 7816 | 2101 | 385 | 11000 | 13300 |
| Cadmium | 2.1 | 0.03 | 5.0 | 9 | 0.26 | 2.3 | 13 | 15 |
| Chlorine | 33.3 | 0.96 | 136 | 182 | 4.25 | 26.3 | 269 | 336 |
| Chromium | 34.1 | 2.53 | 62 | 63 | 3.65 | 15.6 | 142 | 305 |
| Copper | 5.2 | 1.86 | 11.9 | 19 | 8.42 | 6.2 | 83 | 175 |
| Iron | 21100 | 32.4 | 49500 | 43266 | 214 | 2700 | 30650 | 56400 |
| Mercury | 0.4 | 0.05 | 1.2 | 2 | 0.08 | 0.5 | 3 | 3 |
| Potassium | 167 | 1.60 | 500 | 963 | 15.4 | 180 | 1840 | 3867 |
| Magnesium | 131 | 30.8 | 500 | 1201 | 176 | 220 | 2138 | 4007 |
| Manganese | 73.3 | 1.09 | 700 | 1988 | 22.5 | 184 | 1140 | 1667 |
| Sodium | 936 | 96.9 | 2560 | 4741 | 551 | 311 | 3400 | 4066 |
| Ammonia (as nitrogen) | 24 | 0.23 | 33 | 84 | 3.11 | 18 | 404 | 577 |
| Nickel | 49 | 81.0 | 138 | 372 | 595 | 4.7 | 87 | 103 |
| Nitrate (as nitrogen) | 73 | 5.00 | 75 | 173 | 42.8 | 15 | 95 | 18 |
| Lead | 19.4 | 3.49 | 32 | 33 | 11.1 | 6.2 | 85 | 155 |
| Sulphate | 52.3 | 3.38 | - | 314 | 31.8 | 76 | 389 | 461 |
| Phosphate | 714 | 351 | 2200 | 4100 | 1842 | 312 | 3258 | 3793 |
| Uranium | 84.3 | 86.2 | 334 | 780 | 439 | 23 | 190 | 147 |
| Zinc | 11.9 | 1.14 | 28 | 55 | 7.02 | 6.6 | 82 | 154 |

* Not corrected for background concentrations.

TABLE 5-11

Influent and Effluent Analyses from M-Area Settling Basin, Winter/Spring 1985

| Date Sampled | Concentration, Influent/Effluent 3/7/85 | 3/14/85 | 3/21/85 | 3/28/85 | 4/4/85 | 4/11/85 | 4/18/85 | 4/25/85 | 5/2/85 | Average | Standard Deviation | Settling Basin Average Removal Efficiency (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| pH | 9.2 | 10.65 | 12.2 | 12.4 | - | 10.7 | 10.5 | 12.3 | 10.0 | 11.0 | 1.2 | - |
| | 9.3 | 9.85 | 10.4 | 10.5 | 10.6 | 10.9 | 10.5 | 10.6 | 10.8 | 10.4 | 0.50 | |
| Specific conductivity (μmhos/cm) | 2240 | 2390 | 7910 | 18490 | 8690 | 2540 | 7570 | 10410 | 3300 | 7060 | 5300 | 64.7 |
| | 1150 | 1709 | 1877 | 2320 | 2980 | 3570 | 3390 | - | 2900 | 2490 | 860 | |
| Total dissolved solids (mg/L) | 2486 | 6358 | 4870 | - | - | 2010 | 7044 | 5838 | 3334 | 4560 | 2000 | 50.7 |
| | 1134 | 1538 | 1556 | 1948 | - | 2908 | 3326 | 2618 | 2992 | 2250 | 810 | |
| $NO_3^-$ (as N) (mg/L) | 235 | 380 | 425 | 218.2 | 196.6 | 185 | 759 | 391 | 456 | 361 | 180 | 56.7 |
| | 125 | 150 | 143.9 | 165 | - | 145 | 220 | 231 | 269 | 156 | 70 | |
| $PO_4^{\equiv}$ (as P) (mg/L) | 70.9 | 62.5 | - | 45.1 | 30.8 | 39.7 | - | 22.3 | 92.9 | 52.0 | 25 | 55.4 |
| | 12.2 | 13.9 | 17.25 | 22.6 | 32.7 | 34.0 | 26.4 | 25.6 | 23.8 | 23.2 | 7.6 | |
| $Cl^-$ (mg/L) | 12.1 | 9.30 | 7.30 | 7.10 | 12.63 | 22.34 | 2.93 | 7.77 | 11.66 | 10.3 | 5.4 | <1 |
| | 5.94 | 5.40 | 7.20 | 7.50 | 20.40 | 5.83 | 6.74 | 16.51 | 19.42 | 10.4 | 6.4 | |
| Al (mg/L) | 14.6 | 82.1 | 93.3 | 402 | 367 | 142 | 186 | 188 | 129 | 178 | 130 | 26.4 |
| | 30.4 | 68.8 | 173 | 44.9 | 155 | 226 | 163 | 137 | 181 | 131 | 67 | |
| Cu (mg/L | 0.167 | 0.054 | 0.015 | 0.220 | 0.322 | 0.116 | 0.116 | 0.021 | 0.086 | 0.124 | 0.10 | 76.7 |
| | 0.011 | 0.010 | 0.122 | 0.011 | 0.025 | 0.028 | 0.027 | 0.012 | 0.014 | 0.0289 | 0.036 | |
| Pb (mg/L) | 0.396 | 0.026 | 0.011 | 0.259 | 1.634 | 0.642 | 0.412 | 0.102 | 0.177 | 0.407 | 0.50 | 71.0 |
| | 0.008 | 0.006 | 0.934 | 0.011 | 0.018 | 0.027 | 0.017 | <0.004 | 0.037 | 0.110 | 0.31 | |
| Ni (mg/L) | 0.247 | 2.81 | 0.169 | 11.7 | 11.3 | 10.3 | 6.84 | 0.480 | 9.72 | 5.95 | 5.0 | 90.4 |
| | 0.533 | 0.245 | 3.15 | 0.117 | 0.542 | 0.255 | 0.118 | 0.104 | 0.095 | 0.573 | 0.98 | |
| U (mg/L) | 20.0 | 12.5 | 37.5 | 3.5 | 185.0 | 25.0 | 3.80 | 161.3 | 9.30 | 50.9 | 70 | <1 |
| | 17.0 | 18.0 | 115.0 | 175.0 | 48.5 | 90.0 | 42.5 | 47.8 | 46.8 | 66.7 | 51 | |
| K (mg/L) | 426 | 71.4 | 90.3 | 4041 | 1675 | 313 | 1926 | 1942 | 93.7 | 1175 | 1300 | 68.6 |
| | 62.8 | 90.3 | 1596 | 225 | 236 | 277 | 263 | 267 | 303 | 369 | 470 | |

TABLE 5-11, Contd

Influent and Effluent Analyses from M-Area Settling Basin, Winter/Spring 1985

| Date Sampled | Concentration, Influent/Effluent 3/7/85 | 3/14/85 | 3/21/85 | 3/28/85 | 4/4/85 | 4/11/85 | 4/18/85 | 4/25/85 | 5/2/85 | Average | Standard Deviation | Settling Basin Average Removal Efficiency (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cd (mg/L) | 0.004 | 0.003 | <0.001 | 0.007 | 0.007 | 0.003 | 0.004 | 0.004 | 0.005 | <0.004 | 0.002 | >25.0 |
| | <0.002 | <0.001 | 0.001 | 0.003 | 0.003 | 0.003 | 0.002 | 0.004 | 0.004 | <0.003 | 0.001 | |
| Cr (mg/L) | 0.114 | 0.023 | <0.004 | 0.020 | 0.056 | 0.014 | 0.025 | <0.004 | 0.073 | <0.037 | 0.037 | >83.8 |
| | <0.004 | <0.004 | 0.022 | <0.004 | <0.004 | <0.004 | 0.025 | <0.004 | 0.073 | <0.00600 | 0.0060 | |
| Hg (µg/L) | 0.610 | <0.200 | <0.200 | 0.250 | 0.220 | 0.380 | 0.220 | <0.200 | <0.200 | <0.276 | 0.14 | >22.1 |
| | 0.260 | <0.200 | 0.220 | <0.200 | <0.200 | 0.250 | <0.200 | <0.200 | <0.200 | <0.215 | 0.024 | |
| Fe (mg/L) | 2.37 | 0.870 | 0.079 | 2.11 | 3.35 | 1.43 | 1.42 | 0.364 | 1.30 | 1.48 | 1.0 | 84.6 |
| | 0.110 | 0.041 | 1.39 | 0.026 | 0.203 | 0.130 | 0.062 | 0.037 | 0.050 | 0.228 | 0.44 | |
| Zn (mg/L) | 0.212 | 0.125 | 0.055 | 0.200 | 0.227 | 0.141 | 0.123 | 0.044 | 0.140 | 0.141 | 0.065 | >82.9 |
| | 0.010 | 0.006 | 0.108 | 0.044 | 0.027 | 0.013 | 0.005 | <0.002 | <0.002 | <0.0241 | 0.03 | |
| Mn (mg/L) | 0.066 | 0.015 | 0.005 | 0.039 | 0.051 | 0.029 | 0.034 | 0.018 | 0.049 | 0.0340 | 0.020 | 75.8 |
| | 0.005 | 0.003 | 0.032 | 0.003 | 0.006 | 0.008 | 0.005 | 0.006 | 0.006 | 0.00822 | 0.0091 | |
| Mg (mg/L) | 0.621 | 0.088 | 0.019 | 0.083 | 0.108 | 0.125 | 0.084 | 0.099 | 0.660 | 0.210 | 0.25 | 75.6 |
| | 0.130 | 0.026 | 0.073 | 0.035 | 0.016 | 0.010 | 0.009 | 0.071 | 0.092 | 0.0513 | 0.042 | |
| Na (mg/L) | 251 | 589 | 361 | 466 | 658 | 383 | 270 | 171 | 725 | 430 | 190 | <1 |
| | 232 | 304 | 333 | 490 | 526 | 698 | 587 | 459 | 528 | 462 | 148 | |
| Ca (mg/L) | 9.30 | 0.171 | 0.046 | 0.084 | 0.152 | 0.228 | 0.066 | 1.58 | 5.76 | 1.93 | 3.3 | 77.6 |
| | 1.85 | 0.026 | 0.073 | 0.031 | 0.030 | 0.027 | 0.022 | 0.912 | 0.928 | 0.433 | 0.66 | |
| 1,1,1-trichloroethane (µg/L) | 183.0 | 218.0 | 225.0 | 113.0 | 78.0 | 217.0 | 15.0 | 183.0 | 66.0 | 144 | 79 | <1 |
| | 73.0 | 181.0 | 120.0 | 161.0 | 189.0 | 283.0 | 167.0 | 66.0 | 115.0 | 151 | 67 | |
| Trichloroethylene (µg/L) | <5.0 | 6.0 | 51.0 | <5.0 | 7.0 | 7.0 | <5.0 | 7.0 | <5.0 | <10.9 | 15 | <1 |
| | <5.0 | 30.0 | 7.0 | 16.0 | 17.0 | 15.0 | 28.0 | 13.0 | 30.0 | <17.9 | 9.5 | |
| Tetrachloroethylene (µg/L) | <5.0 | <5.0 | 41.0 | <5.0 | 8.0 | <5.0 | 9.0 | <5.0 | 7.0 | <10.0 | 12 | >7.8 |
| | <5.0 | 26.0 | <5.0 | 10.0 | 6.0 | 8.0 | 8.0 | 6.0 | 9.0 | <9.22 | 6.5 | |

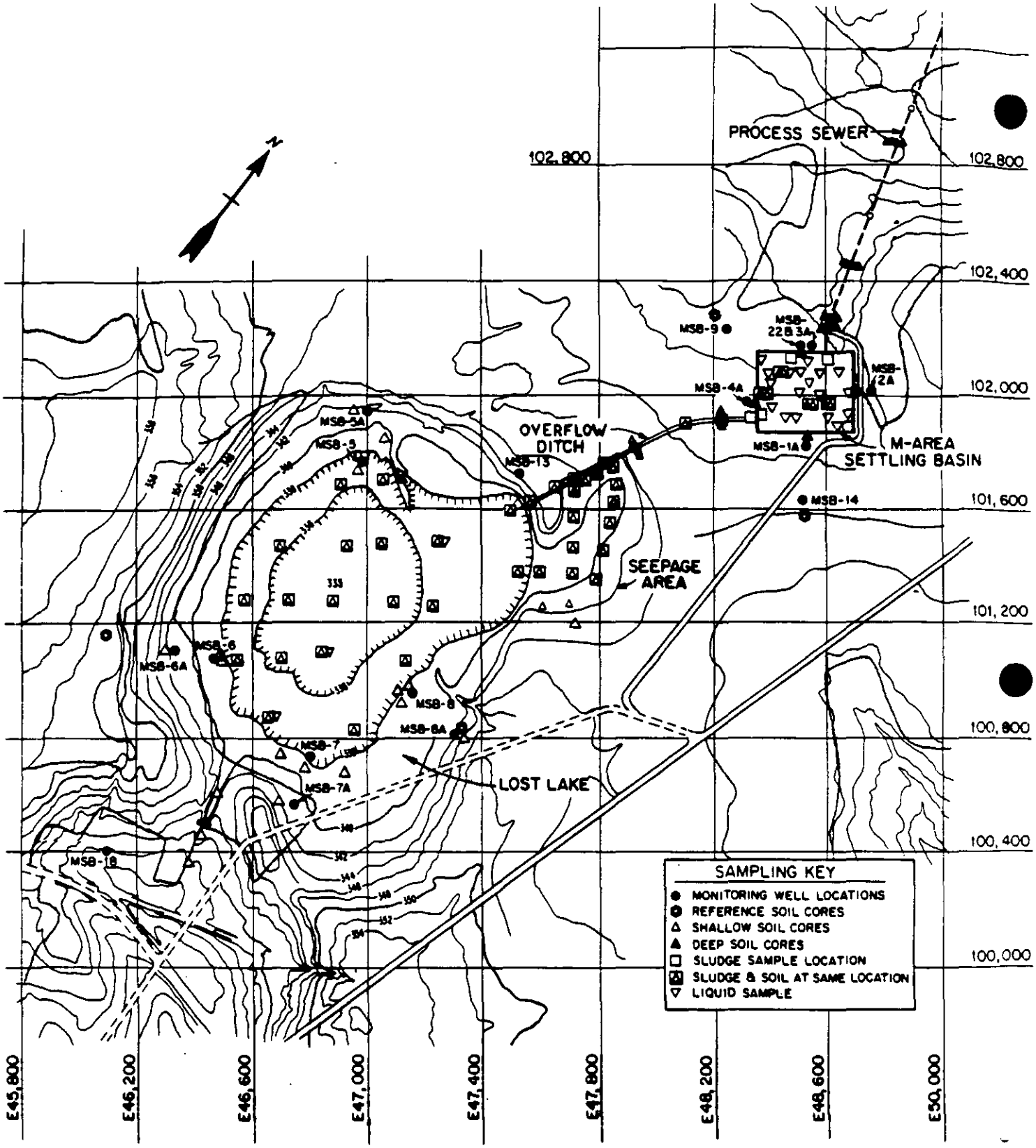



**FIGURE 5-1. Overview of Sample Sites for Extended Characterization Program (1985)**

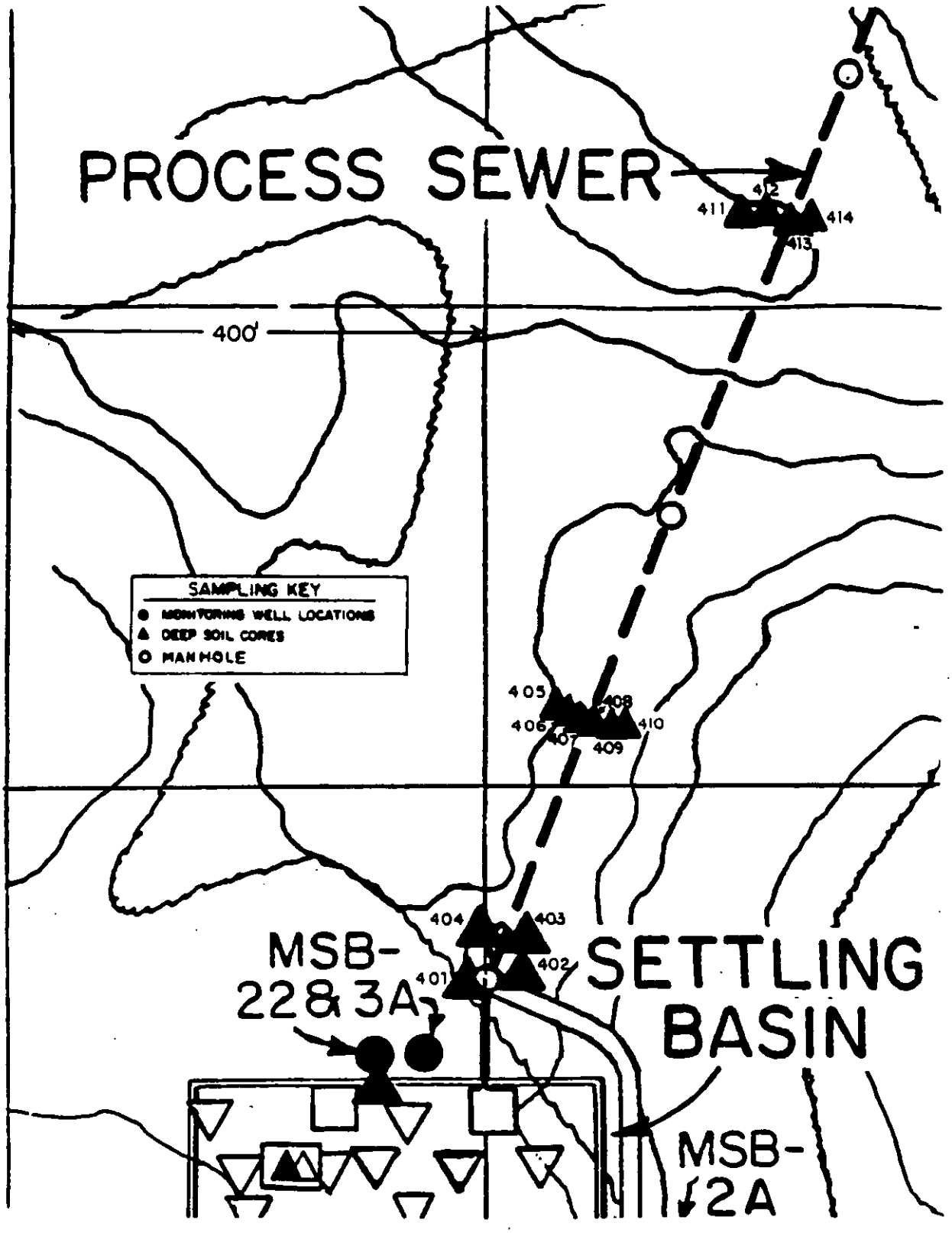



FIGURE 5-2. Inlet Process Sewer Line Sampling Locations (1985)

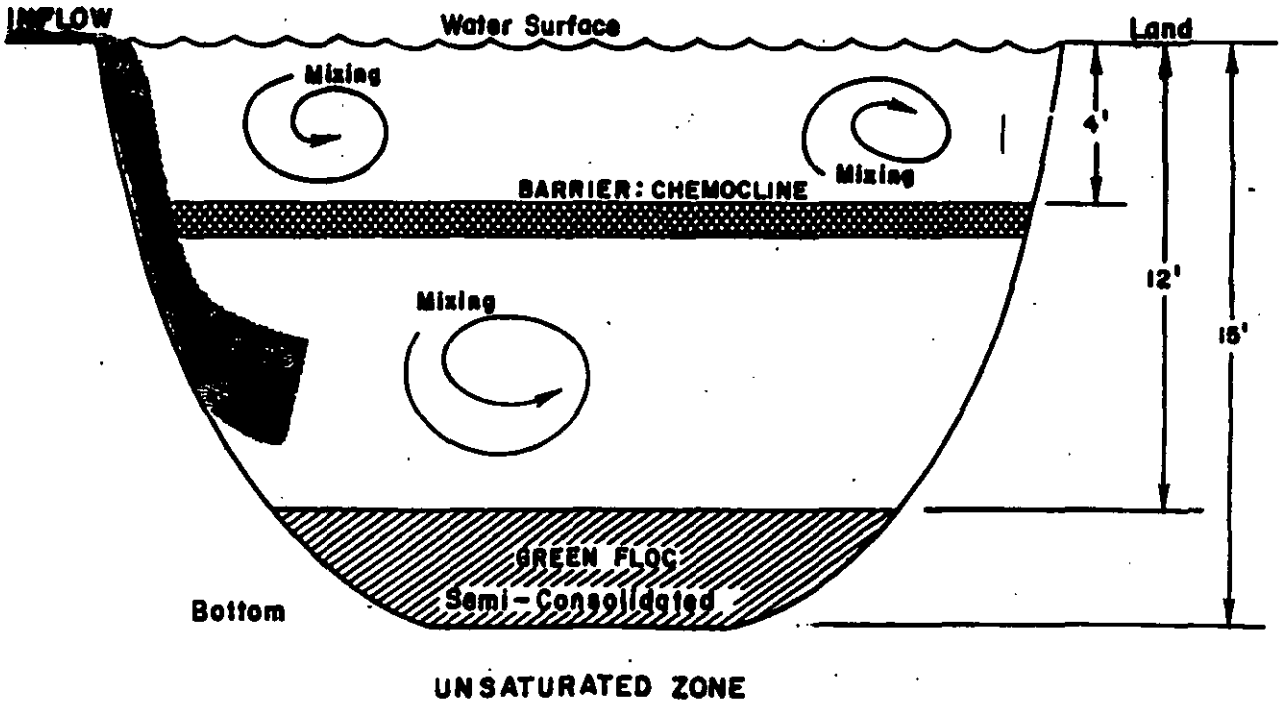



FIGURE 5-3. Side View of the H-Area Settling Basin (February 1982) (Reference 1, Hollod, 1982)

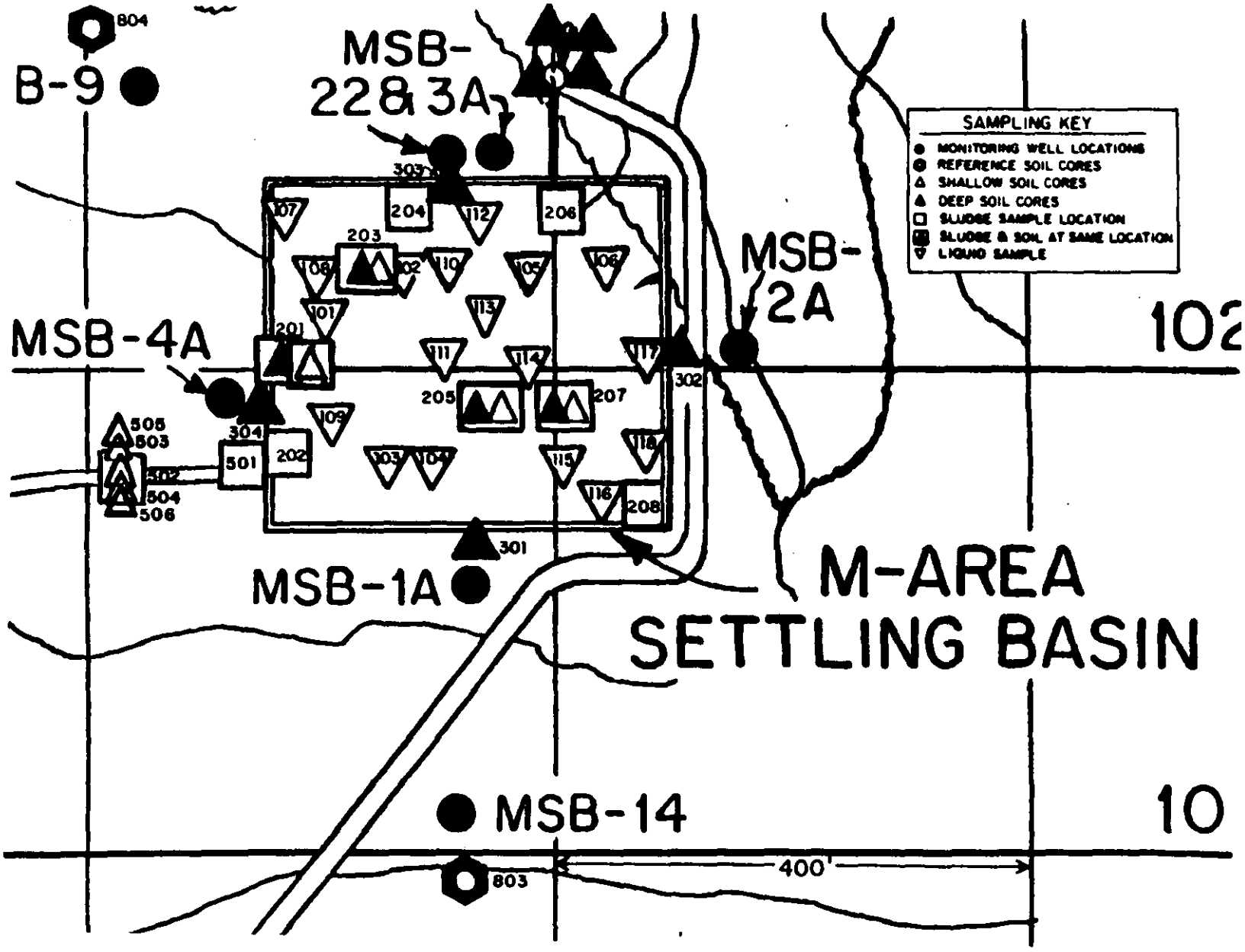



FIGURE 5-4. M-Area Settling Basin Sampling Locations (1985)

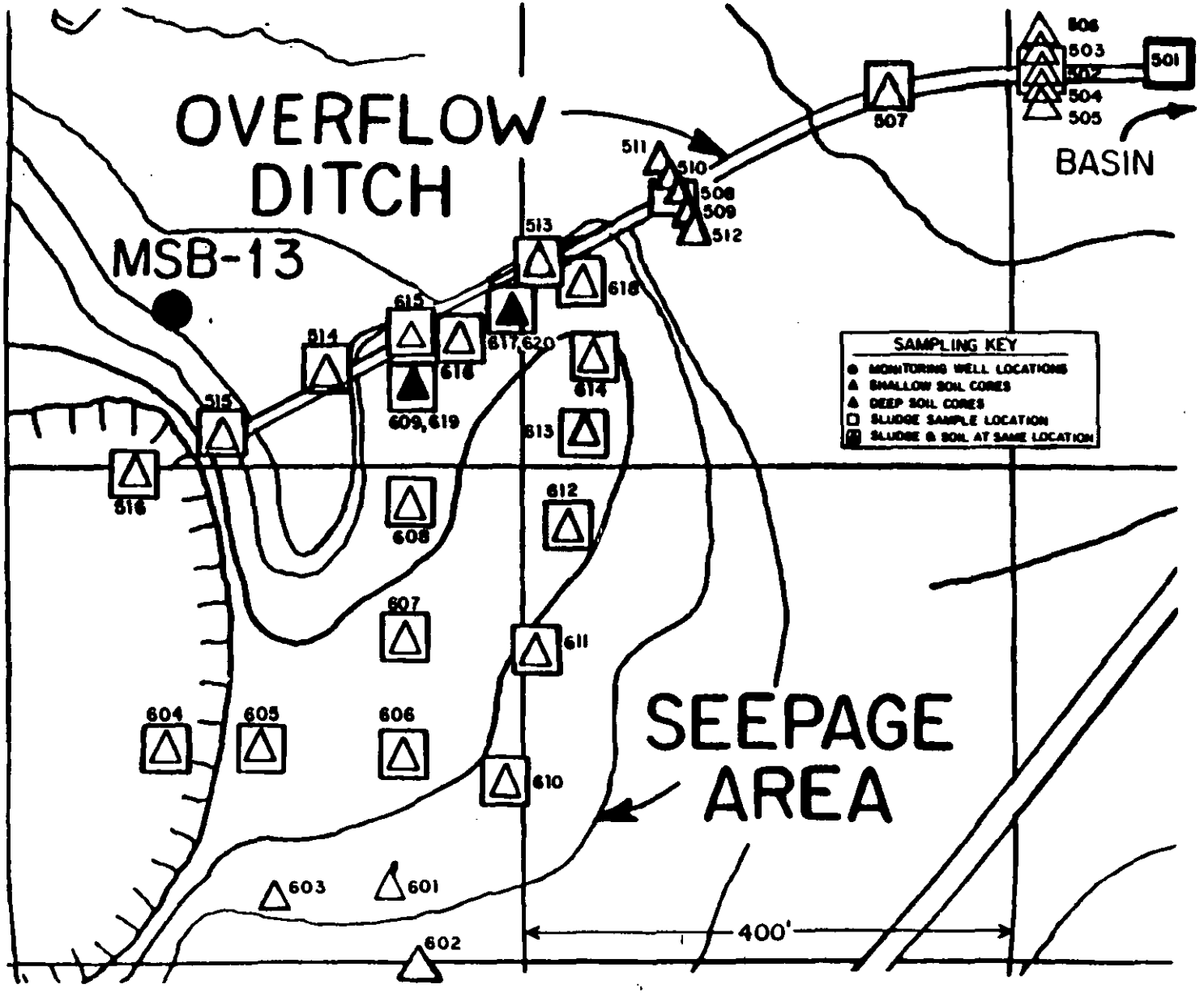



FIGURE 5-5. Overflow Ditch and Seepage Area Sampling Locations (1985)

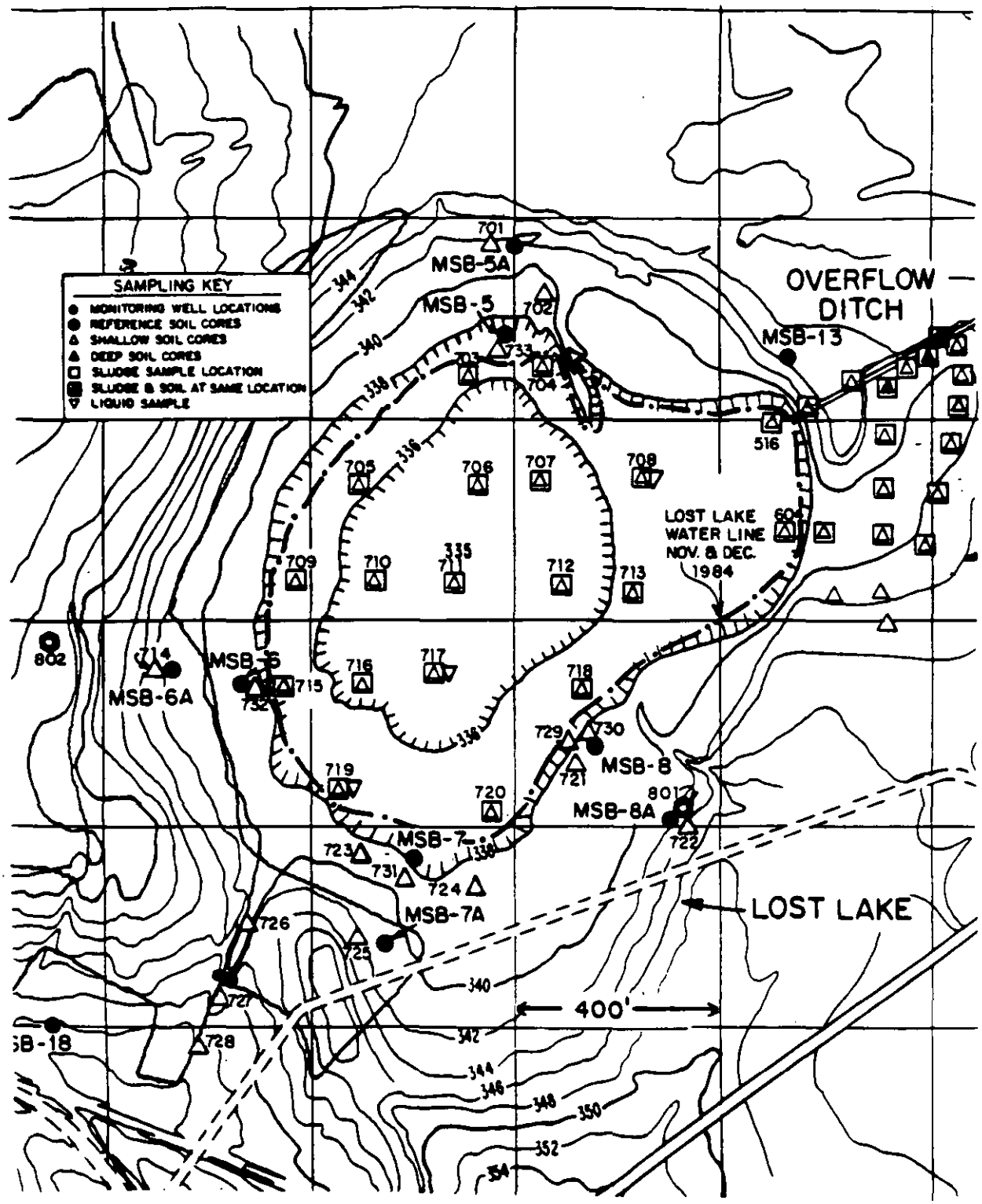



FIGURE 5-6. Lost Lake Sampling Locations (1985)

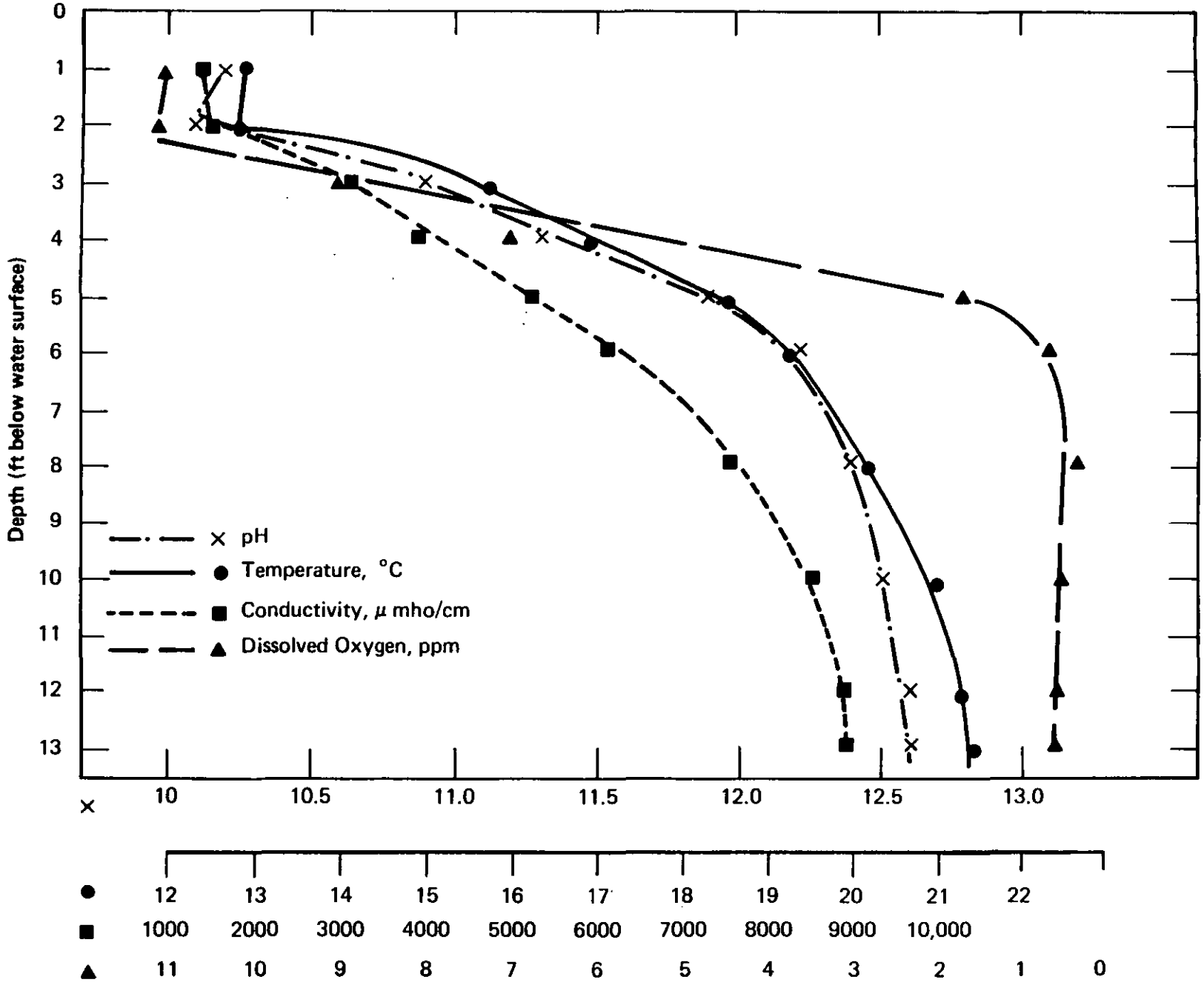



**FIGURE 5-7. Water Profile in the M-Area Settling Basin (December 1984)**

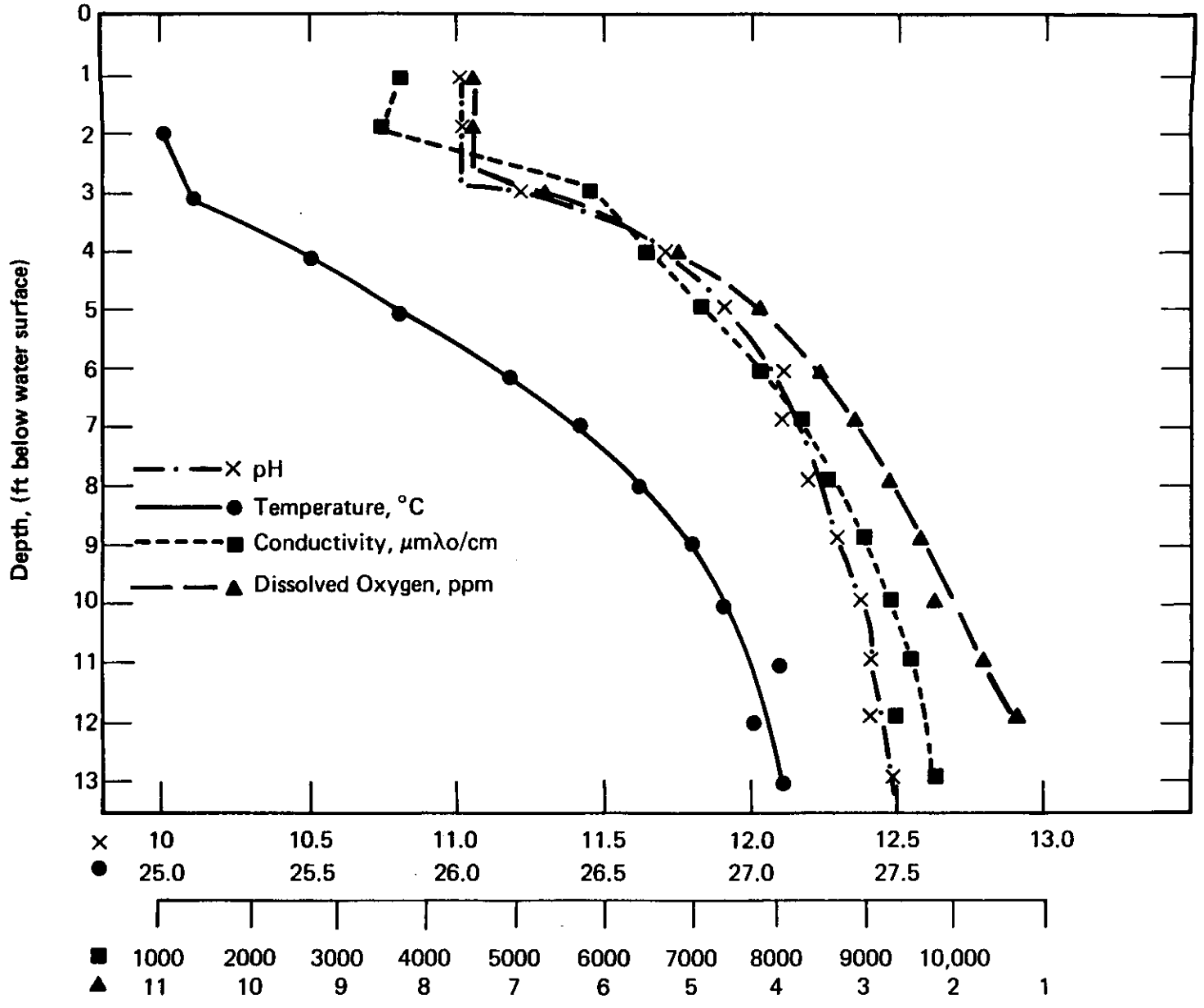



**FIGURE 5-8. Water Profile in the M-Area Settling Basin (April 1985)**

# 6.0 ANALYTICAL RESULTS

## 6.1 Data Management

Envirodyne Engineers, Inc. keypunched all the analytical data that they generated and provided Du Pont with the magnetic tape encoded with the analytical results. Du Pont read the tape into a SAS (Statistical Analysis System — SAS Institute, Inc.) dataset on the IBM mainframe computer; and the SAS data management program was used to archive, sort, plot, and tabulate these data.

## 6.2 Quality Assurance

### Data Management

Envirodyne's data management team proofread the coding forms and validated entries prior to submitting the tape to Du Pont. After reading the tape into the SAS dataset, the author of the report checked each data entry for internal agreement with all the other data.

### Laboratory Analysis

A discussion of analytical procedures and the quality assurance program utilized by Envirodyne can be found in Appendix E. Envirodyne's "M-Area Settling Basin QC Plan" is given in Reference 1.

## 6.3 Tabulation of Data

All of the data generated in the program has been compiled and condensed into a series of tables, which are presented in this chapter. In addition, SAS (Statistical Analysis System) was utilized to plot a number of the data sets as cross sectional depth profiles. Top level surface concentrations of selected inorganic and organic materials in the seepage and Lost Lake areas are plotted in Figures 6-1 through 6-19. Each of the various areas in the study was assigned a code number, and these code numbers are summarized below:

| Identification | Location |
|---|---|
| MBL-100 | 101 thru 118 were liquid samples from the settling basin, 119, 120, and 121 were from Lost Lake |
| MBC-200 | Sludge and soil from bottom of settling basin |

| Identification | Location |
|---|---|
| MBC-300 | Four soil boring locations around periphery of basin |
| MBC-400 | Process sewer line soil cores |
| MBC-500 | Overflow ditch, sludge and soil |
| MBC-600 | Seepage area, sludge and soil |
| MBC-700 | Lost Lake area soil samples |
| MBC-800 | Reference background soil corings 801 and 802 near Lost Lake; 803 and 804 near basin. |

All depths in this report are reported from the soil surface, or from the sludge-soil interface. All sludge samples were assigned a negative depth (in feet). For example, the samples taken at location MBC-203 were a sludge sample 4-inches thick (-0.3 feet), and six consecutive one foot soil samples, with the 0 to 1.0 foot soil sample starting at the sludge/soil interface. The analytical detection limits are indicated by negative concentration values; i.e., -2.0 µg/g means that the concentration was less than the detection limit of 2.0 µg/g for that analyte. If no value is given in a table, then that analysis was not run on that sample.

Each of the tables of data is briefly described below.

**M-Area Seepage Basin Field Data (Table 6-1)**

The field data generated during the collection of each sample is compiled in this table.

**Limited Inorganic Analyses of Sediments and Sludges (Table 6-2)**

The limited (Type "E") inorganic analyses of the sediments and sludges are compiled in Table 6-2.

**Full Inorganic Analyses of Sediments and Sludges (Table 6-3)**

Nineteen soil (or sludge) samples were analyzed for a more comprehensive set of inorganic constituents (Type "B"). These data are in Table 6-3.

**Limited Inorganic Analyses of Sludges (Table 6-4)**

The limited inorganic analysis data for all the sludge samples have been extracted from Table 6-2, and compiled into a separate table, Table 6-4. This allows the chemical makeup of the sludge samples from each of three areas (basin, overflow ditch, and seepage area) to be easily compared.

**Organic Analytes Detected and Not Detected in Soils and Sludges (Table 6-5)**

Those organic compounds which were either detected or not detected are listed in Table 6-5. The detection limit for each compound is shown.

**Organic Analytes Detected in Laboratory Blanks Run With Soils and Sludges (Table 6-6)**

The analytical laboratory periodically analyzed a "blank" sample as a quality control procedure. The soil/sludge laboratory blank values for organic compounds are given in Table 6-6.

**Analyses of Sediments and Sludges for Five Volatile Organics (Table 6-7)**

The majority of the samples were analyzed for volatile organic constituents (nineteen soil samples were analyzed for Appendix VIII organics). Of the volatile organic compounds, only five were frequently detected at concentrations above detection limit or laboratory blank. These five volatile organic compounds are shown in Table 6-7.

**Analyses for Other Volatile Organics Which Were Occasionally Found in Sediments and Sludges (Table 6-8)**

The remainder of the volatile organic constituents are shown in Table 6-8. Most of the compounds were infrequently found above the detection limit, hence most of the values are negative numbers (i.e., -10 means less than the detection limit of 10 ng/g).

**Appendix VIII Organic Scan of Sediments and Sludges (Table 6-9)**

Nineteen soil (or sludge) samples were subjected to a GC/MS scan for Appendix VIII organic compounds. All of the organic compounds which were detected in these 19 samples are given in Table 6-9.

**Inorganic Analyses of Water Samples (Table 6-10)**

Eighteen samples from the M-Area basin, and three samples from Lost Lake were analyzed for inorganic constituents. Three of these samples were analyzed for the full suite of inorganic analytes (Type "B") and the remainder of the samples for the "limited inorganic" analyses (Type "E"). These data are shown in Table 6-10.

**Organic Analytes Detected in Water Samples (Table 6-11)**

The analyses of the water samples for organic constituents are given in Table 6-11. This table also includes:

- Organic analytes detected and not detected, and
- Organic analytes detected in water control samples.

**Inorganic Inventory Calculations (Table 6-12)**

These tables show the inventory calculations for the inorganic constituents in each of the various areas in the M-Area basin system. The average concentration levels were calculated by averaging the analyte concentration levels from the specific samples from each area. Then, a volume of soil (or sludge) was determined based on the area and on the depth of soil until the analyte concentrations reached approximate background levels. The soil (or sludge) density values were based on the field data analyses. Then, a sub-total weight (in kilograms) was calculated for each analyte (in each area). The sub-total values were combined to give a final total of the weight of each inorganic constituent. It should be noted that the background values have not been subtracted from the "Total Calculated Inorganic Inventory." The background inventory values have been calculated in the last page of Table 6-12, and may be compared to determine if an excess of an inorganic material is present. For example, the calculated background inventory of cadmium is ~47 kg; the inventory from the M-Area basin and overflow areas is 52 kg. Therefore, there is very little, if any, cadmium above background in the M-Area basin system.

**Inorganic Analyses of Basin Influents and Effluents (Table 6-13)**

The influent process stream to the M-Area settling basin and the effluent overflow were monitored for a period of 10 weeks in March and April of 1985. A full round of analyses was conducted on the first week's sample (Types "A", "B", and "C"). Limited

analyses were performed on the remaining samples (Types "A", "D", and "E"). The samples for inorganic analyses were collected by proportional samplers, Monday through Wednesday of each week. The organic analyses were performed on a grab sample taken on the last day of the cycle. The inorganic analyses are shown in Table 6-13; the organic analyses in Table 6-14.

**Cross Sections of Process Sewer - Inorganic Analytes (Table 6-15)**
**Cross Sections of Process Sewer - Five Volatile Organics (Table 6-16)**

The data from the soil cores beneath the process sewer line were plotted using the "SAS" computer program as a series of "Block Charts of Results." These plots depict the cross-sectional vs. depth analyses of the key inorganic and organic constituents.

**Depth Profiles of Cores from the Bottom of the Basin - Inorganic Analytes (Table 6-17)**
**Depth Profiles of Cores from the Bottom of the Basin - Five Volatile Organics (Table 6-18)**

A similar series of plots for the key inorganic and volatile organic constituents in the soil at the bottom of the basin are shown in Tables 6-17 and 6-18. These plots depict the analyte concentrations for the four, 6-foot-deep soil cores sampled from the M-Area settling basin.

**Cross Sections of Overflow Ditch, Inorganic Analytes (Table 6-19)**

A final series of block charts are shown in Table 6-19. These plots depict the key inorganic constituents for two cross sections which were determined across the overflow ditch, to a depth of 3.5 feet.

**EP Toxicity Analyses of Sediments and Sludges (Table 6-20)**

A number of soil and sludge samples were analyzed by the U.S. Environmental Protection Agency's EP (extraction procedure) toxicity test to determine toxic metal concentrations (per Appendix II of 40 CFR 261). The samples were chosen to represent the highest expected levels of total concentration of toxic, heavy metal constituents. Sludge and shallow soil samples from the basin, overflow ditch, and seepage area were tested. In addition, two shallow cores from the soil below Lost Lake were tested. None of the toxic metal concentrations, as determined by the EPA Toxicity Analyses, exceeded the EPA guidelines for hazardous waste.

In fact, the highest value determined was 3.2% of the applicable limit (0.158 mg/L of chromium vs. a limit of 5.0). All the other determinations were less than 1% of the limit.

**Contour Plots (Figures 6-1 thru 6-19)**

The concentration values for various analytes are depicted in Figures 6-1 through 6-19. The actual concentration values are shown at the approximate location of the sample, in either the overflow ditch/seepage area, or in the Lost Lake area. For example, it can be seen by inspection that the concentration of lead in the sludge is significantly higher in the overflow ditch than in the outlet from the seepage area. A similar trend can be discerned in Lost Lake, where the concentration of lead is (in the 0 to 0.5-foot-deep soil samples) higher from those locations inside the 336-foot contour.

## 6.4 Reference

1. Envirodyne Engineers, Inc., to E. I. du Pont de Nemours and Company. M-Area Settling Basin QC Plan. Envirodyne Engineers, Inc., St. Louis, MO (received 12/15/84).

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SLUDGE/SOIL CORES - SETTLING BASIN

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | DEPTH | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC201 | -0.3 | 0.3 | 4.0 | 12/11/84 | CLEAR TUBE | 12 | 97 | 3 | SLUDGE | | DARK GREEN | | | | | | | |
| MBC201 | 0.0 | 1.0 | . | 12/11/84 | SHELBY TUBE | 12 | 13 | 87 | SC/SM | 2.5YR4/8 | RED | 35 | 10 | 10 | 20 | 15 | 10 | |
| MBC201 | 1.0 | 1.0 | . | 12/11/84 | SHELBY TUBE | 12 | 14 | 86 | SC/SM | 2.5YR4/8 | RED | 35 | 10 | 10 | 20 | 20 | 5 | |
| MBC201 | 2.0 | 1.0 | . | 12/11/84 | SHELBY TUBE | 12 | 12 | 88 | SC/SM | 2.5YR4/8 | RED | 24 | 10 | 20 | 30 | 15 | 1 | |
| MBC201 | 3.0 | 1.0 | . | 12/11/84 | SHELBY TUBE | 12 | 10 | 90 | SC/SM | 2.5YR5/8 | RED | 27 | 10 | 20 | 30 | 10 | 3 | |
| MBC201 | 4.0 | 1.0 | . | 12/11/84 | SHELBY TUBE | 12 | 0 | 100 | SC/SM | 2.5YR5/8 | RED | 30 | 10 | 15 | 20 | 20 | 5 | |
| MBC201 | 5.0 | 1.0 | . | 12/11/84 | SHELBY TUBE | 12 | 12 | 88 | CL | 2.5YR4/8 | RED | 45 | 10 | 5 | 10 | 30 | | |
| MBC202 | -0.5 | 0.5 | 5.4 | 12/12/84 | CLEAR TUBE | | 96 | 4 | SLUDGE | | DARK GREEN | | | | | | | |
| MBC203 | -1.8 | 1.8 | 9.2 | 12/12/84 | CLEAR TUBE | | 95 | 5 | SLUDGE | | BLUEISH GREEN | | | | | | | |
| MBC203 | 0.0 | 1.0 | . | 12/13/84 | SHELBY TUBE | 12 | 12 | | SC/SM | 2.5YR6/4 | LIGHT REDDISH BROWN | 30 | 10 | 10 | 10 | 15 | 25 | |
| MBC203 | 1.0 | 1.0 | . | 12/13/84 | SHELBY TUBE | 12 | 11 | 89 | SC/SM | 2.5YR6/4 | LIGHT REDDISH BROWN | 15 | 10 | 10 | 10 | 20 | 35 | |
| MBC203 | 2.0 | 1.0 | . | 12/13/84 | SHELBY TUBE | 12 | 10 | 90 | SC/SM | 2.5YR6/4 | LIGHT REDDISH BROWN | 20 | 5 | 5 | 15 | 20 | 35 | |
| MBC203 | 3.0 | 1.0 | . | 12/13/84 | SHELBY TUBE | 12 | 10 | 90 | SC/SM | 2.5YR6/4 | LIGHT REDDISH BROWN | 15 | 10 | 10 | 20 | 35 | 10 | |
| MBC203 | 4.0 | 1.0 | . | 12/13/84 | SHELBY TUBE | 12 | 15 | 85 | CL | 2.5YR4/8 | RED | 50 | 10 | 5 | 10 | 25 | | |
| MBC203 | 5.0 | 1.0 | . | 12/13/84 | SHELBY TUBE | 12 | 15 | 85 | CL | 2.5YR4/8 | RED | 60 | 10 | 5 | 10 | 15 | | |
| MBC204 | -1.5 | 1.5 | 6.7 | 12/13/84 | CLEAR TUBE | | 90 | 10 | SLUDGE | | DARK GREEN | | | | | | | |
| MBC205 | -1.5 | 1.5 | 13.7 | 12/10/84 | CLEAR TUBE | | 93 | 7 | SLUDGE | | DARK GREEN | | | | | | | |
| MBC205 | 0.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 17 | 83 | SC/SM | 2.5YR6/2 | LIGHT BROWNISH GRAY | 5 | 15 | 25 | 50 | 5 | | |
| MBC205 | 1.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 16 | 84 | SC/SM | 2.5YR6/2 | LIGHT BROWNISH GRAY | 10 | 20 | 30 | 40 | | | |
| MBC205 | 2.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 10 | 90 | SC/SM | 2.5YR6/2 | LIGHT BROWNISH GRAY | 5 | 15 | 30 | 50 | | | |
| MBC205 | 3.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 0 | 100 | SC/SM | 2.5YR6/4 | LIGHT REDDISH BROWN | 10 | 10 | 15 | 45 | 20 | | |
| MBC205 | 4.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 7 | 93 | SM/SC | 2.5YR4/8 | RED | 40 | 10 | 15 | 15 | 12 | 8 | |
| MBC205 | 5.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 13 | 87 | SM/SC | 2.5YR4/8 | RED | 30 | 15 | 20 | 15 | 15 | 5 | |
| MBC206 | -3.0 | 3.0 | 6.0 | 12/13/84 | CLEAR TUBE | | 97 | 3 | SLUDGE | | DARK GREEN | | | | | | | |
| MBC207 | -2.1 | 2.1 | 12.8 | 12/08/84 | CLEAR TUBE | | 96 | 4 | SLUDGE | | DARK GREEN | | | | | | | |
| MBC207 | 0.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 13 | 87 | SC/SM | 5YR4/1 | DARK GREY | 35 | 10 | 5 | 10 | 15 | 25 | |
| MBC207 | 1.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 17 | 83 | SC/SM | 5YR5/6 | YELLOWISH RED | 5 | 5 | 15 | 20 | 25 | 30 | |
| MBC207 | 2.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 17 | 83 | SC/SM | 5YR6/6 | REDDISH YELLOW | 5 | 5 | 10 | 20 | 35 | 25 | |
| MBC207 | 3.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 1 | 99 | SC/SM | 5YR6/4 | LIGHT REDDISH BROWN | 5 | 5 | 10 | 25 | 25 | 30 | |
| MBC207 | 4.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 0 | 100 | SM/SC | 5YR6/4 | LIGHT REDDISH BROWN | 5 | 5 | 15 | 25 | 20 | 30 | |
| MBC207 | 5.0 | 1.0 | . | 12/10/84 | SHELBY TUBE | 12 | 13 | 87 | SM/SC | 5YR6/3 | LIGHT REDDISH BROWN | 5 | 5 | 15 | 20 | 25 | 30 | |
| MBC208 | -1.1 | 1.1 | 8.0 | 12/14/84 | CLEAR TUBE | | 89 | 11 | SLUDGE | | DARK GREEN | | | | | | | |

SERIES=SOIL CORES ADJACENT TO SETTLING BASIN

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC301 | 0 | 5 | 11/20/84 | SPLIT SPOON | 12 | 14 | 86 | CL | 5YR4/6 | YELLOWISH RED | 55 | 10 | 10 | 25 | | | 4.3-4.5 |
| MBC301 | 2 | 2 | 11/20/84 | SPLIT SPOON | 12 | | | SM/SC | 2.5YR4/8 | RED | 35 | 10 | 10 | 30 | 15 | | |
| MBC301 | 4 | 2 | 11/20/84 | SPLIT SPOON | 18 | | | SM/SC | 2.5YR3/6 | DARK RED | 30 | 10 | 20 | 40 | | | |
| MBC301 | 5 | 5 | 11/20/84 | SPLIT SPOON | | 14 | 86 | | | | | | | | | | 4.0-4.5 |
| MBC301 | 6 | 2 | 11/20/84 | SPLIT SPOON | 15 | | | SM/SC | 2.5YR3/6 | DARK RED | 30 | 10 | 15 | 30 | 10 | 5 | |
| MBC301 | 8 | 2 | 11/20/84 | SPLIT SPOON | 15 | | | SC/SM | 2.5YR3/6 | DARK RED | 44 | 10 | 15 | 30 | | 1 | |
| MBC301 | 10 | 5 | 11/20/84 | SPLIT SPOON | 11 | 14 | 86 | SC/SM | 2.5YR3/6 | DARK RED | 30 | 10 | 30 | 30 | | | 3.5-4.5 |
| MBC301 | 12 | 2 | 11/20/84 | SPLIT SPOON | 17 | | | SC/SM | 2.5YR4/8 | RED | 35 | 10 | 25 | 25 | 5 | | |
| MBC301 | 14 | 2 | 11/20/84 | SPLIT SPOON | 18 | | | SC/SM | 2.5YR4/8 | RED | 40 | 5 | 10 | 45 | | | |
| MBC301 | 15 | 1 | 11/20/84 | SPLIT SPOON | | 12 | 88 | | | | | | | | | | 3.5 |
| MBC301 | 16 | 1 | 11/20/84 | SPLIT SPOON | 12 | 11 | 89 | SM/SC | 5YR5/6 | YELLOWISH RED | 40 | 5 | 10 | 15 | 30 | | 3.5 |
| MBC301 | 17 | 1 | 11/20/84 | SPLIT SPOON | | | | | | | | | | | | | 3.5 |

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SOIL CORES ADJACENT TO SETTLING BASIN

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC301 | 18 | 1 | 11/20/84 | SPLIT SPOON | 11 | 11 | 89 | CL | 2.5YR4/8 | RED | 54 | 5 | 10 | 20 | 10 | 1 | 4.0 |
| MBC301 | 19 | 1 | 11/20/84 | SPLIT SPOON | | | | | | | | | | | | | 4.0 |
| MBC301 | 20 | 1 | 11/20/84 | SPLIT SPOON | 12 | 11 | 89 | SM/SC | 2.5YR4/8 | RED | 30 | 5 | 10 | 20 | 35 | | 2.5 |
| MBC302 | 0 | 5 | 11/21/84 | SPLIT SPOON | 19 | 14 | 86 | CL | 5YR4/6 | YELLOWISH RED | 63 | 5 | 20 | 10 | 1 | | 4.5 |
| MBC302 | 2 | 2 | 11/21/84 | SPLIT SPOON | 20 | | | SM/SC | 2.5YR4/8 | RED | 39 | 10 | 20 | 25 | 5 | 1 | |
| MBC302 | 4 | 2 | 11/21/84 | SPLIT SPOON | 15 | | | CL | 2.5YR3/6 | DARK RED | 65 | 10 | 15 | 10 | | | |
| MBC302 | 5 | 5 | 11/21/84 | SPLIT SPOON | | 20 | 80 | | | | | | | | | | 4.5 |
| MBC302 | 6 | 2 | 11/21/84 | SPLIT SPOON | 17 | | | CL | 2.5YR3/6 | DARK RED | 65 | 10 | 15 | 10 | | | |
| MBC302 | 8 | 2 | 11/21/84 | SPLIT SPOON | 14 | | | CL | 2.5YR4/6 | RED | 65 | 10 | 10 | 15 | | | |
| MBC302 | 10 | 5 | 11/21/84 | SPLIT SPOON | 12 | 10 | 90 | CL | 2.5YR4/6 | RED | 63 | 5 | 5 | 10 | 15 | 1 | 4.5 |
| MBC302 | 12 | 2 | 11/21/84 | SPLIT SPOON | 21 | | | CL | 2.5YR4/6 | RED | 65 | 5 | 15 | 10 | 5 | | |
| MBC302 | 14 | 2 | 11/21/84 | SPLIT SPOON | 18 | | | CL | 2.5YR3/6 | DARK RED | 60 | 5 | 10 | 20 | 5 | | |
| MBC302 | 15 | 1 | 11/21/84 | SPLIT SPOON | | 13 | 87 | | | | | | | | | | 4.5 |
| MBC302 | 16 | 1 | 11/21/84 | SPLIT SPOON | 20 | 12 | 88 | CL | 2.5YR4/8 | RED | 65 | 5 | 15 | 10 | 5 | | 4.0 |
| MBC302 | 17 | 1 | 11/21/84 | SPLIT SPOON | | 13 | 87 | | | | | | | | | | 4.0 |
| MBC302 | 18 | 1 | 11/21/84 | SPLIT SPOON | 22 | NA | NA | SM/SC | 2.5YR4/8 | RED | 40 | 5 | 5 | 10 | 30 | 10 | 4.5 |
| MBC302 | 19 | 1 | 11/21/84 | SPLIT SPOON | | NA | NA | | | | | | | | | | 4.5 |
| MBC302 | 20 | 1 | 11/21/84 | SPLIT SPOON | 20 | NA | NA | SM/SC | 5YR5/8 | YELLOWISH RED | 40 | 5 | 5 | 10 | 25 | 15 | 3.0 |
| MBC303 | 0 | 5 | 11/20/84 | SPLIT SPOON | | 13 | 87 | | | | | | | | | | 4.5 |
| MBC303 | 2 | 2 | 11/20/84 | SPLIT SPOON | 18 | | | SM/SC | 2.5YR4/8 | RED | 49 | 5 | 20 | 20 | 5 | 1 | |
| MBC303 | 4 | 2 | 11/20/84 | SPLIT SPOON | 15 | | | CL | 5YR4/6 | YELLOWISH RED | 55 | 5 | 10 | 15 | 10 | 5 | |
| MBC303 | 5 | 5 | 11/20/84 | SPLIT SPOON | | 13 | 87 | | | | | | | | | | 4.5 |
| MBC303 | 6 | 2 | 11/20/84 | SPLIT SPOON | 16 | | | SM/SC | 2.5YR4/8 | RED | 42 | 5 | 20 | 20 | 10 | 3 | 4.5 |
| MBC303 | 8 | 2 | 11/20/84 | SPLIT SPOON | 20 | | | CL | 2.5YR4/6 | RED | 59 | 10 | 15 | 10 | 5 | 1 | 4.5 |
| MBC303 | 10 | 5 | 11/20/84 | SPLIT SPOON | 12 | 11 | 89 | SM/SC | 2.5YR3/6 | DARK RED | 30 | 5 | 15 | 15 | 30 | 5 | 4.0-4.5 |
| MBC303 | 12 | 2 | 11/20/84 | SPLIT SPOON | 21 | | | SM/SC | 2.5YR4/8 | RED | 35 | 5 | 20 | 15 | 20 | 5 | |
| MBC303 | 14 | 2 | 11/20/84 | SPLIT SPOON | 12 | | | SM/SC | 5YR4/6 | YELLOWISH RED | 20 | 5 | 5 | 10 | 25 | 35 | |
| MBC303 | 16 | 1 | 11/20/84 | SPLIT SPOON | 21 | 10 | 90 | CL | 7.5YR5/8 | STRONG BROWN | 45 | 5 | 10 | 25 | 15 | | 4 |
| MBC303 | 17 | 1 | 11/20/84 | SPLIT SPOON | | 9 | 91 | | | | | | | | | | 4.0 |
| MBC303 | 18 | 1 | 11/20/84 | SPLIT SPOON | 22 | 10 | 90 | SM/SC | 10R5/2 | WEAK RED | 25 | 10 | 15 | 20 | 30 | | 4.5 |
| MBC303 | 19 | 1 | 11/20/84 | SPLIT SPOON | | 10 | 90 | | | | | | | | | | 4.5 |
| MBC303 | 20 | 1 | 11/20/84 | SPLIT SPOON | 24 | 10 | 90 | SM/SC | 2.5YR4/4 | WEAK RED | 20 | 10 | 10 | 25 | 35 | | 4.5 |
| MBC304 | 0 | 5 | 11/20/84 | SPLIT SPOON | 17 | 10 | 90 | SM/SC | 5YR4/6 | YELLOWISH RED | 45 | 10 | 15 | 20 | 10 | | 4.5 |
| MBC304 | 2 | 2 | 11/20/84 | SPLIT SPOON | 13 | | | CL | 2.5YR3/6 | DARK RED | 60 | 10 | 10 | 15 | 5 | | 4.5 |
| MBC304 | 4 | 2 | 11/20/84 | SPLIT SPOON | 12 | | | CL | 2.5YR3/6 | DARK RED | 50 | 10 | 10 | 25 | | 5 | |
| MBC304 | 5 | 5 | 11/20/84 | SPLIT SPOON | | 13 | 87 | | | | | | | | | | 4.5 |
| MBC304 | 6 | 2 | 11/20/84 | SPLIT SPOON | 20 | | | CL | 2.5YR3/6 | DARK RED | 69 | 5 | 10 | 10 | 5 | 1 | 4.5 |
| MBC304 | 8 | 2 | 11/20/84 | SPLIT SPOON | 20 | | | CL | 2.5YR3/6 | DARK RED | 57 | 5 | 15 | 20 | 2 | 1 | 4.5 |
| MBC304 | 10 | 5 | 11/20/84 | SPLIT SPOON | 23 | 13 | 87 | CL | 2.5YR3/6 | DARK RED | 64 | 10 | 10 | 10 | 5 | 1 | 4.5 |
| MBC304 | 12 | 2 | 11/20/84 | SPLIT SPOON | 24 | | | CL | 2.5YR3/6 | DARK RED | 60 | 10 | 10 | 15 | 5 | | |
| MBC304 | 14 | 2 | 11/20/84 | SPLIT SPOON | 22 | | | CL | 2.5YR3/6 | DARK RED | 50 | 10 | 10 | 20 | 10 | | |
| MBC304 | 15 | 1 | 11/20/84 | SPLIT SPOON | | 13 | 87 | | | | | | | | | | 4.5 |
| MBC304 | 16 | 1 | 11/20/84 | SPLIT SPOON | 23 | 12 | 88 | CL | 2.5YR3/6 | DARK RED | 65 | 5 | 5 | 5 | 10 | 10 | 4.5 |
| MBC304 | 17 | 1 | 11/20/84 | SPLIT SPOON | | 9 | 91 | | | | | | | | | | 4.5 |
| MBC304 | 18 | 1 | 11/20/84 | SPLIT SPOON | 20 | 13 | 87 | SM/SC | 2.5YR4/6 | RED | 20 | 10 | 10 | 10 | 20 | 30 | 4 |
| MBC304 | 19 | 1 | 11/20/84 | SPLIT SPOON | | 10 | 90 | | | | | | | | | | 4.0 |
| MBC304 | 20 | 1 | 11/20/84 | SPLIT SPOON | 12 | 11 | 89 | SM/SC | 2.5YR4/8 | RED | 40 | 5 | 10 | 10 | 15 | 20 | 3.5 |

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SOIL CORES - PROCESS SEWER

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC401 | 7 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | SM/SC | 5YR5/6 | YELLOWISH RED | 20 | 5 | 15 | 20 | 25 | 15 | |
| MBC401 | 8 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | SC/SM | 2.5YR5/8 | RED | 20 | 5 | 10 | 15 | 25 | 25 | |
| MBC401 | 9 | 1 | 12/12/84 | SPLIT SPOON | 12 | 13 | 87 | SC/SM | 2.5YR4/8 | RED | 10 | 5 | 15 | 30 | 25 | 15 | |
| MBC401 | 10 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | SC/SM | 2.5YR4/8 | RED | 15 | 5 | 10 | 15 | 20 | 35 | |
| MBC401 | 11 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | SC/SM | 2.5YR5/6 | RED | 10 | 5 | 20 | 25 | 30 | 10 | |
| MBC401 | 12 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | SC/SM | 2.5YR5/6 | RED | 10 | 5 | 20 | 25 | 35 | | |
| MBC402 | 7 | 1 | 12/12/84 | SPLIT SPOON | 12 | 15 | 85 | CL | 2.5YR4/8 | RED | 85 | 15 | | | | | |
| MBC402 | 8 | 1 | 12/12/84 | SPLIT SPOON | 12 | 14 | 86 | CL | 2.5YR4/8 | RED | 85 | 15 | | | | | |
| MBC402 | 9 | 1 | 12/12/84 | SPLIT SPOON | 12 | 13 | 87 | CL | 2.5YR5/8 | RED | 85 | 15 | | | | | |
| MBC402 | 10 | 1 | 12/12/84 | SPLIT SPOON | 12 | 15 | 85 | NA | 2.5YR4/8 | RED | 70 | 15 | | | 15 | | |
| MBC402 | 11 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | CL | 2.5YR6/6 | LIGHT RED | 60 | 5 | 5 | 5 | 15 | 10 | |
| MBC402 | 12 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | CL | 2.5YR6/6 | LIGHT RED | 50 | 5 | 5 | 10 | 20 | 10 | |
| MBC403 | 7 | 1 | 12/12/84 | SPLIT SPOON | 12 | 13 | 87 | CL | 2.5YR5/8 | RED | 65 | 5 | 10 | 15 | 5 | | |
| MBC403 | 8 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | CL | 2.5YR5/8 | RED | 50 | 5 | 10 | 15 | 15 | 5 | |
| MBC403 | 9 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | CL | 2.5YR6/4 | LIGHT REDDISH BROWN | 45 | 5 | 10 | 15 | 15 | 10 | |
| MBC403 | 10 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | CL | 2.5YR6/6 | LIGHT RED | 35 | 5 | 10 | 15 | 20 | 15 | |
| MBC403 | 11 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | SC/SM | 2.5YR5/8 | RED | 30 | 5 | 10 | 15 | 25 | 15 | |
| MBC403 | 12 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | SC/SM | 2.5YR6/6 | LIGHT RED | 30 | 5 | 10 | 15 | 20 | 20 | |
| MBC404 | 7 | 1 | 12/12/84 | SPLIT SPOON | 12 | 13 | 87 | CL | 2.5YR4/8 | RED | 70 | 10 | 5 | 10 | 5 | | |
| MBC404 | 8 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | CL | 2.5YR4/8 | RED | 50 | 10 | 5 | 10 | 15 | 10 | |
| MBC404 | 9 | 1 | 12/12/84 | SPLIT SPOON | 12 | 11 | 89 | SC/SM | 2.5YR4/8 | RED | 40 | 5 | 10 | 15 | 20 | 10 | |
| MBC404 | 10 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | NA | 2.5YR6/4 | LIGHT REDDISH BROWN | 55 | 5 | 5 | 10 | 20 | 5 | |
| MBC404 | 11 | 1 | 12/12/84 | SPLIT SPOON | 12 | 12 | 88 | SM/SC | 2.5YR6/6 | LIGHT RED | 40 | 5 | 15 | 20 | 15 | 5 | |
| MBC404 | 12 | 1 | 12/12/84 | SPLIT SPOON | 12 | 10 | 90 | SM/SC | 7.5YR8/4 | PINK | 35 | 5 | 10 | 20 | 10 | 20 | |
| MBC405 | 0 | 1 | 12/18/84 | HAND AUGER | 12 | 16 | 84 | SC/SM | 5YR5/8 | YELLOWISH RED | 20 | 10 | 15 | 20 | 35 | | |
| MBC405 | 1 | 1 | 12/18/84 | HAND AUGER | 12 | 17 | 83 | SC/SM | 2.5YR4/8 | RED | 25 | 10 | 15 | 20 | 30 | | |
| MBC405 | 2 | 1 | 12/18/84 | HAND AUGER | 12 | 17 | 83 | SC/SM | 2.5YR4/8 | RED | 20 | 10 | 15 | 25 | 30 | | |
| MBC405 | 3 | 1 | 12/18/84 | HAND AUGER | 12 | 15 | 85 | SC/SM | 2.5YR4/8 | RED | 35 | 5 | 10 | 20 | 20 | 10 | |
| MBC405 | 4 | 1 | 12/18/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 5YR5/8 | YELLOWISH RED | 20 | 5 | 10 | 15 | 30 | 20 | |
| MBC405 | 5 | 1 | 12/18/84 | HAND AUGER | 12 | 15 | 85 | SC/SM | 5YR5/8 | YELLOWISH RED | 15 | 5 | 10 | 20 | 35 | 15 | |
| MBC406 | 0 | 1 | 12/18/84 | HAND AUGER | 12 | 15 | 85 | SC | 10YR8/4 | VERY PALE BROWN | 25 | | 15 | 40 | 20 | | |
| MBC406 | 1 | 1 | 12/18/84 | HAND AUGER | 12 | 17 | 83 | SC | 10YR8/6 | YELLOW | 20 | | 15 | 35 | 30 | | |
| MBC406 | 2 | 1 | 12/18/84 | HAND AUGER | 12 | 18 | 82 | SC | 2.5YR4/8 | RED | 15 | | 15 | 30 | 35 | 5 | |
| MBC406 | 3 | 1 | 12/18/84 | HAND AUGER | 12 | 17 | 83 | SC | 2.5YR6/6 | LIGHT RED | 30 | | 15 | 25 | 30 | | |
| MBC406 | 4 | 1 | 12/18/84 | HAND AUGER | 12 | 18 | 82 | SC | 2.5YR6/6 | LIGHT RED | 25 | | 15 | 25 | 35 | | |
| MBC406 | 5 | 1 | 12/18/84 | HAND AUGER | 12 | 16 | 84 | SC | 2.5YR4/6 | RED | 20 | | 15 | 30 | 35 | | |
| MBC407 | 0 | 1 | 12/18/84 | HAND AUGER | 12 | 16 | 84 | SC | 2.5YRN4/0 | DARK GREY | 30 | | 15 | 35 | 20 | | |
| MBC407 | 1 | 1 | 12/18/84 | HAND AUGER | 12 | 17 | 83 | SC | 2.5YR4/8 | RED | 25 | | 15 | 25 | 25 | 10 | |
| MBC407 | 2 | 1 | 12/18/84 | HAND AUGER | 12 | 17 | 83 | SC | 10YR8/4 | VERY PALE BROWN | 20 | | 15 | 30 | 20 | 15 | |
| MBC407 | 3 | 1 | 12/18/84 | HAND AUGER | 12 | 18 | 82 | SC | 2.5YR6/6 | LIGHT RED | 15 | | 15 | 25 | 25 | 20 | |
| MBC407 | 4 | 1 | 12/18/84 | HAND AUGER | 12 | 15 | 85 | SC | 2.5YR4/8 | RED | 20 | | 15 | 40 | 20 | 5 | |
| MBC407 | 5 | 1 | 12/18/84 | HAND AUGER | 12 | 15 | 85 | SC | 2.5YR4/8 | RED | 15 | | 15 | 40 | 20 | 10 | |
| MBC408 | 0 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 2.5YR6/6 | LIGHT RED | 45 | 5 | 20 | 15 | 10 | 5 | |
| MBC408 | 1 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 5YR8/2 | PINKISH WHITE | 45 | 5 | 15 | 20 | 10 | 5 | |
| MBC408 | 2 | 1 | 12/14/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR4/8 | RED | 55 | 10 | 20 | 10 | 5 | 1 | |
| MBC408 | 3 | 1 | 12/14/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR6/6 | LIGHT RED | 54 | 10 | 25 | 10 | 1 | | |
| MBC408 | 4 | 1 | 12/14/84 | HAND AUGER | 12 | 15 | 85 | CL | 2.5YR6/6 | LIGHT RED | 55 | 10 | 20 | 15 | | | |
| MBC408 | 5 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | NA | 2.5YR6/8 | LIGHT RED | 55 | 10 | 25 | 10 | | | |
| MBC409 | 0 | 1 | 12/19/84 | HAND AUGER | 12 | 15 | 85 | SC | 2.5YR6/8 | LIGHT RED | 25 | | 15 | 25 | 35 | | |
| MBC409 | 1 | 1 | 12/19/84 | HAND AUGER | 12 | 12 | 88 | CL | 2.5YR4/8 | RED | 90 | 10 | | | | | |
| MBC409 | 2 | 1 | 12/19/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR5/6 | RED | 55 | 10 | 5 | 20 | 10 | | |
| MBC409 | 3 | 1 | 12/19/84 | HAND AUGER | 12 | 14 | 86 | SC | 2.5YR4/6 | RED | 30 | | 15 | 20 | 20 | 15 | |

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SOIL CORES - PROCESS SEWER

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC409 | 4 | 1 | 12/19/84 | HAND AUGER | 12 | 13 | 87 | CL | 2.5YR8/4 | PALE YELLOW | 85 | 15 | | | | | |
| MBC409 | 5 | 1 | 12/19/84 | HAND AUGER | 12 | 17 | 83 | CL | 10R6/1 | REDDISH GREY | 85 | 15 | | | | | |
| MBC410 | 0 | 1 | 12/19/84 | HAND AUGER | 12 | 17 | 83 | CL | 10R5/8 | RED | 90 | 10 | | | | | |
| MBC410 | 1 | 1 | 12/19/84 | HAND AUGER | 12 | 18 | 82 | CL | 10R4/8 | RED | 90 | 10 | | | | | |
| MBC410 | 2 | 1 | 12/19/84 | HAND AUGER | 12 | 17 | 83 | CL | 10R4/6 | RED | 85 | 15 | | | | | |
| MBC410 | 3 | 1 | 12/19/84 | HAND AUGER | 12 | 13 | 87 | CL | 10R6/6 | LIGHT RED | 90 | 10 | | | | | |
| MBC410 | 4 | 1 | 12/19/84 | HAND AUGER | 12 | 18 | 82 | CL | 10R4/4 | WEAK RED | 90 | 10 | | | | | |
| MBC410 | 5 | 1 | 12/19/84 | HAND AUGER | 12 | 19 | 81 | CL | 10R6/1 | REDDISH GREY | 90 | 10 | | | | | |
| MBC411 | 0 | 1 | 12/14/84 | HAND AUGER | 12 | 13 | 87 | SC/SM | 5YR5/6 | YELLOWISH RED | 45 | | 20 | 15 | 10 | | |
| MBC411 | 1 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 2.5YR4/8 | RED | 40 | 10 | 20 | 15 | 10 | 5 | |
| MBC411 | 2 | 1 | 12/14/84 | HAND AUGER | 12 | 15 | 85 | CL | 2.5YR5/8 | RED | 50 | 10 | 25 | 10 | 5 | | |
| MBC411 | 3 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 2.5YR5/8 | RED | 50 | 10 | 25 | 10 | 5 | | |
| MBC411 | 4 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | SM/SC | 10YR8/6 | YELLOW | 45 | 10 | 35 | 10 | | | |
| MBC411 | 5 | 1 | 12/14/84 | HAND AUGER | 12 | 13 | 87 | SM/SC | 2.5YR5/8 | RED | 45 | 10 | 35 | 10 | | | |
| MBC412 | 0 | 1 | 12/14/84 | HAND AUGER | 12 | 12 | 88 | CL | 2.5YR5/8 | RED | 60 | 5 | 15 | 10 | 10 | | |
| MBC412 | 0 | 1 | 12/14/84 | HAND AUGER | 12 | 12 | 88 | CL | 5YR5/8 | YELLOWISH RED | 60 | 5 | 15 | 10 | 10 | | |
| MBC412 | 1 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | CL | 2.5YR5/8 | RED | 55 | 5 | 20 | 15 | 5 | | |
| MBC412 | 2 | 1 | 12/14/84 | HAND AUGER | 12 | 15 | 85 | CL | 2.5YR5/8 | RED | 50 | 10 | 25 | 15 | | | |
| MBC412 | 3 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | NA | 2.5YR5/8 | RED | 50 | 10 | 25 | 15 | | | |
| MBC412 | 4 | 1 | 12/14/84 | HAND AUGER | 12 | 14 | 86 | SM/SC | 2.5YR5/8 | RED | 40 | 10 | 25 | 15 | 10 | | |
| MBC412 | 5 | 1 | 12/14/84 | HAND AUGER | 12 | 13 | 87 | SM/SC | 2.5YR5/8 | RED | 50 | 10 | 25 | 15 | | | |
| MBC413 | 0 | 1 | 12/13/84 | HAND AUGER | 12 | 10 | 90 | SC/SM | 2.5YR5/8 | RED | 40 | 10 | 20 | 15 | 10 | 5 | |
| MBC413 | 1 | 1 | 12/13/84 | HAND AUGER | 12 | 12 | 88 | SC/SM | 2.5YR5/8 | RED | 50 | 10 | 20 | 15 | 5 | | |
| MBC413 | 2 | 1 | 12/13/84 | HAND AUGER | 12 | 13 | 87 | SC/SM | 2.5YR5/8 | RED | 45 | 10 | 20 | 10 | 15 | | |
| MBC413 | 3 | 1 | 12/13/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 2.5YR5/6 | RED | 40 | 10 | 25 | 15 | 10 | | |
| MBC413 | 4 | 1 | 12/13/84 | HAND AUGER | 12 | 13 | 87 | CL | 2.5YR5/8 | RED | 50 | 10 | 20 | 15 | 5 | | |
| MBC413 | 5 | 1 | 12/13/84 | HAND AUGER | 12 | 13 | 87 | SM/SC | 2.5YR5/8 | RED | | 10 | 20 | 15 | | | |
| MBC414 | 0 | 1 | 12/13/84 | HAND AUGER | 12 | 13 | 87 | SC/SM | 5YR5/8 | YELLOWISH RED | 45 | 10 | 15 | 20 | 10 | | |
| MBC414 | 1 | 1 | 12/13/84 | HAND AUGER | 12 | 13 | 87 | SC/SM | 5YR5/8 | YELLOWISH RED | 54 | 5 | 20 | 15 | 5 | 1 | |
| MBC414 | 2 | 1 | 12/13/84 | HAND AUGER | 12 | 15 | 85 | SC/SM | 2.5YR5/8 | RED | 49 | 5 | 15 | 20 | 10 | 1 | |
| MBC414 | 3 | 1 | 12/13/84 | HAND AUGER | 12 | 15 | 85 | SC/SM | 5YR5/8 | YELLOWISH RED | 45 | 5 | 15 | 20 | 10 | 5 | |
| MBC414 | 4 | 1 | 12/13/84 | HAND AUGER | 12 | 15 | 85 | SC/SM | 7.5YR6/8 | REDDISH YELLOW | 40 | | 20 | 15 | 15 | 5 | |
| MBC414 | 5 | 1 | 12/13/84 | HAND AUGER | 12 | 14 | 86 | SC/SM | 2.5YR4/8 | RED | 30 | 5 | 25 | 20 | 15 | 5 | |

SERIES=SLUDGE/SOIL CORES - DRAINAGE DITCH

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC501 | -1.20 | 1.20 | 12/27/84 | CLEAR TUBE | 14 | 86 | 14 | SLUDGE | | GREENISH TAN | | | | | | | |
| MBC502 | -0.67 | 0.67 | 12/21/84 | CLEAR TUBE | 8 | 93 | 7 | SLUDGE | | YELLOWISH RED | | | | | | | |
| MBC502 | 0.00 | 0.50 | 12/21/84 | HAND AUGER | 6 | 30 | 70 | CL | 2.5YR4/8 | RED | 50 | 5 | 25 | 20 | | | |
| MBC502 | 0.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 22 | 78 | CL | 2.5YR4/6 | RED | 70 | 5 | 10 | 10 | 5 | | |
| MBC502 | 1.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 22 | 78 | CL | 2.5YR4/8 | RED | 45 | 5 | 10 | 15 | 25 | | |
| MBC502 | 2.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 22 | 78 | SC/SM | 2.5YR4/8 | RED | 45 | 5 | 10 | 15 | 20 | 5 | |
| MBC503 | 0.00 | 0.50 | 12/20/84 | HAND AUGER | 6 | 29 | 71 | CL | 5YR3/1 | VERY DARK GREY | 85 | 15 | | | | | |
| MBC503 | 0.50 | 1.00 | 12/20/84 | HAND AUGER | 12 | 13 | 87 | CL | 2.5YR4/6 | RED | 45 | 15 | 5 | 20 | 15 | | |
| MBC503 | 1.50 | 1.00 | 12/20/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR4/6 | RED | 45 | 15 | 5 | 20 | 15 | | |
| MBC503 | 2.50 | 1.00 | 12/20/84 | HAND AUGER | 12 | 14 | 86 | CL | 2.5YR4/6 | RED | 40 | 15 | 5 | 25 | 15 | | |
| MBC504 | 0.00 | 0.50 | 12/20/84 | HAND AUGER | 6 | 33 | 67 | CL | 5YR3/1 | VERY DARK GREY | 75 | 10 | 5 | 10 | | | |

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SLUDGE/SOIL CORES - DRAINAGE DITCH

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC504 | 0.50 | 1.00 | 12/20/84 | HAND AUGER | 12 | 14 | 86 | CL | 2.5YR4/6 | RED | 60 | 10 | 10 | 15 | 5 | | |
| MBC504 | 1.50 | 1.00 | 12/20/84 | HAND AUGER | 12 | 13 | 87 | CL | 2.5YR4/6 | RED | 45 | 10 | 10 | 20 | 5 | | |
| MBC504 | 2.50 | 1.00 | 12/20/84 | HAND AUGER | 12 | 18 | 82 | CL | 2.5YR4/6 | RED | 55 | 10 | 10 | 20 | 5 | | |
| MBC505 | 0.00 | 0.50 | 11/19/84 | HAND AUGER | 6 | 39 | 61 | SM/SC | 5YR4/6 | YELLOWISH RED | 35 | 5 | 10 | 20 | 30 | | |
| MBC505 | 0.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 19 | 81 | CL | 2.5YR4/6 | RED | 55 | 5 | 10 | 20 | 10 | | |
| MBC505 | 1.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR4/6 | RED | 60 | 5 | 10 | 15 | 10 | | |
| MBC505 | 2.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 15 | 85 | CL | 2.5YR4/6 | RED | 65 | 5 | 10 | 10 | 5 | 5 | |
| MBC506 | 0.00 | 0.50 | 11/19/84 | HAND AUGER | 6 | 30 | 70 | CL | 2.5YR4/6 | RED | 55 | 5 | 10 | 20 | 10 | | |
| MBC506 | 0.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR4/6 | RED | 60 | 5 | 10 | 20 | 5 | | |
| MBC506 | 1.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 15 | 85 | CL | 2.5YR4/6 | RED | 49 | 10 | 25 | 10 | 5 | 1 | |
| MBC506 | 2.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 16 | 84 | CL | 2.5YR4/6 | RED | 55 | 5 | 20 | 15 | 5 | | |
| MBC507 | -1.30 | 1.30 | 12/21/84 | CLEAR TUBE | 16 | 92 | 8 | SLUDGE | | GREEN | | | | | | | |
| MBC507 | 0.00 | 0.50 | 12/21/84 | HAND AUGER | 6 | 25 | 75 | SC/SM | 2.5YR4/8 | RED | 40 | 5 | 10 | 15 | 25 | 5 | |
| MBC507 | 0.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 52 | 48 | CL | 2.5YR4/6 | RED | 50 | 5 | 10 | 15 | 20 | | |
| MBC507 | 1.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 23 | 77 | SC/SM | 2.5YR4/6 | RED | 35 | 5 | 10 | 25 | 15 | 10 | |
| MBC507 | 2.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 19 | 81 | SC/SM | 2.5YR4/8 | RED | 25 | 5 | 10 | 20 | 25 | 15 | |
| MBC508 | -0.33 | 0.33 | 12/21/84 | CLEAR TUBE | 4 | 94 | 6 | SLUDGE | | GREENISH TAN | | | | | | | |
| MBC508 | 0.00 | 0.50 | 12/21/84 | HAND AUGER | 6 | 30 | 70 | SM/SC | 2.5YR4/6 | RED | 40 | 5 | 25 | 20 | 10 | | |
| MBC508 | 0.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 18 | 82 | SC/SM | 2.5YR4/6 | RED | 45 | 5 | 25 | 20 | 5 | | |
| MBC508 | 1.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 22 | 78 | SM/SC | 2.5YR4/6 | RED | 49 | 5 | 25 | 20 | 1 | | |
| MBC508 | 2.50 | 1.00 | 12/21/84 | HAND AUGER | 12 | 19 | 81 | SC/SM | 2.5YR4/8 | RED | 39 | 10 | 20 | 30 | 1 | | |
| MBC509 | 0.00 | 0.50 | 11/19/84 | HAND AUGER | 6 | 87 | 13 | SM/SC | 2.5YR4/6 | RED | 40 | 5 | 25 | 20 | 10 | | |
| MBC509 | 0.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 17 | 83 | SC/SM | 2.5YR4/6 | RED | 45 | 5 | 25 | 20 | 5 | | |
| MBC509 | 1.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 18 | 82 | SM/SC | 2.5YR4/6 | RED | 49 | 5 | 25 | 20 | 1 | | |
| MBC509 | 2.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 20 | 80 | SC/SM | 2.5YR4/8 | RED | 39 | 10 | 20 | 30 | 1 | | |
| MBC510 | 0.00 | 0.50 | 12/26/84 | HAND AUGER | 6 | 19 | 81 | SM/SC | 2.5YR4/6 | RED | 45 | 5 | 30 | 20 | | | |
| MBC510 | 0.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 16 | 84 | SM/SC | 2.5YR4/6 | RED | 45 | 5 | 30 | 20 | | | |
| MBC510 | 1.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 17 | 83 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC510 | 2.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 19 | 81 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC511 | 0.00 | 0.50 | 11/19/84 | HAND AUGER | 6 | 17 | 83 | SM | 7.5YR3/2 | DARK BROWN | | 10 | 35 | 40 | 10 | 5 | |
| MBC511 | 0.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 13 | 87 | SM/SC | 7.5YR3/4 | DARK BROWN | 10 | 10 | 25 | 30 | 20 | 5 | |
| MBC511 | 1.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 13 | 87 | SM/SC | 5YR4/6 | YELLOWISH RED | 35 | 10 | 15 | 25 | 10 | 5 | |
| MBC511 | 2.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 14 | 86 | CL | 2.5YR3/6 | DARK RED | 60 | 10 | 10 | 10 | 5 | 5 | |
| MBC512 | 0.00 | 0.50 | 11/19/84 | HAND AUGER | 6 | 6 | 94 | SM | 10YR4/3 | DARK BROWN | | 5 | 20 | 30 | 40 | 5 | |
| MBC512 | 0.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 9 | 91 | SM/SC | 5YR4/6 | YELLOWISH RED | 5 | 10 | 30 | 20 | 30 | 5 | |
| MBC512 | 1.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 10 | 90 | SM/SC | 2.5YR3/6 | DARK RED | 10 | 10 | 40 | 15 | 20 | 5 | |
| MBC512 | 2.50 | 1.00 | 11/19/84 | HAND AUGER | 12 | 10 | 90 | SM/SC | 2.5YR3/6 | DARK RED | 10 | 10 | 35 | 30 | 10 | 5 | |
| MBC513 | -1.20 | 1.20 | 12/26/84 | CLEAR TUBE | 14 | 84 | 16 | SLUDGE | | GREENISH TAN | | | | | | | |
| MBC513 | 0.00 | 0.50 | 12/26/84 | HAND AUGER | 6 | 17 | 83 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC513 | 0.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 17 | 83 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC513 | 1.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 19 | 81 | CL | 2.5YR4/4 | WEAK RED | 50 | 5 | 25 | 20 | | | |
| MBC513 | 2.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 19 | 81 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC514 | -0.25 | 0.25 | 12/26/84 | CLEAR TUBE | 3 | 88 | 12 | SLUDGE | | GREEN | | | | | | | |
| MBC514 | 0.00 | 0.50 | 12/26/84 | HAND AUGER | 6 | 20 | 80 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC514 | 0.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 19 | 81 | CL | 2.5YR4/8 | RED | 50 | 5 | 25 | 20 | | | |
| MBC514 | 1.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 17 | 83 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC514 | 2.50 | 1.00 | 12/26/84 | HAND AUGER | 12 | 17 | 83 | CL | 2.5YR4/8 | RED | 45 | 5 | 25 | 20 | 5 | | |
| MBC515 | -0.50 | 0.50 | 12/27/84 | CLEAR TUBE | 6 | 85 | 15 | SLUDGE | | | | | | | | | |
| MBC515 | 0.00 | 0.50 | 12/27/84 | HAND AUGER | 6 | 15 | 85 | SC/SM | 2.5YRN3/0 | VERY DARK GREY | 45 | 5 | 20 | 15 | 10 | 5 | |
| MBC515 | 0.50 | 1.00 | 12/27/84 | HAND AUGER | 12 | 18 | 82 | SC/SM | 5YR7/1 | LIGHT GREY | 35 | 5 | 25 | 20 | 15 | | |
| MBC515 | 1.50 | 1.00 | 12/27/84 | HAND AUGER | 12 | 19 | 81 | SC/SM | 5YR8/1 | WHITE | 30 | 5 | 30 | 20 | 15 | | |
| MBC515 | 2.50 | 1.00 | 12/27/84 | HAND AUGER | 12 | 20 | 80 | SM/SC | 5YR8/1 | WHITE | 25 | 5 | 30 | 25 | 15 | | |

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SLUDGE/SOIL CORES - DRAINAGE DITCH

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC516 | -0.33 | 0.33 | 12/27/84 | CLEAR TUBE | 4 | 85 | 15 | SLUDGE | | BROWN | | | | | | | |
| MBC516 | 0.00 | 0.50 | 12/27/84 | HAND AUGER | 6 | 14 | 86 | SC | 5YR5/1 | GREY | 40 | | 20 | 20 | 15 | 5 | |
| MBC516 | 0.50 | 1.00 | 12/27/84 | HAND AUGER | 12 | 14 | 86 | SC | 5YR7/1 | LIGHT GREY | 35 | | 25 | 20 | 15 | 5 | |
| MBC516 | 1.50 | 1.00 | 12/27/84 | HAND AUGER | 12 | 17 | 83 | SC | 5YR7/1 | LIGHT GREY | 40 | | 30 | 25 | 5 | | |
| MBC516 | 2.50 | 1.00 | 12/27/84 | HAND AUGER | 12 | 16 | 84 | CL | 10YR7/2 | LIGHT GREY | 50 | | 25 | 20 | 5 | | |

SERIES=SLUDGE/SOIL CORES - SEEPAGE AREA

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC601 | 0.00 | 1.00 | 01/02/85 | SHELBY TUBE | 12 | 13 | 87 | SM/SC | 7.5YR5/2 | BROWN | 40 | 5 | 10 | 15 | 30 | | |
| MBC602 | 0.00 | 1.00 | 01/02/85 | SHELBY TUBE | 12 | 1 | 99 | SM | 7.5YR5/6 | STRONG BROWN | | 10 | 15 | 20 | 30 | 25 | |
| MBC603 | 0.00 | 1.00 | 01/02/85 | SHELBY TUBE | 12 | 5 | 95 | SM/SC | 10YR7/2 | LIGHT GREY | 30 | 5 | 15 | 15 | 20 | 15 | |
| MBC604 | -0.42 | 0.42 | 01/04/85 | GLASS JAR | 5 | 85 | 15 | SLUDGE | | TAN | | | | | | | |
| MBC604 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 22 | 78 | SM/SC | 5YR5/1 | GREY | 40 | 5 | 10 | 20 | 15 | 10 | |
| MBC605 | -0.33 | 0.33 | 01/04/85 | GLASS JAR | 4 | 83 | 17 | SLUDGE | | BROWN | | | | | | | |
| MBC605 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 16 | 84 | SM/SC | 5YR7/1 | LIGHT GREY | 45 | 5 | 5 | 10 | 25 | 10 | |
| MBC606 | -0.25 | 0.25 | 01/04/85 | GLASS JAR | 3 | 76 | 24 | SLUDGE | | TAN | | | | | | | |
| MBC606 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 33 | 67 | SM | 5YR4/3 | REDDISH BROWN | | 5 | 30 | 25 | 30 | 10 | |
| MBC607 | -0.50 | 0.50 | 01/04/85 | GLASS JAR | 6 | 92 | 8 | SLUDGE | | TAN | | | | | | | |
| MBC607 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 18 | 82 | CL | 5YR6/1 | GREY | 65 | 5 | 15 | 10 | 5 | | |
| MBC608 | -0.58 | 0.58 | 01/04/85 | GLASS JAR | 7 | 93 | 7 | SLUDGE | | GREEN | | | | | | | |
| MBC608 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 18 | 82 | SM/SC | 5YR5/6 | YELLOWISH RED | 45 | 5 | 10 | 15 | 20 | 5 | |
| MBC609 | -0.25 | 0.25 | 01/04/85 | GLASS JAR | 3 | 78 | 22 | SLUDGE | | TAN | | | | | | | |
| MBC609 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 14 | 86 | CL | 5YR5/6 | YELLOWISH RED | 55 | 5 | 10 | 15 | 15 | | |
| MBC610 | -0.25 | 0.25 | 01/04/85 | GLASS JAR | 3 | 83 | 17 | SLUDGE | | GREEN | | | | | | | |
| MBC610 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 23 | 77 | CL | 2.5YR5/6 | RED | 70 | 5 | 10 | 5 | 10 | | |
| MBC611 | -0.25 | 0.25 | 01/04/85 | GLASS JAR | 3 | 88 | 12 | SLUDGE | | GREEN | | | | | | | |
| MBC611 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 18 | 82 | CL | 2.5YR5/6 | RED | 65 | 5 | 20 | 5 | 5 | | |
| MBC612 | -0.67 | 0.67 | 01/04/85 | GLASS JAR | 8 | 74 | 26 | SLUDGE | | GREEN | | | | | | | |
| MBC612 | 0.00 | 1.00 | 01/04/85 | SHELBY TUBE | 12 | 27 | 73 | CL | 2.5YR4/8 | RED | 60 | 5 | 5 | 10 | 20 | | |
| MBC613 | -0.67 | 0.67 | 01/04/85 | GLASS JAR | 8 | 90 | 10 | SLUDGE | | GREEN | | | | | | | |
| MBC613 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 17 | 83 | NA | 5YR5/6 | YELLOWISH RED | 45 | 5 | 15 | 10 | 10 | 15 | |
| MBC614 | -0.67 | 0.67 | 01/04/85 | GLASS JAR | 8 | 84 | 16 | SLUDGE | | BROWNISH GREEN | | | | | | | |
| MBC614 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 17 | 83 | CL | 2.5YR5/6 | RED | 55 | 5 | 15 | 10 | 15 | | |
| MBC615 | -1.10 | 1.10 | 12/22/84 | GLASS JAR | 13 | 92 | 8 | SLUDGE | | BROWN | | | | | | | |
| MBC615 | 0.00 | 1.00 | 12/22/84 | SHELBY TUBE | 12 | 17 | 83 | CL | 2.5YR4/6 | RED | 50 | 5 | 25 | 20 | | | |
| MBC616 | -0.42 | 0.42 | 01/04/85 | GLASS JAR | 5 | 74 | 26 | SLUDGE | | BROWN | | | | | | | |
| MBC616 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 16 | 84 | CL | 5YR5/8 | YELLOWISH RED | 55 | 5 | 15 | 10 | 15 | | |
| MBC617 | -0.84 | 0.84 | 01/04/85 | GLASS JAR | 10 | 92 | 8 | SLUDGE | | GREENISH BROWN | | | | | | | |
| MBC617 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 18 | 82 | SM/SC | 5YR5/6 | YELLOWISH RED | 50 | 5 | 10 | 10 | 15 | 10 | |
| MBC618 | -0.58 | 0.58 | 01/04/85 | GLASS JAR | 7 | 83 | 17 | SLUDGE | | GREENISH TAN | | | | | | | |
| MBC618 | 0.00 | 1.00 | 12/31/84 | SHELBY TUBE | 12 | 16 | 84 | SM/SC | 5YR5/8 | YELLOWISH RED | 50 | 5 | 10 | 15 | 15 | 5 | |
| MBC619 | -0.25 | 0.25 | 01/11/85 | GLASS JAR | 3 | 81 | 19 | SLUDGE | | GREEN | | | | | | | |
| MBC619 | 0.00 | 0.50 | 01/11/85 | SHELBY TUBE | 6 | 15 | 85 | SM/SC | 5YR4/6 | YELLOWISH RED | 25 | 5 | 15 | 25 | 20 | 10 | |
| MBC619 | 0.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 16 | 84 | CL | 2.5YR4/8 | RED | 55 | 5 | 20 | 15 | 5 | | |
| MBC619 | 1.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 17 | 83 | CL | 2.5YR4/8 | RED | 50 | 5 | 20 | 15 | 10 | | |
| MBC619 | 2.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 17 | 83 | CL | 2.5YR4/8 | RED | 55 | 5 | 20 | 15 | 5 | | |
| MBC619 | 3.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 18 | 82 | SM/SC | 2.5YR4/8 | RED | 35 | 5 | 20 | 25 | 15 | | |

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SLUDGE/SOIL CORES - SEEPAGE AREA

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC619 | 4.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 17 | 83 | SM/SC | 5YR5/8 | YELLOWISH RED | 30 | 5 | 20 | 20 | 15 | 10 | |
| MBC619 | 5.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 17 | 83 | NA | 5YR5/8 | YELLOWISH RED | 15 | 5 | 35 | 30 | 10 | 5 | |
| MBC620 | -0.84 | 0.84 | 01/11/85 | GLASS JAR | 10 | 95 | 5 | SLUDGE | | GREEN | | | | | | | |
| MBC620 | 0.00 | 0.50 | 01/11/85 | SHELBY TUBE | 6 | 21 | 79 | SM/SC | 2.5YR3/6 | DARK RED | 30 | 5 | 20 | 25 | 15 | 5 | |
| MBC620 | 0.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 16 | 84 | SM/SC | 5YR5/8 | YELLOWISH RED | 30 | 5 | 20 | 25 | 15 | 5 | |
| MBC620 | 1.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 18 | 82 | CL | 2.5YR4/8 | RED | 50 | 5 | 10 | 20 | 15 | | |
| MBC620 | 2.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 17 | 83 | SM/SC | 2.5YR4/8 | RED | 35 | 5 | 15 | 25 | 15 | 5 | |
| MBC620 | 3.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 15 | 85 | SM/SC | 2.5YR4/8 | RED | 35 | 5 | 20 | 25 | 15 | | |
| MBC620 | 4.50 | 1.00 | 01/11/85 | SHELBY TUBE | 12 | 15 | 85 | SM/SC | 2.5YR4/8 | RED | 30 | 5 | 20 | 25 | 15 | 5 | |

SERIES=SLUDGE/SOIL CORES - LOST LAKE

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC701 | 0.0 | 0.5 | 11/30/84 | HAND AUGER | 6 | 5 | 95 | SM | 10YR4/6 | DARK YELLOWISH BROWN | 0 | 10 | 25 | 40 | 15 | 10 | |
| MBC701 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 8 | 92 | SM/SC | 7.5YR4/6 | STRONG BROWN | 10 | 15 | 15 | 30 | 20 | 10 | |
| MBC701 | 1.5 | 1.0 | 11/30/84 | HAND AUGER | 12 | 8 | 92 | SM | 7.5YR5/6 | STRONG BROWN | | 10 | 20 | 50 | 10 | 10 | |
| MBC702 | 0.0 | 0.5 | 11/30/84 | HAND AUGER | 6 | 6 | 94 | SM | 10YR4/2 | DARK GREYISH BROWN | | 10 | 30 | 35 | 15 | 10 | |
| MBC702 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 10 | 90 | SM/SC | 10YR3/2 | DARK GREYISH BROWN | 10 | 25 | 30 | 20 | 15 | | |
| MBC702 | 1.5 | 1.0 | 11/30/84 | HAND AUGER | 12 | 7 | 93 | SM | 10YR6/3 | PALE BROWN | | 10 | 20 | 40 | 20 | 10 | |
| MBC703 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 23 | 77 | SM/SC | 10YR2/2 | VERY DARK BROWN | 40 | 5 | 10 | 15 | 25 | 5 | |
| MBC703 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 18 | 82 | SM/SC | 10YR5/1 | GREY | 30 | 5 | 10 | 20 | 30 | 5 | |
| MBC704 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 17 | 83 | SC | 10YR6/1 | GREY | 35 | | 5 | 20 | 30 | 10 | |
| MBC704 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 19 | 81 | CL | 10YR7/1 | LIGHT GREY | 55 | | 5 | 15 | 20 | 5 | |
| MBC705 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 29 | 71 | CL | 10YR4/1 | DARK GREY | 60 | | 5 | 15 | 20 | | |
| MBC705 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 25 | 75 | CL | 10YR6/2 | LIGHT BROWNISH GREY | 75 | | 5 | 15 | 5 | | |
| MBC706 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 34 | 66 | CL | 10YR4/1 | DARK GREY | 74 | 10 | 10 | 5 | 1 | | |
| MBC706 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 29 | 71 | CL | 10YR5/1 | GREY | 80 | 5 | 10 | 5 | | | |
| MBC707 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 29 | 71 | CL | 10YR4/1 | DARK GREY | 70 | 5 | 10 | 10 | 5 | | |
| MBC707 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 23 | 77 | CL | 10YR6/1 | GREY | 70 | 5 | 10 | 10 | 5 | | |
| MBC708 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 40 | 60 | CL | 10YR3/1 | VERY DARK GREY | 49 | 5 | 5 | 10 | 30 | 1 | |
| MBC708 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 4 | 96 | CL | 10YR5/1 | GREY | 50 | 5 | 5 | 10 | 25 | 5 | |
| MBC709 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 27 | 73 | CL | 10YR3/1 | VERY DARK GREY | 55 | 5 | 5 | 10 | 20 | 5 | |
| MBC709 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 21 | 79 | CL | 10YR6/1 | GREY | 55 | 5 | 5 | 10 | 25 | | |
| MBC710 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 30 | 70 | CL | 10YR4/1 | DARK GREY | 70 | 5 | 5 | 5 | 10 | 5 | |
| MBC710 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 25 | 75 | CL | 10YR6/1 | GREY | 60 | 5 | 5 | 10 | 20 | | |
| MBC711 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 23 | 77 | CL | 10YR4/1 | DARK GREY | 60 | 5 | 5 | 15 | 10 | 5 | |
| MBC711 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 25 | 75 | CL | 10YR4/1 | DARK GREY | 75 | 5 | 5 | 10 | 5 | | |
| MBC712 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 32 | 68 | SC/SM | 10YR5/1 | GREY | 25 | 15 | 10 | 35 | 15 | | |
| MBC712 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 23 | 77 | SC/SM | 10YR6/2 | LIGHT BROWNISH GREY | 15 | 15 | 20 | 35 | 15 | | |
| MBC713 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 31 | 69 | SC/SM | 10YR2/1 | BLACK | 50 | 5 | 15 | 25 | 5 | | |
| MBC713 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 10 | 90 | CL | 10YR6/1 | GREY | 50 | 5 | 5 | 10 | 30 | | |
| MBC714 | 0.0 | 0.5 | 11/30/84 | HAND AUGER | 6 | 5 | 95 | SM | 10YR4/3 | DARK BROWN | | 10 | 15 | 35 | 25 | 15 | |
| MBC714 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 9 | 91 | SM/SC | 10YR5/4 | YELLOWISH BROWN | 15 | 15 | 10 | 40 | 20 | | |
| MBC714 | 1.5 | 1.0 | 11/30/84 | HAND AUGER | 12 | 5 | 95 | SM | 10YR7/4 | VERY PALE BROWN | | 10 | 20 | 40 | 20 | 10 | |
| MBC715 | 0.0 | 0.5 | 11/30/84 | HAND AUGER | 6 | 18 | 82 | SM/SC | 10YR3/1 | VERY DARK GREY | 35 | 5 | 10 | 15 | 30 | 5 | |
| MBC715 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 12 | 88 | SM/SC | 10YR5/1 | GREY | 20 | 20 | 15 | 20 | 15 | 10 | |
| MBC715 | 1.5 | 1.0 | 11/30/84 | HAND AUGER | 12 | 19 | 99 | SM/SC | 10YR6/1 | GREY | 40 | 5 | 10 | 15 | 25 | 5 | |
| MBC716 | 0.0 | 0.5 | 12/06/84 | SHELBY TUBE | 6 | 31 | 69 | CL | 10YR3/1 | VERY DARK GREY | 65 | 5 | 5 | 20 | 5 | | |

Table

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=SLUDGE/SOIL CORES - LOST LAKE

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC716 | 0.5 | 1.0 | 12/06/84 | SHELBY TUBE | 12 | 26 | 74 | CL | 10YR7/1 | LIGHT GREY | 65 | 5 | 10 | 15 | 5 | | |
| MBC717 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 36 | 64 | SC/SM | 10YR6/1 | GREY | 15 | 10 | 15 | 25 | 35 | | |
| MBC717 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 24 | 76 | SC/SM | 10YR6/1 | GREY | 15 | 15 | 20 | 30 | 20 | | |
| MBC718 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 20 | 80 | SC/SM | 10YR6/1 | GREY | 15 | 10 | 15 | 20 | 40 | | |
| MBC718 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 17 | 83 | SC/SM | 10YR6/1 | GREY | 15 | 15 | 20 | 30 | 20 | | |
| MBC719 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 19 | 81 | SC/SM | 10YR3/1 | VERY DARK GREY | 40 | 5 | 5 | 15 | 25 | 10 | |
| MBC719 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 22 | 78 | CL | 10YR7/1 | LIGHT GREY | 55 | 5 | 5 | 15 | 20 | | |
| MBC720 | 0.0 | 0.5 | 12/07/84 | SHELBY TUBE | 6 | 24 | 76 | SC/SM | 10YR5/1 | GREY | 15 | 5 | 10 | 15 | 35 | 20 | |
| MBC720 | 0.5 | 1.0 | 12/07/84 | SHELBY TUBE | 12 | 19 | 81 | SC/SM | 10YR7/1 | LIGHT GREY | 10 | 10 | 10 | 15 | 35 | 20 | |
| MBC721 | 0.0 | 0.5 | 11/30/84 | HAND AUGER | 6 | 16 | 84 | SM/SC | 10YR7/2 | LIGHT GREY | 35 | 5 | 10 | 15 | 25 | 10 | |
| MBC721 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 19 | 81 | CL | 2.5YR6/2 | LIGHT BROWNISH GRAY | 75 | | 5 | 10 | 10 | | |
| MBC721 | 1.5 | 1.0 | 11/30/84 | HAND AUGER | 12 | 14 | 86 | SM/SC | 10YR7/2 | LIGHT GREY | 25 | 5 | 10 | 15 | 35 | 10 | |
| MBC722 | 0.0 | 0.5 | 11/30/84 | HAND AUGER | 6 | 3 | 97 | SM | 10YR6/4 | LIGHT YELLOWISH BROW | | 10 | 30 | 35 | 15 | 10 | |
| MBC722 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 10 | 90 | SM/SC | 7.5YR4/6 | STRONG BROWN | 10 | 10 | 30 | 20 | 25 | 5 | |
| MBC722 | 1.5 | 1.0 | 11/30/84 | HAND AUGER | 12 | 5 | 95 | SM | 10YR5/6 | YELLOWISH BROWN | | 5 | 25 | 35 | 20 | 15 | |
| MBC723 | 0.0 | 0.5 | 11/21/84 | HAND AUGER | 6 | 12 | 88 | SM/SC | 2.5YR4/2 | WEAK RED | 25 | 5 | 10 | 20 | 30 | 10 | |
| MBC723 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 15 | 85 | CL | 2.5YR6/2 | LIGHT BROWNISH GRAY | 75 | | 5 | 10 | 10 | | |
| MBC723 | 1.0 | 1.0 | 11/21/84 | HAND AUGER | 12 | 14 | 86 | SM/SC | 10YR5/2 | GREYISH BROWN | 25 | 5 | 10 | 20 | 35 | 5 | |
| MBC724 | 0.0 | 0.5 | 11/21/84 | HAND AUGER | 6 | 8 | 92 | SM/SC | 10YR3/1 | VERY DARK GREY | 15 | 5 | 15 | 25 | 35 | 5 | |
| MBC724 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 12 | 88 | SM/SC | 2.5YR3/2 | VERY DARK GREYISH BR | 10 | 30 | 30 | 10 | 20 | | |
| MBC724 | 1.0 | 1.0 | 11/21/84 | HAND AUGER | 12 | 13 | 87 | SM/SC | 10YR3/1 | VERY DARK GREY | 20 | 5 | 30 | 25 | 10 | 10 | |
| MBC725 | 0.0 | 0.5 | 11/21/84 | HAND AUGER | 6 | 5 | 95 | SM | 10YR4/4 | DARK YELLOWISH BROWN | | 20 | 40 | 30 | 10 | | |
| MBC725 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 10 | 90 | SM/SC | 7.5YR4/6 | STRONG BROWN | 10 | 30 | 20 | 20 | 20 | | |
| MBC725 | 1.0 | 1.0 | 11/21/84 | HAND AUGER | 12 | 7 | 93 | NA | 7.5YR4/6 | STRONG BROWN | | 10 | 20 | 30 | 20 | 20 | |
| MBC726 | 0.0 | 0.5 | 11/21/84 | HAND AUGER | 6 | 9 | 91 | SM | 10YR3/3 | DARK BROWN | | 10 | 20 | 40 | 20 | 10 | |
| MBC726 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 12 | 88 | SM/SC | 2.5YR3/2 | VERY DARK GREYISH BR | 15 | 20 | 25 | 10 | 20 | 10 | |
| MBC726 | 1.0 | 1.0 | 11/21/84 | HAND AUGER | 12 | 8 | 92 | SM | 10YR3/6 | DARK YELLOWISH BROWN | | 10 | 20 | 45 | 15 | 10 | |
| MBC726 | 3.0 | 1.0 | 01/07/85 | HAND AUGER | 12 | 16 | 84 | SM | 10YR4/6 | DARK YELLOWISH BROWN | | 10 | 25 | 40 | 15 | 10 | |
| MBC727 | 0.0 | 0.5 | 11/21/84 | HAND AUGER | 6 | 7 | 93 | SM | 10YR3/3 | DARK BROWN | | 10 | 25 | 35 | 20 | 10 | |
| MBC727 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 14 | 86 | CL | 10YR3/3 | DARK BROWN | 60 | | 20 | 5 | 15 | | |
| MBC727 | 3.0 | 1.0 | 11/21/84 | HAND AUGER | 12 | 9 | 91 | NA | 10YR4/6 | DARK YELLOWISH BROWN | | 10 | 30 | 40 | 15 | 5 | |
| MBC728 | 0.0 | 0.5 | 11/21/84 | HAND AUGER | 6 | 6 | 94 | SM | 10YR4/4 | DARK YELLOWISH BROWN | | 10 | 30 | 45 | 10 | 5 | |
| MBC728 | 0.5 | 1.0 | 03/19/85 | HAND AUGER | 12 | 11 | 89 | SM/SC | 10YR3/3 | DARK BROWN | 15 | 25 | 30 | 10 | 20 | | |
| MBC728 | 2.0 | 1.0 | 11/21/84 | HAND AUGER | 12 | 8 | 92 | SM | 10YR4/6 | DARK YELLOWISH BROWN | | 10 | 30 | 40 | 15 | 5 | |
| MBC728 | 3.0 | 1.0 | 01/07/85 | HAND AUGER | 12 | 14 | 86 | SM | 10YR5/4 | YELLOWISH BROWN | | 10 | 30 | 35 | 15 | 10 | |
| MBC729 | 0.0 | 0.1 | 02/18/85 | HAND AUGER | 1 | 30 | 70 | SM/SC | 10YR6/1 | GREY | 10 | 10 | 10 | 25 | 25 | 10 | |
| MBC729 | 0.1 | 0.2 | 02/18/85 | HAND AUGER | 2 | 15 | 85 | SM/SC | 5Y6/1 | | 10 | 10 | 10 | 25 | 25 | 10 | |
| MBC729 | 0.3 | 0.2 | 02/18/85 | HAND AUGER | 4 | 18 | 82 | SM/SC | 5Y6/1 | | 10 | 10 | 10 | 25 | 25 | 10 | |
| MBC730 | 0.0 | 0.1 | 02/18/85 | HAND AUGER | 1 | 38 | 62 | SM/SC | 10YR6/1 | GREY | 10 | 15 | 10 | 20 | 25 | 10 | |
| MBC730 | 0.1 | 0.2 | 02/18/85 | HAND AUGER | 2 | 26 | 74 | SM/SC | 10YR6/1 | GREY | 25 | 10 | 15 | 15 | 25 | 10 | |
| MBC730 | 0.3 | 0.2 | 02/18/85 | HAND AUGER | 4 | 21 | 79 | SM/SC | 10YR6/1 | GREY | 25 | 10 | 15 | 15 | 25 | 10 | |
| MBC731 | 0.0 | 0.1 | 02/18/85 | HAND AUGER | 1 | 21 | 79 | SM/SC | 10YR6/1 | GREY | 10 | 10 | 15 | 10 | 30 | 10 | |
| MBC731 | 0.1 | 0.2 | 02/18/85 | HAND AUGER | 2 | 10 | 90 | SM/SC | 10YR6/1 | GREY | 25 | 10 | 15 | 10 | 30 | 10 | |
| MBC731 | 0.3 | 0.2 | 02/18/85 | HAND AUGER | 4 | 9 | 91 | SM/SC | 10YR6/1 | GREY | 25 | 10 | 15 | 10 | 30 | 10 | |
| MBC732 | 0.0 | 0.1 | 02/18/85 | HAND AUGER | 1 | 20 | 80 | SM/SC | 10YR6/1 | GREY | 10 | 15 | 10 | 20 | 20 | 15 | |
| MBC732 | 0.1 | 0.2 | 02/18/85 | HAND AUGER | 2 | 13 | 87 | SM/SC | 10YR6/1 | GREY | 15 | 10 | 20 | 10 | 35 | 10 | |
| MBC732 | 0.3 | 0.2 | 02/18/85 | HAND AUGER | 4 | 18 | 82 | SM/SC | 10YR6/1 | GREY | 15 | 10 | 20 | 10 | 35 | 10 | |
| MBC733 | 0.0 | 0.1 | 02/18/85 | HAND AUGER | 1 | 24 | 76 | SM/SC | 10YR6/1 | GREY | 10 | 20 | 30 | 10 | 15 | | |
| MBC733 | 0.1 | 0.2 | 02/18/85 | HAND AUGER | 2 | 15 | 85 | SM/SC | 10YR6/1 | GREY | 5 | 15 | 25 | 20 | 25 | 10 | |
| MBC733 | 0.3 | 0.2 | 02/18/85 | HAND AUGER | 4 | 14 | 86 | SM/SC | 10YR6/1 | GREY | 10 | 15 | 25 | 10 | 30 | 10 | |

Table 6-1

M-AREA SEEPAGE BASIN FIELD DATA

SERIES=REFERENCE SOIL CORES

| CORE | DEPTH FROM TOP OF SEDIMENT | INT | SAMPLE DATE | SAMPLING METHOD | REC | % H2O | SOLID | USCS | MUNSELL COLOR | VISUAL COLOR | CLAY | SILT | VF SAND | FINE SAND | MED. SAND | COARSE SAND | PENET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBC801 | 0 | 2 | 11/15/84 | SPLIT SPOON | 24 | 7 | 93 | SM | 10YR5/4 | YELLOWISH BROWN | | 20 | 25 | 20 | 20 | 15 | 0.5 |
| MBC801 | 2 | 2 | 11/15/84 | SPLIT SPOON | 18 | 10 | 90 | SM/SC | 2.5YR4/6 | RED | 35 | 10 | 20 | 10 | 15 | 10 | 4.5 |
| MBC801 | 4 | 2 | 11/15/84 | SPLIT SPOON | 18 | 8 | 92 | SM/SC | 2.5YR4/6 | RED | 40 | 10 | 15 | 20 | 15 | | 4.5 |
| MBC801 | 6 | 2 | 11/15/84 | SPLIT SPOON | 16 | 11 | 89 | SM/SC | 2.5YR5/6 | RED | 45 | 10 | 15 | 25 | 5 | | 4.5 |
| MBC801 | 8 | 2 | 11/15/84 | SPLIT SPOON | 10 | 9 | 91 | SM/SC | 2.5YR5/6 | RED | 30 | 15 | 20 | 10 | 25 | | |
| MBC802 | 0 | 2 | 11/15/84 | SPLIT SPOON | 24 | 5 | 95 | SM/SC | 7.5YR5/6 | STRONG BROWN | 25 | 15 | 10 | 20 | 20 | 10 | 4.5 |
| MBC802 | 2 | 2 | 11/15/84 | SPLIT SPOON | 11 | 13 | 87 | SM/SC | 5YR5/6 | YELLOWISH RED | 35 | 20 | 15 | 10 | 20 | | 4.5 |
| MBC802 | 4 | 2 | 11/15/84 | SPLIT SPOON | 16 | 10 | 90 | SM/SC | 7.5YR5/8 | STRONG BROWN | 30 | 15 | 10 | 10 | 15 | 20 | 4.5 |
| MBC802 | 6 | 2 | 11/15/84 | SPLIT SPOON | 14 | 9 | 91 | SM/SC | 7.5YR5/6 | STRONG BROWN | 30 | 20 | 30 | 10 | | 10 | 4.5 |
| MBC802 | 8 | 2 | 11/15/84 | SPLIT SPOON | 17 | 13 | 87 | SM/SC | 5YR5/8 | YELLOWISH RED | 30 | 25 | 20 | 10 | | 15 | 4.5 |
| MBC803 | 0 | 4 | 11/16/84 | SPLIT SPOON | 13 | 12 | 88 | SM/SC | 5YR5/6 | YELLOWISH RED | 35 | 25 | 15 | 10 | 15 | | 0.2-4.5 |
| MBC803 | 2 | 2 | 11/16/84 | SPLIT SPOON | 13 | | | SM/SC | 2.5YR4/6 | RED | 25 | 15 | 10 | 10 | 30 | 10 | |
| MBC803 | 4 | 4 | 11/16/84 | SPLIT SPOON | 18 | 14 | 86 | SM/SC | 2.5YR4/6 | RED | 40 | 10 | 30 | 20 | | | 4.5 |
| MBC803 | 6 | 2 | 11/16/84 | SPLIT SPOON | 18 | | | SM/SC | 2.5YR3/6 | DARK RED | 40 | 10 | 15 | 10 | 25 | | |
| MBC803 | 8 | 2 | 11/16/84 | SPLIT SPOON | 15 | 13 | 87 | SM/SC | 2.5YR4/6 | RED | 30 | 20 | 15 | 10 | 20 | 5 | 4.5 |
| MBC803 | 10 | 2 | 11/16/84 | SPLIT SPOON | 14 | 13 | 87 | SM/SC | 2.5YR4/8 | RED | 30 | 20 | 10 | 10 | 20 | 10 | 4.5 |
| MBC803 | 12 | 2 | 11/16/84 | SPLIT SPOON | 20 | 15 | 85 | SM/SC | 2.5YR4/6 | RED | 40 | 20 | 10 | 5 | 20 | 5 | 4.5 |
| MBC803 | 14 | 2 | 11/16/84 | SPLIT SPOON | 13 | 13 | 87 | SM/SC | 2.5YR4/8 | RED | 45 | 10 | 10 | 15 | 15 | 5 | 4.0 |
| MBC803 | 16 | 2 | 11/16/84 | SPLIT SPOON | 18 | 12 | 88 | SM/SC | 2.5YR5/6 | RED | 30 | 20 | 15 | 5 | 25 | 5 | 4.0 |
| MBC803 | 18 | 2 | 11/16/84 | SPLIT SPOON | 19 | 13 | 87 | SM/SC | 2.5YR5/6 | RED | 35 | 15 | 10 | 5 | 30 | 5 | 4.3 |
| MBC804 | 0 | 4 | 11/16/84 | SPLIT SPOON | 14 | 9 | 91 | SM/SC | 10YR5/6 | YELLOWISH BROWN | 30 | 15 | 15 | 10 | 25 | 5 | 0.5-4.5 |
| MBC804 | 2 | 2 | 11/16/84 | SPLIT SPOON | 15 | | | SM/SC | 7.5YR5/6 | STRONG BROWN | 30 | 15 | 15 | 10 | 20 | 10 | |
| MBC804 | 4 | 4 | 11/16/84 | SPLIT SPOON | 15 | 13 | 87 | SM/SC | 2.5YR3/6 | DARK RED | 45 | 10 | 15 | 20 | 10 | | 4.5 |
| MBC804 | 6 | 2 | 11/16/84 | SPLIT SPOON | 23 | | | SM/SC | 2.5YR4/8 | RED | 35 | 15 | 10 | 15 | 20 | 5 | |
| MBC804 | 8 | 2 | 11/16/84 | SPLIT SPOON | 17 | 13 | 87 | SM/SC | 2.5YR4/8 | RED | 25 | 20 | 15 | 10 | 20 | 10 | 4.5 |
| MBC804 | 10 | 2 | 11/16/84 | SPLIT SPOON | 10 | 13 | 87 | SM/SC | 2.5YR5/6 | RED | 35 | 15 | 20 | 10 | 15 | 5 | 4.0 |
| MBC804 | 12 | 2 | 11/16/84 | SPLIT SPOON | 20 | 13 | 87 | SM/SC | 2.5YR5/6 | RED | 30 | 20 | 15 | 10 | 20 | 5 | 4.5 |
| MBC804 | 14 | 2 | 11/16/84 | SPLIT SPOON | 12 | 12 | 88 | CL | 5YR7/4 | PINK | 60 | 15 | 10 | 5 | 10 | | 4.5 |
| MBC804 | 16 | 2 | 11/16/84 | SPLIT SPOON | 15 | 11 | 89 | SM/SC | 2.5YR6/6 | LIGHT RED | 35 | 15 | 10 | 5 | 30 | 5 | 3.5 |
| MBC804 | 18 | 2 | 11/16/84 | SPLIT SPOON | 17 | 11 | 89 | SM/SC | 5YR6/6 | REDDISH YELLOW | 25 | 20 | 15 | 5 | 30 | 5 | 4.0 |

Notes to Table 6-1

Depth to top of sediment; in feet
Interval (sample interval); in feet
Depth (in basin, is depth from surface of water to top of sludge), in feet
Sample Method - Indicates how the sample was obtained
Recovery; amount of material recovered, in inches
% $H_2O$, % by weight water
% Solid, % by weight solid
USCS - Unified Soil Classification System
Munsell Color - Color of each soil or sludge sample classified by Munsell Color System
Clay, silt, UF sand, fine sand, medium sand, coarse sand refer to the % of each material
Penetrometer Reading; in Tons/$ft^2$

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC201 | -0.3 | 71610.000 | 26290.000 | 2.500 | 102.000 | 282.000 | 239.000 | 5480.000 | 1.800 | 108.000 |
| | 0 | 5660.000 | 327.100 | -1.000 | 7.200 | 37.000 | -2.000 | 25995.000 | -0.200 | 62.200 |
| | 1 | 6780.000 | 442.600 | -1.000 | 48.500 | 32.000 | -2.000 | 29915.000 | -0.200 | 69.700 |
| | 2 | 5880.000 | 443.700 | -1.000 | 16.900 | 29.000 | -2.000 | 29540.000 | -0.200 | 58.600 |
| | 3 | 5930.000 | 452.900 | -1.000 | 60.000 | 26.800 | -2.000 | 22590.000 | -0.200 | 64.600 |
| | 4 | 4835.000 | 371.300 | -1.000 | 32.400 | 18.800 | -2.000 | 21415.000 | -0.200 | 49.900 |
| | 5 | . | 205.800 | -1.000 | 5.000 | 18.000 | -2.000 | 18805.000 | -0.200 | 43.000 |
| MBC202 | -0.5 | 34410.000 | 12540.000 | -1.000 | 63.800 | 97.800 | 90.300 | 9290.000 | 1.480 | 81.900 |
| MBC203 | -1.8 | 68940.000 | 56250.000 | 2.100 | 188.000 | 96.700 | 436.000 | 7080.000 | 1.780 | 223.000 |
| | 0 | 1630.000 | 25.600 | -1.000 | 32.900 | 4.300 | 2.050 | 3820.000 | -0.200 | 36.900 |
| | 1 | 2565.000 | 134.000 | -1.000 | 18.600 | 8.450 | -2.000 | 8690.000 | -0.200 | 29.400 |
| | 2 | 2695.000 | 150.000 | -1.000 | 8.000 | 7.750 | -2.000 | 9355.000 | -0.200 | 31.500 |
| | 3 | 2665.000 | 70.950 | -1.000 | 8.400 | 13.400 | -2.000 | 9420.000 | -0.200 | 24.400 |
| | 4 | 2080.000 | 418.000 | -1.000 | 4.900 | 14.400 | -2.000 | 10100.000 | -0.200 | 27.200 |
| | 5 | 2420.000 | 384.400 | -1.000 | 26.600 | 20.200 | -2.000 | 13235.000 | -0.200 | 32.100 |
| MBC204 | -1.5 | 152100.000 | 13890.000 | 3.150 | 524.500 | 66.200 | 119.000 | 4360.000 | 0.670 | 167.000 |
| MBC205 | -1.5 | 83100.000 | 50600.000 | 2.100 | 654.500 | 146.000 | 406.000 | 8240.000 | 2.290 | 260.000 |
| | 0 | 1070.000 | 33.000 | -0.002 | 21.200 | -0.004 | -2.000 | 7550.000 | -0.200 | 23.200 |
| | 1 | 2060.000 | 57.700 | -1.000 | 29.600 | 5.900 | -2.000 | 8520.000 | -0.200 | 40.600 |
| | 2 | 1580.000 | 39.200 | -1.000 | 45.600 | 7.350 | -2.000 | 9220.000 | -0.200 | 26.800 |
| | 3 | 915.000 | 29.000 | -1.000 | 36.100 | 3.050 | -2.000 | 4770.000 | -0.200 | 17.900 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS [illegible]

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC205 | 4 | 2300.000 | 60.000 | -1.000 | 6.700 | 9.850 | -2.000 | 8580.000 | 0.430 | 25.400 |
| | 5 | 1540.000 | 158.000 | -1.000 | 61.800 | 4.950 | -2.000 | 4250.000 | -0.200 | 15.300 |
| MBC206 | -3 | 171580.000 | 11440.000 | 3.800 | 604.500 | 35.200 | 133.000 | 2880.000 | 0.470 | 169.000 |
| MBC207 | -2.1 | 136000.000 | 26030.000 | 3.000 | 476.000 | 97.500 | 286.000 | 5990.000 | 0.930 | 244.000 |
| | 0 | 3840.000 | 147.000 | -0.002 | 199.000 | 13.100 | 2.850 | 8740.000 | -0.200 | 39.400 |
| | 1 | 4800.000 | 49.200 | -1.000 | 170.000 | 27.500 | 5.700 | 21000.000 | -0.200 | 50.400 |
| | 2 | 1540.000 | 51.000 | -1.000 | 113.900 | 4.050 | -2.000 | 5300.000 | -0.200 | 22.800 |
| | 3 | 2125.000 | 227.000 | -1.000 | 7.500 | 4.500 | -2.000 | 8010.000 | -0.200 | 28.000 |
| | 4 | 1890.000 | 168.000 | -1.000 | 26.000 | 5.450 | -2.000 | 10430.000 | -0.200 | 28.400 |
| | 5 | 1250.000 | 91.600 | -1.000 | 6.200 | 2.450 | -2.000 | 5550.000 | -0.200 | 22.800 |
| MBC208 | -1.1 | 105290.000 | 24390.000 | 2.850 | 318.500 | 62.400 | 139.000 | 3860.000 | 1.100 | 104.000 |
| MBC301 | 0 | 24650.000 | 390.000 | -1.000 | 9.800 | 30.200 | -2.000 | 25900.000 | -0.200 | 229.000 |
| | 5 | 9800.000 | 487.000 | -1.000 | 11.700 | 39.200 | -2.000 | 30800.000 | -0.200 | 115.000 |
| | 10 | 5950.000 | 630.000 | -1.000 | 9.900 | 25.200 | -2.000 | 22500.000 | -0.200 | 74.200 |
| | 15 | 3550.000 | 65.500 | -1.000 | 13.000 | 16.000 | -2.000 | 14350.000 | -0.200 | 48.800 |
| | 16 | 3150.000 | 734.000 | -1.000 | 12.750 | 13.400 | -2.000 | 10900.000 | -0.200 | 50.400 |
| | 18 | 5800.000 | 535.000 | -1.000 | 18.300 | 20.000 | -2.000 | 16700.000 | -0.200 | 73.400 |
| | 20 | 3200.000 | 253.000 | -1.000 | 5.400 | 11.000 | -2.000 | 9950.000 | -0.200 | 43.200 |
| MBC302 | 0 | 22300.000 | 64.000 | -1.000 | 7.120 | 29.800 | 3.700 | 25600.000 | -0.200 | 76.500 |
| | 5 | 8820.000 | 21.000 | -1.000 | 21.000 | 32.500 | 4.800 | 30700.000 | -0.200 | 47.700 |
| | 10 | 6100.000 | 50.000 | -1.000 | 24.200 | 16.500 | 6.600 | 24300.000 | -0.200 | 44.400 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC302 | 15 | 4150.000 | 48.000 | -1.000 | 6.500 | 15.900 | 5.100 | 15500.000 | -0.200 | 27.600 |
| | 16 | 4090.000 | 30.000 | -1.000 | 21.900 | 17.000 | 6.600 | 12900.000 | -0.200 | 29.400 |
| | 17 | 4140.000 | 98.000 | -1.000 | 23.000 | 16.200 | 6.800 | 11600.000 | -0.200 | 29.400 |
| | 18 | 4390.000 | 53.000 | -1.000 | 22.900 | 15.200 | 6.600 | 13700.000 | -0.200 | 29.800 |
| | 19 | 3550.000 | 32.000 | -1.000 | 16.600 | 8.000 | 2.500 | 8520.000 | -0.200 | 21.200 |
| | 20 | 3590.000 | 30.000 | -1.000 | 19.400 | 10.400 | 3.200 | 9400.000 | -0.200 | 24.500 |
| MBC303 | 0 | 44000.000 | 232.000 | -1.000 | 8.660 | 36.700 | -2.000 | 58400.000 | -0.200 | 80.500 |
| | 5 | 7870.000 | 136.000 | -1.000 | 22.400 | 34.200 | 2.200 | 29200.000 | -0.200 | 50.600 |
| | 10 | 4140.000 | 175.000 | -1.000 | 32.600 | 29.200 | 6.000 | 15100.000 | -0.200 | 32.200 |
| | 16 | 2579.000 | 16.000 | -1.000 | 16.000 | 30.200 | 11.900 | 17100.000 | -0.200 | 30.000 |
| | 17 | 1860.000 | 13.000 | -1.000 | 19.600 | 3.600 | -2.000 | 7470.000 | -0.200 | 32.000 |
| | 18 | 5010.000 | 432.000 | -1.000 | 19.000 | 60.900 | 9.800 | 17900.000 | -0.200 | 48.000 |
| | 19 | 1830.000 | 50.000 | -1.000 | 19.200 | 16.600 | 4.700 | 9650.000 | -0.200 | 24.600 |
| | 20 | 2640.000 | 75.500 | -1.000 | 24.500 | 14.700 | 2.750 | 10755.000 | -0.200 | 39.200 |
| MBC304 | 0 | 16100.000 | 178.000 | -1.000 | 11.300 | 25.200 | -2.000 | 19500.000 | -0.200 | 101.000 |
| | 5 | 12100.000 | 82.000 | -1.000 | 3.000 | 32.800 | -2.000 | 26350.000 | -0.200 | 84.300 |
| | 10 | 6150.000 | 86.000 | -1.000 | 6.800 | 35.200 | -2.000 | 29200.000 | -0.200 | 60.800 |
| | 15 | 4700.000 | 26.500 | -1.000 | 23.100 | 27.600 | -2.000 | 26250.000 | -0.200 | 38.000 |
| | 16 | 6250.000 | 137.000 | -1.000 | 32.300 | 31.950 | -2.000 | 26450.000 | -0.200 | 54.300 |
| | 17 | 5600.000 | 37.500 | -1.000 | 8.100 | 27.600 | -2.000 | 28300.000 | -0.200 | 44.800 |
| | 18 | 3600.000 | 121.000 | -1.000 | 10.900 | 29.400 | -2.000 | 11800.000 | -0.200 | 58.600 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC304 | 19 | 2800.000 | 50.000 | -1.000 | 19.000 | 11.800 | -2.000 | 15500.000 | -0.200 | 31.100 |
| | 20 | 3600.000 | 24.000 | -1.000 | 22.300 | 11.400 | -2.000 | 11800.000 | -0.200 | 32.500 |
| MBC401 | 7 | 3600.000 | 140.000 | -1.000 | 9.300 | 18.100 | -2.000 | 13200.000 | -0.200 | 33.200 |
| | 8 | 1930.000 | 174.000 | -1.000 | 5.200 | 13.600 | -2.000 | 10000.000 | -0.200 | 26.200 |
| | 9 | 2040.000 | 174.000 | -1.000 | 4.700 | 13.800 | -2.000 | 10700.000 | -0.200 | 28.100 |
| | 10 | 2670.000 | 197.000 | -1.000 | 6.000 | 25.400 | -2.000 | 15300.000 | -0.200 | 35.300 |
| | 11 | 3030.000 | 146.000 | -1.000 | 6.300 | 14.600 | 12.100 | 9040.000 | -0.200 | 30.800 |
| | 12 | 2070.000 | 130.000 | -1.000 | 5.800 | 11.000 | -2.000 | 8660.000 | -0.200 | 23.900 |
| MBC402 | 7 | 8060.000 | 32.200 | -1.000 | 7.900 | 54.800 | -2.000 | 57500.000 | -0.200 | 60.600 |
| | 8 | 4740.000 | 16.000 | -1.000 | 6.500 | 41.650 | -2.000 | 38000.000 | -0.200 | 38.900 |
| | 9 | 5430.000 | 34.000 | -1.000 | 7.300 | 38.200 | -2.000 | 32800.000 | -0.200 | 46.500 |
| | 10 | 3460.000 | 14.400 | -1.000 | 5.500 | 29.400 | -2.000 | 21400.000 | -0.200 | 28.000 |
| | 11 | 2510.000 | 13.000 | -1.000 | 4.400 | 19.800 | -2.000 | 14500.000 | -0.200 | 19.800 |
| | 12 | 2190.000 | 14.600 | -1.000 | 5.400 | 17.000 | -2.000 | 11900.000 | -0.200 | 18.400 |
| MBC403 | 7 | 4060.000 | 41.700 | -1.000 | 5.900 | 18.000 | -2.000 | 14000.000 | -0.200 | 34.600 |
| | 8 | 1800.000 | 14.200 | -1.000 | 5.800 | 12.600 | -2.000 | 8520.000 | -0.200 | 17.800 |
| | 9 | 1900.000 | 17.100 | -1.000 | 5.700 | 13.000 | -2.000 | 9860.000 | -0.200 | 19.800 |
| | 10 | 1440.000 | 22.400 | -1.000 | 7.600 | 7.650 | -2.000 | 5940.000 | -0.200 | 17.000 |
| | 11 | 1890.000 | 11.000 | -1.000 | 7.500 | 12.400 | -2.000 | 9340.000 | -0.200 | 19.200 |
| | 12 | 1970.000 | 21.000 | -1.000 | 7.500 | 12.400 | -2.000 | 9380.000 | -0.200 | 23.400 |
| MBC404 | 7 | 5490.000 | 29.600 | -1.000 | 5.300 | 20.200 | -2.000 | 16800.000 | -0.200 | 37.900 |

(CONTINUED)

TABLE 6-2

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC404 | 8 | 5530.000 | 41.800 | -1.000 | 6.300 | 19.600 | -2.000 | 16200.000 | -0.200 | 33.300 |
| | 9 | 4890.000 | 34.600 | -1.000 | 5.100 | 20.800 | -2.000 | 16500.000 | -0.200 | 34.600 |
| | 10 | 2540.000 | 27.900 | -1.000 | 4.900 | 16.600 | -2.000 | 14400.000 | -0.200 | 24.000 |
| | 11 | 1960.000 | 32.800 | -1.000 | 6.400 | 11.600 | -2.000 | 9260.000 | -0.200 | 22.000 |
| | 12 | 1750.000 | 26.000 | -1.000 | 7.600 | 8.250 | -2.000 | 6710.000 | -0.200 | 19.200 |
| MBC405 | 0 | 4610.000 | 23.600 | -1.000 | 6.400 | 26.400 | -2.000 | 30405.000 | -0.200 | 40.600 |
| | 1 | 5040.000 | 24.400 | -1.000 | 6.500 | 24.000 | -2.000 | 29200.000 | -0.200 | 44.600 |
| | 2 | 3570.000 | 53.800 | -1.000 | 6.800 | 20.900 | -2.000 | 23600.000 | -0.200 | 34.200 |
| | 3 | 2920.000 | 46.400 | -1.000 | 7.700 | 17.400 | -2.000 | 15400.000 | -0.200 | 28.700 |
| | 4 | 2320.000 | 30.400 | -1.000 | 7.200 | 17.200 | -2.000 | 11800.000 | -0.200 | 24.600 |
| | 5 | 2720.000 | 20.600 | -1.000 | 7.000 | 17.400 | -2.000 | 15000.000 | -0.200 | 30.600 |
| MBC406 | 0 | 3795.000 | 50.600 | -1.000 | 6.100 | 19.200 | -2.000 | 20475.000 | -0.200 | 37.000 |
| | 1 | 4005.000 | 28.100 | -1.000 | 6.800 | 20.700 | -2.000 | 24150.000 | -0.200 | 36.800 |
| | 2 | 3325.000 | 58.700 | -1.000 | 10.100 | 20.400 | -2.000 | 22955.000 | -0.200 | 43.400 |
| | 3 | 2895.000 | 50.700 | -1.000 | 15.800 | 17.900 | -2.000 | 20275.000 | -0.200 | 34.600 |
| | 4 | 3875.000 | 56.600 | -1.000 | 15.900 | 19.200 | -2.000 | 24040.000 | -0.200 | 39.300 |
| | 5 | 2985.000 | 45.800 | -1.000 | 14.200 | 15.800 | -2.000 | 19425.000 | -0.200 | 31.900 |
| MBC407 | 0 | 13975.000 | 259.000 | -1.000 | 30.300 | 40.800 | 2.400 | 19270.000 | -0.200 | 64.800 |
| | 1 | 4275.000 | 198.000 | -1.000 | 29.900 | 29.900 | -2.000 | 19510.000 | -0.200 | 40.000 |
| | 2 | 3210.000 | 26.800 | -1.000 | 24.800 | 17.700 | -2.000 | 21870.000 | -0.200 | 32.900 |
| | 3 | 3530.000 | 16.800 | -1.000 | 38.200 | 20.600 | -2.000 | 20085.000 | -0.200 | 33.100 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC407 | 4 | 3820.000 | 19.300 | -1.000 | 42.400 | 19.400 | -2.000 | 20815.000 | -0.200 | 35.200 |
| | 5 | 2430.000 | 11.300 | -1.000 | 39.900 | 11.300 | -2.000 | 12900.000 | -0.200 | 25.200 |
| MBC408 | 0 | 11200.000 | 492.800 | -1.000 | 11.600 | 32.600 | -2.000 | 23300.000 | -0.200 | 64.200 |
| | 1 | 4290.000 | 192.000 | -1.000 | 11.000 | 21.000 | -2.000 | 20600.000 | -0.200 | 46.100 |
| | 2 | 4690.000 | 51.700 | -1.000 | 29.500 | 20.400 | -2.000 | 28200.000 | -0.200 | 42.200 |
| | 3 | 3560.000 | 21.000 | -1.000 | 48.800 | 15.500 | -2.000 | 16500.000 | -0.200 | 28.000 |
| | 4 | 2840.000 | 19.800 | -1.000 | 61.200 | 10.800 | -2.000 | 13600.000 | -0.200 | 24.100 |
| | 5 | 2680.000 | 25.400 | -1.000 | 45.900 | 11.400 | -2.000 | 14100.000 | -0.200 | 25.900 |
| MBC409 | 0 | 10190.000 | 155.000 | -1.000 | 4.900 | 34.500 | -2.000 | 39960.000 | -0.200 | 49.200 |
| | 1 | 6900.000 | 18.100 | -1.000 | 8.400 | 26.100 | -2.000 | 41590.000 | -0.200 | 38.200 |
| | 2 | 6190.000 | 27.600 | -1.000 | 16.100 | 19.800 | -2.000 | 24170.000 | -0.200 | 26.600 |
| | 3 | 2545.000 | 34.600 | -1.000 | 22.600 | 21.800 | -2.000 | 16600.000 | -0.200 | 26.300 |
| | 4 | 6920.000 | 50.800 | -1.000 | 31.800 | 28.200 | -2.000 | 42070.000 | -0.200 | 48.500 |
| | 5 | 6550.000 | 39.300 | -1.000 | 35.100 | 26.800 | -2.000 | 34300.000 | -0.200 | 52.100 |
| MBC410 | 0 | 11350.000 | 76.000 | -1.000 | 4.400 | 43.600 | 2.930 | 56390.000 | -0.200 | 54.900 |
| | 1 | 8180.000 | 46.900 | -1.000 | 5.100 | 31.600 | -2.000 | 41460.000 | -0.200 | 39.800 |
| | 2 | 9070.000 | 34.600 | -1.000 | 13.900 | 34.600 | -2.000 | 46430.000 | -0.200 | 41.900 |
| | 3 | 5710.000 | 28.900 | -1.000 | 23.100 | 30.400 | -2.000 | 40880.000 | -0.200 | 30.500 |
| | 4 | 7450.000 | 48.400 | -1.000 | 33.800 | 31.400 | -2.000 | 50400.000 | -0.200 | 48.800 |
| | 5 | 6430.000 | 24.300 | -1.000 | 36.700 | 37.800 | -2.000 | 41930.000 | -0.200 | 51.000 |
| MBC411 | 0 | 7950.000 | 70.600 | -1.000 | 7.800 | 13.000 | -2.000 | 13600.000 | -0.200 | 54.300 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND WATERS

REPORTED AS MICROGRAMS/GRAM

| CORE | DEPTH TO TOP OF SAMPLE | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| MBC411 | 1 | 8450.000 | 123.000 | -1.000 | 2.300 | 15.600 | -2.000 | 16300.000 | -0.200 | 52.400 |
| | 2 | 10200.000 | 131.000 | -1.000 | 5.100 | 22.800 | -2.000 | 25500.000 | -0.200 | 57.400 |
| | 3 | 9530.000 | 160.000 | -1.000 | 10.800 | 32.600 | -2.000 | 28500.000 | -0.200 | 67.100 |
| | 4 | 8380.000 | 172.000 | -1.000 | 12.600 | 25.000 | -2.000 | 22700.000 | -0.200 | 72.400 |
| | 5 | 5460.000 | 164.000 | -1.000 | 16.600 | 30.300 | -2.000 | 25900.000 | -0.200 | 68.900 |
| MBC412 | 0 | 7830.000 | 87.600 | -1.000 | 2.900 | 12.800 | -2.000 | 12900.000 | -0.200 | 56.200 |
| | 1 | 12200.000 | 209.000 | -1.000 | 5.600 | 22.200 | -2.000 | 21700.000 | -0.200 | 55.000 |
| | 2 | 14200.000 | 125.000 | -1.000 | 20.000 | 26.800 | -2.000 | 26300.000 | -0.200 | 64.400 |
| | 3 | 14600.000 | 126.400 | -1.000 | 20.800 | 26.600 | -2.000 | 25800.000 | -0.200 | 69.200 |
| | 4 | 11500.000 | 137.000 | -1.000 | 16.900 | 27.000 | -2.000 | 25300.000 | -0.200 | 67.500 |
| | 5 | 9500.000 | 229.600 | -1.000 | 10.800 | 26.800 | -2.000 | 26200.000 | -0.200 | 73.600 |
| MBC413 | 0 | 7930.000 | 41.400 | -1.000 | 2.400 | 12.000 | -2.000 | 10900.000 | -0.200 | 58.100 |
| | 1 | 10800.000 | 237.400 | -1.000 | 6.100 | 29.300 | -2.000 | 16400.000 | -0.200 | 61.400 |
| | 2 | 17600.000 | 63.600 | -1.000 | 11.100 | 24.400 | -2.000 | 23400.000 | -0.200 | 61.200 |
| | 3 | 21735.000 | 83.700 | -1.000 | 21.200 | 31.000 | -2.000 | 29620.000 | -0.200 | 63.600 |
| | 4 | 17940.000 | 67.800 | -1.000 | 14.100 | 25.400 | -2.000 | 26240.000 | -0.200 | 64.800 |
| | 5 | 10825.000 | 207.000 | -1.000 | 11.000 | 27.100 | -2.000 | 26240.000 | -0.200 | 66.900 |
| MBC414 | 0 | 6770.000 | 59.700 | -1.000 | 3.300 | 13.500 | -2.000 | 14250.000 | -0.200 | 46.400 |
| | 1 | 8905.000 | 192.000 | -1.000 | 3.800 | 17.800 | -2.000 | 18260.000 | -0.200 | 46.200 |
| | 2 | 9440.000 | 220.000 | -1.000 | 3.700 | 21.000 | -2.000 | 20520.000 | -0.200 | 48.800 |
| | 3 | 9410.000 | 238.000 | -1.000 | 5.000 | 23.400 | -2.000 | 22080.000 | -0.200 | 51.200 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC414 | 4 | 9440.000 | 251.000 | -1.000 | 8.100 | 25.000 | -2.000 | 23520.000 | -0.200 | 58.900 |
| | 5 | 5600.000 | 184.000 | -1.000 | 8.000 | 23.900 | -2.000 | 20930.000 | -0.200 | 58.200 |
| MBC501 | -1.2 | 79590.000 | 23840.000 | 2.150 | 41.100 | 794.000 | 169.000 | 3690.000 | 3.000 | 98.800 |
| MBC502 | -0.67 | 67000.000 | 90480.000 | -1.000 | 186.000 | 59.500 | 138.000 | 3400.000 | 4.790 | 135.000 |
| | 0 | 8380.000 | 1100.000 | -1.000 | 35.300 | 20.800 | 5.600 | 13500.000 | -0.200 | 70.000 |
| | 0.5 | 8175.000 | 918.000 | -1.000 | 3.800 | 22.200 | -2.000 | 18005.000 | -0.200 | 68.300 |
| | 1.5 | 6920.000 | 942.000 | -1.000 | 3.700 | 24.000 | -2.000 | 19160.000 | -0.200 | 55.900 |
| | 2.5 | 6340.000 | 1183.000 | -1.000 | 6.000 | 33.800 | 2.050 | 16180.000 | -0.200 | 71.500 |
| MBC503 | 0 | 94720.000 | 37030.000 | 3.050 | 116.600 | 77.800 | 330.000 | 1990.000 | 4.750 | 80.600 |
| | 0.5 | 10860.000 | 485.600 | -1.000 | 17.100 | 19.500 | 2.450 | 16055.000 | -0.200 | 82.600 |
| | 1.5 | 10995.000 | 486.700 | -1.000 | 30.400 | 20.400 | 2.250 | 16580.000 | -0.200 | 87.100 |
| | 2.5 | 8250.000 | 534.000 | -1.000 | 3.700 | 23.400 | 6.250 | 17650.000 | -0.200 | 64.300 |
| MBC504 | 0 | 62880.000 | 10370.000 | 1.450 | 43.500 | 382.000 | 154.000 | 1540.000 | 5.070 | 222.000 |
| | 0.5 | 7325.000 | 424.000 | -1.000 | 9.400 | 22.100 | 4.100 | 17010.000 | -0.200 | 62.100 |
| | 1.5 | 6890.000 | 412.000 | -1.000 | 4.100 | 20.900 | 2.700 | 16040.000 | -0.200 | 55.600 |
| | 2.5 | 7250.000 | 527.000 | -1.000 | 4.000 | 24.300 | 3.050 | 17370.000 | -0.200 | 64.400 |
| MBC505 | 0 | 22400.000 | 445.000 | -1.000 | 101.700 | 21.800 | 3.300 | 14500.000 | -0.200 | 139.000 |
| | 0.5 | 25600.000 | 381.000 | -1.000 | 20.400 | 22.000 | -2.000 | 17500.000 | -0.200 | 135.000 |
| | 1.5 | 21600.000 | 387.000 | -1.000 | 5.300 | 29.000 | -2.000 | 21700.000 | -0.200 | 109.000 |
| | 2.5 | 21400.000 | 426.000 | -1.000 | 5.900 | 27.300 | -2.000 | 22400.000 | -0.200 | 106.000 |
| MBC506 | 0 | 26200.000 | 608.000 | -1.000 | 107.200 | 19.900 | -2.000 | 14200.000 | -0.200 | 144.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC506 | 0.5 | 25000.000 | 434.000 | -1.000 | 6.500 | 24.500 | -2.000 | 20200.000 | -0.200 | 121.000 |
| | 1.5 | 25600.000 | 465.000 | -1.000 | 9.900 | 29.100 | -2.000 | 21900.000 | -0.200 | 139.000 |
| | 2.5 | 21800.000 | 496.000 | -1.000 | 8.600 | 30.800 | -2.000 | 24600.000 | -0.200 | 106.000 |
| MBC507 | -1.3 | 102210.000 | 75180.000 | 1.900 | 27.100 | 200.000 | 211.000 | 2510.000 | 6.870 | 76.300 |
| | 0 | 8670.000 | 709.000 | -1.000 | 11.300 | 16.600 | -2.000 | 14025.000 | -0.200 | 88.600 |
| | 0.5 | 7000.000 | 688.000 | -1.000 | 15.300 | 20.600 | -2.000 | 16120.000 | 0.230 | 83.700 |
| | 1.5 | 6905.000 | 828.000 | -1.000 | 17.600 | 19.500 | -2.000 | 16010.000 | 0.220 | 72.500 |
| | 2.5 | 7010.000 | 765.000 | -1.000 | 5.400 | 20.400 | -2.000 | 17440.000 | -0.200 | 79.400 |
| MBC508 | -0.33 | 111570.000 | 40280.000 | 2.750 | 73.200 | 189.000 | 165.000 | 3530.000 | 11.880 | 162.000 |
| | 0 | 13145.000 | 874.000 | -1.000 | 21.200 | 15.000 | 5.500 | 11905.000 | -0.200 | 110.000 |
| | 0.5 | 12360.000 | 520.000 | -1.000 | 3.600 | 13.900 | -2.000 | 14035.000 | -0.200 | 101.000 |
| | 1.5 | 11005.000 | 562.000 | -1.000 | 4.800 | 16.000 | -2.000 | 14370.000 | -0.200 | 97.300 |
| | 2.5 | 9340.000 | 739.000 | -1.000 | 4.600 | 18.400 | -2.000 | 14340.000 | -0.200 | 82.800 |
| MBC509 | 0 | 61650.000 | 17224.000 | 1.900 | 48.500 | 222.000 | 189.000 | 1210.000 | 2.340 | 127.000 |
| | 0.5 | 15965.000 | 406.000 | -1.000 | 19.900 | 11.900 | -2.000 | 13890.000 | -0.200 | 103.000 |
| | 1.5 | 13100.000 | 390.700 | -1.000 | 8.000 | 13.600 | -2.000 | 14490.000 | -0.200 | 94.200 |
| | 2.5 | 13570.000 | 352.600 | -1.000 | 6.700 | 14.800 | -2.000 | 15845.000 | -0.200 | 82.400 |
| MBC510 | 0 | 17105.000 | 1172.000 | -1.000 | 24.100 | 34.300 | 11.700 | 8265.000 | -0.200 | 82.600 |
| | 0.5 | 13455.000 | 510.000 | -1.000 | 6.000 | 10.400 | -2.000 | 10780.000 | -0.200 | 119.000 |
| | 1.5 | 12410.000 | 566.000 | -1.000 | 3.500 | 14.200 | -2.000 | 12850.000 | -0.200 | 112.000 |
| | 2.5 | 10850.000 | 541.000 | -1.000 | 4.400 | 19.800 | -2.000 | 13560.000 | -0.200 | 82.200 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC511 | 0 | 12600.000 | 1089.000 | -1.000 | 4.200 | 9.150 | 3.200 | 5500.000 | -0.200 | 115.000 |
| | 0.5 | 29200.000 | 731.000 | -1.000 | 7.400 | 13.200 | -2.000 | 12100.000 | -0.200 | 186.000 |
| | 1.5 | 26400.000 | 605.000 | -1.000 | 15.800 | 14.800 | -2.000 | 14000.000 | -0.200 | 183.000 |
| | 2.5 | 23600.000 | 536.000 | -1.000 | 4.800 | 18.100 | -2.000 | 16300.000 | -0.200 | 147.000 |
| MBC512 | 0 | 12800.000 | 1540.000 | -1.000 | 4.900 | 8.050 | 5.650 | 4950.000 | -0.200 | 126.000 |
| | 0.5 | 27400.000 | 968.000 | -1.000 | 3.600 | 14.200 | -2.000 | 12400.000 | -0.200 | 167.000 |
| | 1.5 | 24800.000 | 668.000 | -1.000 | 4.400 | 15.200 | -2.000 | 13100.000 | -0.200 | 164.000 |
| | 2.5 | 26600.000 | 695.000 | -1.000 | 8.200 | 19.300 | -2.000 | 16700.000 | -0.200 | 159.000 |
| MBC513 | -1.2 | 96900.000 | 59140.000 | 2.700 | 3.000 | 164.000 | 157.000 | 2370.000 | 1.630 | 134.000 |
| | 0 | 16200.000 | 459.000 | -1.000 | 28.800 | 11.600 | 4.200 | 11200.000 | -0.200 | 116.000 |
| | 0.5 | 12800.000 | 602.000 | -1.000 | 3.800 | 14.600 | -2.000 | 13800.000 | -0.200 | 102.000 |
| | 1.5 | 13015.000 | 646.000 | -1.000 | 33.000 | 17.400 | -2.000 | 14870.000 | -0.200 | 105.000 |
| | 2.5 | 10100.000 | 650.000 | -1.000 | 4.500 | 16.800 | -2.000 | 13000.000 | -0.200 | 82.200 |
| MBC514 | -0.25 | 86460.000 | 20640.000 | 2.600 | 35.300 | 63.200 | 90.800 | 1820.000 | 1.100 | 107.000 |
| | 0 | 10485.000 | 468.000 | -1.000 | 30.500 | 13.600 | 4.850 | 10640.000 | -0.200 | 96.400 |
| | 0.5 | 10800.000 | 447.000 | -1.000 | 4.600 | 16.300 | 2.600 | 12580.000 | -0.200 | 87.400 |
| | 1.5 | 7415.000 | 456.000 | -1.000 | 4.900 | 18.000 | -2.000 | 12475.000 | -0.200 | 80.600 |
| | 2.5 | 6790.000 | 467.000 | -1.000 | 4.600 | 19.000 | -2.000 | 13310.000 | -0.200 | 83.200 |
| MBC515 | -0.5 | 78780.000 | 11560.000 | 1.650 | 161.100 | 140.000 | 147.000 | 1770.000 | 1.650 | 154.000 |
| | 0 | 14410.000 | 422.000 | -1.000 | 27.800 | 9.450 | 3.300 | 1550.000 | -0.200 | 73.400 |
| | 0.5 | 11145.000 | 355.000 | -1.000 | 31.700 | 17.600 | -2.000 | 1345.000 | -0.200 | 62.400 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC515 | 1.5 | 9975.000 | 378.000 | -1.000 | 23.100 | 17.500 | -2.000 | 1160.000 | -0.200 | 60.400 |
| | 2.5 | 10700.000 | 399.000 | -1.000 | 27.200 | 20.500 | -2.000 | 1250.000 | -0.200 | 57.400 |
| MBC516 | -0.33 | 108240.000 | 1669.000 | 2.900 | 58.800 | 36.900 | 90.000 | 1115.000 | 1.150 | 109.000 |
| | 0 | 11460.000 | 762.000 | -1.000 | 38.500 | 11.400 | 4.550 | 1495.000 | -0.200 | 58.600 |
| | 0.5 | 8490.000 | 435.000 | -1.000 | 22.100 | 7.650 | -2.000 | 755.000 | -0.200 | 58.600 |
| | 1.5 | 10820.000 | 524.000 | -1.000 | 23.100 | 13.200 | -2.000 | 1385.000 | -0.200 | 86.800 |
| | 2.5 | 11030.000 | 526.000 | -1.000 | 7.800 | 15.000 | -2.000 | 1305.000 | -0.200 | 82.200 |
| MBC601 | 0 | 7260.000 | 394.000 | -1.000 | 23.900 | 3.800 | -2.000 | 2165.000 | 0.280 | 83.500 |
| MBC602 | 0 | 2320.000 | 75.200 | -1.000 | 3.600 | 3.150 | -2.000 | 2445.000 | -0.200 | 69.200 |
| MBC603 | 0 | 13200.000 | 526.000 | -1.000 | 10.200 | 4.450 | -2.000 | 1210.000 | -0.200 | 75.100 |
| MBC604 | -0.42 | 96290.000 | 15110.000 | 3.000 | 48.200 | 19.400 | 33.500 | 1060.000 | 0.630 | 252.000 |
| | 0 | 11050.000 | 256.000 | -1.000 | 23.400 | 7.400 | 2.500 | 775.000 | -0.200 | 71.900 |
| MBC605 | -0.33 | 60380.000 | 8974.000 | 1.400 | 36.400 | 8.050 | 23.000 | 990.000 | 0.430 | 106.000 |
| | 0 | 12430.000 | 343.000 | -1.000 | 18.000 | 7.450 | -2.000 | 930.000 | -0.200 | 72.300 |
| MBC606 | -0.25 | 72980.000 | 10950.000 | 2.000 | 20.900 | 7.550 | 25.600 | 1330.000 | 0.220 | 121.000 |
| | 0 | 10800.000 | 1486.000 | -1.000 | 7.400 | 4.250 | 2.050 | 2180.000 | 0.270 | 88.400 |
| MBC607 | -0.5 | 71430.000 | 26960.000 | 2.850 | 41.900 | 30.100 | 91.100 | 1805.000 | 0.660 | 148.000 |
| | 0 | 12355.000 | 1130.000 | -1.000 | 10.800 | 5.400 | -2.000 | 4130.000 | -0.200 | 128.000 |
| MBC608 | -0.58 | 90860.000 | 27270.000 | 3.750 | 42.100 | 33.000 | 112.000 | 1900.000 | 0.860 | 162.000 |
| | 0 | 11880.000 | 518.000 | -1.000 | 26.200 | 8.600 | -2.000 | 7625.000 | -0.200 | 120.000 |
| MBC609 | -0.25 | 73910.000 | 13540.000 | 2.450 | 24.800 | 12.100 | 70.200 | 1240.000 | 0.620 | 137.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENT AND [illegible]

REPORTED AS MICROGRAMS/GRAM

| CORE | DEPTH TO TOP OF SAMPLE | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| MBC609 | 0 | 13235.000 | 812.000 | -1.000 | 32.100 | 7.550 | -2.000 | 6830.000 | -0.200 | 143.000 |
| MBC610 | -0.25 | 87020.000 | 17430.000 | 2.350 | 11.600 | 12.800 | 45.000 | 1570.000 | 0.530 | 177.000 |
| | 0 | 13960.000 | 1308.000 | -1.000 | 3.600 | 9.050 | -2.000 | 7180.000 | -0.200 | 127.000 |
| MBC611 | -0.25 | 90570.000 | 19020.000 | 3.100 | 6.100 | 12.800 | 57.000 | 830.000 | 0.500 | 185.000 |
| | 0 | 13185.000 | 980.000 | -1.000 | 18.900 | 6.950 | -2.000 | 5910.000 | -0.200 | 131.000 |
| MBC612 | -0.67 | 85000.000 | 23990.000 | 3.000 | 108.000 | 27.200 | 104.000 | 2280.000 | 0.480 | 225.000 |
| | 0 | 12000.000 | 743.000 | -1.000 | 29.900 | 8.550 | -2.000 | 8490.000 | 0.170 | 107.000 |
| MBC613 | -0.67 | 91900.000 | 28180.000 | 3.450 | 44.100 | 51.100 | 119.000 | 2110.000 | 1.160 | 152.000 |
| | 0 | 13350.000 | 911.000 | -1.000 | 35.900 | 10.400 | -2.000 | 9760.000 | -0.200 | 131.000 |
| MBC614 | -0.67 | 58350.000 | 15440.000 | 1.500 | 28.400 | 55.400 | 62.800 | 3120.000 | 0.850 | 147.000 |
| | 0 | 16175.000 | 1159.000 | -1.000 | 39.400 | 17.400 | 3.550 | 8505.000 | -0.200 | 112.000 |
| MBC615 | -1.1 | 29345.000 | 4617.000 | -1.000 | 18.800 | 54.400 | 52.200 | 6575.000 | 0.440 | 94.700 |
| | 0 | 10625.000 | 450.000 | -1.000 | 26.700 | 10.400 | -2.000 | 10735.000 | -0.200 | 119.000 |
| MBC616 | -0.42 | 54510.000 | 9971.000 | 1.950 | 20.000 | 10.000 | 65.500 | 1620.000 | 0.380 | 109.000 |
| | 0 | 13865.000 | 984.000 | -1.000 | 28.200 | 7.500 | -2.000 | 7060.000 | -0.200 | 133.000 |
| MBC617 | -0.84 | 95050.000 | 50790.000 | 3.100 | 64.500 | 92.200 | 169.000 | 2230.000 | 1.850 | 132.000 |
| | 0 | 14905.000 | 1224.000 | -1.000 | 26.400 | 9.550 | -2.000 | 9570.000 | -0.200 | 126.000 |
| MBC618 | -0.58 | 81610.000 | 31310.000 | 3.450 | 47.800 | 120.000 | 187.000 | 2750.000 | 2.050 | 123.000 |
| | 0 | 15140.000 | 1002.000 | -1.000 | 16.200 | 15.600 | 4.900 | 8115.000 | -0.200 | 131.000 |
| MBC619 | -0.25 | 49070.000 | 9232.000 | 1.700 | 34.400 | 9.600 | 56.400 | 1440.000 | 0.310 | 94.600 |
| | 0 | 8960.000 | 1267.000 | -1.000 | 14.500 | 4.250 | 4.100 | 3980.000 | 0.220 | 97.100 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC619 | 0.5 | 14030.000 | 613.000 | -1.000 | 38.900 | 10.200 | -2.000 | 9655.000 | -0.200 | 156.000 |
| | 1.5 | 7845.000 | 417.000 | -1.000 | 16.000 | 16.900 | -2.000 | 13290.000 | 0.210 | 106.000 |
| | 2.5 | 9985.000 | 826.000 | -1.000 | 42.200 | 10.200 | -2.000 | 9990.000 | 0.310 | 115.000 |
| | 3.5 | 7305.000 | 409.000 | -1.000 | 60.300 | 16.600 | -2.000 | 13265.000 | 0.440 | 91.000 |
| | 4.5 | 5235.000 | 406.000 | -1.000 | 16.100 | 21.600 | -2.000 | 13640.000 | 0.310 | 60.200 |
| | 5.5 | 7515.000 | 557.000 | -1.000 | 29.000 | 7.500 | -2.000 | 6125.000 | -0.200 | 52.500 |
| MBC620 | -0.84 | 117530.000 | 38760.000 | 3.200 | 62.700 | 69.300 | 125.000 | 2220.000 | 1.930 | 141.000 |
| | 0 | 14455.000 | 1765.000 | -1.000 | 24.300 | 6.750 | 3.450 | 5815.000 | -0.200 | 77.000 |
| | 0.5 | 13475.000 | 845.000 | -1.000 | 53.200 | 9.900 | -2.000 | 10580.000 | -0.200 | 95.700 |
| | 1.5 | 8430.000 | 552.000 | -1.000 | 24.800 | 10.200 | -2.000 | 10880.000 | 0.260 | 95.500 |
| | 2.5 | 9645.000 | 746.000 | -1.000 | 21.200 | 14.400 | -2.000 | 13015.000 | 0.340 | 78.500 |
| | 3.5 | 5655.000 | 550.000 | -1.000 | 16.700 | 18.200 | -2.000 | 12875.000 | -0.200 | 63.000 |
| | 4.5 | 5730.000 | 648.000 | -1.000 | 6.000 | 20.400 | -2.000 | 13860.000 | -0.200 | 57.500 |
| MBC701 | 0 | 5755.000 | 77.000 | -1.000 | 9.700 | 7.200 | 2.300 | 2643.000 | -0.200 | 63.900 |
| | 0.5 | 14735.000 | 168.000 | -1.000 | 3.400 | 10.800 | -2.000 | 5930.000 | -0.200 | 127.150 |
| | 1.5 | 13119.000 | 165.000 | -1.000 | 6.000 | 10.700 | -2.000 | 5366.000 | -0.200 | 103.000 |
| MBC702 | 0 | 7225.000 | 169.000 | -1.000 | 9.100 | 5.900 | 2.600 | 1928.000 | -0.200 | 65.600 |
| | 0.5 | 13195.000 | 263.000 | -1.000 | 5.800 | 10.800 | -2.000 | 1855.000 | -0.200 | 109.350 |
| | 1.5 | 11475.000 | 212.000 | -1.000 | 9.600 | 13.000 | 4.000 | 1324.000 | -0.200 | 83.200 |
| MBC703 | 0 | 9903.000 | 1114.000 | -1.000 | 26.000 | 8.250 | 6.260 | 1203.000 | -0.200 | 126.000 |
| | 0.5 | 9305.000 | 369.000 | -1.000 | 93.600 | 9.360 | 4.780 | 409.000 | -0.200 | 109.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC704 | 0 | 13228.000 | 1220.000 | -1.000 | 54.500 | 10.900 | 9.400 | 1639.000 | -0.200 | 177.000 |
| | 0.5 | 19063.000 | 570.000 | -1.000 | 20.000 | 17.400 | 10.500 | 1985.000 | -0.200 | 195.000 |
| MBC705 | 0 | 19523.000 | 825.000 | -1.000 | 23.500 | 16.500 | 9.440 | 3639.000 | -0.200 | 219.000 |
| | 0.5 | 30731.000 | 475.000 | -1.000 | 5.000 | 24.500 | 7.010 | 3358.000 | -0.200 | 269.000 |
| MBC706 | 0 | 26370.000 | 952.000 | -1.000 | 47.100 | 17.500 | 12.200 | 5605.000 | -0.200 | 300.000 |
| | 0.5 | 31420.000 | 454.000 | -1.000 | 14.600 | 27.700 | 17.200 | 3966.000 | -0.200 | 294.000 |
| MBC707 | 0 | 22238.000 | 1101.000 | -1.000 | 120.000 | 20.100 | 13.300 | 1772.000 | -0.200 | 309.000 |
| | 0.5 | 24616.000 | 573.000 | -1.000 | 3.900 | 26.400 | 10.200 | 2398.000 | -0.200 | 244.000 |
| MBC708 | 0 | 13788.000 | 1618.000 | -1.000 | 24.300 | 12.600 | 9.850 | 1478.000 | -0.200 | 317.000 |
| | 0.5 | 19714.000 | 720.000 | -1.000 | 39.500 | 18.000 | 9.710 | 1359.000 | -0.200 | 180.000 |
| MBC709 | 0 | 11772.000 | 720.000 | -1.000 | 10.000 | 9.700 | 6.830 | 2752.000 | -0.200 | 134.000 |
| | 0.5 | 29351.000 | 482.000 | -1.000 | 3.500 | 25.800 | 14.800 | 3141.000 | -0.200 | 248.000 |
| MBC710 | 0 | 19578.000 | 1248.000 | -1.000 | 17.600 | 15.500 | 12.900 | 3686.000 | -0.200 | 243.000 |
| | 0.5 | 21949.000 | 341.000 | -1.000 | 7.000 | 16.800 | 12.100 | 2177.000 | -0.200 | 249.000 |
| MBC711 | 0 | 29005.000 | 1267.000 | -1.000 | 16.000 | 21.800 | 14.300 | 4682.000 | -0.200 | 251.000 |
| | 0.5 | 28460.000 | 315.000 | -1.000 | 3.800 | 28.300 | 9.850 | 4198.000 | -0.200 | 217.000 |
| MBC712 | 0 | 24186.000 | 1778.000 | -1.000 | 15.700 | 17.400 | 14.500 | 4228.000 | -0.200 | 337.000 |
| | 0.5 | 16756.000 | 645.000 | -1.000 | 19.600 | 15.200 | 14.800 | 2239.000 | -0.200 | 184.000 |
| MBC713 | 0 | 14080.000 | 1153.000 | -1.000 | 22.600 | 14.200 | 7.350 | 1580.000 | -0.200 | 143.700 |
| | 0.5 | 20500.000 | 478.000 | -1.000 | 38.400 | 22.400 | 12.300 | 1410.000 | -0.200 | 184.300 |
| MBC714 | 0 | 8958.000 | 48.100 | -1.000 | 4.500 | 4.400 | -2.000 | 2804.000 | -0.200 | 62.600 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC714 | 0.5 | 26135.000 | 169.000 | -1.000 | 3.900 | 13.200 | -2.000 | 5270.000 | -0.200 | 221.150 |
| | 1.5 | 10662.000 | 81.100 | -1.000 | 4.600 | 7.100 | -2.000 | 2250.000 | -0.200 | 67.200 |
| MBC715 | 0 | 6540.000 | 351.000 | -1.000 | 6.000 | 8.700 | 3.400 | 2250.000 | -0.200 | 73.800 |
| | 0.5 | 6470.000 | 340.000 | -1.000 | 5.600 | 6.600 | -2.000 | 1740.000 | -0.200 | 101.000 |
| | 1.5 | 13716.000 | 314.000 | -1.000 | 6.500 | 11.100 | 5.500 | 1537.000 | -0.200 | 140.000 |
| MBC716 | 0 | 23470.000 | 1669.000 | -1.000 | 21.300 | 20.700 | 8.760 | 6300.000 | -0.200 | 267.100 |
| | 0.5 | 23320.000 | 529.000 | -1.000 | 4.200 | 23.600 | 7.640 | 2760.000 | -0.200 | 199.800 |
| MBC717 | 0 | 27060.000 | 1388.000 | -1.000 | 24.700 | 22.000 | 11.000 | 7880.000 | -0.200 | 359.900 |
| | 0.5 | 23690.000 | 482.000 | -1.000 | 16.400 | 22.500 | 9.390 | 4810.000 | -0.200 | 251.800 |
| MBC718 | 0 | 21620.000 | 765.000 | -1.000 | 15.100 | 16.200 | 9.800 | 1165.000 | -0.200 | 187.000 |
| | 0.5 | 19650.000 | 507.000 | -1.000 | 229.000 | 14.800 | 7.800 | 900.000 | -0.200 | 145.000 |
| MBC719 | 0 | 11360.000 | 695.000 | -1.000 | 14.200 | 9.810 | 5.500 | 3620.000 | 0.510 | 116.400 |
| | 0.5 | 19920.000 | 342.000 | -1.000 | 8.300 | 20.200 | 7.970 | 2640.000 | -0.200 | 177.300 |
| MBC720 | 0 | 6900.000 | 470.000 | -1.000 | 11.600 | 6.000 | 4.200 | 786.000 | -0.200 | 87.800 |
| | 0.5 | 22967.000 | 397.000 | -1.000 | 13.400 | 19.700 | 10.100 | 1822.000 | -0.200 | 193.000 |
| MBC721 | 0 | 13285.000 | 228.000 | -1.000 | 21.000 | 9.800 | 4.400 | 620.000 | -0.200 | 96.600 |
| | 0.5 | 28930.000 | 327.000 | -1.000 | 6.600 | 19.800 | 4.150 | 1725.000 | -0.200 | 218.050 |
| | 1.5 | 15679.000 | 88.200 | -1.000 | 4.400 | 13.400 | 6.300 | 909.000 | -0.200 | 118.000 |
| MBC722 | 0 | 3058.000 | 33.300 | -1.000 | 4.300 | 3.300 | -2.000 | 1995.000 | 0.260 | 40.000 |
| | 0.5 | 7380.000 | 65.100 | -1.000 | 3.100 | 10.700 | -2.000 | 6260.000 | -0.200 | 81.200 |
| | 1.5 | 9436.000 | 61.200 | -1.000 | 5.400 | 7.200 | -2.000 | 4441.000 | -0.200 | 61.800 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC723 | 0 | 6000.000 | 94.500 | -1.000 | 11.200 | 6.500 | -2.000 | 901.000 | -0.200 | 69.900 |
| | 0.5 | 17585.000 | 195.000 | -1.000 | 9.300 | 15.000 | 2.400 | 1565.000 | -0.200 | 135.000 |
| | 1 | 13000.000 | 190.000 | -1.000 | 3.600 | 12.200 | -2.000 | 1230.000 | -0.200 | 84.900 |
| MBC724 | 0 | 7200.000 | 189.000 | -1.000 | 5.200 | 5.450 | -2.000 | 1340.000 | -0.200 | 90.000 |
| | 0.5 | 9030.000 | 155.000 | -1.000 | 3.300 | 7.300 | -2.000 | 1110.000 | -0.200 | 122.850 |
| | 1 | 9000.000 | 204.000 | -1.000 | 18.600 | 8.650 | -2.000 | 1200.000 | -0.200 | 82.400 |
| MBC725 | 0 | 6400.000 | 561.000 | -1.000 | 10.000 | 8.750 | -2.000 | 5750.000 | -0.200 | 73.800 |
| | 0.5 | 14385.000 | 237.000 | -1.000 | 5.800 | 15.800 | -2.000 | 10230.000 | -0.200 | 127.550 |
| | 1 | 10200.000 | 276.000 | -1.000 | 7.500 | 14.200 | -2.000 | 9000.000 | -0.200 | 80.000 |
| MBC726 | 0 | 5285.000 | 610.200 | -1.000 | 24.900 | 15.200 | -2.000 | 6575.000 | -0.200 | 64.600 |
| | 0.5 | 9445.000 | 584.000 | -1.000 | 9.500 | 25.800 | 2.700 | 11920.000 | -0.200 | 95.600 |
| | 3 | 8140.000 | 468.600 | -1.000 | 20.600 | 27.700 | -2.000 | 9215.000 | -0.200 | 76.600 |
| MBC727 | 0 | 4945.000 | 400.000 | -1.000 | 13.100 | 6.900 | -2.000 | 5095.000 | -0.200 | 111.000 |
| | 0.5 | 10910.000 | 338.000 | -1.000 | 7.600 | 13.800 | -2.000 | 9445.000 | -0.200 | 156.050 |
| | 3 | 10955.000 | 277.700 | -1.000 | 11.100 | 14.900 | -2.000 | 9740.000 | -0.200 | 135.000 |
| MBC728 | 0 | 3845.000 | 374.000 | -1.000 | 17.400 | 4.900 | -2.000 | 3295.000 | -0.200 | 140.000 |
| | 0.5 | 9380.000 | 334.000 | -1.000 | 4.500 | 8.550 | -2.000 | 5780.000 | -0.200 | 171.000 |
| | 3 | 7600.000 | 243.000 | -1.000 | 20.500 | 7.550 | -2.000 | 6575.000 | -0.200 | 130.000 |
| MBC729 | 0 | 6060.000 | 724.000 | -1.000 | 16.500 | 5.200 | -2.000 | 545.000 | 0.210 | 106.000 |
| | 0.1 | 5980.000 | 292.000 | -1.000 | 34.000 | 4.950 | -2.000 | 415.000 | -0.200 | 77.400 |
| | 0.3 | 13870.000 | 254.000 | -1.000 | 18.100 | 11.000 | 2.050 | 800.000 | -0.200 | 118.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC730 | 0 | 19200.000 | 2285.000 | -1.000 | 14.700 | 13.700 | 5.700 | 1635.000 | -0.200 | 258.000 |
| | 0.1 | 8220.000 | 501.000 | -1.000 | 24.100 | 6.300 | 2.100 | 635.000 | -0.200 | 92.850 |
| | 0.3 | 22360.000 | 406.000 | -1.000 | 20.400 | 16.200 | 5.250 | 1340.000 | -0.200 | 180.700 |
| MBC731 | 0 | 4740.000 | 470.000 | -1.000 | 3.200 | 4.750 | -2.000 | 915.000 | -0.200 | 76.000 |
| | 0.1 | 4955.000 | 180.000 | -1.000 | 6.100 | 4.950 | -2.000 | 1150.000 | -0.200 | 56.600 |
| | 0.3 | 5225.000 | 128.000 | -1.000 | 8.100 | 5.000 | -2.000 | 1245.000 | -0.200 | 57.400 |
| MBC732 | 0 | 3860.000 | 932.000 | -1.000 | 6.800 | 3.250 | -2.000 | 865.000 | -0.200 | 70.150 |
| | 0.1 | 4920.000 | 442.000 | -1.000 | 3.500 | 3.700 | -2.000 | 1120.000 | -0.200 | 79.850 |
| | 0.3 | 4800.000 | 476.000 | -1.000 | 8.500 | 4.050 | -2.000 | 1115.000 | 0.220 | 70.700 |
| MBC733 | 0 | 7690.000 | 579.000 | -1.000 | 12.800 | 5.200 | 2.350 | 850.000 | -0.200 | 113.150 |
| | 0.1 | 8590.000 | 500.000 | -1.000 | 10.700 | 4.950 | 3.050 | 1160.000 | 0.200 | 109.650 |
| | 0.3 | 7135.000 | 335.000 | -1.000 | 3.100 | 5.100 | 2.350 | 945.000 | -0.200 | 108.900 |
| MBC801 | 0 | 8540.000 | 131.000 | -1.000 | 10.800 | 11.300 | -2.000 | 5015.000 | -0.200 | 59.700 |
| | 2 | 11240.000 | 206.000 | -1.000 | 3.100 | 25.400 | -2.000 | 24490.000 | -0.200 | 56.600 |
| | 4 | 8185.000 | 84.000 | -1.000 | 12.000 | 30.400 | -2.000 | 31650.000 | -0.200 | 61.600 |
| | 6 | 6580.000 | 42.500 | -1.000 | 16.800 | 24.000 | -2.000 | 30425.000 | -0.200 | 44.000 |
| | 8 | 6570.000 | 43.000 | -1.000 | 8.500 | 27.800 | -2.000 | 22910.000 | -0.200 | 47.200 |
| MBC802 | 0 | 19365.000 | 222.000 | -1.000 | 12.700 | 13.800 | -2.000 | 11370.000 | -0.200 | 112.000 |
| | 2 | 26210.000 | 176.000 | -1.000 | 11.000 | 30.000 | -2.000 | 22050.000 | -0.200 | 103.000 |
| | 4 | 14600.000 | 122.000 | -1.000 | 13.400 | 33.200 | -2.000 | 22300.000 | -0.200 | 82.800 |
| | 6 | 7630.000 | 80.000 | -1.000 | 15.300 | 20.200 | -2.000 | 14800.000 | -0.200 | 42.400 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC802 | 8 | 4570.000 | 44.000 | -1.000 | 11.700 | 27.800 | -2.000 | 18800.000 | -0.200 | 41.800 |
| MBC803 | 0 | 17644.000 | 380.000 | -1.000 | 9.900 | 16.100 | -2.000 | 14565.000 | -0.200 | 134.000 |
| | 4 | 9280.000 | 116.000 | -1.000 | 9.500 | 23.400 | -2.000 | 19390.000 | -0.200 | 69.800 |
| | 8 | 9350.000 | 88.000 | -1.000 | 14.500 | 36.800 | -2.000 | 29350.000 | -0.200 | 92.400 |
| | 10 | 8075.000 | 58.000 | -1.000 | 12.500 | 54.900 | -2.000 | 43685.000 | -0.200 | 77.300 |
| | 12 | 5200.000 | 30.500 | -1.000 | 9.100 | 27.000 | -2.000 | 25955.000 | -0.200 | 47.400 |
| | 14 | 6205.000 | 30.000 | -1.000 | 4.410 | 29.000 | -2.000 | 28215.000 | -0.200 | 51.400 |
| | 16 | 5960.000 | 27.500 | -1.000 | 6.640 | 24.800 | -2.000 | 23465.000 | -0.200 | 51.800 |
| | 18 | 5135.000 | 32.000 | -1.000 | 15.600 | 19.600 | -2.000 | 21100.000 | -0.200 | 40.000 |
| MBC804 | 0 | 11800.000 | 322.000 | -1.000 | 4.900 | 19.400 | -2.000 | 19300.000 | 0.230 | 108.000 |
| | 4 | 6770.000 | 50.000 | -1.000 | 6.900 | 33.300 | -2.000 | 27200.000 | -0.200 | 63.400 |
| | 8 | 8700.000 | 76.800 | -1.000 | 19.500 | 33.400 | -2.000 | 29600.000 | -0.200 | 55.100 |
| | 10 | 7200.000 | 67.000 | -1.000 | 18.600 | 31.800 | -2.000 | 28800.000 | 0.210 | 60.100 |
| | 12 | 3630.000 | 77.000 | -1.000 | 6.700 | 20.900 | -2.000 | 20400.000 | -0.200 | 35.600 |
| | 14 | 3400.000 | 54.000 | -1.000 | 11.500 | 21.600 | -2.000 | 16800.000 | -0.200 | 44.000 |
| | 16 | 2520.000 | 50.000 | -1.000 | 10.700 | 35.200 | -2.000 | 12800.000 | -0.200 | 33.100 |
| | 18 | 2430.000 | 42.000 | -1.000 | 11.700 | 17.800 | -2.000 | 10100.000 | -0.200 | 29.400 |

TABLE 6-

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC201 | -0.3 | 1618.000 | 51.300 | 18670.000 | 1.390 | 7638.000 | 3025.000 | 317.000 | 1.000 | 82000.000 |
| | 0 | 44.600 | 25.800 | 1596.000 | 8.350 | 6.000 | 44.300 | 3.000 | . | 595.000 |
| | 1 | 47.800 | 21.600 | 1612.000 | -1.500 | 3.350 | 47.300 | 2.800 | . | 880.000 |
| | 2 | 40.600 | 18.000 | 30.950 | 4.150 | -2.000 | 1.300 | -2.000 | . | 668.000 |
| | 3 | 42.600 | 16.600 | 33.750 | 9.750 | -2.000 | 41.800 | 2.700 | . | 898.000 |
| | 4 | 33.300 | 12.600 | 27.000 | 9.500 | -2.000 | 37.100 | -2.000 | . | 632.000 |
| | 5 | 24.800 | 14.100 | 524.600 | 25.400 | -2.000 | 42.100 | -2.000 | . | 926.000 |
| MBC202 | -0.5 | 800.000 | 74.100 | 8538.000 | 5.500 | 3291.000 | 1230.900 | 131.000 | 0.989 | 200000.000 |
| MBC203 | -1.8 | 10190.000 | 220.000 | 66830.000 | 2.750 | 29150.000 | 5114.100 | 738.000 | 0.990 | 80000.000 |
| | 0 | 3.900 | 2.200 | 869.000 | -1.500 | 7.600 | 45.400 | 11.200 | . | 994.000 |
| | 1 | 13.600 | 5.350 | 1094.000 | -1.500 | -2.000 | 15.400 | -2.000 | . | 955.000 |
| | 2 | 15.000 | 5.150 | 1176.000 | -1.500 | -2.000 | 8.600 | -2.000 | . | 790.000 |
| | 3 | 12.900 | 5.700 | 1128.000 | 33.270 | -2.000 | 12.200 | -2.000 | . | 351.000 |
| | 4 | 27.800 | 6.900 | 346.000 | -1.500 | 37.700 | 32.000 | 4.200 | . | 1031.000 |
| | 5 | 34.400 | 8.200 | 514.000 | 43.790 | 31.800 | 33.200 | 3.250 | . | 797.000 |
| MBC204 | -1.5 | 2811.000 | 56.100 | 82770.000 | -1.500 | 7851.000 | 10816.000 | 250.000 | 1.001 | 32000.000 |
| MBC205 | -1.5 | 8209.000 | 184.000 | 68250.000 | 3.860 | 33980.000 | 12034.800 | 926.000 | 1.008 | 72000.000 |
| | 0 | 14.500 | 22.000 | 806.000 | 5.570 | 3.900 | 8.500 | 7.650 | . | 372.000 |
| | 1 | 4.000 | 7.850 | 1077.000 | 2.780 | 13.000 | 38.600 | 9.750 | . | 871.000 |
| | 2 | 3.850 | 10.100 | 938.000 | 11.180 | 5.200 | 27.800 | 7.000 | . | 475.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC205 | 3 | -1.000 | 5.700 | 655.000 | 27.030 | -2.000 | 22.500 | 4.200 | . | 331.000 |
| | 4 | 6.300 | 8.500 | 863.000 | 41.260 | -2.000 | 17.200 | 4.350 | . | 435.000 |
| | 5 | 16.100 | 4.250 | 762.000 | -1.500 | 61.200 | 55.100 | 2.900 | . | 442.000 |
| MBC206 | -3 | 2105.000 | 37.700 | 20000.000 | -1.500 | 11710.000 | 10528.000 | 291.000 | 1.017 | 55000.000 |
| MBC207 | -2.1 | 5522.000 | 148.000 | 73350.000 | -1.500 | 28700.000 | 6833.100 | 603.000 | 1.012 | 50000.000 |
| | 0 | 13.800 | 5.550 | 1125.000 | 4.190 | 41.400 | 42.900 | 22.000 | . | 1353.000 |
| | 1 | 16.900 | 8.700 | 1116.000 | 65.150 | 6.900 | 41.300 | 25.600 | . | 1857.000 |
| | 2 | 12.400 | 5.500 | 790.000 | 19.330 | 4.600 | 6.200 | 4.950 | . | 585.000 |
| | 3 | 13.500 | 9.950 | 844.000 | 96.210 | 3.400 | 13.200 | 7.650 | . | 668.000 |
| | 4 | 16.600 | 25.300 | 704.000 | 60.630 | 2.750 | 14.300 | 8.250 | . | 334.000 |
| | 5 | 8.650 | 10.800 | 600.000 | 8.220 | 2.100 | 33.000 | 4.300 | . | 359.000 |
| MBC208 | -1.1 | 3098.000 | 66.900 | 15400.000 | -1.500 | 9847.000 | 7912.200 | 271.000 | 1.016 | 130000.000 |
| MBC301 | 0 | 208.000 | 36.600 | 122.000 | -1.500 | 4.500 | 0.680 | -2.000 | . | 2439.000 |
| | 5 | 100.000 | 23.000 | 92.500 | -1.500 | -2.000 | -0.560 | 2.450 | . | 1431.000 |
| | 10 | 90.500 | 14.000 | 120.000 | -1.500 | -2.000 | 5.000 | 2.450 | . | 1357.000 |
| | 15 | 41.500 | 8.800 | 120.000 | -1.500 | -2.000 | 9.800 | -2.000 | . | 1840.000 |
| | 16 | 52.000 | 8.200 | 115.000 | -1.500 | -2.000 | 8.800 | -2.000 | . | 1519.000 |
| | 18 | 72.500 | 13.600 | 116.000 | -1.500 | 2.600 | 6.700 | -2.000 | . | 1749.000 |
| | 20 | 45.000 | 8.000 | 97.000 | -1.500 | -2.000 | 3.700 | -2.000 | . | 829.000 |
| MBC302 | 0 | 156.000 | 18.800 | 84.000 | -1.500 | 2.200 | -0.560 | 5.200 | . | 2528.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGE

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC302 | 5 | 44.000 | 13.300 | 73.000 | -1.500 | -2.000 | -0.560 | 2.200 | . | 1267.000 |
| | 10 | 34.000 | 15.200 | 72.000 | -1.500 | 2.000 | -0.560 | 2.400 | . | 1096.000 |
| | 15 | 18.000 | 10.600 | 70.000 | -1.500 | -2.000 | -0.560 | 2.900 | . | 794.000 |
| | 16 | 22.000 | 10.600 | 74.000 | -1.500 | -2.000 | -0.560 | 3.200 | . | 839.000 |
| | 17 | 29.000 | 11.800 | 70.000 | -1.500 | -2.000 | -0.560 | -2.000 | . | 1012.000 |
| | 18 | 21.000 | 11.400 | 84.000 | -1.500 | -2.000 | -0.560 | 2.800 | . | 864.000 |
| | 19 | 14.000 | 6.200 | 92.000 | -1.500 | -2.000 | -0.560 | -2.000 | . | 778.000 |
| | 20 | 16.000 | 9.000 | 77.000 | -1.500 | -2.000 | -0.560 | -2.000 | . | 761.000 |
| MBC303 | 0 | 148.000 | 22.800 | 94.000 | -1.500 | 3.400 | 0.750 | 3.600 | . | 1524.000 |
| | 5 | 83.000 | 17.500 | 76.000 | -1.500 | -2.000 | -0.560 | 2.600 | . | 1436.000 |
| | 10 | 50.000 | 9.300 | 92.000 | -1.500 | 2.100 | -0.560 | 3.200 | . | 1492.000 |
| | 16 | 28.000 | 11.500 | 78.000 | -1.500 | -2.000 | -0.560 | 5.600 | . | 1421.000 |
| | 17 | 30.000 | 17.900 | 83.000 | -1.500 | -2.000 | -0.560 | 5.600 | . | 310.000 |
| | 18 | 60.000 | 14.500 | 92.000 | -1.500 | 4.400 | -0.560 | 6.000 | . | 1672.000 |
| | 19 | 23.000 | 24.000 | 76.000 | -1.500 | -2.000 | -0.560 | 7.400 | . | 3186.000 |
| | 20 | 32.000 | 23.100 | 81.000 | 5.550 | 3.450 | -0.560 | 7.450 | . | 2642.000 |
| MBC304 | 0 | 134.000 | 88.900 | 82.500 | -1.500 | 2.150 | 2.200 | 6.950 | . | 1722.000 |
| | 5 | 118.000 | 34.800 | 79.500 | -1.500 | 2.000 | 2.100 | 5.150 | . | 1259.000 |
| | 10 | 68.000 | 24.000 | 92.000 | -1.500 | -2.000 | 9.500 | 4.150 | . | 806.000 |
| | 15 | 37.500 | 14.600 | 75.000 | -1.500 | -2.000 | 4.100 | 4.100 | . | 2615.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC304 | 16 | 53.000 | 19.700 | 95.000 | -1.500 | 3.400 | 1.700 | 4.150 | . | 817.000 |
| | 17 | 43.500 | 16.700 | 93.000 | -1.500 | -2.000 | 4.500 | 3.700 | . | 524.000 |
| | 18 | 42.000 | 20.000 | 85.000 | -1.500 | 3.200 | 1.400 | 3.500 | . | 879.000 |
| | 19 | 20.000 | 8.200 | 116.000 | -1.500 | -2.000 | -0.560 | -2.000 | . | 888.000 |
| | 20 | 19.000 | 5.300 | 72.000 | -1.500 | -2.000 | 4.600 | -2.000 | . | 599.000 |
| MBC401 | 7 | 73.900 | 11.000 | 88.600 | 5.580 | -2.000 | 7.200 | -2.000 | . | 1442.000 |
| | 8 | 47.000 | 7.700 | 105.000 | 6.990 | -2.000 | 3.700 | -2.000 | . | 841.000 |
| | 9 | 42.600 | 7.600 | 103.000 | 5.580 | -2.000 | 2.300 | -2.000 | . | 1425.000 |
| | 10 | 59.400 | 8.900 | 143.000 | 6.920 | -2.000 | 2.200 | -2.000 | . | 1326.000 |
| | 11 | 68.600 | 11.600 | 119.000 | 6.890 | -2.000 | 2.600 | -2.000 | . | 1200.000 |
| | 12 | 63.600 | 6.150 | 117.000 | 8.140 | -2.000 | 7.900 | -2.000 | . | 710.000 |
| MBC402 | 7 | 59.000 | 9.900 | 93.700 | 4.160 | -2.000 | 0.280 | 4.250 | . | 2045.000 |
| | 8 | 39.500 | 3.600 | 85.200 | 2.790 | -2.000 | -0.560 | -2.000 | . | 1782.000 |
| | 9 | 50.400 | 8.350 | 97.600 | 2.750 | -2.000 | -0.560 | -2.000 | . | 2456.000 |
| | 10 | 21.700 | 4.150 | 89.800 | 1.360 | -2.000 | 1.200 | -2.000 | . | 1528.000 |
| | 11 | 20.000 | 4.350 | 70.800 | 5.560 | -2.000 | 1.800 | -2.000 | . | 1546.000 |
| | 12 | 18.400 | 3.200 | 85.500 | 4.180 | -2.000 | 2.000 | -2.000 | . | 1125.000 |
| MBC403 | 7 | 56.000 | 8.600 | 98.400 | 12.340 | -2.000 | 0.570 | -2.000 | . | 1448.000 |
| | 8 | 29.200 | 4.500 | 110.000 | 9.660 | -2.000 | 1.900 | -2.000 | . | 1669.000 |
| | 9 | 28.200 | 4.250 | 99.000 | 8.000 | -2.000 | 2.800 | -2.000 | . | 1571.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC403 | 10 | 35.000 | 3.250 | 111.000 | 4.180 | -2.000 | 5.500 | -2.000 | . | 412.000 |
| | 11 | 30.200 | 3.750 | 95.200 | 1.390 | -2.000 | 7.200 | -2.000 | . | 458.000 |
| | 12 | 43.800 | 3.950 | 111.000 | 2.740 | -2.000 | 5.900 | -2.000 | . | 462.000 |
| MBC404 | 7 | 41.600 | 10.500 | 81.500 | -1.500 | -2.000 | 0.630 | 2.200 | . | 1945.000 |
| | 8 | 45.000 | 8.100 | 97.000 | 1.380 | -2.000 | -0.560 | 2.350 | . | 1295.000 |
| | 9 | 41.300 | 9.900 | 96.300 | 2.730 | -2.000 | 0.600 | 2.500 | . | 2673.000 |
| | 10 | 28.200 | 7.500 | 106.000 | 2.740 | -2.000 | 0.950 | 2.100 | . | 873.000 |
| | 11 | 22.400 | 5.800 | 109.000 | 2.780 | -2.000 | 1.100 | -2.000 | . | 849.000 |
| | 12 | 17.600 | 4.050 | 109.000 | 2.700 | -2.000 | 1.500 | -2.000 | . | 738.000 |
| MBC405 | 0 | 23.900 | 1.300 | 98.600 | -1.500 | 1.400 | 4.500 | 2.500 | . | 656.000 |
| | 1 | 25.600 | 2.000 | 100.000 | -1.500 | -2.000 | 5.700 | 3.550 | . | 1517.000 |
| | 2 | 21.600 | 2.500 | 104.000 | -1.500 | -2.000 | 7.700 | 2.800 | . | 790.000 |
| | 3 | 22.500 | 3.100 | 97.300 | -1.500 | -2.000 | 7.700 | -2.000 | . | 877.000 |
| | 4 | 26.800 | 3.800 | 94.800 | -1.500 | -2.000 | 8.000 | -2.000 | . | 1033.000 |
| | 5 | 42.500 | 5.650 | 88.800 | -1.500 | -2.000 | 12.100 | -2.000 | . | 1368.000 |
| MBC406 | 0 | 25.000 | 2.350 | 110.000 | -1.500 | -1.000 | 1.900 | 3.050 | . | 687.000 |
| | 1 | 15.400 | 3.050 | 116.000 | -1.500 | -1.000 | 10.700 | -2.000 | . | 1111.000 |
| | 2 | 18.600 | 2.650 | 203.000 | -1.500 | 1.000 | 19.800 | -2.000 | . | 667.000 |
| | 3 | 19.300 | 3.100 | 119.000 | -1.500 | -1.000 | 17.700 | 2.000 | . | 566.000 |
| | 4 | 39.800 | 4.300 | 122.000 | -1.500 | -1.000 | 17.800 | 2.250 | . | 640.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC406 | 5 | 29.500 | 4.000 | 109.000 | -1.500 | -1.000 | 16.800 | 3.650 | . | 611.000 |
| MBC407 | 0 | 85.200 | 13.600 | 548.000 | 15.290 | 8.150 | 1.500 | 16.400 | . | 7458.000 |
| | 1 | 29.800 | 3.150 | 546.000 | 9.690 | 8.000 | 1.900 | 10.500 | . | 2460.000 |
| | 2 | 16.000 | 3.000 | 196.000 | -1.500 | -1.000 | 4.700 | 3.900 | . | 633.000 |
| | 3 | 13.200 | 3.450 | 171.000 | -1.500 | -1.000 | 42.400 | 2.250 | . | 977.000 |
| | 4 | 16.400 | 2.950 | 169.000 | -1.500 | 1.200 | 41.900 | 2.200 | . | 938.000 |
| | 5 | 9.650 | 2.850 | 140.000 | -1.500 | -2.000 | 20.500 | -2.000 | . | 687.000 |
| MBC408 | 0 | 59.250 | 7.550 | 341.200 | 6.840 | 12.200 | -0.560 | 10.800 | . | 2376.000 |
| | 1 | 22.200 | -1.000 | 628.000 | 9.590 | -2.000 | -0.560 | 8.700 | . | 1258.000 |
| | 2 | 25.000 | 3.000 | 285.000 | 5.590 | -2.000 | 6.100 | 3.750 | . | 729.000 |
| | 3 | 18.350 | 3.300 | 134.900 | 4.150 | -2.000 | 41.000 | -2.000 | . | 397.000 |
| | 4 | 15.150 | 4.300 | 119.800 | -1.500 | -2.000 | 27.600 | -2.000 | . | 363.000 |
| | 5 | 12.800 | 5.900 | 143.900 | 6.960 | -2.000 | 26.000 | -2.000 | . | 335.000 |
| MBC409 | 0 | 54.100 | 5.520 | 128.000 | 6.880 | -2.000 | 0.570 | 6.160 | . | 1468.000 |
| | 1 | 30.800 | 12.400 | 57.200 | -1.500 | -2.000 | 12.300 | 4.400 | . | 972.000 |
| | 2 | 25.900 | 7.480 | 51.100 | -1.500 | -2.000 | 15.200 | -2.000 | . | 839.000 |
| | 3 | 12.400 | 6.550 | 89.400 | -1.500 | -2.000 | 10.100 | 2.900 | . | 940.000 |
| | 4 | 38.900 | 6.680 | 47.200 | -1.500 | -2.000 | 10.100 | 2.980 | . | 719.000 |
| | 5 | 56.700 | 5.620 | 60.100 | -1.500 | -2.000 | 13.200 | 3.360 | . | 745.000 |
| MBC410 | 0 | 55.200 | 4.780 | 56.700 | -1.500 | -2.000 | 0.420 | 4.050 | . | 1205.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC410 | 1 | 24.300 | 3.040 | 75.300 | -1.500 | -2.000 | 1.900 | 2.480 | . | 1096.000 |
| | 2 | 34.600 | 5.400 | 64.100 | 2.750 | -2.000 | 11.100 | 2.180 | . | 932.000 |
| | 3 | 26.900 | 9.950 | 41.100 | 1.370 | -2.000 | 9.900 | 2.020 | . | 1227.000 |
| | 4 | 44.600 | 8.160 | 47.000 | -1.500 | -2.000 | 10.100 | 2.340 | . | 1123.000 |
| | 5 | 63.000 | 4.900 | 46.900 | -1.500 | -2.000 | 10.900 | 4.760 | . | 972.000 |
| MBC411 | 0 | 68.100 | 20.600 | 83.800 | 4.090 | -2.000 | -0.560 | 2.650 | . | 1124.000 |
| | 1 | 77.100 | 23.500 | 75.400 | 4.160 | -2.000 | -0.560 | 3.350 | . | 993.000 |
| | 2 | 70.200 | 22.200 | 90.200 | -1.500 | -2.000 | 6.400 | 4.800 | . | 780.000 |
| | 3 | 77.900 | 20.800 | 174.000 | -1.500 | 2.050 | 11.400 | 3.100 | . | 760.000 |
| | 4 | 91.200 | 14.000 | 161.000 | -1.500 | -2.000 | 8.400 | 2.650 | . | 838.000 |
| | 5 | 90.600 | 23.800 | 106.000 | -1.500 | -2.000 | 10.600 | 3.600 | . | 1036.000 |
| MBC412 | 0 | 54.000 | 39.400 | 69.800 | -1.500 | 10.400 | -0.560 | 3.250 | . | 940.000 |
| | 1 | 43.400 | 20.200 | 206.000 | -1.500 | 4.200 | -0.560 | 6.750 | . | 1090.000 |
| | 2 | 43.050 | 19.600 | 140.500 | -1.500 | 2.300 | 17.600 | 4.800 | . | 953.000 |
| | 3 | 50.650 | 26.400 | 157.600 | -1.500 | 2.350 | 30.800 | 5.300 | . | 881.000 |
| | 4 | 47.150 | 18.200 | 137.000 | -1.500 | 2.400 | 30.000 | 4.650 | . | 833.000 |
| | 5 | 60.250 | 24.500 | 124.000 | -1.500 | 2.950 | 27.500 | 4.200 | . | 773.000 |
| MBC413 | 0 | 49.350 | 17.800 | 73.350 | 4.180 | 2.350 | -0.560 | 3.050 | . | 1129.000 |
| | 1 | 53.100 | 21.200 | 335.300 | 4.020 | 31.800 | -0.560 | 23.200 | . | 1252.000 |
| | 2 | 44.700 | 21.800 | 161.800 | 4.000 | 3.200 | 1.100 | 7.850 | . | 882.000 |

(CONTINUED)

TABLE A-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SOILS

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC413 | 3 | 48.300 | 29.900 | 172.600 | 6.850 | -2.000 | 27.700 | 4.900 | . | 1133.000 |
| | 4 | 45.400 | 29.600 | 130.000 | 4.120 | 2.300 | 26.200 | 3.300 | . | 1067.000 |
| | 5 | 57.900 | 27.400 | 136.800 | 4.150 | -2.000 | 23.000 | 2.800 | . | 823.000 |
| MBC414 | 0 | 48.000 | 19.000 | 60.400 | 5.540 | -2.000 | -0.560 | 5.250 | . | 745.000 |
| | 1 | 49.400 | 18.900 | 70.600 | 4.160 | -2.000 | -0.560 | 6.150 | . | 624.000 |
| | 2 | 47.600 | 14.000 | 68.800 | 8.140 | -2.000 | 1.100 | 5.200 | . | 684.000 |
| | 3 | 49.000 | 12.200 | 91.500 | 5.440 | -2.000 | 9.300 | 4.400 | . | 827.000 |
| | 4 | 50.800 | 11.300 | 123.000 | 5.580 | -2.000 | 19.500 | 5.050 | . | 940.000 |
| | 5 | 57.000 | 18.000 | 98.200 | 1.360 | -2.000 | 12.500 | 5.300 | . | 695.000 |
| MBC501 | -1.2 | 1615.000 | 42.800 | 7678.000 | 13.930 | 4624.000 | 473.900 | 240.000 | 1.050 | 79000.000 |
| MBC502 | -0.67 | 3398.000 | 109.000 | 6008.000 | 2.790 | 8190.000 | 383.900 | 236.000 | 1.060 | 90000.000 |
| | 0 | 69.800 | 25.000 | 546.000 | 23.610 | 50.800 | 33.100 | 16.600 | . | 3757.000 |
| | 0.5 | 63.000 | 24.500 | 428.000 | 19.540 | 35.700 | 42.000 | 11.600 | . | 2038.000 |
| | 1.5 | 55.400 | 25.000 | 442.000 | 20.960 | 42.800 | 46.100 | 9.350 | . | 1795.000 |
| | 2.5 | 68.000 | 20.900 | 423.000 | 17.910 | 59.000 | 52.900 | 9.250 | . | 2233.000 |
| MBC503 | 0 | 1698.000 | 80.300 | 8237.000 | 31.380 | 8010.000 | 1294.400 | 486.000 | . | 100000.000 |
| | 0.5 | 59.200 | 25.500 | 472.800 | 21.980 | 2.800 | 35.400 | 13.600 | . | 2873.000 |
| | 1.5 | 60.000 | 26.200 | 476.600 | 20.930 | 4.100 | 31.700 | 11.300 | . | 2549.000 |
| | 2.5 | 46.800 | 26.000 | 468.000 | 24.680 | 4.850 | 42.800 | 23.000 | . | 3234.000 |
| MBC504 | 0 | 512.000 | 60.400 | 5171.000 | 16.280 | 1856.000 | 279.000 | 288.000 | . | 5700.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC504 | 0.5 | 45.700 | 23.600 | 543.000 | 31.190 | 10.200 | 35.100 | 39.700 | . | 1824.000 |
| | 1.5 | 40.400 | 22.200 | 439.000 | 34.380 | 11.400 | 40.900 | 18.200 | . | 1610.000 |
| | 2.5 | 43.600 | 23.000 | 430.000 | 28.520 | 21.100 | 46.500 | 17.800 | . | 2180.000 |
| MBC505 | 0 | 126.500 | 40.000 | 828.000 | -1.500 | 16.300 | 2.200 | 28.200 | . | 1109.000 |
| | 0.5 | 119.000 | 36.500 | 634.000 | -1.500 | 7.850 | 29.800 | 7.800 | . | 4291.000 |
| | 1.5 | 86.500 | 20.000 | 462.000 | -1.500 | 4.400 | 55.000 | 3.150 | . | 1589.000 |
| | 2.5 | 85.000 | 16.500 | 389.000 | -1.500 | 3.700 | 54.000 | 5.350 | . | 2042.000 |
| MBC506 | 0 | 144.000 | 21.000 | 880.000 | -1.500 | 18.600 | 4.100 | 18.700 | . | 9863.000 |
| | 0.5 | 104.000 | 26.000 | 590.000 | -1.500 | 6.250 | 17.800 | 4.850 | . | 2752.000 |
| | 1.5 | 124.000 | 20.000 | 550.000 | -1.500 | 5.250 | 97.100 | 4.000 | . | 2511.000 |
| | 2.5 | 88.500 | 18.000 | 512.000 | -1.500 | 4.100 | 139.700 | 4.850 | . | 1941.000 |
| MBC507 | -1.3 | 2725.000 | 69.600 | 6352.000 | 5.570 | 8462.000 | 587.100 | 340.000 | 0.995 | 160000.000 |
| | 0 | 63.600 | 36.400 | 415.000 | 27.500 | 30.200 | 33.500 | 7.700 | . | 2020.000 |
| | 0.5 | 55.300 | 33.200 | 410.000 | 26.150 | 26.600 | 31.800 | 6.650 | . | 1695.000 |
| | 1.5 | 55.600 | 28.900 | 498.000 | 37.500 | 42.600 | 41.400 | 7.500 | . | 1705.000 |
| | 2.5 | 57.600 | 29.500 | 461.000 | 6.940 | 41.600 | 46.100 | 5.900 | . | 1673.000 |
| MBC508 | -0.33 | 3120.000 | 93.300 | 8472.000 | 11.980 | 6898.000 | 610.400 | 201.000 | 1.050 | 81000.000 |
| | 0 | 85.100 | 67.400 | 572.000 | 12.080 | 23.100 | 40.900 | 55.800 | . | 1750.000 |
| | 0.5 | 70.300 | 59.200 | 383.000 | -1.500 | 14.300 | 41.200 | 10.200 | . | 1553.000 |
| | 1.5 | 65.600 | 46.800 | 312.000 | -1.500 | 19.500 | 43.900 | 8.500 | . | 1562.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC508 | 2.5 | 62.000 | 38.400 | 313.000 | -1.500 | 28.200 | 42.900 | 9.100 | . | 2039.000 |
| MBC509 | 0 | 630.200 | 121.000 | 4078.000 | 19.160 | 4088.000 | 376.700 | 336.000 | . | 67760.000 |
| | 0.5 | 81.600 | 201.000 | 427.400 | 5.550 | 8.500 | 19.800 | 5.300 | . | 3036.000 |
| | 1.5 | 57.900 | 123.000 | 404.600 | 4.040 | 4.850 | 44.200 | 6.000 | . | 1913.000 |
| | 2.5 | 56.800 | 92.200 | 454.900 | -1.500 | 5.400 | 52.000 | 5.300 | . | 1990.000 |
| MBC510 | 0 | 126.000 | 173.000 | 511.000 | 11.670 | 154.000 | 35.400 | 44.600 | . | 28000.000 |
| | 0.5 | 103.000 | 229.000 | 341.000 | 14.720 | 13.400 | 32.200 | 6.750 | . | 2048.000 |
| | 1.5 | 79.100 | 95.800 | 270.000 | -1.500 | 12.600 | 30.900 | 8.100 | . | 1540.000 |
| | 2.5 | 61.000 | 44.200 | 241.000 | 5.290 | 10.300 | 36.200 | 10.900 | . | 1591.000 |
| MBC511 | 0 | 150.000 | 748.000 | 168.000 | -1.500 | 54.400 | 31.900 | 7.200 | . | 6272.000 |
| | 0.5 | 267.000 | 712.000 | 198.000 | -1.500 | 16.450 | 18.900 | 5.500 | . | 5563.000 |
| | 1.5 | 200.000 | 226.000 | 202.000 | -1.500 | 17.400 | 4.000 | 6.800 | . | . |
| | 2.5 | 128.000 | 63.500 | 192.000 | 5.570 | 9.800 | 0.930 | 7.400 | . | 1732.000 |
| MBC512 | 0 | 185.000 | 793.500 | 129.000 | 15.250 | 171.000 | 0.840 | 5.050 | . | 3465.000 |
| | 0.5 | 202.000 | 401.300 | 130.000 | 4.190 | 87.200 | 0.720 | -2.000 | . | 4572.000 |
| | 1.5 | 178.000 | 120.100 | 146.000 | 5.590 | 29.500 | 0.930 | 2.250 | . | 3930.000 |
| | 2.5 | 152.000 | 67.700 | 180.000 | 6.750 | 35.900 | -0.560 | 3.150 | . | 3856.000 |
| MBC513 | -1.2 | 3293.000 | 103.000 | 7609.000 | 8.130 | 8706.000 | 29.000 | 261.000 | 1.080 | 40000.000 |
| | 0 | 105.000 | 160.000 | 447.000 | 5.560 | 9.100 | 13.900 | 19.600 | . | 1625.000 |
| | 0.5 | 84.800 | 44.800 | 328.000 | 8.360 | 28.600 | 41.600 | 6.550 | . | 1574.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC513 | 1.5 | 73.000 | 48.000 | 690.000 | -1.500 | 33.200 | 41.700 | 9.700 | . | 2039.000 |
| | 2.5 | 72.900 | 55.000 | 467.000 | 12.210 | 45.400 | 46.200 | 5.400 | . | 1507.000 |
| MBC514 | -0.25 | 2000.000 | 77.600 | 5833.000 | 32.140 | 6372.000 | 345.700 | 125.000 | 0.991 | 100000.000 |
| | 0 | 71.000 | 25.400 | 414.000 | 5.540 | 21.600 | 20.800 | 45.000 | . | 1345.000 |
| | 0.5 | 62.600 | 32.200 | 386.000 | 1.390 | 23.100 | 44.000 | 5.500 | . | 1637.000 |
| | 1.5 | 51.400 | 27.000 | 380.000 | 1.370 | 24.900 | 40.700 | 3.950 | . | 1039.000 |
| | 2.5 | 50.000 | 28.000 | 378.000 | 2.780 | 18.800 | 41.100 | 3.450 | . | 1064.000 |
| MBC515 | -0.5 | 1061.000 | 116.000 | 11450.000 | 60.870 | 468.000 | 215.900 | 711.000 | 1.050 | 400000.000 |
| | 0 | 99.000 | 31.900 | 1496.000 | 7.760 | 5.850 | 20.700 | 2.800 | . | 10800.000 |
| | 0.5 | 41.700 | 22.200 | 424.000 | 25.000 | -2.000 | 14.800 | -2.000 | . | 1003.000 |
| | 1.5 | 39.400 | 29.900 | 451.000 | 22.180 | -2.000 | 20.800 | -2.000 | . | 1531.000 |
| | 2.5 | 45.400 | 23.100 | 532.000 | 5.580 | 3.700 | 21.100 | 3.350 | . | 2088.000 |
| MBC516 | -0.33 | 1749.000 | 52.600 | 6534.000 | 30.800 | 4940.000 | 142.700 | 128.000 | 1.100 | 81000.000 |
| | 0 | 91.000 | 8.050 | 488.000 | 4.180 | 32.300 | 18.800 | 11.800 | . | 5165.000 |
| | 0.5 | 39.800 | 6.200 | 340.000 | 9.540 | 11.100 | 24.400 | 2.900 | . | 1910.000 |
| | 1.5 | 57.400 | 13.600 | 386.000 | 5.550 | 14.600 | 34.100 | -2.000 | . | 1613.000 |
| | 2.5 | 59.000 | 16.200 | 357.000 | 5.500 | 19.000 | 41.800 | 2.800 | . | 1578.000 |
| MBC601 | 0 | 119.000 | 172.000 | 484.000 | 2.670 | 8.650 | 21.400 | -2.000 | . | 3065.000 |
| MBC602 | 0 | 61.800 | 139.000 | 65.100 | 12.410 | -2.000 | -0.560 | -2.000 | . | 4470.000 |
| MBC603 | 0 | 137.000 | 159.000 | 453.000 | -1.500 | 12.200 | 16.600 | 2.150 | . | 2431.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC604 | -0.42 | 1481.000 | 116.000 | 5914.000 | . | 2933.000 | 497.600 | 76.400 | 1.000 | 150000.000 |
| | 0 | 64.100 | 70.100 | 348.000 | 8.210 | 5.850 | 20.300 | 5.200 | . | 2533.000 |
| MBC605 | -0.33 | 897.000 | 109.000 | 3467.000 | 11.200 | 1996.000 | 447.700 | 24.200 | 1.010 | 12000.000 |
| | 0 | 68.400 | 100.000 | 492.000 | 5.270 | 12.800 | 12.900 | -2.000 | . | 3796.000 |
| MBC606 | -0.25 | 1134.000 | 232.000 | 3958.000 | 56.860 | 2193.000 | 403.400 | 32.200 | 1.090 | 91000.000 |
| | 0 | 225.000 | 338.000 | 638.000 | 1.360 | 122.000 | 35.800 | 5.050 | . | 8570.000 |
| MBC607 | -0.5 | 2160.000 | 217.000 | 5236.000 | 27.970 | 8275.000 | 308.900 | 102.000 | 1.060 | 95000.000 |
| | 0 | 144.000 | 223.000 | 550.000 | 14.760 | 79.000 | 27.800 | 3.050 | . | 4639.000 |
| MBC608 | -0.58 | 2656.000 | 141.000 | 6803.000 | 27.890 | 11540.000 | 1344.500 | 115.000 | 1.060 | 84000.000 |
| | 0 | 100.000 | 104.000 | 438.000 | 16.470 | 26.800 | 17.000 | 2.650 | . | 2832.000 |
| MBC609 | -0.25 | 1258.000 | 227.000 | 4592.000 | 27.660 | 5500.000 | 375.800 | 65.250 | 1.020 | 110000.000 |
| | 0 | 141.000 | 179.000 | 456.000 | 3.980 | 19.800 | 14.600 | -2.000 | . | 3323.000 |
| MBC610 | -0.25 | 1667.000 | 220.000 | 4650.000 | 23.310 | 4399.000 | 199.200 | 51.000 | 1.040 | 76000.000 |
| | 0 | 154.000 | 225.000 | 704.000 | 8.220 | 36.400 | 21.400 | 3.850 | . | 4212.000 |
| MBC611 | -0.25 | 1918.000 | 146.000 | 5846.000 | 8.120 | 4339.000 | 39.200 | 54.200 | 0.994 | 97000.000 |
| | 0 | 138.000 | 432.000 | 572.000 | 6.760 | 36.200 | 21.400 | 2.350 | . | 5454.000 |
| MBC612 | -0.67 | 1785.000 | 460.000 | 7624.000 | 72.550 | 9650.000 | 727.200 | 102.000 | 1.090 | 100000.000 |
| | 0 | 99.600 | 273.000 | 367.000 | 26.250 | 14.200 | 10.800 | 2.900 | . | 4268.000 |
| MBC613 | -0.67 | 2534.000 | 165.000 | 7143.000 | 18.140 | 10400.000 | 1086.000 | 155.000 | 1.080 | 110000.000 |
| | 0 | 116.000 | 200.000 | 534.000 | 16.530 | 9.300 | 18.400 | 7.050 | . | 2599.000 |

(CONTINUED)

TABLE 6-2

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC614 | -0.67 | 1407.000 | 396.000 | 3588.000 | 23.470 | 3255.000 | 287.800 | 136.000 | 1.010 | 97000.000 |
| | 0 | 132.300 | 316.000 | 555.200 | 19.960 | 32.400 | 16.900 | 19.300 | . | 5909.000 |
| MBC615 | -1.1 | 422.000 | 32.300 | 2015.000 | 15.660 | 1292.000 | 100.000 | 146.000 | 1.020 | 19000.000 |
| | 0 | 75.400 | 27.200 | 471.000 | 30.460 | 13.000 | 27.300 | 20.800 | . | 1631.000 |
| MBC616 | -0.42 | 592.000 | 374.000 | 3809.000 | 44.050 | 4025.000 | 250.100 | 50.400 | 1.040 | 27000.000 |
| | 0 | 144.000 | 219.000 | 443.000 | 5.350 | 60.800 | 15.400 | 5.450 | . | 5305.000 |
| MBC617 | -0.84 | 3431.000 | 115.000 | 7208.000 | 24.750 | 8688.000 | 385.000 | 238.000 | 0.992 | 100000.000 |
| | 0 | 140.000 | 165.000 | 740.000 | 5.590 | 27.200 | 18.900 | 9.350 | . | 2614.000 |
| MBC618 | -0.58 | 2240.000 | 124.000 | 5557.000 | 25.170 | 9960.000 | 183.800 | 287.000 | 1.010 | 4300.000 |
| | 0 | 159.000 | 409.000 | 476.000 | -1.500 | 11.100 | 17.600 | 22.700 | . | 5324.000 |
| MBC619 | -0.25 | 878.000 | 279.000 | 3201.000 | 19.400 | 3716.000 | 230.400 | 41.000 | 1.280 | 87000.000 |
| | 0 | 151.000 | 369.000 | 518.000 | 2.770 | 126.000 | 17.500 | 3.550 | . | 6236.000 |
| | 0.5 | 108.000 | 65.400 | 468.000 | 4.110 | 3.600 | 10.100 | 2.500 | . | 1383.000 |
| | 1.5 | 49.000 | 36.700 | 482.000 | 6.870 | 2.800 | 14.700 | 4.400 | . | 868.000 |
| | 2.5 | 80.600 | 54.800 | 576.000 | 9.610 | 104.000 | 13.400 | 5.000 | . | 2609.000 |
| | 3.5 | 41.700 | 36.400 | 483.000 | 7.920 | 6.850 | 6.900 | 4.200 | . | 1192.000 |
| | 4.5 | 34.800 | 30.600 | 515.000 | 6.490 | 3.400 | 16.500 | 3.450 | . | 695.000 |
| | 5.5 | 69.600 | 115.000 | 471.000 | 13.580 | 78.300 | 13.600 | 3.250 | . | 1785.000 |
| MBC620 | -0.84 | 3164.000 | 129.000 | 9382.000 | 20.450 | 6725.000 | 294.900 | 207.000 | 1.030 | 25000.000 |
| | 0 | 211.000 | 428.000 | 688.000 | 8.260 | 40.400 | 23.400 | 10.600 | . | 5044.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC620 | 0.5 | 109.000 | 87.200 | 714.000 | 12.180 | 3.500 | 13.800 | 4.550 | . | 1224.000 |
| | 1.5 | 83.400 | 49.900 | 418.000 | 2.730 | 4.050 | 13.300 | 4.800 | . | 1080.000 |
| | 2.5 | 72.700 | 45.800 | 542.000 | -1.500 | 5.550 | 14.200 | 6.200 | . | 913.000 |
| | 3.5 | 50.100 | 40.600 | 427.000 | 4.130 | 2.200 | 10.900 | 4.800 | . | 834.000 |
| | 4.5 | 51.200 | 57.200 | 408.000 | 6.810 | 16.000 | 19.000 | 5.100 | . | 1485.000 |
| MBC701 | 0 | 71.000 | 81.000 | 20.000 | 8.390 | -2.000 | -0.560 | 3.300 | . | 5655.600 |
| | 0.5 | 144.000 | 70.650 | 96.300 | 32.200 | 3.350 | -0.310 | -2.000 | . | 4506.000 |
| | 1.5 | 118.000 | 41.500 | 19.800 | -1.500 | 2.200 | -0.560 | 2.200 | . | 3832.200 |
| MBC702 | 0 | 95.200 | 193.800 | 62.200 | 4.090 | -2.000 | -0.560 | 3.700 | . | 8393.700 |
| | 0.5 | 148.000 | 356.500 | 205.000 | 39.200 | 3.700 | 0.590 | -2.000 | . | 3337.000 |
| | 1.5 | 121.000 | 180.600 | 88.700 | -1.500 | 2.200 | -0.560 | 2.900 | . | 2759.800 |
| MBC703 | 0 | 197.000 | 33.400 | 331.000 | 57.710 | 11.000 | 4.700 | 6.460 | 1.410 | 10363.000 |
| | 0.5 | 116.000 | 7.500 | 186.000 | 31.880 | 2.860 | 0.990 | 2.170 | . | 3170.000 |
| MBC704 | 0 | 194.000 | 50.800 | 315.000 | 20.650 | 10.600 | 1.800 | 7.380 | 1.690 | 6681.000 |
| | 0.5 | 175.000 | 35.600 | 134.000 | 45.030 | 4.490 | 0.670 | 5.760 | . | 3103.000 |
| MBC705 | 0 | 271.000 | 129.100 | 212.000 | 8.310 | 7.820 | 0.800 | 8.660 | 1.900 | 8011.000 |
| | 0.5 | 304.000 | 50.000 | 128.000 | 8.330 | 7.710 | 1.550 | 9.800 | . | 3659.000 |
| MBC706 | 0 | 319.000 | 184.300 | 313.000 | 56.940 | 8.350 | 1.400 | 15.200 | 2.010 | 15207.000 |
| | 0.5 | 302.000 | 78.200 | 206.000 | 27.050 | 8.880 | 0.930 | 2.930 | . | 9311.000 |
| MBC707 | 0 | 292.000 | 41.300 | 447.000 | 48.930 | 6.580 | 5.200 | 5.590 | 1.980 | 3640.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC707 | 0.5 | 232.000 | 26.200 | 167.000 | 11.130 | 5.240 | -0.560 | 4.270 | . | 2770.000 |
| MBC708 | 0 | 183.000 | 41.700 | 538.000 | 64.890 | 14.900 | 14.400 | 10.000 | 1.930 | 18841.000 |
| | 0.5 | 160.000 | 20.800 | 391.000 | 29.700 | 4.510 | 2.900 | 2.480 | . | 3267.000 |
| MBC709 | 0 | 184.000 | 107.500 | 246.000 | 37.020 | 7.280 | 0.820 | 7.520 | 2.140 | 14174.000 |
| | 0.5 | 342.000 | 82.300 | 124.000 | 22.350 | 7.510 | -0.560 | 3.660 | . | 2798.000 |
| MBC710 | 0 | 275.000 | 131.300 | 321.000 | 77.010 | 8.720 | 1.280 | 15.400 | 1.780 | 4404.000 |
| | 0.5 | 288.000 | 52.100 | 123.000 | 11.010 | 5.720 | -0.560 | 6.320 | . | 6620.000 |
| MBC711 | 0 | 335.000 | 173.500 | 335.000 | 53.440 | 10.500 | 1.090 | 12.900 | 1.850 | 15001.000 |
| | 0.5 | 240.000 | 57.400 | 161.000 | 18.070 | 5.350 | -0.560 | 4.060 | . | 3839.000 |
| MBC712 | 0 | 364.000 | 147.100 | 455.000 | 27.050 | 8.430 | 1.120 | 13.100 | 2.090 | 3916.000 |
| | 0.5 | 181.000 | 94.600 | 249.000 | 48.040 | 5.710 | 0.720 | 4.340 | . | 5952.000 |
| MBC713 | 0 | 190.000 | 76.300 | 375.000 | 12.110 | 8.280 | 3.600 | 7.450 | 1.800 | 5969.000 |
| | 0.5 | 203.000 | 59.500 | 237.000 | 17.880 | 4.560 | 0.600 | 5.240 | . | 2642.000 |
| MBC714 | 0 | 110.000 | 351.700 | 17.800 | 2.790 | -2.000 | -0.560 | 2.600 | . | 6834.800 |
| | 0.5 | 448.000 | 176.500 | 91.700 | 36.400 | 8.450 | -0.310 | -2.000 | . | 1699.000 |
| | 1.5 | 128.000 | 36.400 | 16.200 | -1.500 | -2.000 | -0.560 | 2.200 | . | 2761.600 |
| MBC715 | 0 | 87.000 | 55.000 | 74.000 | 17.650 | -2.000 | 0.990 | 5.200 | . | 3163.800 |
| | 0.5 | 95.600 | 67.500 | 115.000 | 35.000 | 2.250 | 0.580 | -2.000 | . | 7900.000 |
| | 1.5 | 198.000 | 87.200 | 112.000 | 4.170 | 2.700 | -0.560 | 2.600 | . | 4920.900 |
| MBC716 | 0 | 309.000 | 186.000 | 293.000 | 63.830 | 7.720 | 0.870 | 16.900 | 1.750 | 10363.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC716 | 0.5 | 191.000 | 112.000 | 153.000 | 12.290 | 4.290 | -0.560 | 5.380 | . | 6910.000 |
| MBC717 | 0 | 348.000 | 228.000 | 388.000 | 107.050 | 9.450 | 2.800 | 40.100 | 1.930 | 9989.000 |
| | 0.5 | 214.000 | 172.000 | 182.000 | 36.160 | 5.240 | -0.560 | 8.300 | . | 9142.000 |
| MBC718 | 0 | 202.000 | 30.600 | 246.000 | 17.640 | 5.000 | 7.900 | 3.200 | 2.030 | 1741.400 |
| | 0.5 | 152.000 | 20.600 | 185.000 | 11.060 | 4.200 | 0.700 | 2.800 | . | 2449.700 |
| MBC719 | 0 | 165.000 | 212.000 | 192.000 | 68.760 | 3.510 | 0.970 | 8.010 | 1.700 | 19670.000 |
| | 0.5 | 226.000 | 103.000 | 122.000 | 10.890 | 4.210 | -0.560 | 6.780 | . | 3725.000 |
| MBC720 | 0 | 104.000 | 31.900 | 260.000 | 26.050 | 4.000 | 4.000 | 3.200 | 1.880 | 1687.000 |
| | 0.5 | 232.000 | 62.100 | 220.000 | 21.890 | 5.000 | 10.100 | 3.400 | . | 3188.900 |
| MBC721 | 0 | 116.000 | 17.600 | 120.000 | 10.870 | 2.200 | 21.900 | 2.800 | . | 4143.000 |
| | 0.5 | 275.000 | 24.000 | 238.000 | 39.200 | 5.800 | 1.100 | -2.000 | . | 1854.000 |
| | 1.5 | 120.000 | 6.600 | 110.000 | 1.390 | -2.000 | 1.400 | 3.000 | . | 1636.000 |
| MBC722 | 0 | 32.700 | 34.400 | 17.300 | 1.330 | -2.000 | -0.560 | 2.600 | . | 7705.500 |
| | 0.5 | 89.300 | 64.550 | 69.300 | 2.800 | 2.650 | 0.560 | -2.000 | . | 4872.000 |
| | 1.5 | 92.400 | 48.900 | 16.100 | 2.740 | -2.000 | -0.560 | 2.900 | . | 8264.700 |
| MBC723 | 0 | 73.000 | 22.000 | 174.000 | 13.900 | -2.000 | 1.400 | 2.300 | 2.000 | 7353.000 |
| | 0.5 | 181.000 | 45.600 | 155.000 | 15.400 | 4.550 | 2.800 | -2.000 | . | 2581.000 |
| | 1 | 114.000 | 29.300 | 153.000 | 2.780 | 2.750 | 0.970 | -2.000 | . | 4526.000 |
| MBC724 | 0 | 106.000 | 91.800 | 195.000 | 2.760 | 2.150 | 2.400 | 2.250 | 1.830 | 7207.000 |
| | 0.5 | 135.000 | 126.200 | 107.000 | 28.000 | 2.950 | 0.530 | -2.000 | . | 5600.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC724 | 1 | 97.000 | 112.400 | 176.000 | 13.740 | 2.150 | 1.700 | -2.000 | . | 5262.000 |
| MBC725 | 0 | 102.000 | 110.600 | 94.500 | 20.750 | -2.000 | -0.560 | 4.350 | 1.240 | 3468.000 |
| | 0.5 | 202.000 | 35.600 | 80.200 | 44.800 | 4.150 | 0.540 | -2.000 | . | 6496.000 |
| | 1 | 153.000 | 49.600 | 90.000 | 10.920 | 2.500 | -0.560 | -2.000 | . | 7440.000 |
| MBC726 | 0 | 78.800 | 156.000 | 195.500 | 19.250 | 2.250 | 42.600 | 9.250 | . | 7782.000 |
| | 0.5 | 90.100 | 71.600 | 128.000 | 71.400 | 2.200 | -0.310 | 2.550 | . | 12000.000 |
| | 3 | 86.600 | 74.500 | 145.400 | 10.770 | -2.000 | 1.000 | 2.400 | . | 7836.000 |
| MBC727 | 0 | 85.600 | 70.200 | 159.200 | 19.070 | -2.000 | 0.700 | 5.600 | . | 18724.000 |
| | 0.5 | 122.000 | 84.700 | 124.000 | 60.200 | 2.400 | -1.560 | 3.600 | . | 12000.000 |
| | 3 | 90.600 | 49.800 | 166.000 | 10.660 | -2.000 | 0.730 | 3.400 | . | 7204.000 |
| MBC728 | 0 | 86.400 | 117.000 | 127.000 | 18.880 | 2.600 | 0.640 | 9.800 | . | 14258.000 |
| | 0.5 | 176.000 | 92.100 | 126.000 | 61.600 | 3.150 | -0.310 | 2.100 | . | 6509.000 |
| | 3 | 133.000 | 142.000 | 162.000 | 12.110 | 2.600 | 0.440 | 3.100 | . | 4037.000 |
| MBC729 | 0 | 118.000 | 33.600 | 181.000 | 2.800 | 3.450 | 1.600 | 6.800 | . | 28000.000 |
| | 0.1 | 75.800 | 14.800 | 164.000 | -1.400 | -2.000 | 1.200 | 2.300 | . | 5772.000 |
| | 0.3 | 133.000 | 18.400 | 178.000 | 2.800 | 3.450 | 1.100 | -2.000 | . | 3024.000 |
| MBC730 | 0 | 337.000 | 157.400 | 836.000 | 16.800 | 19.000 | 3.600 | 5.300 | . | 19000.000 |
| | 0.1 | 92.400 | 42.200 | 233.000 | 1.400 | 3.750 | 1.800 | 3.750 | . | 20000.000 |
| | 0.3 | 214.000 | 60.700 | 265.000 | 2.800 | 6.000 | 1.400 | 2.200 | . | 9993.000 |
| MBC731 | 0 | 89.000 | 77.800 | 115.000 | 4.200 | 3.850 | 1.600 | 5.600 | . | 16000.000 |

(CONTINUED)

TABLE C-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC731 | 0.1 | 59.400 | 123.000 | 109.000 | 2.800 | . | 2.500 | 3.800 | . | 7217.000 |
| | 0.3 | 63.400 | 150.400 | 115.000 | 4.200 | -2.000 | 3.700 | 3.350 | . | 4822.000 |
| MBC732 | 0 | 98.600 | 68.400 | 151.000 | 5.600 | 2.550 | 2.500 | 8.700 | . | 8280.000 |
| | 0.1 | 100.000 | 46.950 | 134.000 | 1.400 | 6.100 | 1.500 | 5.200 | . | 9214.000 |
| | 0.3 | 92.400 | 44.000 | 142.000 | 5.600 | 2.150 | 0.430 | 5.750 | . | 7917.000 |
| MBC733 | 0 | 124.000 | 25.800 | 244.000 | 2.800 | 3.450 | 1.600 | 5.600 | . | 3343.000 |
| | 0.1 | 134.000 | 16.100 | 165.000 | 4.200 | 2.000 | 1.200 | 5.550 | . | 9593.000 |
| | 0.3 | 123.000 | 13.900 | 149.000 | -1.400 | 2.600 | 0.950 | 4.050 | . | 6354.000 |
| MBC801 | 0 | 88.500 | 70.600 | 90.500 | -1.500 | -2.000 | -0.560 | 2.350 | . | 5950.000 |
| | 2 | 90.000 | 15.000 | 76.500 | -1.500 | -2.000 | -0.560 | -2.000 | . | 2020.000 |
| | 4 | 72.500 | 38.400 | 73.500 | -1.500 | -2.000 | -0.560 | 2.550 | . | 1390.000 |
| | 6 | 36.500 | 30.200 | 77.000 | -1.500 | -2.000 | 0.630 | 2.550 | . | 2520.000 |
| | 8 | 32.500 | 33.500 | 79.000 | -1.500 | -2.000 | -0.560 | 2.350 | . | 3704.000 |
| MBC802 | 0 | 156.000 | 93.800 | 85.000 | -1.500 | 2.600 | 3.340 | 7.200 | . | 6710.000 |
| | 2 | 167.000 | 35.400 | 80.500 | -1.500 | 2.200 | -0.560 | 5.500 | . | 6840.000 |
| | 4 | 110.000 | 47.200 | 89.000 | -1.500 | 4.000 | -0.560 | -2.000 | . | 2736.000 |
| | 6 | 64.000 | 15.800 | 70.000 | -1.500 | 2.050 | -0.560 | -2.000 | . | 1797.000 |
| | 8 | 69.000 | 11.900 | 76.000 | -1.500 | -2.000 | -0.560 | -2.000 | . | 1783.000 |
| MBC803 | 0 | 141.000 | 60.600 | 80.500 | 2.700 | 2.150 | -0.560 | 3.800 | . | 4264.000 |
| | 4 | 90.000 | 48.400 | 76.000 | 2.760 | -2.000 | -0.560 | 3.700 | . | 4016.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC803 | 8 | 59.200 | 42.600 | 83.500 | -1.500 | -2.000 | -0.560 | 7.650 | . | 1291.000 |
| | 10 | 92.500 | 27.200 | 72.500 | -1.500 | -2.000 | -0.560 | 3.850 | . | 5004.000 |
| | 12 | 50.500 | 17.000 | 72.000 | 4.090 | -2.000 | -0.560 | 2.650 | . | 2644.000 |
| | 14 | 49.500 | 19.200 | 72.500 | 2.750 | -2.000 | -0.560 | 2.950 | . | 2750.000 |
| | 16 | 47.500 | 15.000 | 79.000 | 2.750 | -2.000 | -0.560 | -2.000 | . | 3128.000 |
| | 18 | 37.000 | 15.000 | 82.000 | 6.640 | -2.000 | -0.560 | -2.000 | . | 4456.000 |
| MBC804 | 0 | 158.000 | 249.000 | 93.000 | -1.500 | 2.800 | -0.560 | 3.450 | . | 5867.000 |
| | 4 | 65.000 | 46.800 | 72.000 | -1.500 | -2.000 | -0.560 | 3.350 | . | 1125.000 |
| | 8 | 18.400 | 46.800 | 73.500 | -1.500 | -2.000 | -0.560 | 3.650 | . | 2928.000 |
| | 10 | 60.000 | 39.800 | 71.000 | -1.500 | -2.000 | -0.560 | 2.950 | . | 4343.000 |
| | 12 | 58.000 | 14.200 | 81.000 | -1.500 | -2.000 | -0.560 | 3.550 | . | 765.000 |
| | 14 | 52.000 | 8.600 | 83.000 | -1.500 | -2.000 | -0.560 | 4.700 | . | 487.000 |
| | 16 | 32.000 | 8.000 | 72.000 | -1.500 | -2.000 | -0.560 | 2.800 | . | 590.000 |
| | 18 | 28.000 | 10.200 | 124.000 | -1.500 | -2.000 | -0.560 | 2.000 | . | 542.000 |

TABLE . ?.

LIMITED INORGANIC ANALYSES OF SEDIMENTS A.. SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC201 | -0.3 | 12.000 | 15800.000 | 6115.000 | 106.000 |
| | 0 | -10.000 | 521.000 | 12.700 | 7.550 |
| | 1 | -10.000 | 483.000 | 26.800 | 4.950 |
| | 2 | -10.000 | 460.000 | 17.000 | 4.350 |
| | 3 | -10.000 | 433.000 | 24.800 | 3.950 |
| | 4 | 10.000 | 399.000 | 61.800 | 3.150 |
| | 5 | 16.000 | 179.000 | -10.000 | 6.200 |
| MBC202 | -0.5 | 14.000 | 7570.000 | 2300.000 | 53.400 |
| MBC203 | -1.8 | 12.000 | 28430.000 | 47520.000 | 455.000 |
| | 0 | 10.000 | 96.000 | 55.300 | 1.950 |
| | 1 | -10.000 | 152.000 | 99.400 | 1.900 |
| | 2 | -10.000 | 152.000 | 104.000 | 3.900 |
| | 3 | -10.000 | 174.000 | 50.200 | 4.000 |
| | 4 | 10.000 | 168.000 | 23.500 | 2.350 |
| | 5 | 12.000 | 207.000 | 103.000 | 3.700 |
| MBC204 | -1.5 | -10.000 | 30630.000 | 13385.000 | 129.000 |
| MBC205 | -1.5 | -10.000 | 29530.000 | 24740.000 | 479.000 |
| | 0 | 10.000 | 276.000 | 119.000 | -1.000 |
| | 1 | 10.000 | 282.000 | 126.000 | -1.000 |
| | 2 | 10.000 | 354.000 | 19.900 | 2.500 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SED[illegible]TS AND [illegible]ES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC205 | 3 | -10.000 | 304.000 | -10.000 | -1.000 |
| | 4 | 12.000 | 99.000 | -10.000 | 1.600 |
| | 5 | -10.000 | 240.000 | 84.600 | 2.400 |
| MBC206 | -3 | -10.000 | 40510.000 | 16410.000 | 166.000 |
| MBC207 | -2.1 | -10.000 | 26240.000 | 22250.000 | 325.000 |
| | 0 | 14.000 | 392.000 | 184.000 | 7.750 |
| | 1 | -10.000 | 824.000 | 64.800 | 3.950 |
| | 2 | -10.000 | 342.000 | 61.000 | 2.200 |
| | 3 | 10.000 | 392.000 | 19.400 | 4.500 |
| | 4 | 10.000 | 228.000 | -10.000 | 4.500 |
| | 5 | 10.000 | 74.000 | -10.000 | 10.000 |
| MBC208 | -1.1 | 16.000 | 26240.000 | 11575.000 | 131.000 |
| MBC301 | 0 | 14.000 | 240.000 | -10.000 | 6.350 |
| | 5 | 18.000 | 180.000 | -10.000 | 3.200 |
| | 10 | 24.000 | 120.000 | -10.000 | 1.500 |
| | 15 | 32.000 | 70.000 | -10.000 | 1.150 |
| | 16 | 18.000 | 90.000 | -10.000 | 1.450 |
| | 18 | 22.000 | 100.000 | -10.000 | 2.000 |
| | 20 | 35.000 | 80.000 | -10.000 | 1.200 |
| MBC302 | 0 | 24.000 | 210.000 | -10.000 | -1.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF S IENTS L SLUDGE

REPORTED AS MICROGR. G/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC302 | 5 | 14.000 | 140.000 | -10.000 | -1.000 |
| | 10 | 14.000 | 120.000 | -10.000 | -1.000 |
| | 15 | -10.000 | 90.000 | -10.000 | -1.000 |
| | 16 | 24.000 | 80.000 | -10.000 | -1.000 |
| | 17 | 14.000 | 80.000 | -10.000 | -1.000 |
| | 18 | 32.000 | 70.000 | -10.000 | 3.000 |
| | 19 | 28.000 | 60.000 | -10.000 | -1.000 |
| | 20 | 28.000 | 70.000 | -10.000 | -1.000 |
| MBC303 | 0 | 18.000 | 260.000 | -10.000 | -1.000 |
| | 5 | 22.000 | 170.000 | -10.000 | -1.000 |
| | 10 | -10.000 | 90.000 | -10.000 | -1.000 |
| | 16 | 14.000 | 80.000 | -10.000 | -1.000 |
| | 17 | -10.000 | 20.000 | -10.000 | -1.000 |
| | 18 | -10.000 | 100.000 | -10.000 | 2.000 |
| | 19 | 10.000 | 50.000 | -10.000 | -1.000 |
| | 20 | 20.000 | 20.000 | -10.000 | 2.550 |
| MBC304 | 0 | 26.000 | 150.000 | -10.000 | 4.550 |
| | 5 | 22.000 | 190.000 | -10.000 | 3.500 |
| | 10 | 12.000 | 220.000 | -10.000 | 2.150 |
| | 15 | -10.000 | 170.000 | -10.000 | 1.500 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS - SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC304 | 16 | 16.000 | 170.000 | -10.000 | 2.750 |
| | 17 | 28.000 | 190.000 | -10.000 | 1.100 |
| | 18 | -10.000 | 160.000 | -10.000 | 3.050 |
| | 19 | 30.000 | 140.000 | -10.000 | 0.650 |
| | 20 | 18.000 | 90.000 | -10.000 | 1.350 |
| MBC401 | 7 | 10.000 | 99.000 | -10.000 | -1.000 |
| | 8 | 18.000 | 77.000 | -10.000 | -1.000 |
| | 9 | 16.000 | 71.000 | -10.000 | -1.000 |
| | 10 | 16.000 | 138.000 | -10.000 | -1.000 |
| | 11 | 12.000 | 71.000 | -10.000 | 6.100 |
| | 12 | 12.000 | 49.000 | -10.000 | -1.000 |
| MBC402 | 7 | 12.000 | 280.000 | -10.000 | 5.250 |
| | 8 | 12.000 | 280.000 | -10.000 | -1.000 |
| | 9 | 10.000 | 190.000 | -10.000 | 1.700 |
| | 10 | -10.000 | 150.000 | 10.500 | -1.000 |
| | 11 | -10.000 | 90.000 | -10.000 | -1.000 |
| | 12 | -10.000 | 80.000 | -10.000 | 1.150 |
| MBC403 | 7 | 30.000 | 110.000 | -10.000 | -1.000 |
| | 8 | 22.000 | 71.000 | -10.000 | -1.000 |
| | 9 | 18.000 | 71.000 | -10.000 | -1.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SED[illegible]TS AND SLUDGES

REPORTED AS MICROGRAMS PER GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC403 | 10 | 18.000 | 55.000 | -10.000 | 1.100 |
| | 11 | 18.000 | 71.000 | -10.000 | -1.000 |
| | 12 | 26.000 | 60.000 | -10.000 | -1.000 |
| MBC404 | 7 | 24.000 | 110.000 | -10.000 | 4.800 |
| | 8 | 12.000 | 100.000 | -10.000 | 3.950 |
| | 9 | 12.000 | 110.000 | -10.000 | 2.400 |
| | 10 | 14.000 | 70.000 | -10.000 | 1.050 |
| | 11 | 24.000 | 60.000 | -10.000 | -1.000 |
| | 12 | 18.000 | 40.000 | -10.000 | -1.000 |
| MBC405 | 0 | -10.000 | 150.000 | -10.000 | 3.550 |
| | 1 | -10.000 | 140.000 | 10.800 | 4.050 |
| | 2 | -10.000 | 130.000 | -10.000 | 3.300 |
| | 3 | -10.000 | 80.000 | -10.000 | 2.650 |
| | 4 | 10.000 | 60.000 | -10.000 | 2.750 |
| | 5 | 12.000 | 90.000 | -10.000 | 2.850 |
| MBC406 | 0 | -10.000 | 170.000 | -10.000 | 2.200 |
| | 1 | -10.000 | 130.000 | -10.000 | 2.550 |
| | 2 | -10.000 | 130.000 | -10.000 | 3.350 |
| | 3 | 10.000 | 140.000 | -10.000 | 2.000 |
| | 4 | 16.000 | 110.000 | -10.000 | 2.650 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF S. ENTS AN. SLUDGES

REPORTED AS MICROGR. GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC406 | 5 | 10.000 | 80.000 | -10.000 | 1.850 |
| MBC407 | 0 | 10.000 | 880.000 | 33.200 | 6.200 |
| | 1 | 16.000 | 550.000 | 22.400 | 3.050 |
| | 2 | 10.000 | 150.000 | -10.000 | 3.050 |
| | 3 | 10.000 | 120.000 | -10.000 | 2.600 |
| | 4 | 10.000 | 90.000 | -10.000 | 2.550 |
| | 5 | 12.000 | 90.000 | -10.000 | 1.800 |
| MBC408 | 0 | 82.000 | 560.000 | 49.900 | 4.450 |
| | 1 | 36.000 | 483.000 | 12.600 | 2.300 |
| | 2 | 34.000 | 201.000 | -10.000 | 2.950 |
| | 3 | 30.000 | 79.000 | -10.000 | 1.850 |
| | 4 | 16.000 | 63.000 | -10.000 | 1.200 |
| | 5 | 18.000 | 79.000 | -10.000 | 1.450 |
| MBC409 | 0 | -10.000 | 150.000 | -10.000 | 5.910 |
| | 1 | -10.000 | 100.000 | -10.000 | 4.060 |
| | 2 | -10.000 | 90.000 | -10.000 | 3.590 |
| | 3 | -10.000 | 100.000 | -10.000 | 2.250 |
| | 4 | -10.000 | -10.000 | -10.000 | 5.050 |
| | 5 | -10.000 | 80.000 | -10.000 | 4.380 |
| MBC410 | 0 | 12.000 | 150.000 | -10.000 | 5.850 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIME.  AND SLUDG..

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC410 | 1 | -10.000 | 150.000 | -10.000 | 5.370 |
| | 2 | -10.000 | 140.000 | -10.000 | 5.440 |
| | 3 | -10.000 | 100.000 | -10.000 | 3.790 |
| | 4 | -10.000 | 100.000 | -10.000 | 4.530 |
| | 5 | -10.000 | 120.000 | 11.000 | 5.000 |
| MBC411 | 0 | 16.000 | 152.000 | -10.000 | 3.500 |
| | 1 | 24.000 | 201.000 | -10.000 | 3.050 |
| | 2 | 16.000 | 295.000 | -10.000 | 3.950 |
| | 3 | 12.000 | 245.000 | -10.000 | 4.700 |
| | 4 | 14.000 | 207.000 | -10.000 | 3.650 |
| | 5 | -10.000 | 223.000 | -10.000 | 3.650 |
| MBC412 | 0 | 12.000 | 245.000 | -10.000 | 4.050 |
| | 1 | 12.000 | 317.000 | -10.000 | 4.600 |
| | 2 | 18.000 | 273.000 | -10.000 | 5.800 |
| | 3 | 574.000 | 267.000 | -10.000 | 6.700 |
| | 4 | 1170.000 | 245.000 | -10.000 | 5.550 |
| | 5 | 122.000 | 212.000 | -10.000 | 4.250 |
| MBC413 | 0 | -10.000 | 141.000 | -10.000 | 4.000 |
| | 1 | -10.000 | 626.000 | 55.100 | 5.150 |
| | 2 | 80.000 | 278.000 | -10.000 | 6.150 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SE[illegible]TS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC413 | 3 | 76.000 | 223.000 | -10.000 | 7.300 |
| | 4 | 102.000 | 207.000 | -10.000 | 6.900 |
| | 5 | 58.000 | 196.000 | -10.000 | 4.900 |
| MBC414 | 0 | 16.000 | 190.000 | 12.900 | 3.250 |
| | 1 | -10.000 | 262.000 | -10.000 | 4.100 |
| | 2 | 10.000 | 273.000 | -10.000 | 5.500 |
| | 3 | 16.000 | 300.000 | -10.000 | 4.150 |
| | 4 | 12.000 | 278.000 | -10.000 | 3.950 |
| | 5 | -10.000 | 234.000 | 15.600 | 3.400 |
| MBC501 | -1.2 | 32.000 | 13240.000 | 3903.000 | 51.400 |
| MBC502 | -0.67 | 12.000 | 49320.000 | 12100.000 | 103.000 |
| | 0 | 10.000 | 730.000 | 88.600 | 8.750 |
| | 0.5 | 20.000 | 484.000 | 32.100 | 6.050 |
| | 1.5 | 16.000 | 462.000 | 73.200 | 5.150 |
| | 2.5 | 10.000 | 631.000 | 82.800 | 5.050 |
| MBC503 | 0 | 10.000 | 29340.000 | 8045.000 | 160.000 |
| | 0.5 | 10.000 | 342.000 | -10.000 | 8.950 |
| | 1.5 | -10.000 | 336.000 | -10.000 | 8.600 |
| | 2.5 | -10.000 | 339.000 | 20.500 | 6.900 |
| MBC504 | 0 | 18.000 | 7820.000 | 4352.000 | 57.000 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIME . . AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC504 | 0.5 | 14.000 | 378.000 | 33.400 | 7.050 |
| | 1.5 | 12.000 | 261.000 | 25.400 | 5.350 |
| | 2.5 | 12.000 | 294.000 | 38.100 | 5.600 |
| MBC505 | 0 | 12.000 | 170.000 | -10.000 | 9.200 |
| | 0.5 | -10.000 | 150.000 | 12.300 | 7.500 |
| | 1.5 | 12.000 | 150.000 | -10.000 | 55.600 |
| | 2.5 | 14.000 | 180.000 | -10.000 | 5.550 |
| MBC506 | 0 | 10.000 | 160.000 | 24.400 | 9.350 |
| | 0.5 | 10.000 | 170.000 | -10.000 | 6.600 |
| | 1.5 | 12.000 | 150.000 | -10.000 | 7.250 |
| | 2.5 | -10.000 | 170.000 | -10.000 | 6.150 |
| MBC507 | -1.3 | 14.000 | 29840.000 | 9795.000 | 118.000 |
| | 0 | -10.000 | 339.000 | 55.400 | 6.900 |
| | 0.5 | 10.000 | 289.000 | 48.400 | 6.850 |
| | 1.5 | -10.000 | 455.000 | 110.000 | 4.900 |
| | 2.5 | -10.000 | 367.000 | 84.200 | 4.650 |
| MBC508 | -0.33 | 12.000 | 28780.000 | 8340.000 | 98.000 |
| | 0 | -10.000 | 573.000 | 174.000 | 7.100 |
| | 0.5 | -10.000 | 233.000 | 17.200 | 6.650 |
| | 1.5 | -10.000 | 255.000 | 23.000 | 6.900 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIM... AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC508 | 2.5 | 14.000 | 328.000 | 44.200 | 4.100 |
| MBC509 | 0 | 10.000 | 12900.000 | 3702.000 | 88.800 |
| | 0.5 | 10.000 | 247.000 | -10.000 | 7.450 |
| | 1.5 | 22.000 | 196.000 | -10.000 | 5.350 |
| | 2.5 | 18.000 | 191.000 | -10.000 | 5.250 |
| MBC510 | 0 | 24.000 | 713.000 | 170.000 | 10.400 |
| | 0.5 | 10.000 | 261.000 | -10.000 | 6.400 |
| | 1.5 | 10.000 | 233.000 | 10.400 | 5.250 |
| | 2.5 | -10.000 | 239.000 | 13.500 | 5.100 |
| MBC511 | 0 | 66.000 | 470.000 | 84.000 | 8.650 |
| | 0.5 | 30.000 | 420.000 | 28.800 | 12.100 |
| | 1.5 | 30.000 | 340.000 | 48.800 | 9.650 |
| | 2.5 | 20.000 | 280.000 | 19.500 | 7.100 |
| MBC512 | 0 | 18.000 | 570.000 | 177.000 | 11.200 |
| | 0.5 | 20.000 | 570.000 | 101.000 | 10.600 |
| | 1.5 | 16.000 | 410.000 | 29.700 | 8.800 |
| | 2.5 | -10.000 | 290.000 | 57.700 | 7.750 |
| MBC513 | -1.2 | 12.000 | 32600.000 | 9290.000 | 117.000 |
| | 0 | -10.000 | 433.000 | 17.400 | 8.450 |
| | 0.5 | -10.000 | 245.000 | 10.700 | 5.500 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGE

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC513 | 1.5 | 10.000 | 305.000 | 31.600 | 6.250 |
| | 2.5 | -10.000 | 301.000 | 41.600 | 5.450 |
| MBC514 | -0.25 | -10.000 | 18300.000 | 4096.000 | 80.400 |
| | 0 | -10.000 | 483.000 | 117.000 | 6.200 |
| | 0.5 | 12.000 | 201.000 | 13.000 | 6.800 |
| | 1.5 | 10.000 | 201.000 | -10.000 | 8.000 |
| | 2.5 | 12.000 | 179.000 | 10.400 | 7.150 |
| MBC515 | -0.5 | 12.000 | 11570.000 | 2540.000 | 55.800 |
| | 0 | -10.000 | 557.000 | 12.700 | 8.150 |
| | 0.5 | -10.000 | 130.000 | -10.000 | 2.600 |
| | 1.5 | -10.000 | 135.000 | -10.000 | 2.450 |
| | 2.5 | -10.000 | 179.000 | -10.000 | 2.700 |
| MBC516 | -0.33 | -10.000 | 24340.000 | 4306.000 | 74.000 |
| | 0 | 16.000 | 554.000 | 91.200 | 13.800 |
| | 0.5 | 10.000 | 188.000 | 16.800 | 3.450 |
| | 1.5 | -10.000 | 174.000 | 27.700 | 4.100 |
| | 2.5 | -10.000 | 174.000 | 27.400 | 3.700 |
| MBC601 | 0 | -10.000 | 293.000 | 35.400 | 4.500 |
| MBC602 | 0 | 22.000 | 168.000 | -10.000 | 2.150 |
| MBC603 | 0 | -10.000 | 409.000 | 49.200 | 3.050 |

(CONTINUED)

TABLE 6-2

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAM/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC604 | -0.42 | -10.000 | 22120.000 | 3960.000 | 51.000 |
| | 0 | -10.000 | 311.000 | -10.000 | 3.350 |
| MBC605 | -0.33 | -10.000 | 9350.000 | 2296.000 | 27.500 |
| | 0 | 14.000 | 283.000 | 35.200 | 2.550 |
| MBC606 | -0.25 | 10.000 | 9910.000 | 2342.000 | 33.800 |
| | 0 | -10.000 | 932.000 | 133.000 | 6.250 |
| MBC607 | -0.5 | -10.000 | 17180.000 | 5400.000 | 78.000 |
| | 0 | -10.000 | 556.000 | 140.000 | 6.200 |
| MBC608 | -0.58 | -10.000 | 20460.000 | 6950.000 | 113.000 |
| | 0 | 10.000 | 283.000 | 34.400 | 5.750 |
| MBC609 | -0.25 | -10.000 | 13790.000 | 2952.000 | 61.000 |
| | 0 | -10.000 | 489.000 | 141.000 | 8.450 |
| MBC610 | -0.25 | 12.000 | 17450.000 | 4365.000 | 52.000 |
| | 0 | 14.000 | 590.000 | 57.000 | 8.650 |
| MBC611 | -0.25 | -10.000 | 21840.000 | 4810.000 | 49.000 |
| | 0 | -10.000 | 517.000 | 138.000 | 6.850 |
| MBC612 | -0.67 | -10.000 | 13790.000 | 6795.000 | 66.000 |
| | 0 | -10.000 | 331.000 | 38.000 | 7.650 |
| MBC613 | -0.67 | -10.000 | 21010.000 | 4768.000 | 103.000 |
| | 0 | -10.000 | 417.000 | 147.000 | 8.800 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC614 | -0.67 | -10.000 | 11570.000 | 2900.000 | 49.400 |
| | 0 | 16.000 | 763.000 | 136.000 | 7.500 |
| MBC615 | -1.1 | 12.000 | 3530.000 | 770.000 | 29.300 |
| | 0 | 12.000 | 406.000 | 21.600 | 7.250 |
| MBC616 | -0.42 | -10.000 | 5470.000 | 2156.000 | 49.200 |
| | 0 | 14.000 | 607.000 | 188.000 | 6.000 |
| MBC617 | -0.84 | -10.000 | 29840.000 | 7875.000 | 125.000 |
| | 0 | -10.000 | 568.000 | 70.000 | 5.900 |
| MBC618 | -0.58 | -10.000 | 16570.000 | 5550.000 | 133.000 |
| | 0 | -10.000 | 618.000 | 168.000 | 6.600 |
| MBC619 | -0.25 | -10.000 | 9350.000 | 2017.000 | 42.800 |
| | 0 | 12.000 | 672.000 | 151.000 | 9.150 |
| | 0.5 | -10.000 | 374.000 | 42.200 | 5.950 |
| | 1.5 | 12.000 | 165.000 | -10.000 | 3.100 |
| | 2.5 | -10.000 | 529.000 | 62.600 | 8.650 |
| | 3.5 | -10.000 | 187.000 | -10.000 | 2.800 |
| | 4.5 | 10.000 | 203.000 | -10.000 | 3.500 |
| | 5.5 | 12.000 | 396.000 | 54.700 | 4.300 |
| MBC620 | -0.84 | 10.000 | 32110.000 | 7105.000 | 99.000 |
| | 0 | -10.000 | 876.000 | 119.000 | 7.250 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SLUDGES AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC620 | 0.5 | -10.000 | 518.000 | 93.200 | 6.050 |
| | 1.5 | 10.000 | 341.000 | -10.000 | 5.100 |
| | 2.5 | 10.000 | 446.000 | -10.000 | 5.200 |
| | 3.5 | -10.000 | 176.000 | -10.000 | 3.700 |
| | 4.5 | -10.000 | 226.000 | 23.400 | 3.500 |
| MBC701 | 0 | 12.000 | 70.000 | -10.000 | 3.650 |
| | 0.5 | 14.000 | 128.000 | -10.000 | 5.100 |
| | 1.5 | 10.000 | 110.000 | -10.000 | -1.000 |
| MBC702 | 0 | -10.000 | 190.000 | -10.000 | 3.010 |
| | 0.5 | 10.000 | 296.000 | -10.000 | 8.250 |
| | 1.5 | -10.000 | 160.000 | -10.000 | 2.110 |
| MBC703 | 0 | -10.000 | 410.000 | 45.000 | 6.270 |
| | 0.5 | -10.000 | 140.000 | -10.000 | -1.000 |
| MBC704 | 0 | 12.000 | 300.000 | 16.500 | 7.730 |
| | 0.5 | -10.000 | 90.000 | -10.000 | 2.240 |
| MBC705 | 0 | 16.000 | 230.000 | -10.000 | 6.340 |
| | 0.5 | 10.000 | 130.000 | -10.000 | 6.170 |
| MBC706 | 0 | -10.000 | 430.000 | -10.000 | 10.200 |
| | 0.5 | 12.000 | 190.000 | -10.000 | 11.200 |
| MBC707 | 0 | -10.000 | 210.000 | -10.000 | 9.400 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC707 | 0.5 | 26.000 | 150.000 | -10.000 | 4.850 |
| MBC708 | 0 | 12.000 | 460.000 | -10.000 | 4.630 |
| | 0.5 | -10.000 | 130.000 | -10.000 | 4.320 |
| MBC709 | 0 | 12.000 | 200.000 | -10.000 | 6.780 |
| | 0.5 | 16.000 | 110.000 | -10.000 | 10.600 |
| MBC710 | 0 | -10.000 | 310.000 | -10.000 | 11.000 |
| | 0.5 | 14.000 | 140.000 | -10.000 | 8.370 |
| MBC711 | 0 | -10.000 | 320.000 | 12.400 | 13.700 |
| | 0.5 | 14.000 | 140.000 | -10.000 | 6.480 |
| MBC712 | 0 | 10.000 | 600.000 | -10.000 | 18.400 |
| | 0.5 | -10.000 | 170.000 | -10.000 | 4.290 |
| MBC713 | 0 | -10.000 | 450.000 | -10.000 | 12.000 |
| | 0.5 | 28.000 | 130.000 | -10.000 | 9.220 |
| MBC714 | 0 | -10.000 | 160.000 | -10.000 | 1.780 |
| | 0.5 | -10.000 | 217.000 | -10.000 | 18.000 |
| | 1.5 | 16.000 | 130.000 | -10.000 | -1.000 |
| MBC715 | 0 | 16.000 | 80.000 | -10.000 | 2.150 |
| | 0.5 | 10.000 | 116.000 | -10.000 | 5.450 |
| | 1.5 | 14.000 | 70.000 | -10.000 | 3.430 |
| MBC716 | 0 | -10.000 | 370.000 | -10.000 | 15.700 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENT AND SLUDGE

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC716 | 0.5 | -10.000 | 140.000 | -10.000 | 7.500 |
| MBC717 | 0 | -10.000 | 500.000 | -10.000 | 21.200 |
| | 0.5 | -10.000 | 180.000 | -10.000 | 11.500 |
| MBC718 | 0 | 12.000 | 150.000 | -10.000 | 8.850 |
| | 0.5 | 14.000 | 180.000 | -10.000 | 3.550 |
| MBC719 | 0 | -10.000 | 170.000 | -10.000 | 8.010 |
| | 0.5 | 16.000 | 80.000 | -10.000 | 9.360 |
| MBC720 | 0 | 16.000 | 170.000 | -10.000 | 2.100 |
| | 0.5 | -10.000 | 90.000 | -10.000 | 7.570 |
| MBC721 | 0 | -10.000 | 90.000 | -10.000 | 2.650 |
| | 0.5 | -10.000 | 99.000 | -10.000 | 13.000 |
| | 1.5 | -10.000 | 80.000 | -10.000 | 3.350 |
| MBC722 | 0 | 12.000 | 70.000 | -10.000 | -1.000 |
| | 0.5 | -10.000 | 105.000 | -10.000 | 5.050 |
| | 1.5 | 16.000 | 120.000 | -10.000 | 1.420 |
| MBC723 | 0 | -10.000 | 80.000 | -10.000 | 2.250 |
| | 0.5 | -10.000 | 83.000 | -10.000 | 15.600 |
| | 1 | 46.000 | 60.000 | -10.000 | 3.150 |
| MBC724 | 0 | -10.000 | 140.000 | -10.000 | 3.750 |
| | 0.5 | -10.000 | 150.000 | -10.000 | 5.500 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS & SLUDGE.

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC724 | 1 | -10.000 | 90.000 | -10.000 | 3.100 |
| MBC725 | 0 | -10.000 | 110.000 | -10.000 | 5.750 |
| | 0.5 | -10.000 | 150.000 | -10.000 | 11.700 |
| | 1 | -10.000 | 120.000 | -10.000 | 6.550 |
| MBC726 | 0 | -10.000 | 202.000 | -10.000 | 6.650 |
| | 0.5 | 10.000 | 234.000 | -10.000 | 14.800 |
| | 3 | -10.000 | 151.000 | -10.000 | 5.450 |
| MBC727 | 0 | -10.000 | 118.000 | -10.000 | 5.300 |
| | 0.5 | -10.000 | 156.000 | -10.000 | 8.350 |
| | 3 | -10.000 | 118.000 | -10.000 | 4.750 |
| MBC728 | 0 | 12.000 | 67.000 | -10.000 | 3.600 |
| | 0.5 | 10.000 | 145.000 | -10.000 | 6.050 |
| | 3 | -10.000 | 101.000 | -10.000 | 3.000 |
| MBC729 | 0 | -10.000 | 139.000 | -10.000 | 5.700 |
| | 0.1 | -10.000 | 99.000 | -10.000 | 2.900 |
| | 0.3 | 12.000 | 77.000 | -10.000 | 4.450 |
| MBC730 | 0 | -10.000 | 396.000 | 41.300 | 12.600 |
| | 0.1 | -10.000 | 111.000 | -10.000 | 2.450 |
| | 0.3 | 16.000 | 122.000 | -10.000 | 7.200 |
| MBC731 | 0 | 14.000 | 105.000 | 14.400 | 3.650 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC731 | 0.1 | 12.000 | 94.000 | -10.000 | 1.300 |
| | 0.3 | 10.000 | 66.000 | -10.000 | -1.000 |
| MBC732 | 0 | -10.000 | 105.000 | -10.000 | 6.550 |
| | 0.1 | 10.000 | 83.000 | -10.000 | 3.050 |
| | 0.3 | 10.000 | 77.000 | -10.000 | 2.250 |
| MBC733 | 0 | -10.000 | 289.000 | 11.200 | 4.200 |
| | 0.1 | 10.000 | 278.000 | -10.000 | 3.900 |
| | 0.3 | -10.000 | 262.000 | -10.000 | 3.150 |
| MBC801 | 0 | 144.000 | 90.000 | -10.000 | 3.000 |
| | 2 | 96.000 | 170.000 | -10.000 | 2.450 |
| | 4 | 66.000 | 170.000 | -10.000 | 2.300 |
| | 6 | 114.000 | 120.000 | -10.000 | 3.450 |
| | 8 | 80.000 | 120.000 | -10.000 | 3.800 |
| MBC802 | 0 | -10.000 | 160.000 | -10.000 | 6.650 |
| | 2 | -10.000 | 160.000 | -10.000 | 6.600 |
| | 4 | -10.000 | 210.000 | -10.000 | -1.000 |
| | 6 | 14.000 | 110.000 | -10.000 | -1.000 |
| | 8 | 18.000 | 110.000 | -10.000 | -1.000 |
| MBC803 | 0 | 10.000 | 120.000 | -10.000 | 4.950 |
| | 4 | 14.000 | 150.000 | -10.000 | 2.950 |

(CONTINUED)

TABLE 6-2.

LIMITED INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES

REPORTED AS MICROGRAMS/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC803 | 8 | 10.000 | 160.000 | -10.000 | 4.600 |
| | 10 | 12.000 | 220.000 | -10.000 | 2.100 |
| | 12 | -10.000 | 130.000 | -10.000 | 2.300 |
| | 14 | 12.000 | 120.000 | -10.000 | 1.800 |
| | 16 | 14.000 | 130.000 | -10.000 | 1.350 |
| | 18 | 12.000 | 120.000 | -10.000 | 1.500 |
| MBC804 | 0 | 14.000 | 330.000 | -10.000 | 1.000 |
| | 4 | 14.000 | 200.000 | -10.000 | -1.000 |
| | 8 | 10.000 | 210.000 | -10.000 | 3.400 |
| | 10 | 12.000 | 210.000 | -10.000 | -1.000 |
| | 12 | 12.000 | 150.000 | -10.000 | -1.000 |
| | 14 | 20.000 | 100.000 | -10.000 | -1.000 |
| | 16 | -10.000 | 80.000 | -10.000 | -1.000 |
| | 18 | 12.000 | 70.000 | -10.000 | -1.000 |

TABLE 6-3.

FULL INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES (19 SAMPLES)

REPORTED AS MICROGRAMS/GRAM EXCEPT RADIOISOTOPES WHICH ARE PICOCURIES/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SILVER | ALUMINUM | GROSS ALPHA | ARSENIC | BORON | BARIUM | BERYLLIUM | GROSS BETA | BROMIDE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | 0.057 | 1630.000 | 17.700 | 0.128 | 5.900 | 2.550 | -1.000 | 20.300 | -2.500 |
| | 4 | 0.113 | 2080.000 | 15.300 | 0.538 | -1.000 | 2.900 | -1.000 | 20.800 | -2.500 |
| MBC205 | -1.5 | 4.820 | 83100.000 | 3801.000 | -0.125 | 113.300 | 193.000 | 4.250 | 10234.000 | -200.000 |
| | 0 | -0.000 | 1070.000 | . | -0.001 | . | 0.091 | . | . | . |
| MBC207 | -2.1 | 6.310 | 136000.000 | 2112.000 | -0.125 | 74.700 | 121.000 | 3.100 | 6765.000 | -500.000 |
| | 0 | -0.000 | 3840.000 | . | -0.001 | . | 0.183 | . | . | . |
| MBC407 | 5 | -0.050 | 2430.000 | 7.400 | 0.490 | -1.000 | 2.500 | -1.000 | 5.000 | -25.000 |
| MBC408 | 1 | 0.079 | 4290.000 | 10.900 | 1.630 | -1.000 | 3.300 | -1.000 | 7.500 | -2.500 |
| MBC502 | -0.67 | 14.200 | 67000.000 | 1402.000 | 0.355 | 4.400 | 139.000 | 1.600 | 2059.000 | -50.000 |
| | 0 | 4.455 | 8380.000 | 19.700 | 1.480 | 9.300 | 16.800 | -1.000 | 31.100 | -25.000 |
| MBC516 | 0.5 | -0.050 | 8490.000 | 9.100 | -0.125 | -1.000 | 66.600 | -1.000 | 7.700 | -2.500 |
| MBC612 | -0.67 | 11.130 | 85000.000 | 1105.000 | -0.125 | 6.500 | 69.000 | -1.000 | 1432.000 | -100.000 |
| | 0 | -0.050 | 12000.000 | 14.200 | 1.330 | -1.000 | 52.400 | -1.000 | 25.400 | -12.500 |
| MBC707 | 0 | -1.000 | 22238.000 | 8.600 | -0.120 | -1.000 | 242.000 | -1.000 | 7.000 | -2.500 |
| | 0.5 | -1.000 | 24616.000 | 9.500 | 0.200 | -1.000 | 144.000 | -1.000 | 7.500 | -2.500 |
| MBC719 | 0 | -1.000 | 11360.000 | 6.300 | 0.170 | -1.000 | 119.000 | -1.000 | 6.900 | -2.500 |
| | 0.5 | -1.000 | 19920.000 | 6.400 | 0.220 | -1.000 | 168.000 | -1.000 | 6.600 | -2.500 |
| MBC721 | 0 | -1.000 | 13285.000 | 4.500 | -0.120 | -1.000 | 86.000 | -1.000 | 5.300 | -2.500 |
| | 1.5 | -1.000 | 15679.000 | 4.900 | 0.140 | -1.000 | 85.400 | -1.000 | 5.000 | -2.500 |
| MBC803 | 8 | -1.000 | 9350.000 | 5.700 | 2.800 | -1.000 | 9.700 | -1.000 | 4.300 | -2.500 |
| MBC804 | 8 | -1.000 | 8700.000 | 8.000 | 2.600 | -1.000 | 12.200 | -1.000 | 6.600 | -2.500 |

TABLE 6-3.

FULL INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES (19 SAMPLES)

REPORTED AS MICROGRAMS/GRAM EXCEPT RADIOISOTOPES WHICH ARE PICOCURIES/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | CYANIDE | FLUORINE | IRON | MERCURY |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | 25.600 | -1.000 | 32.900 | 4.300 | 2.050 | 20.000 | 4.400 | 3820.000 | -0.200 |
| | 4 | 418.000 | -1.000 | 4.900 | 14.400 | -2.000 | 8.800 | 4.100 | 10100.000 | -0.200 |
| MBC205 | -1.5 | 50600.000 | 2.100 | 654.500 | 146.000 | 406.000 | 93.250 | -50.000 | 8240.000 | 2.290 |
| | 0 | 33.000 | -0.002 | 21.200 | -0.004 | -2.000 | . | . | 7550.000 | -0.200 |
| MBC207 | -2.1 | 26030.000 | 3.000 | 476.000 | 97.500 | 286.000 | 52.500 | -50.000 | 5990.000 | 0.930 |
| | 0 | 147.000 | -0.002 | 199.000 | 13.100 | 2.850 | . | . | 8740.000 | -0.200 |
| MBC407 | 5 | 11.300 | -1.000 | 39.900 | 11.300 | -2.000 | -0.250 | 3.400 | 12900.000 | -0.200 |
| MBC408 | 1 | 192.000 | -1.000 | 11.000 | 21.000 | -2.000 | -0.250 | 1.100 | 20600.000 | -0.200 |
| MBC502 | -0.67 | 90480.000 | -1.000 | 186.000 | 59.500 | 138.000 | 16.650 | -10.000 | 3400.000 | 4.790 |
| | 0 | 1100.000 | -1.000 | 35.300 | 20.800 | 5.600 | 0.300 | . | 13500.000 | -0.200 |
| MBC516 | 0.5 | 435.000 | -1.000 | 22.100 | 7.650 | -2.000 | 0.280 | 1.900 | 755.000 | -0.200 |
| MBC612 | -0.67 | 23990.000 | 3.000 | 108.000 | 27.200 | 104.000 | 48.300 | 23.400 | 2280.000 | 0.480 |
| | 0 | 743.000 | -1.000 | 29.900 | 8.550 | -2.000 | -0.250 | 3.200 | 8490.000 | 0.170 |
| MBC707 | 0 | 1101.000 | -1.000 | 120.000 | 20.100 | 13.300 | 11.600 | 0.800 | 1772.000 | -0.200 |
| | 0.5 | 573.000 | -1.000 | 3.900 | 26.400 | 10.200 | 3.240 | 0.810 | 2398.000 | -0.200 |
| MBC719 | 0 | 695.000 | -1.000 | 14.200 | 9.810 | 5.500 | 0.690 | 0.280 | 3620.000 | 0.510 |
| | 0.5 | 342.000 | -1.000 | 8.300 | 20.200 | 7.970 | 1.030 | -0.250 | 2640.000 | -0.200 |
| MBC721 | 0 | 228.000 | -1.000 | 21.000 | 9.800 | 4.400 | -0.250 | 0.190 | 620.000 | -2.000 |
| | 1.5 | 88.200 | -1.000 | 4.400 | 13.400 | 6.300 | -0.250 | 0.860 | 909.000 | -2.000 |
| MBC803 | 8 | 88.000 | -1.000 | 14.500 | 36.800 | -2.000 | -0.250 | 0.530 | 29350.000 | -0.200 |
| MBC804 | 8 | 76.000 | -1.000 | 19.500 | 33.400 | -2.000 | -0.250 | -0.500 | 29600.000 | -0.200 |

TABLE 6-3.

FULL INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES (19 SAMPLES)

REPORTED AS MICROGRAMS/GRAM EXCEPT RADIOISOTOPES WHICH ARE PICOCURIES/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | POTASSIUM | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRITE | NITRATE | LEAD |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | 36.900 | 3.900 | 2.200 | 869.000 | -1.500 | 7.600 | 2.300 | 45.400 | 11.200 |
| | 4 | 27.200 | 27.800 | 6.900 | 346.000 | -1.500 | 37.700 | 7.900 | 32.000 | 4.200 |
| MBC205 | -1.5 | 260.000 | 8209.000 | 184.000 | 68250.000 | 3.860 | 33980.000 | 5523.500 | 12034.800 | 926.000 |
| | 0 | 23.200 | 14.500 | 22.000 | 806.000 | 5.570 | 3.900 | . | 8.500 | 7.650 |
| MBC207 | -2.1 | 244.000 | 5522.000 | 148.000 | 73350.000 | -1.500 | 28700.000 | 3015.400 | 6833.100 | 603.000 |
| | 0 | 39.400 | 13.800 | 5.550 | 1125.000 | 4.190 | 41.400 | . | 42.900 | 22.000 |
| MBC407 | 5 | 25.200 | 9.850 | 2.850 | 140.000 | -1.500 | -2.000 | 0.230 | 20.500 | -2.000 |
| MBC408 | 1 | 46.100 | 22.200 | -1.000 | 628.000 | 9.590 | -2.000 | 0.910 | -0.560 | 8.700 |
| MBC502 | -0.67 | 135.000 | 3398.000 | 109.000 | 6008.000 | 2.790 | 8190.000 | 317.300 | 383.900 | 236.000 |
| | 0 | 70.000 | 69.800 | 25.000 | 546.000 | 23.610 | 50.800 | 3.100 | 33.100 | 16.600 |
| MBC516 | 0.5 | 58.600 | 39.800 | 6.200 | 340.000 | 9.540 | 11.100 | 1.100 | 24.400 | 2.900 |
| MBC612 | -0.67 | 225.000 | 1785.000 | 460.000 | 7624.000 | 72.550 | 9650.000 | 405.100 | 727.200 | 102.000 |
| | 0 | 107.000 | 99.600 | 273.000 | 367.000 | 26.250 | 14.200 | 1.700 | 10.800 | 2.900 |
| MBC707 | 0 | 309.000 | 292.000 | 41.300 | 447.000 | 48.930 | 6.580 | 2.300 | 5.200 | 5.590 |
| | 0.5 | 244.000 | 232.000 | 26.200 | 167.000 | 11.130 | 5.240 | 0.160 | -0.560 | 4.270 |
| MBC719 | 0 | 116.400 | 165.000 | 212.000 | 192.000 | 68.760 | 3.510 | 0.260 | 0.970 | 8.010 |
| | 0.5 | 177.300 | 226.000 | 103.000 | 122.000 | 10.890 | 4.210 | -0.060 | -0.560 | 6.780 |
| MBC721 | 0 | 96.600 | 116.000 | 17.600 | 120.000 | 10.870 | 2.200 | 1.500 | 21.900 | 2.800 |
| | 1.5 | 118.000 | 120.000 | 6.600 | 110.000 | 1.390 | -2.000 | 0.500 | 1.400 | 3.000 |
| MBC803 | 0 | 98.400 | 89.200 | 42.600 | 83.500 | -1.500 | -2.000 | 0.760 | -0.560 | 7.650 |
| MBC804 | 0 | 88.100 | 18.400 | 46.800 | 73.500 | -1.500 | -2.000 | 1.000 | -0.560 | 3.650 |

TABLE 6-3.

FULL INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES (19 SAMPLES)

REPORTED AS MICROGRAMS/GRAM EXCEPT RADIOISOTOPES WHICH ARE PICOCURIES/GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ANTIMONY | SELENIUM | TIN | SULPHATE | SPECIFIC GRAVITY | SULFIDE | TITANIUM | ORGANIC CARBON | TOTAL RADIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | 0.256 | -0.120 | -10.000 | 15.000 | . | -12.500 | -10.000 | 994.000 | 6.400 |
| | 4 | 0.361 | -0.120 | -10.000 | 61.100 | . | -12.500 | -10.000 | 1031.000 | 4.500 |
| MBC205 | -1.5 | 9.610 | -0.120 | 102.000 | -400.000 | 1.008 | -25.000 | 133.000 | 72000.000 | 11.300 |
| | 0 | . | -0.001 | . | . | . | . | . | 372.000 | . |
| MBC207 | -2.1 | 25.520 | -0.120 | 134.000 | -1000.000 | 1.012 | -25.000 | 88.400 | 50000.000 | 13.500 |
| | 0 | . | -0.001 | . | . | . | . | . | 1353.000 | . |
| MBC407 | 5 | 0.460 | -0.120 | -10.000 | 4.600 | . | -12.500 | -10.000 | 687.000 | 11.000 |
| MBC408 | 1 | 0.510 | -0.120 | -10.000 | 188.800 | . | -12.500 | -10.000 | 1258.000 | 7.200 |
| MBC502 | -0.67 | 8.090 | -0.120 | 66.700 | 253.800 | 1.060 | -25.000 | 23.700 | 90000.000 | 14.300 |
| | 0 | 3.410 | -0.120 | -10.000 | 35.400 | . | -12.500 | -10.000 | 3757.000 | 14.600 |
| MBC516 | 0.5 | 21.230 | -0.120 | -10.000 | 15.400 | . | -12.500 | -10.000 | 1910.000 | 10.300 |
| MBC612 | -0.67 | 7.540 | 0.130 | 65.400 | 294.100 | 1.090 | -25.000 | 19.400 | 100000.000 | 5.400 |
| | 0 | 2.720 | -0.120 | -10.000 | 34.300 | . | -25.000 | 12.900 | 4268.000 | 11.500 |
| MBC707 | 0 | 21.120 | -0.120 | 16.300 | 33.100 | 1.980 | -12.500 | -10.000 | 3640.000 | 5.900 |
| | 0.5 | 22.710 | -0.120 | 19.600 | 30.500 | . | -12.500 | 18.000 | 2770.000 | 14.500 |
| MBC719 | 0 | 2.930 | -0.120 | -10.000 | 30.600 | 1.700 | -12.500 | -10.000 | 19670.000 | 9.100 |
| | 0.5 | 4.660 | -0.120 | 12.500 | 20.800 | . | -12.500 | -10.000 | 3725.000 | 4.600 |
| MBC721 | 0 | 9.590 | -0.120 | -10.000 | 33.400 | . | -12.500 | -10.000 | 4143.000 | 6.700 |
| | 1.5 | 14.110 | -0.120 | 11.500 | 40.700 | . | -12.500 | 11.500 | 1636.000 | 4.000 |
| MBC803 | 8 | 12.300 | -0.120 | -10.000 | 5.600 | . | -12.500 | 73.000 | 1291.000 | 4.000 |
| MBC804 | 8 | 11.400 | -0.120 | -10.000 | 6.300 | . | -12.500 | 43.000 | 2928.000 | 3.800 |

TABLE 6-3.

FULL INORGANIC ANALYSES OF SEDIMENTS AND SLUDGES (19 SAMPLES)

REPORTED AS MICROGRAMS/GRAM EXCEPT RADIOISOTOPES WHICH ARE PICOCURIES/GRAM

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC203 | 0 | 10.000 | 96.000 | 55.300 | 1.950 |
| | 4 | 10.000 | 168.000 | 23.500 | 2.350 |
| MBC205 | -1.5 | -10.000 | 29530.000 | 24740.000 | 479.000 |
| | 0 | 10.000 | 276.000 | 119.000 | -1.000 |
| MBC207 | -2.1 | -10.000 | 26240.000 | 22250.000 | 325.000 |
| | 0 | 14.000 | 392.000 | 184.000 | 7.750 |
| MBC407 | 5 | 12.000 | 90.000 | -10.000 | 1.800 |
| MBC408 | 1 | 36.000 | 483.000 | 12.600 | 2.300 |
| MBC502 | -0.67 | 12.000 | 49320.000 | 12100.000 | 103.000 |
| | 0 | 10.000 | 730.000 | 88.600 | 8.750 |
| MBC516 | 0.5 | 10.000 | 188.000 | 16.800 | 3.450 |
| MBC612 | -0.67 | -10.000 | 13790.000 | 6795.000 | 66.000 |
| | 0 | -10.000 | 331.000 | 38.000 | 7.650 |
| MBC707 | 0 | -10.000 | 210.000 | -10.000 | 9.400 |
| | 0.5 | 26.000 | 150.000 | -10.000 | 4.850 |
| MBC719 | 0 | -10.000 | 170.000 | -10.000 | 8.010 |
| | 0.5 | 16.000 | 80.000 | -10.000 | 9.360 |
| MBC721 | 0 | -10.000 | 90.000 | -10.000 | 2.650 |
| | 1.5 | -10.000 | 80.000 | -10.000 | 3.350 |
| MBC803 | 8 | 10.000 | 160.000 | -10.000 | 4.600 |
| MBC804 | 8 | 10.000 | 210.000 | -10.000 | 3.400 |

TABLE 6-4.

LIMITED INORGANIC ANALYSES OF SLUDGES

REPORTED AS MICROGRAMS/GRAM

SERIES=SLUDGE/SOIL CORES - SETTLING BASIN

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM | CALCIUM | CADMIUM | CHLORIDE | CHROMIUM | COPPER | IRON | MERCURY | POTASSIUM |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC201 | -0.3 | 71610.000 | 26290.000 | 2.500 | 102.000 | 282.000 | 239.000 | 5480.000 | 1.800 | 108.000 |
| MBC202 | -0.5 | 34410.000 | 12540.000 | -1.000 | 63.800 | 97.800 | 90.300 | 9290.000 | 1.480 | 81.900 |
| MBC203 | -1.8 | 68940.000 | 56250.000 | 2.100 | 188.000 | 96.700 | 436.000 | 7080.000 | 1.780 | 223.000 |
| MBC204 | -1.5 | 152100.000 | 13890.000 | 3.150 | 524.500 | 66.200 | 119.000 | 4360.000 | 0.670 | 167.000 |
| MBC205 | -1.5 | 83100.000 | 50600.000 | 2.100 | 654.500 | 146.000 | 406.000 | 8240.000 | 2.290 | 260.000 |
| MBC206 | -3 | 171580.000 | 11440.000 | 3.800 | 604.500 | 35.200 | 133.000 | 2860.000 | 0.470 | 169.000 |
| MBC207 | -2.1 | 136000.000 | 26030.000 | 3.000 | 476.000 | 97.500 | 286.000 | 5990.000 | 0.930 | 244.000 |
| MBC208 | -1.1 | 105290.000 | 24390.000 | 2.850 | 318.500 | 62.400 | 139.000 | 3860.000 | 1.100 | 104.000 |
| AVERAGE | | 102878.750 | 27678.750 | 2.312 | 366.475 | 110.475 | 231.037 | 5897.500 | 1.315 | 169.612 |

SERIES=SLUDGE/SOIL CORES - DRAINAGE DITCH

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MBC501 | -1.2 | 79590.000 | 23840.000 | 2.150 | 41.100 | 794.000 | 169.000 | 3690.000 | 3.000 | 98.800 |
| MBC502 | -0.67 | 67000.000 | 90480.000 | -1.000 | 186.000 | 59.500 | 138.000 | 3400.000 | 4.790 | 135.000 |
| MBC507 | -1.3 | 102210.000 | 75180.000 | 1.900 | 27.100 | 200.000 | 211.000 | 2510.000 | 6.870 | 76.300 |
| MBC508 | -0.33 | 111570.000 | 40280.000 | 2.750 | 73.200 | 189.000 | 165.000 | 3530.000 | 11.880 | 162.000 |
| MBC513 | -1.2 | 96900.000 | 59140.000 | 2.700 | 3.000 | 164.000 | 157.000 | 2370.000 | 1.630 | 134.000 |
| MBC514 | -0.25 | 86460.000 | 20640.000 | 2.600 | 35.300 | 63.200 | 90.800 | 1820.000 | 1.100 | 107.000 |
| MBC515 | -0.5 | 78780.000 | 11560.000 | 1.650 | 161.100 | 140.000 | 147.000 | 1770.000 | 1.650 | 154.000 |
| MBC516 | -0.33 | 108240.000 | 1669.000 | 2.900 | 58.800 | 36.900 | 90.000 | 1115.000 | 1.150 | 109.000 |
| AVERAGE | | 91343.750 | 40348.625 | 1.956 | 73.200 | 205.625 | 145.975 | 2525.625 | 4.009 | 122.012 |

SERIES=SLUDGE/SOIL CORES - SEEPAGE AREA

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| MBC604 | -0.42 | 96290.000 | 15110.000 | 3.000 | 48.200 | 19.400 | 33.500 | 1060.000 | 0.630 | 252.000 |
| MBC605 | -0.33 | 60380.000 | 8974.000 | 1.400 | 36.400 | 8.050 | 23.000 | 990.000 | 0.430 | 106.000 |
| MBC606 | -0.25 | 72980.000 | 10950.000 | 2.000 | 20.900 | 7.550 | 25.600 | 1330.000 | 0.220 | 121.000 |
| MBC607 | -0.5 | 71430.000 | 26960.000 | 2.850 | 41.900 | 30.100 | 91.100 | 1805.000 | 0.660 | 148.000 |
| MBC608 | -0.58 | 90860.000 | 27270.000 | 3.750 | 42.100 | 33.000 | 112.000 | 1900.000 | 0.860 | 162.000 |
| MBC609 | -0.25 | 73910.000 | 13540.000 | 2.450 | 24.800 | 12.100 | 70.200 | 1260.000 | 0.620 | 137.000 |
| MBC610 | -0.25 | 87020.000 | 17430.000 | 2.350 | 11.600 | 12.800 | 45.000 | 1570.000 | 0.530 | 177.000 |
| MBC611 | -0.25 | 90570.000 | 19020.000 | 3.100 | 6.100 | 12.800 | 57.000 | 830.000 | 0.500 | 185.000 |
| MBC612 | -0.67 | 85000.000 | 23990.000 | 3.000 | 108.000 | 27.200 | 104.000 | 2280.000 | 0.480 | 225.000 |
| MBC613 | -0.67 | 91900.000 | 28180.000 | 3.450 | 44.100 | 51.100 | 119.000 | 2110.000 | 1.160 | 152.000 |
| MBC614 | -0.67 | 58350.000 | 15440.000 | 1.500 | 28.400 | 55.400 | 62.800 | 3120.000 | 0.650 | 147.000 |
| MBC615 | -1.1 | 29345.000 | 4617.000 | -1.000 | 18.800 | 54.400 | 52.200 | 6575.000 | 0.440 | 94.700 |
| MBC616 | -0.42 | 54510.000 | 9971.000 | 1.950 | 20.000 | 10.000 | 65.500 | 1620.000 | 0.380 | 109.000 |
| MBC617 | -0.84 | 95050.000 | 50790.000 | 3.100 | 64.500 | 92.200 | 169.000 | 2230.000 | 1.850 | 132.000 |
| MBC618 | -0.58 | 81610.000 | 31310.000 | 3.450 | 47.800 | 120.000 | 187.000 | 2750.000 | 2.050 | 123.000 |
| MBC619 | -0.25 | 49070.000 | 9232.000 | 1.700 | 34.400 | 9.600 | 56.400 | 1440.000 | 0.310 | 94.600 |
| MBC620 | -0.84 | 117530.000 | 38760.000 | 3.200 | 62.700 | 69.300 | 125.000 | 2220.000 | 1.930 | 141.000 |
| AVERAGE | | 76812.059 | 20679.059 | 2.426 | 38.865 | 36.765 | 82.253 | 2062.941 | 0.818 | 147.429 |

TABLE 6-4.

LIMITED INORGANIC ANALYSES OF SLUDGES

REPORTED AS MICROGRAMS/GRAM
SERIES=SLUDGE/SOIL CORES - SETTLING BASIN

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MAGNESIUM | MANGANESE | SODIUM | AMMONIA NITROGEN | NICKEL | NITRATE NITROGEN | LEAD | SPECIFIC GRAVITY | ORGANIC CARBON |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC201 | -0.3 | 1618.000 | 51.300 | 18670.000 | 1.390 | 7638.000 | 3025.000 | 317.000 | 1.000 | 82000.000 |
| MBC202 | -0.5 | 800.000 | 74.100 | 8538.000 | 5.500 | 3291.000 | 1230.900 | 131.000 | 0.989 | 200000.000 |
| MBC203 | -1.8 | 10190.000 | 220.000 | 66830.000 | 2.750 | 29150.000 | 5114.100 | 738.000 | 0.990 | 80000.000 |
| MBC204 | -1.5 | 2811.000 | 56.100 | 82770.000 | -1.500 | 7851.000 | 10816.000 | 250.000 | 1.001 | 32000.000 |
| MBC205 | -1.5 | 8209.000 | 184.000 | 68250.000 | 3.860 | 33980.000 | 12034.800 | 926.000 | 1.008 | 72000.000 |
| MBC206 | -3 | 2105.000 | 37.700 | 20000.000 | -1.500 | 11710.000 | 10528.000 | 291.000 | 1.017 | 55000.000 |
| MBC207 | -2.1 | 5522.000 | 148.000 | 73350.000 | -1.500 | 28700.000 | 6833.100 | 603.000 | 1.012 | 50000.000 |
| MBC208 | -1.1 | 3098.000 | 66.900 | 15400.000 | -1.500 | 9847.000 | 7912.200 | 271.000 | 1.016 | 130000.000 |
| AVERAGE | | 4294.125 | 104.762 | 44226.000 | 0.937 | 16520.875 | 7186.762 | 440.875 | 1.004 | 87625.000 |
| SERIES=SLUDGE/SOIL CORES - DRAINAGE DITCH | | | | | | | | | | |
| MBC501 | -1.2 | 1615.000 | 42.800 | 7678.000 | 13.930 | 4624.000 | 473.900 | 240.000 | 1.050 | 79000.000 |
| MBC502 | -0.67 | 3398.000 | 109.000 | 6008.000 | 2.790 | 8190.000 | 383.900 | 236.000 | 1.060 | 90000.000 |
| MBC507 | -1.3 | 2725.000 | 69.600 | 6352.000 | 5.570 | 8462.000 | 587.100 | 340.000 | 0.995 | 160000.000 |
| MBC508 | -0.33 | 3120.000 | 93.300 | 8472.000 | 11.980 | 6898.000 | 610.400 | 201.000 | 1.050 | 81000.000 |
| MBC513 | -1.2 | 3293.000 | 103.000 | 7609.000 | 8.130 | 8706.000 | 29.000 | 261.000 | 1.080 | 40000.000 |
| MBC514 | -0.25 | 2000.000 | 77.600 | 5833.000 | 32.140 | 6372.000 | 345.700 | 125.000 | 0.991 | 100000.000 |
| MBC515 | -0.5 | 1061.000 | 116.000 | 11450.000 | 60.870 | 468.000 | 215.900 | 711.000 | 1.050 | 400000.000 |
| MBC516 | -0.33 | 1749.000 | 52.600 | 6534.000 | 30.800 | 4940.000 | 142.700 | 128.000 | 1.100 | 81000.000 |
| AVERAGE | | 2370.125 | 82.987 | 7492.000 | 20.776 | 6082.500 | 348.575 | 280.250 | 1.047 | 128875.000 |
| SERIES=SLUDGE/SOIL CORES - SEEPAGE AREA | | | | | | | | | | |
| MBC604 | -0.42 | 1481.000 | 116.000 | 5914.000 | . | 2933.000 | 497.600 | 76.400 | 1.000 | 150000.000 |
| MBC605 | -0.33 | 897.000 | 109.000 | 3467.000 | 11.200 | 1996.000 | 447.700 | 24.200 | 1.010 | 12000.000 |
| MBC606 | -0.25 | 1134.000 | 232.000 | 3958.000 | 56.860 | 2193.000 | 403.400 | 32.200 | 1.090 | 91000.000 |
| MBC607 | -0.5 | 2160.000 | 217.000 | 5236.000 | 27.970 | 8275.000 | 308.900 | 102.000 | 1.060 | 95000.000 |
| MBC608 | -0.58 | 2656.000 | 141.000 | 6603.000 | 27.890 | 11540.000 | 1344.500 | 115.000 | 1.060 | 84000.000 |
| MBC609 | -0.25 | 1258.000 | 227.000 | 4592.000 | 27.660 | 5500.000 | 375.800 | 65.250 | 1.020 | 110000.000 |
| MBC610 | -0.25 | 1667.000 | 220.000 | 4650.000 | 23.310 | 4399.000 | 199.200 | 51.000 | 1.040 | 76000.000 |
| MBC611 | -0.25 | 1918.000 | 146.000 | 5846.000 | 8.120 | 4339.000 | 39.200 | 54.200 | 0.994 | 97000.000 |
| MBC612 | -0.67 | 1785.000 | 460.000 | 7624.000 | 72.550 | 9650.000 | 727.200 | 102.000 | 1.090 | 100000.000 |
| MBC613 | -0.67 | 2534.000 | 165.000 | 7143.000 | 18.140 | 10400.000 | 1086.000 | 155.000 | 1.080 | 110000.000 |
| MBC614 | -0.67 | 1407.000 | 396.000 | 3588.000 | 23.470 | 3255.000 | 287.800 | 136.000 | 1.010 | 97000.000 |
| MBC615 | -1.1 | 422.000 | 32.300 | 2015.000 | 15.660 | 1292.000 | 100.000 | 146.000 | 1.020 | 19000.000 |
| MBC616 | -0.42 | 592.000 | 374.000 | 3809.000 | 44.050 | 4025.000 | 250.100 | 50.400 | 1.040 | 27000.000 |
| MBC617 | -0.84 | 3431.000 | 115.000 | 7208.000 | 24.750 | 8688.000 | 385.000 | 238.000 | 0.992 | 100000.000 |
| MBC618 | -0.58 | 2240.000 | 124.000 | 5557.000 | 25.170 | 9960.000 | 183.800 | 287.000 | 1.010 | 4300.000 |
| MBC619 | -0.25 | 878.000 | 279.000 | 3201.000 | 19.400 | 3716.000 | 230.400 | 41.000 | 1.280 | 87000.000 |
| MBC620 | -0.84 | 3164.000 | 129.000 | 9382.000 | 20.450 | 6725.000 | 294.900 | 207.000 | 1.030 | 25000.000 |
| AVERAGE | | 1742.588 | 204.841 | 5293.706 | 27.916 | 5816.824 | 421.265 | 110.744 | 1.049 | 75547.059 |

TABLE 6-4.

LIMITED INORGANIC ANALYSES OF SLUDGES

REPORTED AS MICROGRAMS/GRAM

SERIES=SLUDGE/SOIL CORES - SETTLING BASIN

| | | TESTNAME | | | |
|---|---|---|---|---|---|
| | | ORGANIC HALOGENS | TOTAL PHOSPHATES | URANIUM | ZINC |
| | | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | |
| MBC201 | -0.3 | 12.000 | 15860.000 | 6115.000 | 106.000 |
| MBC202 | -0.5 | 14.000 | 7570.000 | 2300.000 | 53.400 |
| MBC203 | -1.8 | 12.000 | 28430.000 | 47520.000 | 455.000 |
| MBC204 | -1.5 | -10.000 | 30630.000 | 13385.000 | 129.000 |
| MBC205 | -1.5 | -10.000 | 29530.000 | 24740.000 | 479.000 |
| MBC206 | -3 | -10.000 | 40510.000 | 16410.000 | 166.000 |
| MBC207 | -2.1 | -10.000 | 26240.000 | 22250.000 | 325.000 |
| MBC208 | -1.1 | 16.000 | 26240.000 | 11575.000 | 131.000 |
| AVERAGE | | 1.750 | 25618.750 | 18036.875 | 238.550 |

SERIES=SLUDGE/SOIL CORES - DRAINAGE DITCH

| | | | | | |
|---|---|---|---|---|---|
| MBC501 | -1.2 | 32.000 | 13240.000 | 3903.000 | 51.400 |
| MBC502 | -0.67 | 12.000 | 49320.000 | 12180.000 | 103.000 |
| MBC507 | -1.3 | 14.000 | 29840.000 | 9795.000 | 118.000 |
| MBC508 | -0.33 | 12.000 | 28780.000 | 8340.000 | 98.000 |
| MBC513 | -1.2 | 12.000 | 32600.000 | 9290.000 | 117.000 |
| MBC514 | -0.25 | -10.000 | 18300.000 | 4096.000 | 60.400 |
| MBC515 | -0.5 | 12.000 | 11570.000 | 2540.000 | 55.800 |
| MBC516 | -0.33 | -10.000 | 24340.000 | 4306.000 | 74.000 |
| AVERAGE | | 9.250 | 25998.750 | 6796.250 | 87.200 |

SERIES=SLUDGE/SOIL CORES - SEEPAGE AREA

| | | | | | |
|---|---|---|---|---|---|
| MBC604 | -0.42 | -10.000 | 22120.000 | 3960.000 | 51.000 |
| MBC605 | -0.33 | -10.000 | 9350.000 | 2296.000 | 27.500 |
| MBC606 | -0.25 | 10.000 | 9910.000 | 2342.000 | 33.600 |
| MBC607 | -0.5 | -10.000 | 17160.000 | 5400.000 | 78.000 |
| MBC608 | -0.58 | -10.000 | 20460.000 | 6950.000 | 113.000 |
| MBC609 | -0.25 | -10.000 | 13790.000 | 2952.000 | 61.000 |
| MBC610 | -0.25 | 12.000 | 17480.000 | 4365.000 | 52.000 |
| MBC611 | -0.25 | -10.000 | 21840.000 | 4810.000 | 49.000 |
| MBC612 | -0.67 | -10.000 | 13790.000 | 6795.000 | 66.000 |
| MBC613 | -0.67 | -10.000 | 21010.000 | 4768.000 | 103.000 |
| MBC614 | -0.67 | -10.000 | 11570.000 | 2900.000 | 49.400 |
| MBC615 | -1.1 | 12.000 | 3530.000 | 770.000 | 29.300 |
| MBC616 | -0.42 | -10.000 | 5470.000 | 2156.000 | 49.200 |
| MBC617 | -0.84 | -10.000 | 29840.000 | 7875.000 | 125.000 |
| MBC618 | -0.58 | -10.000 | 16570.000 | 5550.000 | 133.000 |
| MBC619 | -0.25 | -10.000 | 9350.000 | 2017.000 | 42.800 |
| MBC620 | -0.84 | 10.000 | 32110.000 | 7105.000 | 99.000 |
| AVERAGE | | -5.059 | 16196.471 | 4294.765 | 68.353 |

TABLE 6-5.

ORGANIC ANALYTES DETECTED IN SOILS AND SLUDGES

| TESTNAME | MAXIMUM LEVEL | MINIMUM REPORTED | UNITS |
|---|---|---|---|
| ACETONE | 37 | 6 | NGG |
| ALCOHOLS (HIGH MOLECULAR WEIGHT) | 4000 | 600 | NGG |
| BIS(2-ETHYLHEXYL) PHTHALATE | 25080 | -150 | NGG |
| HYDROCARBONS (ALL MOLECULAR WEIGHTS) | 182000 | 19 | NGG |
| TRICHLOROFLUOROMETHANE | 35 | -50 | NGG |
| CHLOROFORM | 10 | -10 | UGL |
| METHYLENE CHLORIDE | 257 | -10 | NGG |
| METHYLENE CHLORIDE | 48 | -10 | UGL |
| CHLOROBENZENE | 19 | -10 | NGG |
| CHLOROTOLUENE | 77 | 77 | NGG |
| DICHLOROBENZENES | 182 | 84 | NGG |
| TETRACHLOROBIPHENYL | 7250 | 600 | NGG |
| PENTACHLOROBIPHENYL | 11600 | 300 | NGG |
| HEXACHLOROBIPHENYL | 3110 | 3110 | NGG |
| DECANOIC ACID | 100 | 100 | NGG |
| TRIDECANE | 1380 | 1380 | NGG |
| SATURATED HYDROCABONS (C16) | 11220 | 11220 | NGG |
| HEXADECANOIC ACID | 800 | 200 | NGG |
| HEXADECANOIC ACID, BUTYL ESTER | 500 | 360 | NGG |
| HEXADECANOIC ACID, METHYL ESTER | 220 | 220 | NGG |
| HEPTADECANE | 49600 | 49600 | NGG |
| OCTADECANOIC ACID | 300 | 300 | NGG |
| OCTADECANOIC ACID, BUTYL ESTER | 1000 | 1000 | NGG |
| OCTADECANOIC ACID, DICHLOROMETHYL ESTER | 200 | 200 | NGG |
| BENZENE | 10 | -10 | NGG |
| DIETHYL ETHER | 140 | 140 | NGG |
| DIETHYL PHTHALATE | 170 | -150 | NGG |
| DIMETHYL DISULFIDE | 77 | 77 | NGG |
| DIMETHYL PHTHALATE | 200 | -200 | NGG |
| DI-N-BUTYL PHTHALATE | 1100 | -100 | NGG |
| DI-N-OCTYL PHTHALATE | 970 | -100 | NGG |
| ETHYL BENZENE | 180 | -10 | NGG |
| HEPTADECANE | 103000 | 103000 | NGG |
| HEXANE | 263 | 42 | NGG |
| HEXANEDIOIC ACID, DIOCTYL ESTER | 47100 | 47100 | NGG |
| KETONE | 700 | 700 | NGG |
| 13,16,14-LABDIEN-8-OL | 2000 | 2000 | NGG |
| TOLUENE | 42 | -10 | NGG |
| TOLUENE | 23 | -10 | UGL |
| NITRO-1,METHYLIMIDAZOLE | 100 | 100 | NGG |
| PENTADECANE | 12500 | 12500 | NGG |
| PHENANTHRENE | 170 | -100 | NGG |
| PHTHALATES | 4500 | 4500 | NGG |
| SULFUR | 800 | 800 | NGG |
| 1,1,2,2-TETRACHLOROETHANE | 467 | -10 | NGG |
| TETRACHLOROETHYLENE | 764500 | -10 | NGG |
| 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE | 6 | 6 | NGG |
| 1,1,2-TRICHLOROTRIFLUOROMETHANE | 9 | 9 | NGG |
| TETRADECANOIC ACID | 200 | 100 | NGG |
| TETRADECANE | 7110 | 7110 | NGG |
| TRICHLOROETHYLENE | 278 | -10 | NGG |
| XYLENES | 550 | 435 | NGG |
| 1,CHLORO,2-METHYLBENZENE | 58 | 58 | NGG |
| 1,1-DICHLOROETHYLENE | 176 | -20 | NGG |
| 1,1-DICHLOROETHANE | 39 | -20 | NGG |
| 1,1,1-TRICHLOROETHANE | 2110 | -20 | NGG |
| 1,2-DICHLOROETHANE | 31 | -20 | NGG |
| 2(4H)-BENZOFURANONE-4,4,7A,CH3 | 200 | 200 | NGG |
| 2-BUTOXYETHANOL | 300 | 300 | NGG |
| 2(2-ETHOXYETHOXY)ETHANOL | 610 | 150 | NGG |
| 2-HEXADECEN-1-OL,3,7,11,15-TETRAMETHYL | 176000 | 176000 | NGG |
| METHYL,ETHYL,PROPYL-PROPANOIC ACID ESTER | 130 | 100 | NGG |
| 2-PROPYL DECANE | 4940 | 4940 | NGG |
| 2,5-DIMETHYL HEPTANE | 4330 | 4330 | NGG |
| 3-LICOSENE | 2400 | 2400 | NGG |
| 6-CYCLOHEXYLDODECANE | 5430 | 5430 | NGG |

TABLE 6-5.

ORGANIC ANALYTES NOT DETECTED IN SOILS AND SLUDGES

| TESTNAME | DETECTION LIMIT | UNITS |
|---|---|---|
| ALPHA-BENZENEHEXACHLORIDE | -1000 | NGG |
| ACROLEIN | -100 | NGG |
| ACROLEIN | -100 | UGL |
| ACRYLONITRILE | -100 | NGG |
| ACRYLONITRILE | -100 | UGL |
| ALPHA-ENDOSULFAN | -5000 | NGG |
| ALDRIN | -1000 | NGG |
| ACENAPHTHENE | -150 | NGG |
| ACENAPHTHYLENE | -100 | NGG |
| ANTHRACENE | -100 | NGG |
| BENZO(A)ANTHRACENE | -100 | NGG |
| BENZO(A)PYRENE | -600 | NGG |
| BETA-BENZENEHEXACHLORIDE | -1000 | NGG |
| BUTYLBENZYL PHTHALATE | -150 | NGG |
| BETA-ENDOSULFAN | -5000 | NGG |
| BENZIDINE | -700 | NGG |
| BENZO(G,H,I)PERYLENE | -300 | NGG |
| BENZO(K)FLUORANTHENE | -200 | NGG |
| BROMODICHLOROMETHANE | -20 | NGG |
| BROMODICHLOROMETHANE | -5 | UGL |
| BIS(2-CHLOROETHOXY) METHANE | -200 | NGG |
| BIS(2-CHLOROISOPROPYL) ETHER | -150 | NGG |
| BIS(2-CHLOROETHYL) ETHER | -150 | NGG |
| TRICHLOROFLUOROMETHANE | -5 | UGL |
| CARBON TETRACHLORIDE | -30 | NGG |
| CARBON TETRACHLORIDE | -5 | UGL |
| BROMOFORM | -20 | NGG |
| BROMOFORM | -10 | UGL |
| CHLOROFORM | -10 | NGG |
| CHRYSENE | -100 | NGG |
| BROMOMETHANE | -30 | NGG |
| BROMOMETHANE | -10 | UGL |
| CHLOROMETHANE | -10 | NGG |
| CHLOROMETHANE | -10 | UGL |
| CHLOROBENZENE | -5 | UGL |
| CHLORDANE | -25000 | NGG |
| HEXACHLOROBENZENE | -350 | NGG |
| HEXACHLOROCYCLOPENTADIENE | -800 | NGG |
| HEXACHLOROETHANE | -500 | NGG |
| CHLOROETHENE | -30 | NGG |
| CHLOROETHENE | -10 | UGL |
| CHLOROETHANE | -30 | NGG |
| CHLOROETHANE | -10 | UGL |
| BENZENE | -5 | UGL |
| DIBENZO(A,H)ANTHRACENE | -350 | NGG |
| DELTA-BENZENEHEXACHLORIDE | -1000 | NGG |
| DIBROMOCHLOROMETHANE | -10 | NGG |
| DIBROMOCHLOROMETHANE | -5 | UGL |
| DIELDRIN | -1000 | NGG |
| ENDRIN ALDEHYDE | -5000 | NGG |
| ENDRIN | -2000 | NGG |

TABLE 6-5.

ORGANIC ANALYTES NOT DETECTED IN SOILS AND SLUDGES

| TESTNAME | DETECTION LIMIT | UNITS |
|---|---|---|
| ENDOSULFAN SULFATE | -5000 | NGG |
| ETHYL BENZENE | -5 | UGL |
| FLUORANTHENE | -100 | NGG |
| FLUORENE | -150 | NGG |
| HEXACHLOROBUTADIENE | -800 | NGG |
| HEPTACHLOR | -1000 | NGG |
| HEPTACHLOR EPOXIDE | -1000 | NGG |
| INDENO(1,2,3-C,D)PYRENE | -300 | NGG |
| ISOPHORONE | -100 | NGG |
| LINDANE | -1000 | NGG |
| NAPHTHALENE | -100 | NGG |
| NITROBENZENE | -200 | NGG |
| N-NITROSODIMETHYLAMINE | -150 | NGG |
| NITROSODI-N-PROPYL AMINE | -200 | NGG |
| N-NITROSODIPHENYL AMINE | -350 | NGG |
| PCB 1016 | -10000 | NGG |
| PCB 1221 | -10000 | NGG |
| PCB 1232 | -10000 | NGG |
| PCB 1242 | -10000 | NGG |
| PCB 1248 | -10000 | NGG |
| PCB 1254 | -10000 | NGG |
| PCB 1260 | -10000 | NGG |
| PENTACHLOROPHENOL | -350 | NGG |
| PHENOL | -150 | NGG |
| 2,2-BIS(PARA-CHLOROPHENYL)-1,1-CL,C2H2 | -1000 | NGG |
| 2,2-BIS(PARA-CHLOROPHENYL)-1,1-CL,C2 | -1000 | NGG |
| 2,2-BIS(PARA-CHLOROPHENYL)-1,1,1-CL,C2H2 | -1000 | NGG |
| PYRENE | -100 | NGG |
| 1,1,2,2-TETRACHLOROETHANE | -10 | UGL |
| TETRACHLOROETHYLENE | -5 | UGL |
| TRICHLOROETHYLENE | -5 | UGL |
| TOXAPHENE | -50000 | NGG |
| TRANS-1,2-DICHLOROETHENE | -20 | NGG |
| TRANS-1,2-DICHLOROETHENE | -5 | UGL |
| 1,1-DICHLOROETHYLENE | -5 | UGL |
| 1,1-DICHLOROETHANE | -5 | UGL |
| 1,1,1-TRICHLOROETHANE | -5 | UGL |
| 1,1,2-TRICHLOROETHANE | -20 | NGG |
| 1,1,2-TRICHLOROETHANE | -5 | UGL |
| 1,2-DICHLOROBENZENE | -200 | NGG |
| 1,2-DICHLOROETHANE | -1 | UGL |
| 1,2-DICHLOROPROPANE | -20 | NGG |
| 1,2-DICHLOROPROPANE | -10 | UGL |
| 1,2-DIPHENYL HYDRAZINE | -150 | NGG |
| 1,2,3-TRICHLOROBENZENE | -300 | NGG |
| 1,3-DICHLOROBENZENE | -200 | NGG |
| 1,3-DICHLOROPROPYLENE | -10 | NGG |
| 1,3-DICHLOROPROPYLENE | -5 | UGL |
| 1,4-DICHLOROBENZENE | -200 | NGG |
| 2-CHLOROETHYLVINYL ETHER | -20 | NGG |
| 2-CHLOROETHYLVINYL ETHER | -10 | UGL |
| 2-CHLOROPHENOL | -200 | NGG |
| 2-CHLORONAPHTHALENE | -200 | NGG |
| 2-NITROPHENOL | -400 | NGG |
| 2,4-DICHLOROPHENOL | -300 | NGG |
| 2,4-DIMETHYL PHENOL | -400 | NGG |
| 2,4-DINITROPHENOL | -700 | NGG |
| 2,4-DINITROTOLUENE | -350 | NGG |
| 2,4,6-TRICHLOROPHENOL | -800 | NGG |
| 2,6-DINITROTOLUENE | -800 | NGG |
| 3,3-DICHLOROBENZIDENE | -700 | NGG |
| 3,4-BENZOFLUORANTHENE | -200 | NGG |
| 4-BROMOPHENYLPHENYL ETHER | -350 | NGG |
| 4-CHLOROPHENYLPHENYL ETHER | -150 | NGG |
| 3-METHYL-4-CHLOROPHENOL | -400 | NGG |
| 4-NITROPHENOL | -350 | NGG |
| 2-METHYL-4,6-DINITROPHENOL | -700 | NGG |

TABLE 6-6.

ORGANIC ANALYTES DETECTED IN LABORATORY BLANKS RUN WITH SOILS AND SLUDGES

SERIES=LABORATORY BLANK

| OBS | ANALYSIS DATE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|---|
| 1 | 022685 | ALCOHOLS (HIGH MOLECULAR WEIGHT) | | 600.00000 | NGG |
| 2 | 022685 | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 150.00000 | NGG |
| 3 | 020685 | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 150.00000 | NGG |
| 4 | 022685 | BIS(2-ETHYLHEXYL) PHTHALATE | | 210.00000 | NGG |
| 5 | 022685 | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 150.00000 | NGG |
| 6 | 022685 | BIS(2-ETHYLHEXYL) PHTHALATE | | 230.00000 | NGG |
| 7 | 020485 | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 150.00000 | NGG |
| 8 | 121284 | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 150.00000 | NGG |
| 9 | 020185 | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 150.00000 | NGG |
| 10 | 022685 | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | | 700.00000 | NGG |
| 11 | 022685 | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | | 1500.00000 | NGG |
| 12 | 022685 | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | | 300.00000 | NGG |
| 13 | 030885 | CHLOROFORM | LT | 5.00000 | UGL |
| 14 | 031185 | CHLOROFORM | LT | 5.00000 | UGL |
| 15 | 031585 | CHLOROFORM | LT | 5.00000 | UGL |
| 16 | 022885 | CHLOROFORM | LT | 10.00000 | UGL |
| 17 | 021985 | CHLOROFORM | LT | 10.00000 | UGL |
| 18 | 022685 | CHLOROFORM | LT | 10.00000 | UGL |
| 19 | 022085 | CHLOROFORM | LT | 10.00000 | UGL |
| 20 | 022185 | CHLOROFORM | LT | 10.00000 | UGL |
| 21 | 022285 | CHLOROFORM | LT | 10.00000 | UGL |
| 22 | 022485 | CHLOROFORM | LT | 10.00000 | UGL |
| 23 | 030185 | CHLOROFORM | LT | 10.00000 | UGL |
| 24 | 030285 | CHLOROFORM | LT | 10.00000 | UGL |
| 25 | 022785 | CHLOROFORM | LT | 10.00000 | UGL |
| 26 | 030585 | CHLOROFORM | LT | 10.00000 | UGL |
| 27 | 020785 | CHLOROFORM | LT | 10.00000 | UGL |
| 28 | 020885 | CHLOROFORM | LT | 10.00000 | UGL |
| 29 | 021285 | CHLOROFORM | LT | 10.00000 | UGL |
| 30 | 112984 | CHLOROFORM | LT | 10.00000 | UGL |
| 31 | 120485 | CHLOROFORM | LT | 10.00000 | UGL |
| 32 | 120385 | CHLOROFORM | LT | 10.00000 | UGL |
| 33 | 113084 | CHLOROFORM | LT | 10.00000 | UGL |
| 34 | 012485 | CHLOROFORM | LT | 10.00000 | UGL |
| 35 | 012585 | CHLOROFORM | LT | 10.00000 | UGL |
| 36 | 012685 | CHLOROFORM | LT | 10.00000 | UGL |
| 37 | 012885 | CHLOROFORM | | 10.00000 | UGL |
| 38 | 012985 | CHLOROFORM | LT | 10.00000 | UGL |
| 39 | 013085 | CHLOROFORM | LT | 10.00000 | UGL |
| 40 | 013185 | CHLOROFORM | LT | 10.00000 | UGL |
| 41 | 020185 | CHLOROFORM | LT | 10.00000 | UGL |
| 42 | 020485 | CHLOROFORM | LT | 10.00000 | UGL |
| 43 | 020685 | CHLOROFORM | LT | 10.00000 | UGL |
| 44 | 021485 | CHLOROFORM | LT | 10.00000 | UGL |
| 45 | 021885 | CHLOROFORM | LT | 10.00000 | UGL |
| 46 | 021585 | CHLOROFORM | LT | 10.00000 | UGL |
| 47 | 123184 | CHLOROFORM | LT | 10.00000 | UGL |
| 48 | 012185 | CHLOROFORM | LT | 10.00000 | UGL |
| 49 | 012285 | CHLOROFORM | LT | 10.00000 | UGL |
| 50 | 012385 | CHLOROFORM | LT | 10.00000 | UGL |
| 51 | 021385 | CHLOROFORM | LT | 10.00000 | UGL |
| 52 | 121385 | CHLOROFORM | LT | 10.00000 | UGL |

TABLE 6-6.

ORGANIC ANALYTES DETECTED IN LABORATORY BLANKS RUN WITH SOILS AND SLUDGES

SERIES=LABORATORY BLANK

| OBS | ANALYSIS DATE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|---|
| 53 | 120584 | CHLOROFORM | LT | 10.00000 | UGL |
| 54 | 122784 | CHLOROFORM | LT | 10.00000 | UGL |
| 55 | 122884 | CHLOROFORM | LT | 10.00000 | UGL |
| 56 | 120684 | CHLOROFORM | LT | 10.00000 | UGL |
| 57 | 122985 | CHLOROFORM | LT | 10.00000 | UGL |
| 58 | 122184 | CHLOROFORM | LT | 10.00000 | UGL |
| 59 | 030885 | METHYLENE CHLORIDE | | 18.00000 | UGL |
| 60 | 031185 | METHYLENE CHLORIDE | | 17.00000 | UGL |
| 61 | 031585 | METHYLENE CHLORIDE | | 20.00000 | UGL |
| 62 | 022885 | METHYLENE CHLORIDE | | 16.00000 | UGL |
| 63 | 021985 | METHYLENE CHLORIDE | | 48.00000 | UGL |
| 64 | 022685 | METHYLENE CHLORIDE | | 13.00000 | UGL |
| 65 | 022085 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 66 | 022185 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 67 | 022285 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 68 | 022485 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 69 | 030185 | METHYLENE CHLORIDE | | 12.00000 | UGL |
| 70 | 030285 | METHYLENE CHLORIDE | | 15.00000 | UGL |
| 71 | 022785 | METHYLENE CHLORIDE | | 22.00000 | UGL |
| 72 | 030585 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 73 | 020785 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 74 | 020885 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 75 | 021285 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 76 | 112984 | METHYLENE CHLORIDE | | 20.00000 | UGL |
| 77 | 120485 | METHYLENE CHLORIDE | | 38.00000 | UGL |
| 78 | 120385 | METHYLENE CHLORIDE | | 13.00000 | UGL |
| 79 | 113084 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 80 | 012485 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 81 | 012585 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 82 | 012685 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 83 | 012885 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 84 | 012985 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 85 | 013085 | METHYLENE CHLORIDE | | 19.00000 | UGL |
| 86 | 013185 | METHYLENE CHLORIDE | | 14.00000 | UGL |
| 87 | 020185 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 88 | 020485 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 89 | 020685 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 90 | 021485 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 91 | 021885 | METHYLENE CHLORIDE | | 21.00000 | UGL |
| 92 | 021585 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 93 | 123184 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 94 | 012185 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 95 | 012285 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 96 | 012385 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 97 | 021385 | METHYLENE CHLORIDE | | 13.00000 | UGL |
| 98 | 121385 | METHYLENE CHLORIDE | | 10.00000 | UGL |
| 99 | 120584 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 100 | 122784 | METHYLENE CHLORIDE | | 25.00000 | UGL |
| 101 | 122884 | METHYLENE CHLORIDE | | 14.00000 | UGL |
| 102 | 120684 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 103 | 122985 | METHYLENE CHLORIDE | LT | 10.00000 | UGL |
| 104 | 122184 | METHYLENE CHLORIDE | | 24.00000 | UGL |

TABLE 6-6.

ORGANIC ANALYTES DETECTED IN LABORATORY BLANKS RUN WITH SOILS AND SLUDGES

SERIES=LABORATORY BLANK

| OBS | ANALYSIS DATE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|---|
| 105 | 022685 | HEXADECANOIC ACID | | 200.00000 | NGG |
| 106 | 022685 | HEXADECANOIC ACID | | 400.00000 | NGG |
| 107 | 022685 | DI-N-BUTYL PHTHALATE | LT | 100.00000 | NGG |
| 108 | 020685 | DI-N-BUTYL PHTHALATE | | 270.00000 | NGG |
| 109 | 022685 | DI-N-BUTYL PHTHALATE | LT | 100.00000 | NGG |
| 110 | 022685 | DI-N-BUTYL PHTHALATE | | 250.00000 | NGG |
| 111 | 022685 | DI-N-BUTYL PHTHALATE | | 240.00000 | NGG |
| 112 | 020485 | DI-N-BUTYL PHTHALATE | LT | 100.00000 | NGG |
| 113 | 121284 | DI-N-BUTYL PHTHALATE | | 166.00000 | NGG |
| 114 | 020185 | DI-N-BUTYL PHTHALATE | LT | 100.00000 | NGG |
| 115 | 020685 | ETHYL BENZENE | | 140.00000 | NGG |
| 116 | 030885 | TOLUENE | LT | 5.00000 | UGL |
| 117 | 031185 | TOLUENE | LT | 5.00000 | UGL |
| 118 | 031585 | TOLUENE | LT | 5.00000 | UGL |
| 119 | 022885 | TOLUENE | LT | 10.00000 | UGL |
| 120 | 021985 | TOLUENE | LT | 10.00000 | UGL |
| 121 | 022685 | TOLUENE | LT | 10.00000 | UGL |
| 122 | 022085 | TOLUENE | LT | 10.00000 | UGL |
| 123 | 022185 | TOLUENE | LT | 10.00000 | UGL |
| 124 | 022285 | TOLUENE | LT | 10.00000 | UGL |
| 125 | 022485 | TOLUENE | LT | 10.00000 | UGL |
| 126 | 030185 | TOLUENE | LT | 10.00000 | UGL |
| 127 | 030285 | TOLUENE | LT | 10.00000 | UGL |
| 128 | 022785 | TOLUENE | LT | 10.00000 | UGL |
| 129 | 030585 | TOLUENE | LT | 10.00000 | UGL |
| 130 | 020785 | TOLUENE | LT | 10.00000 | UGL |
| 131 | 020885 | TOLUENE | LT | 10.00000 | UGL |
| 132 | 021285 | TOLUENE | LT | 10.00000 | UGL |
| 133 | 112984 | TOLUENE | LT | 10.00000 | UGL |
| 134 | 120485 | TOLUENE | LT | 10.00000 | UGL |
| 135 | 120385 | TOLUENE | LT | 10.00000 | UGL |
| 136 | 113084 | TOLUENE | LT | 10.00000 | UGL |
| 137 | 012485 | TOLUENE | LT | 10.00000 | UGL |
| 138 | 012585 | TOLUENE | LT | 10.00000 | UGL |
| 139 | 012685 | TOLUENE | LT | 10.00000 | UGL |
| 140 | 012885 | TOLUENE | LT | 10.00000 | UGL |
| 141 | 012985 | TOLUENE | LT | 10.00000 | UGL |
| 142 | 013085 | TOLUENE | LT | 10.00000 | UGL |
| 143 | 013185 | TOLUENE | LT | 10.00000 | UGL |
| 144 | 020185 | TOLUENE | LT | 10.00000 | UGL |
| 145 | 020485 | TOLUENE | LT | 10.00000 | UGL |
| 146 | 020685 | TOLUENE | LT | 10.00000 | UGL |
| 147 | 021485 | TOLUENE | LT | 10.00000 | UGL |
| 148 | 021885 | TOLUENE | LT | 10.00000 | UGL |
| 149 | 021585 | TOLUENE | LT | 10.00000 | UGL |
| 150 | 123184 | TOLUENE | LT | 10.00000 | UGL |
| 151 | 012185 | TOLUENE | LT | 10.00000 | UGL |
| 152 | 012285 | TOLUENE | LT | 10.00000 | UGL |
| 153 | 012385 | TOLUENE | LT | 10.00000 | UGL |
| 154 | 021385 | TOLUENE | LT | 10.00000 | UGL |
| 155 | 121385 | TOLUENE | LT | 10.00000 | UGL |
| 156 | 120584 | TOLUENE | | 23.00000 | UGL |

TABLE 6-6.

ORGANIC ANALYTES DETECTED IN LABORATORY BLANKS RUN WITH SOILS AND SLUDGES

SERIES=LABORATORY BLANK

| OBS | ANALYSIS DATE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|---|
| 157 | 122784 | TOLUENE | LT | 10.00000 | UGL |
| 158 | 122884 | TOLUENE | LT | 10.00000 | UGL |
| 159 | 120684 | TOLUENE | LT | 10.00000 | UGL |
| 160 | 122985 | TOLUENE | LT | 10.00000 | UGL |
| 161 | 122184 | TOLUENE | | 17.00000 | UGL |
| 162 | 022685 | TETRADECANOIC ACID | | 100.00000 | NGG |
| 163 | 022685 | UNK022 | | 100.00000 | NGG |
| 164 | 022585 | UNK039 | | 100.00000 | NGG |
| 165 | 022585 | UNK040 | | 200.00000 | NGG |
| 166 | 022685 | UNK041 | | 300.00000 | NGG |
| 167 | 020185 | UNK045 | | 380.00000 | NGG |
| 168 | 020485 | NO ANALYTES DETECTED | | 0.00000 | NGG |
| 169 | 020685 | XYLENES | | 435.00000 | NGG |
| 170 | 020685 | METHYL,ETHYL,PROPYL-PROPANOIC ACID ESTER | | 130.00000 | NGG |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC201 | -0.3 | 32.000 | 13.000 | 926.000 | 269.000 | 1240.000 |
| | 0 | 54.000 | 13.000 | -10.000 | -10.000 | -20.000 |
| | 1 | 58.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| | 2 | 59.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 56.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 57.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 74.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC202 | -0.5 | 37.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| MBC203 | -1.8 | 21.000 | 21.000 | 4120.000 | 131.000 | 343.000 |
| | 0 | 60.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| | 1 | 78.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 2 | 70.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 80.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 78.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 43.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC204 | -1.5 | 78.000 | -10.000 | 270.000 | 137.000 | 509.000 |
| MBC205 | -1.5 | 29.000 | 17.000 | 20500.000 | 240.000 | 728.000 |
| | 0 | 21.000 | -10.000 | 447.000 | -10.000 | -20.000 |
| | 1 | 35.000 | -10.000 | 449.000 | -10.000 | -20.000 |
| | 2 | 132.000 | 17.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 18.000 | 15.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 40.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 159.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC206 | -3 | 29.000 | -10.000 | 258.000 | 278.000 | 2110.000 |
| MBC207 | -2.1 | 35.000 | 37.000 | 6850.000 | 181.000 | 733.000 |
| | 0 | 51.000 | 11.000 | 24100.000 | 248.000 | 27.000 |
| | 1 | 20.000 | -10.000 | 635.000 | -10.000 | -20.000 |
| | 2 | 18.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 28.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 21.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 12.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC208 | -1.1 | 38.000 | 16.000 | 588.000 | 269.000 | 910.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC301 | 0 | 37.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 26.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 32.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 15 | 23.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 16 | 49.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 18 | 43.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 20 | 31.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC302 | 0 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 52.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 41.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 15 | 49.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 16 | 45.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 17 | 47.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 18 | 31.000 | -10.000 | 43.000 | -10.000 | -20.000 |
| | 19 | 22.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 20 | 39.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC303 | 0 | 28.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 52.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 45.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 16 | 50.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 17 | 80.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| | 18 | 39.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 19 | 58.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 20 | 23.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC304 | 0 | 27.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 23.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 32.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 15 | 24.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 16 | 45.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 17 | 26.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 18 | 28.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 19 | 24.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 20 | 22.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC401 | 8 | 16.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 11.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 12 | 14.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC402 | 8 | 257.000 | -10.000 | 16.000 | -10.000 | -20.000 |
| | 10 | 28.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 12 | 32.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC403 | 8 | 36.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 37.000 | -10.000 | 41.000 | -10.000 | -20.000 |
| | 12 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC404 | 8 | 14.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 13.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 12 | 21.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC405 | 1 | 51.000 | -10.000 | 52.000 | -10.000 | -20.000 |
| | 3 | 38.000 | -10.000 | 19.000 | -10.000 | -20.000 |
| | 5 | 35.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC406 | 1 | 47.000 | -10.000 | 44.000 | -10.000 | -20.000 |
| | 3 | 48.000 | -10.000 | 76.000 | -10.000 | -20.000 |
| | 5 | 46.000 | -10.000 | 2103.000 | -10.000 | 49.000 |
| MBC407 | 1 | 54.000 | -10.000 | 6900.000 | -10.000 | 120.000 |
| | 3 | 52.000 | -10.000 | 172.000 | -10.000 | -20.000 |
| | 5 | 46.000 | -10.000 | 56.000 | -10.000 | -20.000 |
| MBC408 | 1 | 37.000 | -10.000 | 1300.000 | -10.000 | 87.000 |
| | 3 | 42.000 | -10.000 | 875.000 | -10.000 | 38.000 |
| | 5 | 45.000 | -10.000 | 53000.000 | -10.000 | 555.000 |
| MBC409 | 1 | 45.000 | -10.000 | 134.000 | -10.000 | -20.000 |
| | 3 | 57.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 53.000 | -10.000 | 87.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC410 | 1 | 55.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 51.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 63.000 | -10.000 | 94.000 | -10.000 | 37.000 |
| MBC411 | 1 | 33.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 33.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5 | 38.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC412 | 1 | 44.000 | -10.000 | 2900.000 | -10.000 | -20.000 |
| | 3 | 42.000 | -10.000 | 764500.000 | 80.000 | 800.000 |
| | 5 | 20.000 | -10.000 | 12000.000 | 64.000 | 989.000 |
| MBC413 | 1 | 32.000 | 18.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 23.000 | -10.000 | 42.000 | -10.000 | -20.000 |
| | 5 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC414 | 1 | 40.000 | -10.000 | 1570.000 | 12.000 | 280.000 |
| | 3 | 53.000 | -10.000 | 775.000 | 15.000 | 366.000 |
| | 5 | 41.000 | -10.000 | 4380.000 | 10.000 | 198.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC501 | -1.2 | 251.000 | -10.000 | 53.000 | -10.000 | 37.000 |
| MBC502 | -0.67 | 60.000 | -10.000 | 182.000 | 32.000 | 195.000 |
| | 0 | 40.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 43.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 47.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 52.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC503 | 0 | 55.000 | -10.000 | 287.000 | 240.000 | 306.000 |
| | 0.5 | 72.000 | 12.000 | 246.000 | 133.000 | 87.000 |
| | 1.5 | 45.000 | -10.000 | 167.000 | 27.000 | 24.000 |
| | 2.5 | 37.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC504 | 0 | 70.000 | 42.000 | 91.000 | -10.000 | -20.000 |
| | 0.5 | 45.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 44.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 45.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC505 | 0 | 28.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 28.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 33.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 19.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC506 | 0 | 19.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 20.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 22.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 24.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC507 | -1.3 | 34.000 | -10.000 | 137.000 | -10.000 | 164.000 |
| | 0 | 53.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 34.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 38.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 42.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC508 | -0.33 | 45.000 | -10.000 | 86.000 | -10.000 | 158.000 |
| | 0 | 53.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 53.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 54.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 43.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC509 | 0 | 89.000 | -10.000 | 530.000 | 76.000 | 665.000 |
| | 0.5 | 57.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 41.000 | -10.000 | 14.000 | -10.000 | -20.000 |
| | 2.5 | 46.000 | -10.000 | 31.000 | -10.000 | -20.000 |
| MBC510 | 0 | 61.000 | -10.000 | 67.000 | 16.000 | 228.000 |
| | 0.5 | 42.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 61.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 55.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC511 | 0 | 38.000 | 21.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 25.000 | 17.000 | . | -10.000 | -20.000 |
| | 1.5 | 21.000 | 14.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 17.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC512 | 0 | 22.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 25.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 37.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 32.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC513 | -1.2 | 48.000 | -10.000 | 22.000 | -10.000 | 128.000 |
| | 0 | 48.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 49.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 45.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 56.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| CORE | DEPTH TO TOP OF SAMPLE | RESULT | RESULT | RESULT | RESULT | RESULT |
| MBC514 | -0.25 | 47.000 | -10.000 | 46.000 | -10.000 | 132.000 |
| | 0 | 45.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 38.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 32.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 44.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC515 | -0.5 | 59.000 | -10.000 | 13.000 | -10.000 | 64.000 |
| | 0 | 54.000 | 13.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 49.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 40.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 51.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC516 | -0.33 | 61.000 | -10.000 | -10.000 | -10.000 | 25.000 |
| | 0 | 59.000 | -10.000 | 133.000 | 17.000 | 79.000 |
| | 0.5 | 49.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 42.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 55.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC601 | 0 | 130.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| MBC602 | 0 | 161.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC603 | 0 | 158.000 | 17.000 | -10.000 | -10.000 | -20.000 |
| MBC604 | -0.42 | 79.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0 | 42.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC605 | -0.33 | 86.000 | 18.000 | -10.000 | -10.000 | -20.000 |
| | 0 | 37.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC606 | -0.25 | 97.000 | -10.000 | -10.000 | -10.000 | 48.000 |
| | 0 | 235.000 | 28.000 | -10.000 | -10.000 | -20.000 |
| MBC607 | -0.5 | 103.000 | -10.000 | 37.000 | -10.000 | 122.000 |
| | 0 | 55.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| MBC608 | -0.58 | 109.000 | -10.000 | -10.000 | -10.000 | 140.000 |
| | 0 | 45.000 | 22.000 | -10.000 | -10.000 | -20.000 |
| MBC609 | -0.25 | 94.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0 | 53.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC610 | -0.25 | 130.000 | 11.000 | -10.000 | -10.000 | 81.000 |
| | 0 | 38.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC611 | -0.25 | 101.000 | -10.000 | -10.000 | -10.000 | 66.000 |
| | 0 | 74.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC612 | -0.67 | 109.000 | -10.000 | -10.000 | -10.000 | 120.000 |
| | 0 | 98.000 | 14.000 | -10.000 | -10.000 | -20.000 |
| MBC613 | -0.67 | 111.000 | -10.000 | -10.000 | -10.000 | 165.000 |
| | 0 | 35.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC614 | -0.67 | 165.000 | -10.000 | 20.000 | -10.000 | 156.000 |
| | 0 | 39.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| MBC615 | -1.1 | 94.000 | -10.000 | 60.000 | -10.000 | 205.000 |
| | 0 | 62.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC616 | -0.42 | 170.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0 | 78.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| MBC617 | -0.84 | 107.000 | -10.000 | 17.000 | -10.000 | 127.000 |
| | 0 | 49.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC618 | -0.58 | 122.000 | -10.000 | 37.000 | -10.000 | 103.000 |
| | 0 | 62.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC619 | -0.25 | 100.000 | -10.000 | -10.000 | -10.000 | 110.000 |
| | 0 | 117.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 100.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 131.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2.5 | 101.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 3.5 | 112.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4.5 | 90.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 5.5 | 73.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC620 | -0.84 | 76.000 | -10.000 | 73.000 | 13.000 | 1051.000 |
| | 0 | 81.000 | 14.000 | 19.000 | -10.000 | -20.000 |
| | 0.5 | 88.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 41.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC620 | 2.5 | 97.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 3.5 | 81.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4.5 | 105.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC701 | 0 | 27.000 | 16.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 32.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC702 | 0 | 56.000 | 15.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 43.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC703 | 0 | 48.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 27.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC704 | 0 | 107.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 26.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC705 | 0 | 81.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 45.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC706 | 0 | 116.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 44.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC707 | 0 | 96.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 23.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC708 | 0 | 88.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 127.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC709 | 0 | 159.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 57.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| MBC710 | 0 | 127.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 29.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC711 | 0 | 143.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 22.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC712 | 0 | 148.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 26.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC713 | 0 | 23.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 25.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC714 | 0 | 58.000 | 18.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 37.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC715 | 0 | 64.000 | 13.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 23.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC716 | 0 | 83.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 59.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC717 | 0 | 75.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 62.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| MBC718 | 0 | 96.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 35.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC719 | 0 | 16.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 15.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC720 | 0 | 60.000 | 21.000 | -10.000 | -10.000 | -20.000 |
| | 0.5 | 13.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC721 | 0 | 41.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 63.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC722 | 0 | 50.000 | 20.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 73.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC723 | 0 | 62.000 | 11.000 | -10.000 | -10.000 | -20.000 |
| | 1 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC724 | 0 | 149.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 1.5 | 85.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC725 | 0 | 74.000 | 18.000 | -10.000 | -10.000 | -20.000 |
| | 1 | 82.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC726 | 0 | 74.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 77.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC727 | 0 | 85.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 3 | 99.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC728 | 0 | 102.000 | -10.000 | 31.000 | -10.000 | -20.000 |
| | 3 | 162.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-7.

ANALYSES OF SEDIMENTS AND SLUDGES FOR FIVE VOLATILE ORGANICS
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | |
|---|---|---|---|---|---|---|
| | | METHYLENE CHLORIDE | TOLUENE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | 1,1,1-TRICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | |
| MBC801 | 0 | 85.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2 | 75.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 74.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 6 | 52.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 8 | 50.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC802 | 0 | 50.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 2 | 58.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 51.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 6 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 8 | 58.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC803 | 0 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 21.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 8 | 20.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 21.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 12 | 26.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 14 | 19.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 18 | 29.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| MBC804 | 0 | 72.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 4 | 44.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 8 | 113.000 | 12.000 | -10.000 | -10.000 | -20.000 |
| | 10 | 29.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 12 | 103.000 | 10.000 | -10.000 | -10.000 | -20.000 |
| | 14 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 16 | 30.000 | -10.000 | -10.000 | -10.000 | -20.000 |
| | 18 | 96.000 | -10.000 | -10.000 | -10.000 | -20.000 |

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMET-HANE | CHLOROBEN-ZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLO-ROETHANE | 1,1-DICHLOROE-THYLENE | 1,1-DICHLOROE-THANE | 1,2-DICHLOROE-THANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC201 | -0.3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC202 | -0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC203 | -1.8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | 77.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | 11.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC204 | -1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC205 | -1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | 77.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC205 | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC206 | -3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | 57.000 | -20.000 | -20.000 |
| MBC207 | -2.1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | 176.000 | 28.000 | -20.000 |
| | 0 | -50.000 | 19.000 | -10.000 | -10.000 | -10.000 | 45.000 | 27.000 | -20.000 |
| | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC208 | -1.1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | 66.000 | 21.000 | -20.000 |
| MBC301 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 15 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 16 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 18 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 20 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC302 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC302 | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 15 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 16 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 17 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 18 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 19 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 20 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC303 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 16 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 17 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 18 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 19 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 20 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC304 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 15 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TEST NAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC304 | 16 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 17 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 18 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 19 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 20 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC401 | 8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 12 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC402 | 8 | -50.000 | -10.000 | -10.000 | -10.000 | 467.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 12 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC403 | 8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 12 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC404 | 8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 12 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC405 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC406 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC407 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC408 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC409 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC410 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC411 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC412 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | 17.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC412 | 5 | -50.000 | 11.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC413 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC414 | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC501 | -1.2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | 31.000 |
| MBC502 | -0.67 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC503 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC504 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC504 | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC505 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC506 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC507 | -1.3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC508 | -0.33 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC509 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | 39.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC509 | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC510 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC511 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC512 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC513 | -1.2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC514 | -0.25 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC515 | -0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC516 | -0.33 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC601 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC602 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC603 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC604 | -0.42 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMET-HANE | CHLOROBEN-ZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLO-ROETHANE | 1,1-DICHLOROE-THYLENE | 1,1-DICHLOROE-THANE | 1,2-DICHLOROE-THANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC605 | -0.33 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC606 | -0.25 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC607 | -0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC608 | -0.58 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC609 | -0.25 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC610 | -0.25 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC611 | -0.25 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC612 | -0.67 | 13.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | 13.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC613 | -0.67 | -50.000 | -10.000 | -10.000 | -10.000 | 13.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC614 | -0.67 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC615 | -1.1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC616 | -0.42 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC617 | -0.84 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC618 | -0.58 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC619 | -0.25 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 5.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC620 | -0.84 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | 24.000 | -20.000 | -20.000 |
| | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMET-HANE | CHLOROBEN-ZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLO-ROETHANE | 1,1-DICHLOROE-THYLENE | 1,1-DICHLOROE-THANE | 1,2-DICHLOROE-THANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC620 | 2.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC701 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC702 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC703 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC704 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC705 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC706 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC707 | 0 | 8.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC708 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC709 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-6.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMET-HANE | CHLOROBEN-ZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLO-ROETHANE | 1,1-DICHLOROE-THYLENE | 1,1-DICHLOROE-THANE | 1,2-DICHLOROE-THANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC709 | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC710 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC711 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC712 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC713 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC714 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC715 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC716 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC717 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC718 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC719 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC719 | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC720 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 0.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC721 | 0 | -50.000 | -10.000 | -10.000 | 180.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | 160.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC722 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC723 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC724 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1.5 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC725 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 1 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC726 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC727 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC728 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 3 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC801 | 0 | -50.000 | -10.000 | 10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMET-HANE | CHLOROBEN-ZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLO-ROETHANE | 1,1-DICHLOROE-THYLENE | 1,1-DICHLOROE-THANE | 1,2-DICHLOROE-THANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC801 | 2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 6 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC802 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 2 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 6 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC803 | 0 | -50.000 | -10.000 | 10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 8 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 12 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 14 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 18 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| MBC804 | 0 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 4 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 8 | 35.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 10 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

(CONTINUED)

TABLE 6-8.

ANALYSES OF OTHER VOLATILE ORGANICS WHICH WERE OCCASIONALLY FOUND IN SEDIMENTS AND SLUDGES
CONCENTRATION IN NANOGRAMS/GRAM (PPB)

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | TRICHLORO-FLUOROMETHANE | CHLOROBENZENE | BENZENE | ETHYL BENZENE | 1,1,2,2-TETRACHLOROETHANE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,2-DICHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | |
| MBC804 | 12 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 14 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 16 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |
| | 18 | -50.000 | -10.000 | -10.000 | -10.000 | -10.000 | -20.000 | -20.000 | -20.000 |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ACETONE | ALCOHOLS (HIGH MOLECULAR WEIGHT) | BIS(2-ETHYLHEXYL) PHTHALATE | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | TRICHLOROFLUOROMETHANE | METHYLENE CHLORIDE | CHLOROBENZENE | CHLOROTOLUENE | DICHLOROBENZENES |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | -150.000 | . | -50.000 | 60.000 | -10.000 | . | . |
| | 4 | 13.000 | . | 960.000 | 6400.000 | 11.000 | 78.000 | -10.000 | . | . |
| MBC205 | -1.5 | 30.000 | . | 25080.000 | 182000.000 | -50.000 | 29.000 | -10.000 | 77.000 | 168.000 |
| MBC207 | -2.1 | 24.000 | . | 14370.000 | 26730.000 | -50.000 | 35.000 | -10.000 | . | 84.000 |
| MBC407 | 5 | . | . | 900.000 | . | -50.000 | 46.000 | -10.000 | . | . |
| MBC408 | 1 | . | . | 7040.000 | 200.000 | -50.000 | 37.000 | -10.000 | . | 182.000 |
| MBC502 | -0.67 | . | . | 4280.000 | 2630.000 | -50.000 | 60.000 | -10.000 | . | . |
| | 0 | . | . | -150.000 | 2650.000 | -50.000 | 40.000 | -10.000 | . | . |
| MBC516 | 0.5 | . | . | 2530.000 | . | -50.000 | 49.000 | -10.000 | . | . |
| MBC612 | -0.67 | 15.000 | 4000.000 | 2680.000 | 8300.000 | 13.000 | 109.000 | -10.000 | . | . |
| | 0 | 24.000 | . | 3060.000 | 4000.000 | 13.000 | 98.000 | -10.000 | . | . |
| MBC707 | 0 | 6.000 | . | 9328.000 | 27.000 | 8.000 | 96.000 | -10.000 | . | . |
| | 0.5 | . | . | 8920.000 | . | -50.000 | 23.000 | -10.000 | . | . |
| MBC719 | 0 | . | . | -150.000 | . | -50.000 | 16.000 | -10.000 | . | . |
| | 0.5 | . | . | -150.000 | . | -50.000 | 15.000 | -10.000 | . | . |
| MBC721 | 0 | . | . | -150.000 | . | -50.000 | 41.000 | -10.000 | . | . |
| | 1.5 | . | . | -150.000 | . | -50.000 | 63.000 | -10.000 | . | . |
| MBC803 | 8 | . | . | -150.000 | . | -50.000 | 20.000 | -10.000 | . | . |
| MBC804 | 8 | 37.000 | . | -150.000 | 25.000 | 35.000 | 113.000 | -10.000 | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TETRACHLOROBIPHENYL | PENTACHLOROBIPHENYL | HEXACHLOROBIPHENYL | DECANOIC ACID | TRIDECANE | SATURATED HYDROCABONS (C16) | HEXADECANOIC ACID | HEXADECANOIC ACID, BUTYL ESTER | HEXADECANOIC ACID, METHYL ESTER |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | . | . | . | . | . | . | . |
| | 4 | . | . | . | . | . | . | . | . | . |
| MBC205 | -1.5 | . | . | . | . | . | . | . | . | . |
| MBC207 | -2.1 | . | . | . | . | 1380.000 | 11220.000 | . | . | . |
| MBC407 | 5 | . | . | . | . | . | . | . | 360.000 | 220.000 |
| MBC408 | 1 | . | . | . | . | . | . | . | 500.000 | . |
| MBC502 | -0.67 | 3130.000 | 9160.000 | . | . | . | . | . | . | . |
| | 0 | 7250.000 | 11600.000 | 3110.000 | . | . | . | . | . | . |
| MBC516 | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC612 | -0.67 | 600.000 | 300.000 | . | . | . | . | . | . | . |
| | 0 | . | . | . | 100.000 | . | . | 800.000 | . | . |
| MBC707 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC719 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC721 | 0 | . | . | . | . | . | . | . | . | . |
| | 1.5 | . | . | . | . | . | . | . | . | . |
| MBC803 | 8 | . | . | . | . | . | . | . | . | . |
| MBC804 | 8 | . | . | . | . | . | . | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | HEPTADECANE | OCTADECANOIC ACID | OCTADECANOIC ACID, BUTYL ESTER | OCTADECANOIC ACID, DICHLOROMETHYL ESTER | BENZENE | DIETHYL ETHER | DIETHYL PHTHALATE | DIMETHYL DISULFIDE | DIMETHYL PHTHALATE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | . | . | -10.000 | . | -150.000 | . | 200.000 |
| | 4 | . | . | . | . | -10.000 | . | -150.000 | . | 200.000 |
| MBC205 | -1.5 | 103000.000 | . | . | . | -10.000 | . | 170.000 | . | -200.000 |
| MBC207 | -2.1 | 49600.000 | . | . | . | -10.000 | . | -150.000 | 77.000 | -200.000 |
| MBC407 | 5 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC408 | 1 | . | . | 1000.000 | 200.000 | -10.000 | . | -150.000 | . | -200.000 |
| MBC502 | -0.67 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| | 0 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC516 | 0.5 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC612 | -0.67 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| | 0 | . | 300.000 | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC707 | 0 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| | 0.5 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC719 | 0 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| | 0.5 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC721 | 0 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| | 1.5 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |
| MBC803 | 8 | . | . | . | . | -10.000 | 140.000 | -150.000 | . | -200.000 |
| MBC804 | 8 | . | . | . | . | -10.000 | . | -150.000 | . | -200.000 |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DI-N-BUTYL PHTHALATE | DI-N-OCTYL PHTHALATE | ETHYL BENZENE | HEXANE | HEXANEDIOIC ACID, DIOCTYL ESTER | KETONE | 13,16,14-LABDIEN-8-OL | TOLUENE | NITRO-1,METHYLIMIDAZOLE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | 360.000 | -100.000 | -10.000 | 86.000 | . | . | . | 11.000 | . |
| | 4 | 270.000 | 970.000 | -10.000 | 103.000 | . | . | . | -10.000 | 100.000 |
| MBC205 | -1.5 | 1100.000 | -100.000 | -10.000 | 127.000 | 47100.000 | . | . | 17.000 | . |
| MBC207 | -2.1 | 1090.000 | -100.000 | -10.000 | 208.000 | . | . | . | 37.000 | . |
| MBC407 | 5 | -100.000 | -100.000 | -10.000 | 120.000 | . | . | . | -10.000 | . |
| MBC408 | 1 | 360.000 | -100.000 | -10.000 | . | . | . | 2000.000 | -10.000 | . |
| MBC502 | -0.67 | -100.000 | -100.000 | -10.000 | 63.000 | . | . | . | -10.000 | . |
| | 0 | 250.000 | 820.000 | -10.000 | 73.000 | . | . | . | -10.000 | . |
| MBC516 | 0.5 | 156.000 | -100.000 | -10.000 | 110.000 | . | . | . | -10.000 | . |
| MBC612 | -0.67 | 470.000 | -100.000 | -10.000 | 91.000 | . | 700.000 | . | -10.000 | . |
| | 0 | 110.000 | -100.000 | -10.000 | 47.000 | . | . | . | 14.000 | . |
| MBC707 | 0 | 576.000 | -100.000 | -10.000 | 75.000 | . | . | . | -10.000 | . |
| | 0.5 | 620.000 | -100.000 | -10.000 | 122.000 | . | . | . | -10.000 | . |
| MBC719 | 0 | -100.000 | -100.000 | -10.000 | 196.000 | . | . | . | -10.000 | . |
| | 0.5 | 150.000 | -100.000 | -10.000 | 45.000 | . | . | . | -10.000 | . |
| MBC721 | 0 | 230.000 | -100.000 | 180.000 | 120.000 | . | . | . | -10.000 | . |
| | 1.5 | 260.000 | -100.000 | 160.000 | 263.000 | . | . | . | -10.000 | . |
| MBC803 | 8 | -100.000 | 140.000 | -10.000 | 42.000 | . | . | . | -10.000 | . |
| MBC804 | 8 | -100.000 | -100.000 | -10.000 | 139.000 | . | . | . | 12.000 | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PENTADECANE | PHENANTHRENE | PHTHALATES | SULFUR | 1,1,2,2-TETRACHLOROETHANE | TETRACHLOROETHYLENE | 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE | 1,1,2-TRICHLORO-TRIFLUOROMETHANE | TETRADECANOIC ACID |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| | 4 | . | -100.000 | 4500.000 | . | -10.000 | -10.000 | . | . | . |
| MBC205 | -1.5 | 12500.000 | 170.000 | . | . | -10.000 | 20500.000 | 6.000 | . | . |
| MBC207 | -2.1 | . | -100.000 | . | . | -10.000 | 6850.000 | . | 9.000 | . |
| MBC407 | 5 | . | -100.000 | . | . | -10.000 | 56.000 | . | . | . |
| MBC408 | 1 | . | -100.000 | . | 800.000 | -10.000 | 1300.000 | . | . | . |
| MBC502 | -0.67 | . | -100.000 | . | . | -10.000 | 182.000 | . | . | . |
| | 0 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| MBC516 | 0.5 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| MBC612 | -0.67 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| | 0 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | 200.000 |
| MBC707 | 0 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| | 0.5 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| MBC719 | 0 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| | 0.5 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| MBC721 | 0 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| | 1.5 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| MBC803 | 8 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |
| MBC804 | 8 | . | -100.000 | . | . | -10.000 | -10.000 | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | TETRADECANE | TRICHLOROETHYLENE | UNK001 | UNK002 | UNK003 | UNK004 | UNK005 | UNK006 | UNK007 |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | -10.000 | . | . | 400.000 | 400.000 | . | . | . |
| | 4 | . | -10.000 | 11.000 | . | . | . | 2000.000 | 2000.000 | 500.000 |
| MBC205 | -1.5 | 7110.000 | 240.000 | . | 38.000 | . | . | . | . | . |
| MBC207 | -2.1 | . | 181.000 | . | . | . | . | . | . | . |
| MBC407 | 5 | . | -10.000 | . | . | . | . | . | . | . |
| MBC408 | 1 | . | -10.000 | . | . | . | . | . | . | . |
| MBC502 | -0.67 | . | 32.000 | . | . | . | . | . | . | . |
| | 0 | . | -10.000 | . | . | . | . | . | . | . |
| MBC516 | 0.5 | . | -10.000 | . | . | . | . | . | . | . |
| MBC612 | -0.67 | . | -10.000 | . | . | . | . | . | . | . |
| | 0 | . | -10.000 | . | . | . | . | . | . | . |
| MBC707 | 0 | . | -10.000 | . | . | . | . | . | . | . |
| | 0.5 | . | -10.000 | . | . | . | . | . | . | . |
| MBC719 | 0 | . | -10.000 | . | . | . | . | . | . | . |
| | 0.5 | . | -10.000 | . | . | . | . | . | . | . |
| MBC721 | 0 | . | -10.000 | . | . | . | . | . | . | . |
| | 1.5 | . | -10.000 | . | . | . | . | . | . | . |
| MBC803 | 8 | . | -10.000 | . | . | . | . | . | . | . |
| MBC804 | 8 | . | -10.000 | . | . | . | . | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | UNK008 | UNK009 | UNK010 | UNK011 | UNK012 | UNK013 | UNK014 | UNK015 | UNK016 |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | . | . | . | . | . | . | . |
| | 4 | 700.000 | 400.000 | 400.000 | . | . | . | . | . | . |
| MBC205 | -1.5 | . | . | . | . | . | . | . | . | . |
| MBC207 | -2.1 | . | . | . | . | . | . | . | . | . |
| MBC407 | 5 | . | . | . | . | . | . | . | . | . |
| MBC408 | 1 | . | . | . | . | . | . | . | . | . |
| MBC502 | -0.67 | . | . | . | . | . | . | . | . | . |
| | 0 | . | . | . | . | . | . | . | . | . |
| MBC516 | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC612 | -0.67 | . | . | . | . | . | . | . | . | . |
| | 0 | . | . | . | 400.000 | 300.000 | 200.000 | 200.000 | 200.000 | 600.000 |
| MBC707 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC719 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC721 | 0 | . | . | . | . | . | . | . | . | . |
| | 1.5 | . | . | . | . | . | . | . | . | . |
| MBC803 | 8 | . | . | . | . | . | . | . | . | . |
| MBC804 | 8 | . | . | . | . | . | . | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | UNK017 | UNK018 | UNK019 | UNK020 | UNK021 | UNK037 | UNK038 | UNK043 | UNK044 |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | . | . | . | . | . | . | . |
| | 4 | . | . | . | . | . | . | . | . | . |
| MBC205 | -1.5 | . | . | . | . | . | . | . | . | . |
| MBC207 | -2.1 | . | . | . | . | . | 4900.000 | 43600.000 | . | . |
| MBC407 | 5 | . | . | . | . | . | . | . | 130.000 | 210.000 |
| MBC408 | 1 | . | . | . | . | . | . | . | . | . |
| MBC502 | -0.67 | . | . | . | . | . | . | . | . | . |
| | 0 | . | . | . | . | . | . | . | . | . |
| MBC516 | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC612 | -0.67 | . | 1000.000 | 2000.000 | 600.000 | 400.000 | . | . | . | . |
| | 0 | 200.000 | . | . | . | . | . | . | . | . |
| MBC707 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | 210.000 | . |
| MBC719 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | 150.000 | . |
| MBC721 | 0 | . | . | . | . | . | . | . | . | . |
| | 1.5 | . | . | . | . | . | . | . | . | . |
| MBC803 | 8 | . | . | . | . | . | . | . | . | . |
| MBC804 | 8 | . | . | . | . | . | . | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | UNK045 | UNK046 | UNK047 | UNK048 | UNK049 | UNK050 | UNK051 | UNK052 | UNK053 |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | . | . | . | . | . | . | . |
| | 4 | . | . | . | . | . | . | . | . | . |
| MBC205 | -1.5 | . | . | . | . | . | . | . | 8810.000 | 6100.000 |
| MBC207 | -2.1 | 30.000 | . | . | . | . | . | . | . | . |
| MBC407 | 5 | . | . | . | . | . | . | . | . | . |
| MBC408 | 1 | . | . | . | . | . | . | . | . | . |
| MBC502 | -0.67 | . | . | . | 1650.000 | 3700.000 | 2560.000 | 1640.000 | . | . |
| | 0 | . | 190.000 | 310.000 | . | . | . | . | . | . |
| MBC516 | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC612 | -0.67 | . | . | . | . | . | . | . | . | . |
| | 0 | . | . | . | . | . | . | . | . | . |
| MBC707 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC719 | 0 | . | . | . | . | . | . | . | . | . |
| | 0.5 | . | . | . | . | . | . | . | . | . |
| MBC721 | 0 | . | . | . | . | . | . | . | . | . |
| | 1.5 | . | . | . | . | . | . | . | . | . |
| MBC803 | 8 | . | . | . | . | . | . | . | . | . |
| MBC804 | 8 | . | . | . | . | . | . | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | UNK054 | UNK055 | UNK056 | UNK057 | UNK058 | UNK059 | XYLENES | 1,CHLORO,2 METHYLBENZENE | 1,1-DICHLOROETHYLENE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | . | . | . | . | . | . | . | . | -20.000 |
| | 4 | . | . | . | . | . | . | . | . | -20.000 |
| MBC205 | -1.5 | 9220.000 | 5970.000 | 10200.000 | 468000.000 | . | . | . | . | 77.000 |
| MBC207 | -2.1 | . | . | . | . | . | . | . | . | 176.000 |
| MBC407 | 5 | . | . | . | . | . | . | . | . | -20.000 |
| MBC408 | 1 | . | . | . | . | 4000.000 | 900.000 | . | 58.000 | -20.000 |
| MBC502 | -0.67 | . | . | . | . | . | . | . | . | -20.000 |
| | 0 | . | . | . | . | . | . | . | . | -20.000 |
| MBC516 | 0.5 | . | . | . | . | . | . | . | . | -20.000 |
| MBC612 | -0.67 | . | . | . | . | . | . | . | . | -20.000 |
| | 0 | . | . | . | . | . | . | . | . | -20.000 |
| MBC707 | 0 | . | . | . | . | . | . | . | . | -20.000 |
| | 0.5 | . | . | . | . | . | . | . | . | -20.000 |
| MBC719 | 0 | . | . | . | . | . | . | . | . | -20.000 |
| | 0.5 | . | . | . | . | . | . | . | . | -20.000 |
| MBC721 | 0 | . | . | . | . | . | . | 550.000 | . | -20.000 |
| | 1.5 | . | . | . | . | . | . | 500.000 | . | -20.000 |
| MBC803 | 8 | . | . | . | . | . | . | . | . | -20.000 |
| MBC804 | 8 | . | . | . | . | . | . | . | . | -20.000 |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1,1-DICHLOROETHANE | 1,1,1-TRICHLOROETHANE | 1,2-DICHLOROETHANE | 2(4H)-BENZOFURANONE-4,4,7A,CH3 | 2-BUTOXYETHANOL | 2(2-ETHOXYETHOXY)ETHANOL | 2-HEXADECEN-1-OL,3,7,11-,15-TETRAMETHYL | METHYL,ETHYL,PROPYL FROPANOIC ACID ESTER | 2-PROPYL DECANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | | | | | | | |
| MBC203 | 0 | -20.000 | -20.000 | -20.000 | . | 300.000 | . | . | . | . |
| | 4 | -20.000 | -20.000 | -20.000 | . | 300.000 | . | . | . | . |
| MBC205 | -1.5 | -20.000 | 728.000 | -20.000 | . | . | . | 176000.000 | . | 4940.000 |
| MBC207 | -2.1 | 28.000 | 733.000 | -20.000 | . | . | . | . | . | . |
| MBC407 | 5 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC408 | 1 | -20.000 | 87.000 | -20.000 | . | . | . | . | . | . |
| MBC502 | -0.67 | -20.000 | 195.000 | -20.000 | . | . | . | . | . | . |
| | 0 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC516 | 0.5 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC612 | -0.67 | -20.000 | 120.000 | -20.000 | 200.000 | . | . | . | . | . |
| | 0 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC707 | 0 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| | 0.5 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC719 | 0 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| | 0.5 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC721 | 0 | -20.000 | -20.000 | -20.000 | . | . | 610.000 | . | 130.000 | . |
| | 1.5 | -20.000 | -20.000 | -20.000 | . | . | 150.000 | . | 100.000 | . |
| MBC803 | 8 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |
| MBC804 | 8 | -20.000 | -20.000 | -20.000 | . | . | . | . | . | . |

TABLE 6-9.

APPENDIX VIII ORGANIC SCAN OF SEDIMENTS AND SLUDGES (19 SAMPLES)
CONCENTRATIONS IN NANOGRAMS PER GRAM

| | | TESTNAME | | |
|---|---|---|---|---|
| | | 2,5-DIMETHYL HEPTANE | 3-LICOSENE | 6-CYCLOHEXYLDODECANE |
| | | RESULT | RESULT | RESULT |
| CORE | DEPTH TO TOP OF SAMPLE | | | |
| MBC203 | 0 | . | . | . |
| | 4 | . | . | . |
| MBC205 | -1.5 | 4330.000 | . | 5430.000 |
| MBC207 | -2.1 | . | 2400.000 | . |
| MBC407 | 5 | . | . | . |
| MBC408 | 1 | . | . | . |
| MBC502 | -0.67 | . | . | . |
| | 0 | . | . | . |
| MBC516 | 0.5 | . | . | . |
| MBC612 | -0.67 | . | . | . |
| | 0 | . | . | . |
| MBC707 | 0 | . | . | . |
| | 0.5 | . | . | . |
| MBC719 | 0 | . | . | . |
| | 0.5 | . | . | . |
| MBC721 | 0 | . | . | . |
| | 1.5 | . | . | . |
| MBC803 | 8 | . | . | . |
| MBC804 | 8 | . | . | . |

TABLE 6-10.

INORGANIC ANALYSES OF WATER SAMPLES

| | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | SILVER MG/L | ALUMINIUM MG/L | GROSS ALPHA PC/L | ARSENIC MG/L | BORON MG/L | BARIUM MG/L | BERYLLIUM MG/L | GROSS BETA PC/L | BROMIDE MG/L |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | | | |
| RINSE WATER | -0.0005 | 0.0190 | 7.0000 | -0.0010 | . | 0.0060 | -0.0020 | 5.0000 | -0.1000 |
| MBL101- BASIN, 2 FT. DEEP | 0.0010 | 88.4000 | 66.0000 | -0.0010 | -1.0000 | 0.0040 | -0.0020 | 41.0000 | -0.1000 |
| MBL102- BASIN, 2 FT. DEEP | . | 95.3000 | . | . | . | . | . | . | . |
| MBL103- BASIN, 2 FT. DEEP | . | 63.4000 | . | . | . | . | . | . | . |
| MBL104- BASIN, 2 FT. DEEP | . | 60.6000 | . | . | . | . | . | . | . |
| MBL105- BASIN, 2 FT. DEEP | . | 281.0000 | . | . | . | . | . | . | . |
| MBL106- BASIN, 2 FT. DEEP | . | 319.0000 | . | . | . | . | . | . | . |
| MBL107- BASIN, 8 FT. DEEP | . | 625.0000 | . | . | . | . | . | . | . |
| MBL108- BASIN, 8 FT. DEEP | . | 580.0000 | . | . | . | . | . | . | . |
| MBL109- BASIN, 8 FT. DEEP | . | 610.0000 | . | . | . | . | . | . | . |
| MBL110- BASIN, 8 FT. DEEP | . | 640.0000 | . | . | . | . | . | . | . |
| MBL111- BASIN, 8 FT. DEEP | . | 638.0000 | . | . | . | . | . | . | . |
| MBL112- BASIN, 8 FT. DEEP | . | 598.0000 | . | . | . | . | . | . | . |
| MBL113- BASIN, 8 FT. DEEP | . | 592.0000 | . | . | . | . | . | . | . |
| MBL114- BASIN, 8 FT. DEEP | 0.0040 | 608.0000 | 4991.0000 | 0.0010 | 1.6500 | -0.0040 | -0.0020 | 2188.0000 | -0.1000 |
| MBL115- BASIN, 8 FT. DEEP | . | 604.0000 | . | . | . | . | . | . | . |
| MBL116- BASIN, 8 FT. DEEP | . | 586.0000 | . | . | . | . | . | . | . |
| MBL117- BASIN, 8 FT. DEEP | . | 599.0000 | . | . | . | . | . | . | . |
| MBL118- BASIN, 8 FT. DEEP | . | 636.0000 | . | . | . | . | . | . | . |
| MBL119- LOST LAKE, 1 FT. DEEP | . | 3.5200 | . | . | . | . | . | . | . |
| MBL120- LOST LAKE, 1 FT. DEEP | -0.0005 | 3.1400 | -2.0000 | -0.0010 | . | -0.0040 | -0.0020 | -3.0000 | -0.1000 |
| MBL121- LOST LAKE, 1 FT. DEEP | . | 3.3200 | . | . | . | . | . | . | . |

TABLE 6-10.

INORGANIC ANALYSES OF WATER SAMPLES

| | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | CALCIUM MG/L | CADMIUM MG/L | CHLORIDE MG/L | CONDUCTIVITY UMHO/CM | CHROMIUM MG/L | COPPER MG/L | CYANIDE | FLUORIDE MG/L | IRON MG/L |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | | | |
| RINSE WATER | 1.2800 | -0.0020 | 115.5900 | 37.1000 | -0.0040 | 3.7600 | -5.0000 | -0.1000 | 0.6340 |
| MBL101- BASIN, 2 FT. DEEP | 2.4400 | -0.0020 | 14.5700 | 1660.0000 | -0.0040 | 0.0110 | 14.2000 | 0.7500 | 0.0420 |
| MBL102- BASIN, 2 FT. DEEP | 2.1300 | -0.0020 | 24.2800 | 2580.0000 | -0.0040 | 0.0050 | . | . | 0.0400 |
| MBL103- BASIN, 2 FT. DEEP | 2.5300 | -0.0020 | 14.5700 | 1490.0000 | -0.0040 | -0.0040 | . | . | 0.0460 |
| MBL104- BASIN, 2 FT. DEEP | 2.2800 | -0.0020 | 9.7100 | 1490.0000 | -0.0040 | -0.0040 | . | . | 0.0300 |
| MBL105- BASIN, 2 FT. DEEP | 0.8170 | 0.0060 | 29.1400 | 4920.0000 | -0.0040 | 0.0230 | . | . | 0.0570 |
| MBL106- BASIN, 2 FT. DEEP | 0.8470 | 0.0060 | 29.1400 | 4670.0000 | -0.0040 | 0.0240 | . | . | 0.0700 |
| MBL107- BASIN, 8 FT. DEEP | 0.8630 | 0.0120 | 43.7100 | 9120.0000 | -0.0040 | 0.1550 | . | . | 0.1600 |
| MBL108- BASIN, 8 FT. DEEP | 0.7660 | 0.0130 | 43.7100 | 9430.0000 | -0.0040 | 0.1430 | . | . | 0.1560 |
| MBL109- BASIN, 8 FT. DEEP | 0.7650 | 0.0130 | 48.5700 | 9550.0000 | -0.0040 | 0.1580 | . | . | 0.1450 |
| MBL110- BASIN, 8 FT. DEEP | 0.6710 | 0.0140 | 96.1600 | 9420.0000 | -0.0040 | 0.1670 | . | . | 0.1670 |
| MBL111- BASIN, 8 FT. DEEP | 0.7380 | 0.0130 | 101.0200 | 9350.0000 | -0.0040 | 0.1570 | . | . | 0.1930 |
| MBL112- BASIN, 8 FT. DEEP | 1.2800 | 0.0140 | 125.3000 | 9310.0000 | -0.0040 | 0.1570 | . | . | 0.2330 |
| MBL113- BASIN, 8 FT. DEEP | 0.6400 | 0.0140 | 101.0200 | 9050.0000 | 0.0040 | 0.1570 | . | . | 0.1830 |
| MBL114- BASIN, 8 FT. DEEP | 0.7730 | 0.0150 | 105.8800 | 8720.0000 | -0.0040 | 0.1180 | 72.2000 | 6.5000 | 0.2380 |
| MBL115- BASIN, 8 FT. DEEP | 0.7440 | 0.0140 | 105.8800 | 8080.0000 | -0.0040 | 0.1660 | . | . | 0.2160 |
| MBL116- BASIN, 8 FT. DEEP | 0.8540 | 0.0130 | 96.1600 | 7870.0000 | -0.0040 | 0.1140 | . | . | 0.2040 |
| MBL117- BASIN, 8 FT. DEEP | 0.7690 | 0.0150 | 86.4500 | 8070.0000 | 0.0060 | 0.1220 | . | . | 0.2210 |
| MBL118- BASIN, 8 FT. DEEP | 0.8380 | 0.0140 | 101.0200 | 7890.0000 | -0.0040 | 0.1610 | . | . | 0.2210 |
| MBL119- LOST LAKE, 1 FT. DEEP | 1.5400 | -0.0020 | 18.4600 | 578.0000 | -0.0040 | -0.0040 | . | . | 0.0700 |
| MBL120- LOST LAKE, 1 FT. DEEP | 1.2900 | -0.0020 | 18.4600 | 576.0000 | -0.0040 | -0.0040 | -5.0000 | 0.2700 | 0.0740 |
| MBL121- LOST LAKE, 1 FT. DEEP | 1.5200 | -0.0020 | 18.4600 | 522.0000 | -0.0040 | -0.0040 | . | . | 0.1540 |

TABLE 6-10.

INORGANIC ANALYSES OF WATER SAMPLES

| | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | MERCURY UG/L | POTASSIUM MG/L | MAGNESIUM MG/L | MANGANESE MG/L | SODIUM MG/L | AMMONIA NITROGEN MG/L | NICKEL MG/L | NITRITE NITROGEN MG/L | NITRATE NITROGEN MG/L |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | | | |
| RINSE WATER | 0.2500 | 0.4100 | 0.2620 | 0.0130 | 8.5500 | 0.0440 | -0.0040 | -0.5000 | -0.5000 |
| MBL101- BASIN, 2 FT. DEEP | 0.3800 | 0.7230 | 0.4290 | 0.0040 | 332.0000 | 0.6100 | 0.0220 | 2.0000 | 91.0000 |
| MBL102- BASIN, 2 FT. DEEP | 0.3800 | 0.7440 | 0.3490 | 0.0040 | 360.0000 | 0.8820 | 0.0180 | . | 173.0000 |
| MBL103- BASIN, 2 FT. DEEP | 0.3000 | 0.7100 | 0.4490 | 0.0030 | 280.0000 | 0.4730 | 0.0140 | . | 113.0000 |
| MBL104- BASIN, 2 FT. DEEP | 0.3400 | 0.6760 | 0.3580 | 0.0030 | 275.0000 | 0.3850 | 0.0180 | . | 105.0000 |
| MBL105- BASIN, 2 FT. DEEP | 1.6600 | 1.4900 | 0.1000 | 0.0090 | 956.0000 | 1.6500 | 0.0360 | . | 257.0000 |
| MBL106- BASIN, 2 FT. DEEP | 1.5800 | 1.4800 | 0.1120 | 0.0090 | 983.0000 | 2.6400 | 0.0640 | . | 305.0000 |
| MBL107- BASIN, 8 FT. DEEP | 0.4900 | 2.2800 | 0.0400 | 0.0170 | 1812.0000 | 5.7800 | 0.1170 | . | 360.0000 |
| MBL108- BASIN, 8 FT. DEEP | 0.6800 | 2.1900 | 0.0550 | 0.0180 | 1773.0000 | 5.2800 | 0.1300 | . | . |
| MBL109- BASIN, 8 FT. DEEP | 0.6400 | 2.2500 | 0.1100 | 0.0200 | 1885.0000 | 5.5600 | 0.1080 | . | 372.0000 |
| MBL110- BASIN, 8 FT. DEEP | 0.2700 | 2.3600 | 0.0770 | 0.0180 | 1919.0000 | 4.8700 | 0.1220 | . | 352.0000 |
| MBL111- BASIN, 8 FT. DEEP | 0.3100 | 2.4100 | 0.0920 | 0.0190 | 1887.0000 | 5.1100 | 0.1140 | . | 341.0000 |
| MBL112- BASIN, 8 FT. DEEP | 0.4400 | 2.2600 | 0.1420 | 0.0190 | 1806.0000 | 5.8200 | 0.5480 | . | 336.0000 |
| MBL113- BASIN, 8 FT. DEEP | 0.2700 | 2.3100 | 0.0690 | 0.0190 | 1840.0000 | 5.9900 | 0.1260 | . | 355.0000 |
| MBL114- BASIN, 8 FT. DEEP | 0.6000 | 2.3300 | 0.1580 | 0.0200 | 1801.0000 | 5.4100 | 0.1940 | 48.0000 | 347.0000 |
| MBL115- BASIN, 8 FT. DEEP | 0.4000 | 2.2200 | 0.2400 | 0.0200 | 1729.0000 | 4.7000 | 0.1280 | . | 341.0000 |
| MBL116- BASIN, 8 FT. DEEP | 0.3600 | 2.2200 | 0.0540 | 0.0170 | 1691.0000 | 5.2800 | 0.0950 | . | 352.0000 |
| MBL117- BASIN, 8 FT. DEEP | 0.4000 | 2.2300 | 0.0540 | 0.0170 | 1706.0000 | 4.6400 | 0.1130 | . | 350.0000 |
| MBL118- BASIN, 8 FT. DEEP | 0.4800 | 2.3400 | 0.1160 | 0.0200 | 1938.0000 | 7.2800 | 0.1820 | . | 355.0000 |
| MBL119- LOST LAKE, 1 FT. DEEP | 0.2900 | 1.0800 | 0.1500 | 0.0170 | 162.0000 | 0.1650 | 0.0100 | . | 9.4000 |
| MBL120- LOST LAKE, 1 FT. DEEP | -0.2000 | 0.9790 | 0.1380 | 0.0180 | 153.0000 | 0.1040 | 0.0090 | -0.5000 | 2.0500 |
| MBL121- LOST LAKE, 1 FT. DEEP | -0.2000 | 1.0300 | 0.1760 | 0.0600 | 147.0000 | 0.3240 | 0.0140 | . | 2.8000 |

TABLE 6-10.

INORGANIC ANALYSES OF WATER SAMPLES

| | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | LEAD MG/L | PH | ANTIMONY MG/L | SELENIUM MG/L | TIN MG/L | SULFATE MG/L | SPECIFIC GRAVITY G/CC | SULFIDE MG/L | TOTAL DISSOLVED SOLIDS MG/L |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | | | |
| RINSE WATER | -0.0040 | 5.8000 | -0.0030 | -0.0010 | -0.0100 | -5.0000 | . | -1.0000 | 38.0000 |
| MBL101- BASIN, 2 FT. DEEP | 0.0190 | 10.4000 | 0.0550 | -0.0010 | 0.0620 | 10.0000 | 1.0100 | -1.0000 | 1134.0000 |
| MBL102- BASIN, 2 FT. DEEP | 0.0330 | 10.9500 | . | . | . | . | 1.0100 | . | 1908.0000 |
| MBL103- BASIN, 2 FT. DEEP | 0.0190 | 10.3500 | . | . | . | . | 1.0100 | . | 1028.0000 |
| MBL104- BASIN, 2 FT. DEEP | 0.0140 | 10.3500 | . | . | . | . | 1.0100 | . | 1074.0000 |
| MBL105- BASIN, 2 FT. DEEP | 0.1350 | 11.4000 | . | . | . | . | 1.0100 | . | 3658.0000 |
| MBL106- BASIN, 2 FT. DEEP | 0.1350 | 11.4500 | . | . | . | . | 1.0100 | . | 3556.0000 |
| MBL107- BASIN, 8 FT. DEEP | 0.3470 | 12.1000 | . | . | . | . | 1.0100 | . | 6422.0000 |
| MBL108- BASIN, 8 FT. DEEP | 0.3030 | 12.0500 | . | . | . | . | 1.0200 | . | 6460.0000 |
| MBL109- BASIN, 8 FT. DEEP | 0.2310 | 12.0000 | . | . | . | . | 1.0100 | . | 6588.0000 |
| MBL110- BASIN, 8 FT. DEEP | 0.2090 | 11.9000 | . | . | . | . | 1.0100 | . | 6488.0000 |
| MBL111- BASIN, 8 FT. DEEP | 0.2320 | 12.0000 | . | . | . | . | 0.9920 | . | 6488.0000 |
| MBL112- BASIN, 8 FT. DEEP | 0.2210 | 12.0000 | . | . | . | . | 1.0000 | . | 6474.0000 |
| MBL113- BASIN, 8 FT. DEEP | 0.2290 | 12.0000 | . | . | . | . | 0.9970 | . | 6520.0000 |
| MBL114- BASIN, 8 FT. DEEP | 0.1780 | 11.9000 | 0.5330 | -0.0010 | 0.4300 | 68.0000 | 1.0100 | -1.0000 | 6236.0000 |
| MBL115- BASIN, 8 FT. DEEP | 0.2190 | 11.8000 | . | . | . | . | 1.0000 | . | 6048.0000 |
| MBL116- BASIN, 8 FT. DEEP | 0.1970 | 11.9000 | . | . | . | . | 1.0000 | . | 6038.0000 |
| MBL117- BASIN, 8 FT. DEEP | 0.1150 | 11.9000 | . | . | . | . | 1.0000 | . | 6048.0000 |
| MBL118- BASIN, 8 FT. DEEP | 0.2170 | 11.8000 | . | . | . | . | 1.0000 | . | 6022.0000 |
| MBL119- LOST LAKE, 1 FT. DEEP | 0.0060 | 9.6000 | . | . | . | . | 0.9970 | . | 494.0000 |
| MBL120- LOST LAKE, 1 FT. DEEP | 0.0060 | 9.6500 | 0.0080 | -0.0010 | 0.0050 | 10.0000 | 1.0000 | -1.0000 | 456.0000 |
| MBL121- LOST LAKE, 1 FT. DEEP | 0.0090 | 9.5000 | . | . | . | . | 0.9970 | . | 444.0000 |

TABLE 6-10.

INORGANIC ANALYSES OF WATER SAMPLES

| | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | TEMPERATURE C | TITANIUM MG/L | TOTAL ORGANIC CARBON MG/L | TOTAL RADIUM PC/L | TOTAL ORGANIC HALOGENS MG/L | TOTAL PHOSPHATES MG/L | URANIUM MG/L | ZINC MG/L |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | | |
| RINSE WATER | . | 0.0070 | 1.9840 | 2.0000 | -0.0050 | -0.0100 | -0.2000 | 0.1760 |
| MBL101- BASIN, 2 FT. DEEP | 7.8000 | 0.0070 | 4.6890 | -1.0000 | 3.6720 | 0.0177 | -0.2000 | 0.0080 |
| MBL102- BASIN, 2 FT. DEEP | 6.5000 | . | 4.0310 | . | 2.9763 | 0.0271 | 0.4000 | -0.0020 |
| MBL103- BASIN, 2 FT. DEEP | 8.0000 | . | 4.7740 | . | 3.8328 | 0.0166 | 4.2000 | -0.0020 |
| MBL104- BASIN, 2 FT. DEEP | 8.3000 | . | 4.6620 | . | 5.0556 | 0.0007 | 3.0000 | -0.0020 |
| MBL105- BASIN, 2 FT. DEEP | 6.8000 | . | 4.0870 | . | 0.7252 | 0.0586 | -0.2000 | -0.0020 |
| MBL106- BASIN, 2 FT. DEEP | 6.9000 | . | 5.5900 | . | 0.8660 | 0.0177 | -0.2000 | -0.0020 |
| MBL107- BASIN, 8 FT. DEEP | 9.2000 | . | 11.9000 | . | 0.5347 | 0.0240 | 3.8000 | 0.0090 |
| MBL108- BASIN, 8 FT. DEEP | 13.0000 | . | 10.1500 | . | 0.6360 | 0.1080 | 3.3000 | 0.0070 |
| MBL109- BASIN, 8 FT. DEEP | 13.0000 | . | 12.9700 | . | 0.5348 | 0.0156 | 6.2000 | 0.0070 |
| MBL110- BASIN, 8 FT. DEEP | 8.4000 | . | 45.4500 | . | 0.3286 | 0.1028 | -0.2000 | 0.0090 |
| MBL111- BASIN, 8 FT. DEEP | 13.5000 | . | 9.2100 | . | 0.4170 | 0.0813 | -0.2000 | 0.0070 |
| MBL112- BASIN, 8 FT. DEEP | 11.4000 | . | 10.6400 | . | 0.2582 | 0.0702 | -0.2000 | 0.0150 |
| MBL113- BASIN, 8 FT. DEEP | 18.0000 | . | 12.9900 | . | 0.0590 | 0.1164 | -0.2000 | 0.0060 |
| MBL114- BASIN, 8 FT. DEEP | 13.1000 | 0.0080 | 11.1900 | 4.0000 | 0.3204 | 0.0003 | -0.2000 | 0.0090 |
| MBL115- BASIN, 8 FT. DEEP | 10.3000 | . | 48.2800 | . | 0.3094 | 0.1091 | -0.2000 | 0.0070 |
| MBL116- BASIN, 8 FT. DEEP | 9.7000 | . | 11.5400 | . | 0.3220 | 0.0439 | -0.2000 | 0.0040 |
| MBL117- BASIN, 8 FT. DEEP | 16.3000 | . | 10.0600 | . | 0.3652 | 0.0692 | 6.7000 | 0.0060 |
| MBL118- BASIN, 8 FT. DEEP | 11.3000 | . | 11.8600 | . | 0.0960 | 0.1028 | -0.2000 | 0.0130 |
| MBL119- LOST LAKE, 1 FT. DEEP | 5.7000 | . | 38.1000 | . | 0.0159 | 0.0002 | 0.2900 | 0.0030 |
| MBL120- LOST LAKE, 1 FT. DEEP | 5.7000 | 0.0070 | 64.5000 | -1.0000 | 0.0366 | 0.0002 | -0.2000 | 0.0020 |
| MBL121- LOST LAKE, 1 FT. DEEP | 4.8000 | . | 39.6000 | . | 0.0903 | 0.0001 | 0.3100 | 0.0050 |

TABLE 6-11.

ORGANIC ANALYTES NOT DETECTED IN WATER SAMPLES

| TESTNAME | DETECTION LIMIT | UNITS |
|---|---|---|
| ALPHA-BENZENEHEXACHLORIDE | -0.00 | UGL |
| ACROLEIN | -100.00 | UGL |
| ACRYLONITRILE | -100.00 | UGL |
| ALPHA-ENDOSULFAN | -0.00 | UGL |
| ALDRIN | -0.00 | UGL |
| ACENAPHTHENE | -10.00 | UGL |
| ACENAPHTHYLENE | -10.00 | UGL |
| ANTHRACENE | -10.00 | UGL |
| BENZO(A)ANTHRACENE | -10.00 | UGL |
| BENZO(A)PYRENE | -20.00 | UGL |
| BETA-BENZENEHEXACHLORIDE | -0.00 | UGL |
| BUTYLBENZYL PHTHALATE | -10.00 | UGL |
| BETA-ENDOSULFAN | -0.00 | UGL |
| BENZIDINE | -40.00 | UGL |
| BENZO(G,H,I)PERYLENE | -20.00 | UGL |
| BENZO(K)FLUORANTHENE | -20.00 | UGL |
| BROMODICHLOROMETHANE | -5.00 | UGL |
| BIS(2-CHLOROETHOXY) METHANE | -20.00 | UGL |
| BIS(2-CHLOROISOPROPYL) ETHER | -20.00 | UGL |
| BIS(2-CHLOROETHYL) ETHER | -10.00 | UGL |
| CARBON TETRACHLORIDE | -5.00 | UGL |
| BROMOFORM | -10.00 | UGL |
| CHLOROFORM | -5.00 | UGL |
| CHRYSENE | -20.00 | UGL |
| BROMOMETHANE | -10.00 | UGL |
| CHLOROMETHANE | -10.00 | UGL |
| CHLOROBENZENE | -5.00 | UGL |
| CHLORDANE | -0.01 | UGL |
| HEXACHLOROBENZENE | -10.00 | UGL |
| HEXACHLOROCYCLOPENTADIENE | -10.00 | UGL |
| HEXACHLOROETHANE | -10.00 | UGL |
| CHLOROETHENE | -10.00 | UGL |
| CHLOROETHANE | -10.00 | UGL |
| BENZENE | -5.00 | UGL |
| DIBENZO(A,H)ANTHRACENE | -20.00 | UGL |
| DELTA-BENZENEHEXACHLORIDE | -0.00 | UGL |
| DIBROMOCHLOROMETHANE | -5.00 | UGL |
| DIETHYL PHTHALATE | -10.00 | UGL |
| DIELDRIN | -0.00 | UGL |
| DIMETHYL PHTHALATE | -10.00 | UGL |
| ENDRIN ALDEHYDE | -0.00 | UGL |
| ENDRIN | -0.00 | UGL |
| ENDOSULFAN SULFATE | -0.00 | UGL |
| ETHYL BENZENE | -5.00 | UGL |
| FLUORANTHENE | -10.00 | UGL |
| FLUORENE | -10.00 | UGL |
| HEXACHLOROBUTADIENE | -10.00 | UGL |
| HEPTACHLOR | -0.00 | UGL |
| HEPTACHLOR EPOXIDE | -0.00 | UGL |
| INDENO(1,2,3-C,D)PYRENE | -20.00 | UGL |
| ISOPHORONE | -10.00 | UGL |
| LINDANE | -0.00 | UGL |
| NAPHTHALENE | -10.00 | UGL |

TABLE 6-11.

ORGANIC ANALYTES NOT DETECTED IN WATER SAMPLES

| TESTNAME | DETECTION LIMIT | UNITS |
|---|---|---|
| NITROBENZENE | -10.000 | UGL |
| N-NITROSODIMETHYLAMINE | -10.000 | UGL |
| NITROSODI-N-PROPYL AMINE | -10.000 | UGL |
| N-NITROSODIPHENYL AMINE | -10.000 | UGL |
| PCB 1016 | -0.034 | UGL |
| PCB 1221 | -0.133 | UGL |
| PCB 1232 | -0.062 | UGL |
| PCB 1242 | -0.036 | UGL |
| PCB 1248 | -0.023 | UGL |
| PCB 1254 | -0.013 | UGL |
| PCB 1260 | -0.012 | UGL |
| PENTACHLOROPHENOL | -10.000 | UGL |
| PHENANTHRENE | -10.000 | UGL |
| PHENOL | -10.000 | UGL |
| 2,2-BIS(PARA-CHLOROPHENYL)-1,1-CL,C2H2 | -0.001 | UGL |
| 2,2-BIS(PARA-CHLOROPHENYL)-1,1-CL,C2 | -0.001 | UGL |
| 2,2-BIS(PARA-CHLOROPHENYL)-1,1,1-CL,C2H2 | -0.003 | UGL |
| PYRENE | -10.000 | UGL |
| 1,1,2,2-TETRACHLOROETHANE | -10.000 | UGL |
| TOXAPHENE | -0.437 | UGL |
| TRANS-1,2-DICHLOROETHENE | -5.000 | UGL |
| 1,1-DICHLOROETHANE | -5.000 | UGL |
| 1,1,2-TRICHLOROETHANE | -5.000 | UGL |
| 1,2-DICHLOROBENZENE | -10.000 | UGL |
| 1,2-DICHLOROPROPANE | -10.000 | UGL |
| 1,2-DIPHENYL HYDRAZINE | -20.000 | UGL |
| 1,2,3-TRICHLOROBENZENE | -10.000 | UGL |
| 1,3-DICHLOROBENZENE | -10.000 | UGL |
| 1,3-DICHLOROPROPYLENE | -5.000 | UGL |
| 1,4-DICHLOROBENZENE | -10.000 | UGL |
| 2-CHLOROETHYLVINYL ETHER | -10.000 | UGL |
| 2-CHLOROPHENOL | -10.000 | UGL |
| 2-CHLORONAPHTHALENE | -10.000 | UGL |
| 2,4-DICHLOROPHENOL | -10.000 | UGL |
| 2,4-DIMETHYL PHENOL | -10.000 | UGL |
| 2,4-DINITROPHENOL | -50.000 | UGL |
| 2,4-DINITROTOLUENE | -20.000 | UGL |
| 2,4,6-TRICHLOROPHENOL | -10.000 | UGL |
| 2,6-DINITROTOLUENE | -20.000 | UGL |
| 3,3-DICHLOROBENZIDENE | -20.000 | UGL |
| 3,4-BENZOFLUORANTHENE | -20.000 | UGL |
| 4-BROMOPHENYLPHENYL ETHER | -10.000 | UGL |
| 4-CHLOROPHENYLPHENYL ETHER | -10.000 | UGL |
| 3-METHYL-4-CHLOROPHENOL | -10.000 | UGL |
| 4-NITROPHENOL | -50.000 | UGL |
| 2-METHYL-4,6-DINITROPHENOL | -20.000 | UGL |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER SAMPLES

| TESTNAME | MAXIMUM LEVEL | UNITS |
|---|---|---|
| ACETONE | 9.0 | UGL |
| BIS(2-ETHYLHEXYL) PHTHALATE | 203.0 | UGL |
| HYDROCARBONS (ALL MOLECULAR WEIGHTS) | 63.0 | UGL |
| TRICHLOROFLUOROMETHANE | 11.0 | UGL |
| METHYLENE CHLORIDE | 28.0 | UGL |
| HEXADECANOIC ACID | 23.0 | UGL |
| HEXADECANOIC ACID, DIOCTYL ESTER | 2.0 | UGL |
| OCTADECANOIC ACID | 6.0 | UGL |
| OCTADECATRIENOIC ACID, METHYL ESTER | 42.0 | UGL |
| OCTANOIC ACID | 8.0 | UGL |
| DI-N-BUTYL PHTHALATE | 10.0 | UGL |
| DI-N-OCTYL PHTHALATE | 18.0 | UGL |
| ETHYLOXIRANE | 15.0 | UGL |
| HEXANE | 70.0 | UGL |
| HEXANEDIOIC ACID, DIOCTYL ESTER | 300.0 | UGL |
| TOLUENE | 7.0 | UGL |
| PHTHALATES | 36.0 | UGL |
| SULFUR | 2.0 | UGL |
| TETRACHLOROETHYLENE | 173.0 | UGL |
| TETRADECANOIC ACID | 15.0 | UGL |
| TRICHLOROETHYLENE | 213.0 | UGL |
| 1,1-DICHLOROETHYLENE | 138.0 | UGL |
| 1,1,1-TRICHLOROETHANE | 23770.0 | UGL |
| 1,2-BENZENE DICOOH, DIHEPTAL ESTER | 13.0 | UGL |
| 1,2-BENZENE DICOOH, DIISODECYL ESTER | 19.0 | UGL |
| 1,2-BENZENE DICOOH, DINONYL ESTER | 20.0 | UGL |
| 1,2-DICHLOROETHANE | 41.0 | UGL |
| 2-BUTOXYETHANOL | 50.0 | UGL |
| 2-NITROPHENOL | 38.0 | UGL |
| 2,5-FURANDONE-3-ETHYL-4-METHYL | 2.0 | UGL |
| 3-LICOSENE | 17.0 | UGL |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER CONTROL SAMPLES

---------- SERIES=FIELD BLANK ----------

| SITE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|
| FB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| FB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| FB | METHYLENE CHLORIDE | | 9.00000 | UGL |
| FB | METHYLENE CHLORIDE | | 27.00000 | UGL |
| FB | TOLUENE | LT | 5.00000 | UGL |
| FB | TOLUENE | LT | 5.00000 | UGL |
| FB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| FB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| FB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| FB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| FB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| FB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| FB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| FB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| FB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| FB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |

---------- SERIES=RINSE WATER ----------

| SITE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|
| RW | ACETONE | | 1.00000 | UGL |
| RW | BIS(2-ETHYLHEXYL) PHTHALATE | | 40.00000 | UGL |
| RW | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | | 5.00000 | UGL |
| RW | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| RW | TRICHLOROFLUOROMETHANE | LT | 1.00000 | UGL |
| RW | METHYLENE CHLORIDE | | 20.00000 | UGL |
| RW | HEXADECANOIC ACID | | 2.00000 | UGL |
| RW | DI-N-BUTYL PHTHALATE | LT | 10.00000 | UGL |
| RW | DI-N-OCTYL PHTHALATE | LT | 10.00000 | UGL |
| RW | HEXANE | | 13.00000 | UGL |
| RW | TOLUENE | LT | 5.00000 | UGL |
| RW | PHTHALATES | | 29.00000 | UGL |
| RW | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| RW | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| RW | UNK037 | | 8.00000 | UGL |
| RW | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| RW | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| RW | 1,2-BENZENE DICOOH, DIHEPTAL ESTER | | 13.00000 | UGL |
| RW | 1,2-BENZENE DICOOH, DIISODECYL ESTER | | 19.00000 | UGL |
| RW | 1,2-BENZENE DICOOH, DINONYL ESTER | | 20.00000 | UGL |
| RW | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| RW | 2-NITROPHENOL | LT | 20.00000 | UGL |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER CONTROL SAMPLES

---------- SERIES=LABORATORY BLANK ----------

| SITE | TESTNAME | ANMOD | RESULT | UNITS |
|---|---|---|---|---|
| LB | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 10.00000 | UGL |
| LB | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 10.00000 | UGL |
| LB | BIS(2-ETHYLHEXYL) PHTHALATE | LT | 10.00000 | UGL |
| LB | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | | 6.00000 | UGL |
| LB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| LB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| LB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| LB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| LB | TRICHLOROFLUOROMETHANE | LT | 5.00000 | UGL |
| LB | METHYLENE CHLORIDE | | 5.00000 | UGL |
| LB | METHYLENE CHLORIDE | | 8.00000 | UGL |
| LB | METHYLENE CHLORIDE | | 12.00000 | UGL |
| LB | METHYLENE CHLORIDE | | 12.00000 | UGL |
| LB | METHYLENE CHLORIDE | | 28.00000 | UGL |
| LB | HEXADECANOIC ACID, DIOCTYL ESTER | | 2.00000 | UGL |
| LB | DI-N-BUTYL PHTHALATE | LT | 10.00000 | UGL |
| LB | DI-N-BUTYL PHTHALATE | LT | 10.00000 | UGL |
| LB | DI-N-BUTYL PHTHALATE | LT | 10.00000 | UGL |
| LB | DI-N-OCTYL PHTHALATE | LT | 10.00000 | UGL |
| LB | DI-N-OCTYL PHTHALATE | LT | 10.00000 | UGL |
| LB | DI-N-OCTYL PHTHALATE | LT | 10.00000 | UGL |
| LB | TOLUENE | LT | 5.00000 | UGL |
| LB | TOLUENE | LT | 5.00000 | UGL |
| LB | TOLUENE | LT | 5.00000 | UGL |
| LB | TOLUENE | LT | 5.00000 | UGL |
| LB | TOLUENE | LT | 5.00000 | UGL |
| LB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TETRACHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | TRICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | UNK060 | | 7.00000 | UGL |
| LB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | 1,1-DICHLOROETHYLENE | LT | 5.00000 | UGL |
| LB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| LB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| LB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| LB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| LB | 1,1,1-TRICHLOROETHANE | LT | 5.00000 | UGL |
| LB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| LB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| LB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| LB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| LB | 1,2-DICHLOROETHANE | LT | 1.00000 | UGL |
| LB | 2-NITROPHENOL | LT | 20.00000 | UGL |
| LB | 2-NITROPHENOL | LT | 20.00000 | UGL |
| LB | 2-NITROPHENOL | LT | 20.00000 | UGL |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER SAMPLES

| | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ACETONE | BIS(2-ETHYLHEXYL) PHTHALATE | HYDROCARBONS (ALL MOLECULAR WEIGHTS) | TRICHLOROFLUOROMETHANE | METHYLENE CHLORIDE | HEXADECANOIC ACID | HEXADECANOIC ACID, DIOCTYL ESTER | OCTADECANOIC ACID | OCTADECATRIENOIC ACID, METHYL ESTER |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | | | |
| FIELD BLANK | . | . | . | -5.000 | 27.000 | . | . | . | . |
| LAB BLANK | . | -10.000 | 6.000 | -5.000 | 28.000 | . | 2.000 | . | . |
| MBL101 | 6.000 | 203.000 | 13.000 | -5.000 | -5.000 | 5.000 | . | . | . |
| MBL102 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL103 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL104 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL105 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL106 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL107 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL108 | . | . | . | -5.000 | 5.000 | . | . | . | . |
| MBL109 | . | . | . | -5.000 | 5.000 | . | . | . | . |
| MBL110 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL111 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL112 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL113 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL114 | . | -10.000 | 5.000 | -5.000 | -5.000 | 4.000 | . | . | . |
| MBL115 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL116 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL117 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL118 | . | . | . | -5.000 | -5.000 | . | . | . | . |
| MBL119 | . | . | . | -5.000 | 19.000 | . | . | . | . |
| MBL120 | 9.000 | 17.000 | 63.000 | 11.000 | 17.000 | 23.000 | . | 6.000 | 42.000 |
| MBL121 | . | . | . | -5.000 | 22.000 | . | . | . | . |
| BLANK RINSE WATER | 1.000 | 40.000 | 5.000 | -1.000 | 20.000 | 2.000 | . | . | . |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER SAMPLES

| | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | OCTANOIC ACID | DI-N-BUTYL PHTHALATE | DI-N-OCTYL PHTHALATE | ETHYLOXIR-ANE | HEXANE | HEXANEDIO-IC ACID, DIOCTYL ESTER | TOLUENE | PHTHALATES | SULFUR |
| SITE | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| FIELD BLANK | . | . | . | . | . | . | -5.000 | . | . |
| LAB BLANK | . | -10.000 | -10.000 | . | . | . | -5.000 | . | . |
| MBL101 | 8.000 | -10.000 | 18.000 | 15.000 | 12.000 | 300.000 | 5.000 | 36.000 | 2.000 |
| MBL102 | . | . | . | . | . | . | 5.000 | . | . |
| MBL103 | . | . | . | . | . | . | 6.000 | . | . |
| MBL104 | . | . | . | . | . | . | 7.000 | . | . |
| MBL105 | . | . | . | . | . | . | -5.000 | . | . |
| MBL106 | . | . | . | . | . | . | -5.000 | . | . |
| MBL107 | . | . | . | . | . | . | 6.000 | . | . |
| MBL108 | . | . | . | . | . | . | 6.000 | . | . |
| MBL109 | . | . | . | . | . | . | 6.000 | . | . |
| MBL110 | . | . | . | . | . | . | 5.000 | . | . |
| MBL111 | . | . | . | . | . | . | 6.000 | . | . |
| MBL112 | . | . | . | . | . | . | 6.000 | . | . |
| MBL113 | . | . | . | . | . | . | 5.000 | . | . |
| MBL114 | . | -10.000 | -10.000 | . | . | . | 5.000 | . | . |
| MBL115 | . | . | . | . | . | . | 5.000 | . | . |
| MBL116 | . | . | . | . | . | . | 5.000 | . | . |
| MBL117 | . | . | . | . | . | . | -5.000 | . | . |
| MBL118 | . | . | . | . | . | . | 5.000 | . | . |
| MBL119 | . | . | . | . | . | . | -5.000 | . | . |
| MBL120 | . | 10.000 | -10.000 | . | 70.000 | 13.000 | -5.000 | . | . |
| MBL121 | . | . | . | . | . | . | -5.000 | . | . |
| BLANK RINSE WATER | . | -10.000 | -10.000 | . | 13.000 | . | -5.000 | 29.000 | . |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER SAMPLES

| | TESTNAME | | | | | | |
|---|---|---|---|---|---|---|---|
| | TETRACHLOROETHYLENE | TETRADECANOIC ACID | TRICHLOROETHYLENE | 1,1-DICHLORODETHYLENE | 1,1,1-TRICHLOROETHANE | 1,2-BENZENE DICOOH, DIHEPTAL ESTER | 1,2-BENZENE DICOOH, DIISODECYL ESTER |
| | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SITE | | | | | | | |
| FIELD BLANK | -5.000 | . | -5.000 | -5.000 | -5.000 | . | . |
| LAB BLANK | -5.000 | . | -5.000 | -5.000 | -5.000 | . | . |
| MBL101 | 11.000 | . | 22.000 | 131.000 | 4230.000 | . | . |
| MBL102 | 14.000 | . | 30.000 | 73.000 | 5550.000 | . | . |
| MBL103 | 11.000 | . | 24.000 | 71.000 | 4520.000 | . | . |
| MBL104 | 12.000 | . | 25.000 | 138.000 | 23770.000 | . | . |
| MBL105 | 44.000 | . | 131.000 | 30.000 | 1700.000 | . | . |
| MBL106 | 46.000 | . | 125.000 | 25.000 | 1950.000 | . | . |
| MBL107 | 64.000 | . | 141.000 | 57.000 | 886.000 | . | . |
| MBL108 | 59.000 | . | 163.000 | 53.000 | 942.000 | . | . |
| MBL109 | 76.000 | . | 213.000 | 57.000 | 938.000 | . | . |
| MBL110 | 77.000 | . | 156.000 | 46.000 | 766.000 | . | . |
| MBL111 | 92.000 | . | 179.000 | 60.000 | 854.000 | . | . |
| MBL112 | 81.000 | . | 175.000 | 61.000 | 804.000 | . | . |
| MBL113 | 75.000 | . | 161.000 | 38.000 | 760.000 | . | . |
| MBL114 | 60.000 | . | 136.000 | 38.000 | 223.000 | . | . |
| MBL115 | 63.000 | . | 135.000 | 38.000 | 633.000 | . | . |
| MBL116 | 66.000 | . | 143.000 | 42.000 | 660.000 | . | . |
| MBL117 | 173.000 | . | 73.000 | -5.000 | 232.000 | . | . |
| MBL118 | 65.000 | . | 150.000 | 41.000 | 658.000 | . | . |
| MBL119 | -5.000 | . | -5.000 | -5.000 | -5.000 | . | . |
| MBL120 | -5.000 | 15.000 | -5.000 | -5.000 | -5.000 | . | . |
| MBL121 | -5.000 | . | -5.000 | -5.000 | -5.000 | . | . |
| BLANK RINSE WATER | -5.000 | . | -5.000 | -5.000 | -5.000 | 13.000 | 19.000 |

TABLE 6-11.

ORGANIC ANALYTES DETECTED IN WATER SAMPLES

| | TESTNAME | | | | | |
|---|---|---|---|---|---|---|
| | 1,2-BENZENE DICOOH, DINONYL ESTER | 1,2-DICHLOROE-THANE | 2-BUTOXYETH-ANOL | 2-NITROPHEN-OL | 2,5-FURANDONE-3-ETHYL-4-METHYL | 3-LICOSENE |
| SITE | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| FIELD BLANK | . | -1.000 | . | . | . | . |
| LAB BLANK | . | -1.000 | . | -20.000 | . | . |
| MBL101 | . | 29.000 | 50.000 | -20.000 | . | . |
| MBL102 | . | 23.000 | . | . | . | . |
| MBL103 | . | 32.000 | . | . | . | . |
| MBL104 | . | 41.000 | . | . | . | . |
| MBL105 | . | -1.000 | . | . | . | . |
| MBL106 | . | -1.000 | . | . | . | . |
| MBL107 | . | -1.000 | . | . | . | . |
| MBL108 | . | -1.000 | . | . | . | . |
| MBL109 | . | -1.000 | . | . | . | . |
| MBL110 | . | -1.000 | . | . | . | . |
| MBL111 | . | -1.000 | . | . | . | . |
| MBL112 | . | -1.000 | . | . | . | . |
| MBL113 | . | -1.000 | . | . | . | . |
| MBL114 | . | -1.000 | 8.000 | 38.000 | 2.000 | . |
| MBL115 | . | -1.000 | . | . | . | . |
| MBL116 | . | -1.000 | . | . | . | . |
| MBL117 | . | -1.000 | . | . | . | . |
| MBL118 | . | -1.000 | . | . | . | . |
| MBL119 | . | -1.000 | . | . | . | . |
| MBL120 | . | -1.000 | . | -20.000 | . | 17.000 |
| MBL121 | . | -1.000 | . | . | . | . |
| BLANK RINSE WATER | 20.000 | -1.000 | . | -20.000 | . | . |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 1, 340-338 FEET-LOST LAKE

TOP SEDIMENT SAMPLE FROM CORES 702, 721, 723, AND 724.
AREA = 7.95 ACRES, DEPTH = 0.17 FEET, DENSITY = 1.4, MASS = 2,260,000 KILOGRAMS.

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV1 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 1.00000 | 1 | 114280 | 1.4 | 2260000 | 2.3 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 8427.50000 | 4 | 114280 | 1.4 | 2260000 | 19046.1 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 4.50000 | 1 | 114280 | 1.4 | 2260000 | 10.2 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.12000 | 1 | 114280 | 1.4 | 2260000 | 0.3 | KILOGRAMS |
| 5 | BARIUM | UGG | 86.00000 | 1 | 114280 | 1.4 | 2260000 | 194.4 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 5.30000 | 1 | 114280 | 1.4 | 2260000 | 12.0 | MILLICURIES |
| 7 | CALCIUM | UGG | 170.12500 | 4 | 114280 | 1.4 | 2260000 | 384.5 | KILOGRAMS |
| 8 | CHLORIDE | UGG | 1.00000 | 4 | 114280 | 1.4 | 2260000 | 2.3 | KILOGRAMS |
| 9 | CHLORINE | UGG | 11.62500 | 4 | 114280 | 1.4 | 2260000 | 26.3 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 6.91250 | 4 | 114280 | 1.4 | 2260000 | 15.6 | KILOGRAMS |
| 11 | COPPER | UGG | 2.75000 | 4 | 114280 | 1.4 | 2260000 | 6.2 | KILOGRAMS |
| 12 | IRON | UGG | 1197.25000 | 4 | 114280 | 1.4 | 2260000 | 2705.8 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.20000 | 5 | 114280 | 1.4 | 2260000 | 0.5 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 80.52500 | 4 | 114280 | 1.4 | 2260000 | 182.0 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 97.55000 | 4 | 114280 | 1.4 | 2260000 | 220.5 | KILOGRAMS |
| 16 | MANGANESE | UGG | 81.30000 | 4 | 114280 | 1.4 | 2260000 | 183.7 | KILOGRAMS |
| 17 | SODIUM | UGG | 137.80000 | 4 | 114280 | 1.4 | 2260000 | 311.4 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 7.90500 | 4 | 114280 | 1.4 | 2260000 | 17.9 | KILOGRAMS |
| 19 | NICKEL | UGG | 2.08750 | 4 | 114280 | 1.4 | 2260000 | 4.7 | KILOGRAMS |
| 20 | NITRATE | UGG | 6.56500 | 4 | 114280 | 1.4 | 2260000 | 14.8 | KILOGRAMS |
| 21 | LEAD | UGG | 2.76250 | 4 | 114280 | 1.4 | 2260000 | 6.2 | KILOGRAMS |
| 22 | SULPHATE | UGG | 33.40000 | 1 | 114280 | 1.4 | 2260000 | 75.5 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 6827.45000 | 6 | 114280 | 1.4 | 2260000 | 15430.0 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 6.70000 | 1 | 114280 | 1.4 | 2260000 | 15.1 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 10.00000 | 4 | 114280 | 1.4 | 2260000 | 22.6 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 138.00000 | 5 | 114280 | 1.4 | 2260000 | 311.9 | KILOGRAMS |
| 27 | URANIUM | UGG | 10.00000 | 4 | 114280 | 1.4 | 2260000 | 22.6 | KILOGRAMS |
| 28 | ZINC | UGG | 2.91500 | 4 | 114280 | 1.4 | 2260000 | 6.6 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 2, 336-338 FEET LOST LAKE

TOP SEDIMENT SAMPLE FROM CORES 703, 704, 705, 708, 709, 713, 715, 718, 719, 720, AND 726.
AREA = 10.84 ACRES, DEPTH = 0.50 FEET, DENSITY = 1.9, MASS = 12,700,000 KILOGRAMS.

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV2 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 1.00000 | 1 | 236095 | 1.9 | 12700000 | 13 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 11859.38462 | 13 | 236095 | 1.9 | 12700000 | 150614 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 6.30000 | 1 | 236095 | 1.9 | 12700000 | 80 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.17000 | 1 | 236095 | 1.9 | 12700000 | 2 | KILOGRAMS |
| 5 | BARIUM | UGG | 119.00000 | 1 | 236095 | 1.9 | 12700000 | 1511 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 6.90000 | 1 | 236095 | 1.9 | 12700000 | 88 | MILLICURIES |
| 7 | CALCIUM | UGG | 866.47692 | 13 | 236095 | 1.9 | 12700000 | 11004 | KILOGRAMS |
| 8 | CADMIUM | UGG | 1.00000 | 13 | 236095 | 1.9 | 12700000 | 13 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 21.15455 | 11 | 236095 | 1.9 | 12700000 | 269 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 11.19385 | 13 | 236095 | 1.9 | 12700000 | 142 | KILOGRAMS |
| 11 | COPPER | UGG | 6.50231 | 13 | 236095 | 1.9 | 12700000 | 83 | KILOGRAMS |
| 12 | IRON | UGG | 2413.15385 | 13 | 236095 | 1.9 | 12700000 | 30647 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.22583 | 12 | 236095 | 1.9 | 12700000 | 3 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 145.01538 | 13 | 236095 | 1.9 | 12700000 | 1842 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 168.36923 | 13 | 236095 | 1.9 | 12700000 | 2138 | KILOGRAMS |
| 16 | MANGANESE | UGG | 89.76154 | 13 | 236095 | 1.9 | 12700000 | 1140 | KILOGRAMS |
| 17 | SODIUM | UGG | 268.19231 | 13 | 236095 | 1.9 | 12700000 | 3406 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 31.82182 | 11 | 236095 | 1.9 | 12700000 | 404 | KILOGRAMS |
| 19 | NICKEL | UGG | 6.85615 | 13 | 236095 | 1.9 | 12700000 | 87 | KILOGRAMS |
| 20 | NITRATE | UGG | 7.50727 | 11 | 236095 | 1.9 | 12700000 | 95 | KILOGRAMS |
| 21 | LEAD | UGG | 6.67308 | 13 | 236095 | 1.9 | 12700000 | 85 | KILOGRAMS |
| 22 | SULPHATE | UGG | 30.60000 | 1 | 236095 | 1.9 | 12700000 | 389 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 8916.65455 | 11 | 236095 | 1.9 | 12700000 | 113242 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 9.10000 | 1 | 236095 | 1.9 | 12700000 | 116 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 11.75000 | 16 | 236095 | 1.9 | 12700000 | 149 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 256.54545 | 11 | 236095 | 1.9 | 12700000 | 3258 | KILOGRAMS |
| 27 | URANIUM | UGG | 14.94615 | 13 | 236095 | 1.9 | 12700000 | 190 | KILOGRAMS |
| 28 | ZINC | UGG | 6.47000 | 13 | 236095 | 1.9 | 12700000 | 82 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 3, <336 FEET LOST LAKE

SEDIMENT SAMPLES FROM CORES 706, 707, 710, 711, 712, 716, AND 717
AREA = 6.17 ACRES, DEPTH = 1.0 FEET, DENSITY = 1.9, MASS = 14,500,000 KILOGRAMS.

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV3 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 1.00000 | 2 | 268765 | 1.9 | 14500000 | 15 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 24248.33333 | 15 | 268765 | 1.9 | 14500000 | 351601 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 9.05000 | 2 | 268765 | 1.9 | 14500000 | 131 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.16000 | 2 | 268765 | 1.9 | 14500000 | 2 | KILOGRAMS |
| 5 | BARIUM | UGG | 193.00000 | 2 | 268765 | 1.9 | 14500000 | 2799 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 7.25000 | 2 | 268765 | 1.9 | 14500000 | 105 | MILLICURIES |
| 7 | CALCIUM | UGG | 918.20000 | 15 | 268765 | 1.9 | 14500000 | 13314 | KILOGRAMS |
| 8 | CADMIUM | UGG | 1.00000 | 15 | 268765 | 1.9 | 14500000 | 15 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 23.19333 | 15 | 268765 | 1.9 | 14500000 | 336 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 21.00667 | 15 | 268765 | 1.9 | 14500000 | 305 | KILOGRAMS |
| 11 | COPPER | UGG | 12.08267 | 15 | 268765 | 1.9 | 14500000 | 175 | KILOGRAMS |
| 12 | IRON | UGG | 3890.53333 | 15 | 268765 | 1.9 | 14500000 | 56413 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.20000 | 16 | 268765 | 1.9 | 14500000 | 3 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 266.70667 | 15 | 268765 | 1.9 | 14500000 | 3867 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 276.33333 | 15 | 268765 | 1.9 | 14500000 | 4007 | KILOGRAMS |
| 16 | MANGANESE | UGG | 115.00000 | 15 | 268765 | 1.9 | 14500000 | 1667 | KILOGRAMS |
| 17 | SODIUM | UGG | 280.40000 | 15 | 268765 | 1.9 | 14500000 | 4066 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 39.81471 | 17 | 268765 | 1.9 | 14500000 | 577 | KILOGRAMS |
| 19 | NICKEL | UGG | 7.09333 | 15 | 268765 | 1.9 | 14500000 | 103 | KILOGRAMS |
| 20 | NITRATE | UGG | 1.26067 | 15 | 268765 | 1.9 | 14500000 | 18 | KILOGRAMS |
| 21 | LEAD | UGG | 10.65733 | 15 | 268765 | 1.9 | 14500000 | 155 | KILOGRAMS |
| 22 | SULPHATE | UGG | 31.80000 | 2 | 268765 | 1.9 | 14500000 | 461 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 7198.56250 | 16 | 268765 | 1.9 | 14500000 | 104379 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 10.20000 | 2 | 268765 | 1.9 | 14500000 | 148 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 11.85714 | 14 | 268765 | 1.9 | 14500000 | 172 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 261.57895 | 19 | 268765 | 1.9 | 14500000 | 3793 | KILOGRAMS |
| 27 | URANIUM | UGG | 10.15000 | 16 | 268765 | 1.9 | 14500000 | 147 | KILOGRAMS |
| 28 | ZINC | UGG | 10.63400 | 15 | 268765 | 1.9 | 14500000 | 154 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 4, <342 FEET SEEPAGE AREA

SEDIMENT SAMPLES FROM CORES 601, 603, 604, 605, 606, 607, 608, 610, 611 612, AND 613
AREA = 2.48 ACRES, DEPTH = 2.0 FEET, DENSITY = 1.5, MASS = 9,170,000 KILOGRAMS.

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV4 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 0.05000 | 1 | 216000 | 1.5 | 9170000 | 0 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 11927.85714 | 14 | 216000 | 1.5 | 9170000 | 109378 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 14.20000 | 1 | 216000 | 1.5 | 9170000 | 130 | MILLICURIES |
| 4 | ARSENIC | UGG | 1.33000 | 1 | 216000 | 1.5 | 9170000 | 12 | KILOGRAMS |
| 5 | BARIUM | UGG | 52.40000 | 1 | 216000 | 1.5 | 9170000 | 481 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 25.40000 | 1 | 216000 | 1.5 | 9170000 | 233 | MILLICURIES |
| 7 | CALCIUM | UGG | 852.35714 | 14 | 216000 | 1.5 | 9170000 | 7816 | KILOGRAMS |
| 8 | CADMIUM | UGG | 1.00000 | 14 | 216000 | 1.5 | 9170000 | 9 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 19.83333 | 12 | 216000 | 1.5 | 9170000 | 182 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 6.87143 | 14 | 216000 | 1.5 | 9170000 | 63 | KILOGRAMS |
| 11 | COPPER | UGG | 2.03929 | 14 | 216000 | 1.5 | 9170000 | 19 | KILOGRAMS |
| 12 | IRON | UGG | 4718.21429 | 14 | 216000 | 1.5 | 9170000 | 43266 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.21091 | 11 | 216000 | 1.5 | 9170000 | 2 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 105.02857 | 14 | 216000 | 1.5 | 9170000 | 963 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 130.93571 | 14 | 216000 | 1.5 | 9170000 | 1201 | KILOGRAMS |
| 16 | MANGANESE | UGG | 216.79286 | 14 | 216000 | 1.5 | 9170000 | 1988 | KILOGRAMS |
| 17 | SODIUM | UGG | 517.00000 | 14 | 216000 | 1.5 | 9170000 | 4741 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 9.12500 | 12 | 216000 | 1.5 | 9170000 | 84 | KILOGRAMS |
| 19 | NICKEL | UGG | 40.58214 | 14 | 216000 | 1.5 | 9170000 | 372 | KILOGRAMS |
| 20 | NITRATE | UGG | 18.87692 | 13 | 216000 | 1.5 | 9170000 | 173 | KILOGRAMS |
| 21 | LEAD | UGG | 3.61786 | 14 | 216000 | 1.5 | 9170000 | 33 | KILOGRAMS |
| 22 | SULPHATE | UGG | 34.25000 | 2 | 216000 | 1.5 | 9170000 | 314 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 3886.46154 | 13 | 216000 | 1.5 | 9170000 | 35639 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 11.50000 | 1 | 216000 | 1.5 | 9170000 | 105 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 10.61538 | 13 | 216000 | 1.5 | 9170000 | 97 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 447.45455 | 11 | 216000 | 1.5 | 9170000 | 4103 | KILOGRAMS |
| 27 | URANIUM | UGG | 85.01429 | 14 | 216000 | 1.5 | 9170000 | 780 | KILOGRAMS |
| 28 | ZINC | UGG | 5.95000 | 14 | 216000 | 1.5 | 9170000 | 55 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 5. NEXT TO DITCH

SEDIMENT SAMPLES FROM CORES 609, 614, 616, 617, 618, 619, AND 620
AREA = 0.45 ACRES, DEPTH = 6.0 FEET, DENSITY = 1.5, MASS = 4,965,000 KILOGRAMS.

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV5 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ALUMINUM | UGG | 10716.75000 | 20 | 78000 | 1.5 | 4965000 | 53208.7 | KILOGRAMS |
| 2 | CALCIUM | UGG | 801.80000 | 20 | 78000 | 1.5 | 4965000 | 3980.9 | KILOGRAMS |
| 3 | CADMIUM | UGG | 1.00000 | 20 | 78000 | 1.5 | 4965000 | 5.0 | KILOGRAMS |
| 4 | CHLORIDE | UGG | 27.41579 | 19 | 78000 | 1.5 | 4965000 | 136.1 | KILOGRAMS |
| 5 | CHROMIUM | UGG | 12.40000 | 20 | 78000 | 1.5 | 4965000 | 61.6 | KILOGRAMS |
| 6 | COPPER | UGG | 2.40000 | 20 | 78000 | 1.5 | 4965000 | 11.9 | KILOGRAMS |
| 7 | IRON | UGG | 9971.50000 | 20 | 78000 | 1.5 | 4965000 | 49508.5 | KILOGRAMS |
| 8 | MERCURY | UGG | 0.23545 | 22 | 78000 | 1.5 | 4965000 | 1.2 | KILOGRAMS |
| 9 | POTASSIUM | UGG | 101.02500 | 20 | 78000 | 1.5 | 4965000 | 501.6 | KILOGRAMS |
| 10 | MAGNESIUM | UGG | 100.24000 | 20 | 78000 | 1.5 | 4965000 | 497.7 | KILOGRAMS |
| 11 | MANGANESE | UGG | 140.54500 | 20 | 78000 | 1.5 | 4965000 | 697.8 | KILOGRAMS |
| 12 | SODIUM | UGG | 515.16000 | 20 | 78000 | 1.5 | 4965000 | 2557.8 | KILOGRAMS |
| 13 | AMMONIA NITROGEN | UGG | 6.63526 | 19 | 78000 | 1.5 | 4965000 | 32.9 | KILOGRAMS |
| 14 | NICKEL | UGG | 27.75500 | 20 | 78000 | 1.5 | 4965000 | 137.8 | KILOGRAMS |
| 15 | NITRATE | UGG | 15.07895 | 19 | 78000 | 1.5 | 4965000 | 74.9 | KILOGRAMS |
| 16 | LEAD | UGG | 6.45750 | 20 | 78000 | 1.5 | 4965000 | 32.1 | KILOGRAMS |
| 17 | ORGANIC CARBON | UGG | 2738.85000 | 20 | 78000 | 1.5 | 4965000 | 13598.4 | KILOGRAMS |
| 18 | ORGANIC HALOGENS | UGG | 10.84211 | 19 | 78000 | 1.5 | 4965000 | 53.8 | KILOGRAMS |
| 19 | TOTAL PHOSPHATES | UGG | 444.57143 | 21 | 78000 | 1.5 | 4965000 | 2207.3 | KILOGRAMS |
| 20 | URANIUM | UGG | 67.29500 | 20 | 78000 | 1.5 | 4965000 | 334.1 | KILOGRAMS |
| 21 | ZINC | UGG | 5.62000 | 20 | 78000 | 1.5 | 4965000 | 27.9 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 6. SEEPAGE AREA SLUDGE

SLUDGE SAMPLES FROM 600 SERIES CORES
AREA = 2.93 ACRES, DEPTH = 0.5 FEET, DENSITY = 1.0, PERCENT SOLIDS = 6.0, MASS = 108,000 KILOGRAMS

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV6 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 11.13000 | 1 | 3825 | 1 | 108000 | 1.20 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 74549.21053 | 19 | 3825 | 1 | 108000 | 8051.31 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 1105.00000 | 1 | 3825 | 1 | 108000 | 119.34 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.12500 | 1 | 3825 | 1 | 108000 | 0.01 | KILOGRAMS |
| 5 | BARIUM | UGG | 69.00000 | 1 | 3825 | 1 | 108000 | 7.45 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 1432.00000 | 1 | 3825 | 1 | 108000 | 154.66 | MILLICURIES |
| 7 | CALCIUM | UGG | 19461.21053 | 19 | 3825 | 1 | 108000 | 2101.81 | KILOGRAMS |
| 8 | CADMIUM | UGG | 2.43684 | 19 | 3825 | 1 | 108000 | 0.26 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 39.31111 | 18 | 3825 | 1 | 108000 | 4.25 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 33.81579 | 19 | 3825 | 1 | 108000 | 3.65 | KILOGRAMS |
| 11 | COPPER | UGG | 78.00526 | 19 | 3825 | 1 | 108000 | 8.42 | KILOGRAMS |
| 12 | IRON | UGG | 1982.10526 | 19 | 3825 | 1 | 108000 | 214.07 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.77632 | 19 | 3825 | 1 | 108000 | 0.08 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 142.80526 | 19 | 3825 | 1 | 108000 | 15.42 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 1634.94737 | 19 | 3825 | 1 | 108000 | 176.57 | KILOGRAMS |
| 16 | MANGANESE | UGG | 208.43684 | 19 | 3825 | 1 | 108000 | 22.51 | KILOGRAMS |
| 17 | SODIUM | UGG | 5107.36842 | 19 | 3825 | 1 | 108000 | 551.60 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 28.82176 | 17 | 3825 | 1 | 108000 | 3.11 | KILOGRAMS |
| 19 | NICKEL | UGG | 5508.89474 | 19 | 3825 | 1 | 108000 | 594.96 | KILOGRAMS |
| 20 | NITRATE | UGG | 396.06842 | 19 | 3825 | 1 | 108000 | 42.78 | KILOGRAMS |
| 21 | LEAD | UGG | 102.51842 | 19 | 3825 | 1 | 108000 | 11.07 | KILOGRAMS |
| 22 | SULPHATE | UGG | 294.10000 | 1 | 3825 | 1 | 108000 | 31.76 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 72738.88889 | 18 | 3825 | 1 | 108000 | 7855.80 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 5.40000 | 1 | 3825 | 1 | 108000 | 0.58 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 10.21053 | 19 | 3825 | 1 | 108000 | 1.10 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 17051.57895 | 19 | 3825 | 1 | 108000 | 1841.57 | KILOGRAMS |
| 27 | URANIUM | UGG | 4063.89474 | 19 | 3825 | 1 | 108000 | 438.90 | KILOGRAMS |
| 28 | ZINC | UGG | 64.97895 | 19 | 3825 | 1 | 108000 | 7.02 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 7. SOIL UNDER DITCH

SEDIMENT SAMPLES FROM CORES 502, 507, 508, 513, 514, 515, AND 516.
AREA = 0.25 ACRES, DEPTH = 6.0 FEET, DENSITY = 1.5, MASS = 2,060,000 KILOGRAMS

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV7 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 1.51833 | 3 | 43000 | 1.5 | 2060000 | 3.1 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 10046.51515 | 33 | 43000 | 1.5 | 2060000 | 20695.8 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 14.40000 | 2 | 43000 | 1.5 | 2060000 | 29.7 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.57667 | 3 | 43000 | 1.5 | 2060000 | 1.2 | KILOGRAMS |
| 5 | BARIUM | UGG | 49.20000 | 3 | 43000 | 1.5 | 2060000 | 101.4 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 19.40000 | 2 | 43000 | 1.5 | 2060000 | 40.0 | MILLICURIES |
| 7 | CALCIUM | UGG | 609.03030 | 33 | 43000 | 1.5 | 2060000 | 1254.6 | KILOGRAMS |
| 8 | CADMIUM | UGG | 1.00000 | 33 | 43000 | 1.5 | 2060000 | 2.1 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 16.15667 | 30 | 43000 | 1.5 | 2060000 | 33.3 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 16.57424 | 33 | 43000 | 1.5 | 2060000 | 34.1 | KILOGRAMS |
| 11 | COPPER | UGG | 2.51818 | 33 | 43000 | 1.5 | 2060000 | 5.2 | KILOGRAMS |
| 12 | IRON | UGG | 10238.33333 | 33 | 43000 | 1.5 | 2060000 | 21091.0 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.20172 | 29 | 43000 | 1.5 | 2060000 | 0.4 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 80.90000 | 33 | 43000 | 1.5 | 2060000 | 166.7 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 63.54848 | 33 | 43000 | 1.5 | 2060000 | 130.9 | KILOGRAMS |
| 16 | MANGANESE | UGG | 35.55909 | 33 | 43000 | 1.5 | 2060000 | 73.3 | KILOGRAMS |
| 17 | SODIUM | UGG | 454.48485 | 33 | 43000 | 1.5 | 2060000 | 936.2 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 11.66567 | 30 | 43000 | 1.5 | 2060000 | 24.0 | KILOGRAMS |
| 19 | NICKEL | UGG | 23.77424 | 33 | 43000 | 1.5 | 2060000 | 49.0 | KILOGRAMS |
| 20 | NITRATE | UGG | 35.30645 | 31 | 43000 | 1.5 | 2060000 | 72.7 | KILOGRAMS |
| 21 | LEAD | UGG | 9.43333 | 33 | 43000 | 1.5 | 2060000 | 19.4 | KILOGRAMS |
| 22 | SULPHATE | UGG | 25.40000 | 2 | 43000 | 1.5 | 2060000 | 52.3 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 2142.38710 | 31 | 43000 | 1.5 | 2060000 | 4413.3 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 12.45000 | 2 | 43000 | 1.5 | 2060000 | 25.6 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 11.00000 | 30 | 43000 | 1.5 | 2060000 | 22.7 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 346.77419 | 31 | 43000 | 1.5 | 2060000 | 714.4 | KILOGRAMS |
| 27 | URANIUM | UGG | 40.91515 | 33 | 43000 | 1.5 | 2060000 | 84.3 | KILOGRAMS |
| 28 | ZINC | UGG | 5.79242 | 33 | 43000 | 1.5 | 2060000 | 11.9 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 8. SLUDGE IN DITCH

SLUDGE SAMPLES FROM 500 SERIES CORES
AREA = 0.25 ACRES, DEPTH = 0.72 FEET, DENSITY = 1.0, PERCENT SOLIDS = 6.0; MASS = 13,300 KILOGRAMS

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV8 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 14.20000 | 1 | 470 | 1 | 13300 | 0.19 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 90316.66667 | 9 | 470 | 1 | 13300 | 1201.21 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 1402.00000 | 1 | 470 | 1 | 13300 | 18.65 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.35500 | 1 | 470 | 1 | 13300 | 0.00 | KILOGRAMS |
| 5 | BARIUM | UGG | 139.00000 | 1 | 470 | 1 | 13300 | 1.85 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 2059.00000 | 1 | 470 | 1 | 13300 | 27.38 | MILLICURIES |
| 7 | CALCIUM | UGG | 38056.55556 | 9 | 470 | 1 | 13300 | 506.15 | KILOGRAMS |
| 8 | CADMIUM | UGG | 2.23889 | 9 | 470 | 1 | 13300 | 0.03 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 72.50000 | 9 | 470 | 1 | 13300 | 0.96 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 189.88889 | 9 | 470 | 1 | 13300 | 2.53 | KILOGRAMS |
| 11 | COPPER | UGG | 139.65556 | 9 | 470 | 1 | 13300 | 1.86 | KILOGRAMS |
| 12 | IRON | UGG | 2437.22222 | 9 | 470 | 1 | 13300 | 32.42 | KILOGRAMS |
| 13 | MERCURY | UGG | 3.89889 | 9 | 470 | 1 | 13300 | 0.05 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 120.01111 | 9 | 470 | 1 | 13300 | 1.60 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 2315.66667 | 9 | 470 | 1 | 13300 | 30.80 | KILOGRAMS |
| 16 | MANGANESE | UGG | 82.14444 | 9 | 470 | 1 | 13300 | 1.09 | KILOGRAMS |
| 17 | SODIUM | UGG | 7282.00000 | 9 | 470 | 1 | 13300 | 96.85 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 17.31800 | 10 | 470 | 1 | 13300 | 0.23 | KILOGRAMS |
| 19 | NICKEL | UGG | 6090.11111 | 9 | 470 | 1 | 13300 | 81.00 | KILOGRAMS |
| 20 | NITRATE | UGG | 375.86667 | 9 | 470 | 1 | 13300 | 5.00 | KILOGRAMS |
| 21 | LEAD | UGG | 262.77778 | 9 | 470 | 1 | 13300 | 3.49 | KILOGRAMS |
| 22 | SULPHATE | UGG | 253.80000 | 1 | 470 | 1 | 13300 | 3.38 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 121900.00000 | 10 | 470 | 1 | 13300 | 1621.27 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 14.30000 | 1 | 470 | 1 | 13300 | 0.19 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 13.40000 | 10 | 470 | 1 | 13300 | 0.18 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 26384.00000 | 10 | 470 | 1 | 13300 | 350.91 | KILOGRAMS |
| 27 | URANIUM | UGG | 6477.55556 | 9 | 470 | 1 | 13300 | 86.15 | KILOGRAMS |
| 28 | ZINC | UGG | 86.04444 | 9 | 470 | 1 | 13300 | 1.14 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 9. SOIL IN BASIN, 2 FEET DEEP

SEDIMENT SAMPLES FROM TOP 2 FEET OF 200 SERIES CORES.
AREA = 1.47 ACRES, DEPTH = 2.0 FEET, DENSITY = 1.5, MASS = 5,420,000 KILOGRAMS

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV9 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 0.05700 | 1 | 127680 | 1.5 | 5420000 | 0.3 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 3256.11111 | 9 | 127680 | 1.5 | 5420000 | 17648.1 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 17.70000 | 1 | 127680 | 1.5 | 5420000 | 95.9 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.12800 | 1 | 127680 | 1.5 | 5420000 | 0.7 | KILOGRAMS |
| 5 | BARIUM | UGG | 2.55000 | 1 | 127680 | 1.5 | 5420000 | 13.8 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 20.30000 | 1 | 127680 | 1.5 | 5420000 | 110.0 | MILLICURIES |
| 7 | CALCIUM | UGG | 138.00000 | 9 | 127680 | 1.5 | 5420000 | 748.0 | KILOGRAMS |
| 8 | CADMIUM | UGG | 1.00000 | 9 | 127680 | 1.5 | 5420000 | 5.4 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 65.87500 | 8 | 127680 | 1.5 | 5420000 | 357.0 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 14.69444 | 9 | 127680 | 1.5 | 5420000 | 79.6 | KILOGRAMS |
| 11 | COPPER | UGG | 2.51111 | 9 | 127680 | 1.5 | 5420000 | 13.6 | KILOGRAMS |
| 12 | IRON | UGG | 13407.77778 | 9 | 127680 | 1.5 | 5420000 | 72670.2 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.20000 | 8 | 127680 | 1.5 | 5420000 | 1.1 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 41.37778 | 9 | 127680 | 1.5 | 5420000 | 224.3 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 18.85556 | 9 | 127680 | 1.5 | 5420000 | 102.2 | KILOGRAMS |
| 16 | MANGANESE | UGG | 13.12778 | 9 | 127680 | 1.5 | 5420000 | 71.2 | KILOGRAMS |
| 17 | SODIUM | UGG | 1116.33333 | 9 | 127680 | 1.5 | 5420000 | 6050.5 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 11.31750 | 8 | 127680 | 1.5 | 5420000 | 61.3 | KILOGRAMS |
| 19 | NICKEL | UGG | 9.73889 | 9 | 127680 | 1.5 | 5420000 | 52.8 | KILOGRAMS |
| 20 | NITRATE | UGG | 35.46250 | 8 | 127680 | 1.5 | 5420000 | 192.2 | KILOGRAMS |
| 21 | LEAD | UGG | 10.07222 | 9 | 127680 | 1.5 | 5420000 | 54.6 | KILOGRAMS |
| 22 | SULPHATE | UGG | 15.00000 | 1 | 127680 | 1.5 | 5420000 | 81.3 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 984.62500 | 8 | 127680 | 1.5 | 5420000 | 5336.7 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 6.40000 | 1 | 127680 | 1.5 | 5420000 | 34.7 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 10.44444 | 9 | 127680 | 1.5 | 5420000 | 56.6 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 378.25000 | 8 | 127680 | 1.5 | 5420000 | 2050.1 | KILOGRAMS |
| 27 | URANIUM | UGG | 54.40000 | 24 | 127680 | 1.5 | 5420000 | 884.5 | KILOGRAMS |
| 28 | ZINC | UGG | 3.45000 | 9 | 127680 | 1.5 | 5420000 | 18.7 | KILOGRAMS |

Uranium averaged over a depth of 6 feet, and inventory calculated over a total mass of 16,260,000 kilograms of soil.

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 10. SLUDGE IN BASIN, 2 FEET DEEP

SLUDGE SAMPLES FROM 200 SERIES CORES
AREA = 1.47 ACRES, DEPTH = 2.0 FEET, DENSITY = 1.0, PERCENT SOLIDS = 6.0, MASS = 217,000 KILOGRAMS

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV10 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 5.56500 | 2 | 7660 | 1 | 217000 | 1.2 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 102878.75000 | 8 | 7660 | 1 | 217000 | 22324.7 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 2956.50000 | 2 | 7660 | 1 | 217000 | 641.6 | MILLICURIES |
| 4 | ARSENIC | UGG | 0.12500 | 2 | 7660 | 1 | 217000 | 0.0 | KILOGRAMS |
| 5 | BARIUM | UGG | 157.00000 | 2 | 7660 | 1 | 217000 | 34.1 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 8499.50000 | 2 | 7660 | 1 | 217000 | 1844.4 | MILLICURIES |
| 7 | CALCIUM | UGG | 27678.75000 | 8 | 7660 | 1 | 217000 | 6006.3 | KILOGRAMS |
| 8 | CADMIUM | UGG | 2.56250 | 8 | 7660 | 1 | 217000 | 0.6 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 363.97778 | 9 | 7660 | 1 | 217000 | 79.0 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 110.47500 | 8 | 7660 | 1 | 217000 | 24.0 | KILOGRAMS |
| 11 | COPPER | UGG | 231.03750 | 8 | 7660 | 1 | 217000 | 50.1 | KILOGRAMS |
| 12 | IRON | UGG | 5897.50000 | 8 | 7660 | 1 | 217000 | 1279.8 | KILOGRAMS |
| 13 | MERCURY | UGG | 1.40900 | 10 | 7660 | 1 | 217000 | 0.3 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 169.61250 | 8 | 7660 | 1 | 217000 | 36.8 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 4294.12500 | 8 | 7660 | 1 | 217000 | 931.8 | KILOGRAMS |
| 16 | MANGANESE | UGG | 104.76250 | 8 | 7660 | 1 | 217000 | 22.7 | KILOGRAMS |
| 17 | SODIUM | UGG | 44226.00000 | 8 | 7660 | 1 | 217000 | 9597.0 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 2.33333 | 9 | 7660 | 1 | 217000 | 0.5 | KILOGRAMS |
| 19 | NICKEL | UGG | 16520.87500 | 8 | 7660 | 1 | 217000 | 3585.0 | KILOGRAMS |
| 20 | NITRATE | UGG | 7130.14444 | 9 | 7660 | 1 | 217000 | 1547.2 | KILOGRAMS |
| 21 | LEAD | UGG | 440.87500 | 8 | 7660 | 1 | 217000 | 95.7 | KILOGRAMS |
| 22 | SULPHATE | UGG | 800.00000 | 3 | 7660 | 1 | 217000 | 173.6 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 81333.33333 | 9 | 7660 | 1 | 217000 | 17649.3 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 12.40000 | 2 | 7660 | 1 | 217000 | 2.7 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 11.77778 | 9 | 7660 | 1 | 217000 | 2.6 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 26785.55556 | 9 | 7660 | 1 | 217000 | 5812.5 | KILOGRAMS |
| 27 | URANIUM | UGG | 18036.87500 | 8 | 7660 | 1 | 217000 | 3914.0 | KILOGRAMS |
| 28 | ZINC | UGG | 230.55000 | 8 | 7660 | 1 | 217000 | 50.0 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 11. WATER FROM TOP 4 FEET IN BASIN

VOLUME = 8.1E6 LITERS

| OBS | TESTNAME | UNITS | RESULT | N | ENV11 | AMOUNT |
|---|---|---|---|---|---|---|
| 1 | SILVER | MGL | 0.00100 | 1 | 0.0 | KILOGRAMS |
| 2 | ALUMINUM | MGL | 151.28333 | 6 | 1225.4 | KILOGRAMS |
| 3 | GROSS ALPHA | PCL | 66.00000 | 1 | 0.5 | MILLICURIES |
| 4 | ARSENIC | MGL | 0.00100 | 1 | 0.0 | KILOGRAMS |
| 5 | BORON | UGL | 1.0u000 | 1 | 0.0 | KILOGRAMS |
| 6 | BARIUM | MGL | 0.00400 | 1 | 0.0 | KILOGRAMS |
| 7 | BERYLLIUM | MGL | 0.00200 | 1 | 0.0 | KILOGRAMS |
| 8 | GROSS BETA | PCL | 41.00000 | 1 | 0.3 | MILLICURIES |
| 9 | BROMIDE | MGL | 0.10000 | 2 | 0.8 | KILOGRAMS |
| 10 | CALCIUM | MGL | 1.84067 | 6 | 14.9 | KILOGRAMS |
| 11 | CADMIUM | MGL | 0.00333 | 6 | 0.0 | KILOGRAMS |
| 12 | CHLORIDE | MGL | 21.50714 | 7 | 174.2 | KILOGRAMS |
| 13 | CONDUCTIVITY | UMHC | 2801.66667 | 6 | . | |
| 14 | CHROMIUM | MGL | 0.00400 | 6 | 0.0 | KILOGRAMS |
| 15 | COPPER | MGL | 0.01183 | 6 | 0.1 | KILOGRAMS |
| 16 | CYANIDE | UGL | 14.20000 | 1 | 0.1 | KILOGRAMS |
| 17 | FLUORINE | MGL | 0.75000 | 2 | 6.1 | KILOGRAMS |
| 18 | IRON | MGL | 0.04750 | 6 | 0.4 | KILOGRAMS |
| 19 | MERCURY | UGL | 0.70000 | 7 | 0.0 | KILOGRAMS |
| 20 | POTASSIUM | MGL | 0.97050 | 6 | 7.9 | KILOGRAMS |
| 21 | MAGNESIUM | MGL | 0.29950 | 6 | 2.4 | KILOGRAMS |
| 22 | MANGANESE | MGL | 0.00533 | 6 | 0.0 | KILOGRAMS |
| 23 | SODIUM | MGL | 531.00000 | 6 | 4301.1 | KILOGRAMS |
| 24 | AMMONIA NITROGEN | MGL | 1.17700 | 7 | 9.5 | KILOGRAMS |
| 25 | NICKEL | MGL | 0.02867 | 6 | 0.2 | KILOGRAMS |
| 26 | NITRITE | MGL | 2.00000 | 1 | 16.2 | KILOGRAMS |
| 27 | NITRATE | MGL | 172.28571 | 7 | 1395.5 | KILOGRAMS |
| 28 | LEAD | MGL | 0.05917 | 6 | 0.5 | KILOGRAMS |
| 29 | PH | PH | 10.81667 | 6 | . | |
| 30 | ANTIMONY | MGL | 0.05500 | 1 | 0.4 | KILOGRAMS |
| 31 | SELENIUM | MGL | 0.00100 | 1 | 0.0 | KILOGRAMS |
| 32 | TIN | MGL | 0.06200 | 1 | 0.5 | KILOGRAMS |
| 33 | SULPHATE | MGL | 10.00000 | 2 | 81.0 | KILOGRAMS |
| 34 | SPECIFIC GRAVITY | GCC | 1.00857 | 7 | . | |
| 35 | SULFIDE | MGL | 1.00000 | 1 | 8.1 | KILOGRAMS |
| 36 | TOTAL DISSOLVED SOLIDS | MGL | 2059.66667 | 6 | 16683.3 | KILOGRAMS |
| 37 | TEMP | C | 7.38333 | 6 | . | |
| 38 | TITANIUM | MGL | 0.00700 | 1 | 0.1 | KILOGRAMS |
| 39 | ORGANIC CARBON | MGL | 4.60857 | 7 | 37.3 | KILOGRAMS |
| 40 | TOTAL RADIUM | PCL | 1.00000 | 1 | 0.0 | MILLICURIES |
| 41 | ORGANIC HALOGENS | MGL | 2.88456 | 7 | 23.4 | KILOGRAMS |
| 42 | TOTAL PHOSPHATES | MGL | 0.02200 | 7 | 0.2 | KILOGRAMS |
| 43 | URANIUM | MGL | 1.36667 | 6 | 11.1 | KILOGRAMS |
| 44 | ZINC | MGL | 0.00300 | 6 | 0.0 | KILOGRAMS |

TABLE 6-12.
INORGANIC INVENTORY CALCULATIONS FOR AREA 12. WATER FROM BOTTOM 10 FEETIN BASIN

VOLUME = 2.2E7 LITERS

| OBS | TESTNAME | UNITS | RESULT | N | ENV12 | AMOUNT |
|---|---|---|---|---|---|---|
| 1 | SILVER | MGL | 0.00400 | 1 | 0 | KILOGRAMS |
| 2 | ALUMINUM | MGL | 609.66667 | 12 | 13413 | KILOGRAMS |
| 3 | GROSS ALPHA | PCL | 4991.00000 | 1 | 110 | MILLICURIES |
| 4 | ARSENIC | MGL | 0.00100 | 1 | 0 | KILOGRAMS |
| 5 | BORON | UGL | 1.65000 | 1 | 0 | KILOGRAMS |
| 6 | BARIUM | MGL | 0.00400 | 1 | 0 | KILOGRAMS |
| 7 | BERYLLIUM | MGL | 0.00200 | 1 | 0 | KILOGRAMS |
| 8 | GROSS BETA | PCL | 2188.00000 | 1 | 48 | MILLICURIES |
| 9 | BROMIDE | MGL | 0.10000 | 1 | 2 | KILOGRAMS |
| 10 | CALCIUM | MGL | 0.80842 | 12 | 18 | KILOGRAMS |
| 11 | CADMIUM | MGL | 0.01367 | 12 | 0 | KILOGRAMS |
| 12 | CHLORIDE | MGL | 87.79462 | 13 | 1931 | KILOGRAMS |
| 13 | CONDUCTIVITY | UMHC | 8821.66667 | 12 | . | |
| 14 | CHROMIUM | MGL | 0.00417 | 12 | 0 | KILOGRAMS |
| 15 | COPPER | MGL | 0.14792 | 12 | 3 | KILOGRAMS |
| 16 | CYANIDE | UGL | 72.20000 | 1 | 2 | KILOGRAMS |
| 17 | FLUORINE | MGL | 6.50000 | 1 | 143 | KILOGRAMS |
| 18 | IRON | MGL | 0.19475 | 12 | 4 | KILOGRAMS |
| 19 | MERCURY | UGL | 0.43462 | 13 | 0 | KILOGRAMS |
| 20 | POTASSIUM | MGL | 2.28333 | 12 | 50 | KILOGRAMS |
| 21 | MAGNESIUM | MGL | 0.10058 | 12 | 2 | KILOGRAMS |
| 22 | MANGANESE | MGL | 0.01867 | 12 | 0 | KILOGRAMS |
| 23 | SODIUM | MGL | 1815.58333 | 12 | 39943 | KILOGRAMS |
| 24 | AMMONIA NITROGEN | MGL | 5.51231 | 13 | 121 | KILOGRAMS |
| 25 | NICKEL | MGL | 0.16475 | 12 | 4 | KILOGRAMS |
| 26 | NITRITE | MGL | 48.00000 | 1 | 1056 | KILOGRAMS |
| 27 | NITRATE | MGL | 349.66667 | 12 | 7693 | KILOGRAMS |
| 28 | LEAD | MGL | 0.22483 | 12 | 5 | KILOGRAMS |
| 29 | PH | PH | 11.94583 | 12 | . | |
| 30 | ANTIMONY | MGL | 0.53300 | 1 | 12 | KILOGRAMS |
| 31 | SELENIUM | MGL | 0.00100 | 1 | 0 | KILOGRAMS |
| 32 | TIN | MGL | 0.43000 | 1 | 9 | KILOGRAMS |
| 33 | SULPHATE | MGL | 63.00000 | 2 | 1386 | KILOGRAMS |
| 34 | SPECIFIC GRAVITY | GCC | 1.00362 | 13 | . | |
| 35 | SULFIDE | MGL | 1.00000 | 1 | 22 | KILOGRAMS |
| 36 | TOTAL DISSOLVED SOLIDS | MGL | 6305.85714 | 14 | 138729 | KILOGRAMS |
| 37 | TEMP | C | 12.26667 | 12 | . | |
| 38 | TITANIUM | MGL | 0.00300 | 1 | 0 | KILOGRAMS |
| 39 | ORGANIC CARBON | MGL | 19.56462 | 13 | 430 | KILOGRAMS |
| 40 | TOTAL RADIUM | PCL | 4.00000 | 1 | 0 | MILLICURIES |
| 41 | ORGANIC HALOGENS | MGL | 0.34844 | 12 | 8 | KILOGRAMS |
| 42 | TOTAL PHOSPHATES | MGL | 0.07312 | 13 | 2 | KILOGRAMS |
| 43 | URANIUM | MGL | 1.66667 | 15 | 37 | KILOGRAMS |
| 44 | ZINC | MGL | 0.00825 | 12 | 0 | KILOGRAMS |

TABLE 6-12.
TOTAL CALCULATED INORGANIC INVENTORY

| TESTNAME | ENV1 | ENV2 | ENV3 | ENV4 | ENV5 | ENV6 | ENV7 | ENV8 | ENV9 | ENV10 | ENV11 | ENV12 | ENVALL | UNITS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SILVER | 2.3 | 13 | 15 | 0 | . | 1 | 3 | 0 | 0 | 1.2 | 0.0 | 0 | 36 | KILOGRAMS |
| ALUMINUM | 19046.1 | 150614 | 351601 | 109378 | 53208.7 | 8051 | 20696 | 1201 | 17648 | 22324.7 | 1225.4 | 13413 | 768408 | KILOGRAMS |
| GROSS ALPHA | 10.2 | 80 | 131 | 130 | . | 119 | 30 | 19 | 96 | 641.6 | 0.5 | 110 | 1367 | MILLICURIE |
| ARSENIC | 0.3 | 2 | 2 | 12 | . | 0 | 1 | 0 | 1 | 0.0 | 0.0 | 0 | 19 | KILOGRAMS |
| BORON | . | . | . | . | . | . | . | . | . | . | 0.0 | 0 | . | KILOGRAMS |
| BARIUM | 194.4 | 1511 | 2799 | 481 | . | 7 | 101 | 2 | 14 | 34.1 | 0.0 | 0 | 5143 | KILOGRAMS |
| BERYLLIUM | . | . | . | . | . | . | . | . | . | . | 0.0 | 0 | . | KILOGRAMS |
| GROSS BETA | 12.0 | 88 | 105 | 233 | . | 155 | 40 | 27 | 110 | 1844.4 | 0.3 | 48 | 2663 | MILLICURIE |
| BROMIDE | . | . | . | . | . | . | . | . | . | . | 0.8 | 2 | . | KILOGRAMS |
| CALCIUM | 384.5 | 11004 | 13314 | 7816 | 3980.9 | 2102 | 1255 | 506 | 748 | 6006.3 | 14.9 | 18 | 47149 | KILOGRAMS |
| CADMIUM | 2.3 | 13 | 15 | 9 | 5.0 | 0 | 2 | 0 | 5 | 0.6 | 0.0 | 0 | 52 | KILOGRAMS |
| CHLORIDE | 26.3 | 269 | 336 | 182 | 136.1 | 4 | 33 | 1 | 357 | 79.0 | 174.2 | 1931 | 3529 | KILOGRAMS |
| CONDUCTIVITY | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| CHROMIUM | 15.6 | 142 | 305 | 63 | 61.6 | 4 | 34 | 3 | 80 | 24.0 | 0.0 | 0 | 731 | KILOGRAMS |
| COPPER | 6.2 | 83 | 175 | 19 | 11.9 | 8 | 5 | 2 | 14 | 50.1 | 0.1 | 3 | 377 | KILOGRAMS |
| CYANIDE | . | . | . | . | . | . | . | . | . | . | 0.1 | 2 | . | KILOGRAMS |
| FLUORINE | . | . | . | . | . | . | . | . | . | . | 6.1 | 143 | . | KILOGRAMS |
| IRON | 2705.8 | 30647 | 56413 | 43266 | 49508.5 | 214 | 21091 | 32 | 72670 | 1279.8 | 0.4 | 4 | 277832 | KILOGRAMS |
| MERCURY | 0.5 | 3 | 3 | 2 | 1.2 | 0 | 0 | 0 | 1 | 0.3 | 0.0 | 0 | 11 | KILOGRAMS |
| POTASSIUM | 182.0 | 1842 | 3867 | 963 | 501.6 | 15 | 167 | 2 | 224 | 36.8 | 7.9 | 50 | 7858 | KILOGRAMS |
| MAGNESIUM | 220.5 | 2138 | 4007 | 1201 | 497.7 | 177 | 131 | 31 | 102 | 931.8 | 2.4 | 2 | 9441 | KILOGRAMS |
| MANGANESE | 183.7 | 1140 | 1667 | 1988 | 697.8 | 23 | 73 | 1 | 71 | 22.7 | 0.0 | 0 | 5868 | KILOGRAMS |
| SODIUM | 311.4 | 3406 | 4066 | 4741 | 2557.8 | 552 | 936 | 97 | 6051 | 9597.0 | 4301.1 | 39943 | 76558 | KILOGRAMS |
| AMMONIA NITROGEN | 17.9 | 404 | 577 | 84 | 32.9 | 3 | 24 | 0 | 61 | 0.5 | 9.5 | 121 | 1336 | KILOGRAMS |
| NICKEL | 4.7 | 87 | 103 | 372 | 137.8 | 595 | 49 | 81 | 53 | 3585.0 | 0.2 | 4 | 5071 | KILOGRAMS |
| NITRITE | . | . | . | . | . | . | . | . | . | . | 16.2 | 1056 | . | KILOGRAMS |
| NITRATE | 14.8 | 95 | 18 | 173 | 74.9 | 43 | 73 | 5 | 192 | 1547.2 | 1395.5 | 7693 | 11325 | KILOGRAMS |
| LEAD | 6.2 | 85 | 155 | 33 | 32.1 | 11 | 19 | 3 | 55 | 95.7 | 0.5 | 5 | 500 | KILOGRAMS |
| PH | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| ANTIMONY | . | . | . | . | . | . | . | . | . | . | 0.4 | 12 | . | KILOGRAMS |
| SELENIUM | . | . | . | . | . | . | . | . | . | . | 0.0 | 0 | . | KILOGRAMS |
| TIN | . | . | . | . | . | . | . | . | . | . | 0.5 | 9 | . | KILOGRAMS |
| SULPHATE | 75.5 | 389 | 461 | 314 | . | 32 | 52 | 3 | 81 | 173.6 | 81.0 | 1386 | 3049 | KILOGRAMS |
| SPECIFIC GRAVITY | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| SULFIDE | . | . | . | . | . | . | . | . | . | . | 8.1 | 22 | . | KILOGRAMS |
| TOTAL DISSOLVED SOLIDS | . | . | . | . | . | . | . | . | . | . | 16683.3 | 138729 | . | KILOGRAMS |
| TEMP | . | . | . | . | . | . | . | . | . | . | . | . | . | |
| TITANIUM | . | . | . | . | . | . | . | . | . | . | 0.1 | 0 | . | KILOGRAMS |
| ORGANIC CARBON | 15430.0 | 113242 | 104379 | 35639 | 13598.4 | 7856 | 4413 | 1621 | 5337 | 17649.3 | 37.3 | 430 | 319632 | KILOGRAMS |
| TOTAL RADIUM | 15.1 | 116 | 148 | 105 | . | 1 | 26 | 0 | 35 | 2.7 | 0.0 | 0 | 448 | MILLICURIE |
| ORGANIC HALOGENS | 22.6 | 149 | 172 | 97 | 53.8 | 1 | 23 | 0 | 57 | 2.6 | 23.4 | 8 | 609 | KILOGRAMS |
| TOTAL PHOSPHATES | 311.9 | 3258 | 3793 | 4103 | 2207.3 | 1842 | 714 | 351 | 2050 | 5812.5 | 0.2 | 2 | 24445 | KILOGRAMS |
| URANIUM | 22.6 | 190 | 147 | 780 | 334.1 | 439 | 84 | 86 | 885 | 3914.0 | 11.1 | 37 | 6930 | KILOGRAMS |
| ZINC | 6.6 | 82 | 154 | 55 | 27.9 | 7 | 12 | 1 | 19 | 50.0 | 0.0 | 0 | 414 | KILOGRAMS |

TABLE 6-12.
TOTAL CALCULATED BACKGROUND INVENTORY

SEDIMENT SAMPLES FROM 800 SERIES CORES
VOLUMN = 1,096,000 CUBIC FEET, DENSITY = 1.5, MASS = 46,500,000 KILOGRAMS

| OBS | TESTNAME | UNITS | RESULT | N | VOL | DEN | KILOGRAM | ENV13 | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SILVER | UGG | 1.00000 | 3 | 1095975 | 1.5 | 46500000 | 47 | KILOGRAMS |
| 2 | ALUMINUM | UGG | 8239.00000 | 31 | 1095975 | 1.5 | 46500000 | 383114 | KILOGRAMS |
| 3 | GROSS ALPHA | PCG | 6.85000 | 2 | 1095975 | 1.5 | 46500000 | 319 | MILLICURIES |
| 4 | ARSENIC | UGG | 2.70000 | 3 | 1095975 | 1.5 | 46500000 | 126 | KILOGRAMS |
| 5 | BARIUM | UGG | 10.46667 | 3 | 1095975 | 1.5 | 46500000 | 487 | KILOGRAMS |
| 6 | GROSS BETA | PCG | 5.45000 | 2 | 1095975 | 1.5 | 46500000 | 253 | MILLICURIES |
| 7 | CALCIUM | UGG | 93.87419 | 31 | 1095975 | 1.5 | 46500000 | 4365 | KILOGRAMS |
| 8 | CADMIUM | UGG | 1.00000 | 31 | 1095975 | 1.5 | 46500000 | 47 | KILOGRAMS |
| 9 | CHLORIDE | UGG | 10.84259 | 27 | 1095975 | 1.5 | 46500000 | 504 | KILOGRAMS |
| 10 | CHROMIUM | UGG | 26.70968 | 31 | 1095975 | 1.5 | 46500000 | 1242 | KILOGRAMS |
| 11 | COPPER | UGG | 2.00000 | 31 | 1095975 | 1.5 | 46500000 | 93 | KILOGRAMS |
| 12 | IRON | UGG | 22254.51613 | 31 | 1095975 | 1.5 | 46500000 | 1034835 | KILOGRAMS |
| 13 | MERCURY | UGG | 0.20143 | 28 | 1095975 | 1.5 | 46500000 | 9 | KILOGRAMS |
| 14 | POTASSIUM | UGG | 61.44062 | 32 | 1095975 | 1.5 | 46500000 | 2857 | KILOGRAMS |
| 15 | MAGNESIUM | UGG | 70.24194 | 31 | 1095975 | 1.5 | 46500000 | 3266 | KILOGRAMS |
| 16 | MANGANESE | UGG | 38.72258 | 31 | 1095975 | 1.5 | 46500000 | 1801 | KILOGRAMS |
| 17 | SODIUM | UGG | 79.04839 | 31 | 1095975 | 1.5 | 46500000 | 3676 | KILOGRAMS |
| 18 | AMMONIA NITROGEN | UGG | 1.99750 | 28 | 1095975 | 1.5 | 46500000 | 93 | KILOGRAMS |
| 19 | NICKEL | UGG | 2.12258 | 31 | 1095975 | 1.5 | 46500000 | 99 | KILOGRAMS |
| 20 | NITRATE | UGG | 0.66556 | 27 | 1095975 | 1.5 | 46500000 | 31 | KILOGRAMS |
| 21 | LEAD | UGG | 3.20968 | 31 | 1095975 | 1.5 | 46500000 | 149 | KILOGRAMS |
| 22 | SULPHATE | UGG | 5.95000 | 2 | 1095975 | 1.5 | 46500000 | 277 | KILOGRAMS |
| 23 | ORGANIC CARBON | UGG | 3028.51852 | 27 | 1095975 | 1.5 | 46500000 | 140826 | KILOGRAMS |
| 24 | TOTAL RADIUM | PCG | 3.90000 | 2 | 1095975 | 1.5 | 46500000 | 181 | MILLICURIES |
| 25 | ORGANIC HALOGENS | UGG | 29.23077 | 26 | 1095975 | 1.5 | 46500000 | 1359 | KILOGRAMS |
| 26 | TOTAL PHOSPHATES | UGG | 151.37931 | 29 | 1095975 | 1.5 | 46500000 | 7039 | KILOGRAMS |
| 27 | URANIUM | UGG | 10.00000 | 31 | 1095975 | 1.5 | 46500000 | 465 | KILOGRAMS |
| 28 | ZINC | UGG | 2.41452 | 31 | 1095975 | 1.5 | 46500000 | 112 | KILOGRAMS |

TABLE 6-13.

INORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, COMPLETE ROUND

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SILVER MG/L | ALUMINIUM MG/L | GROSS ALPHA PC/L | ARSENIC MG/L | BORON MG/L | BARIUM MG/L | BERYLLIUM MG/L | GROSS BETA PC/L | BROMIDE MG/L |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| INFLUENT | 030785 | 0.012 | 14.600 | 193.000 | -0.001 | -0.010 | 0.020 | -0.002 | 2552.000 | -0.100 |
| EFFLUENT | 030785 | 0.004 | 38.400 | 184.000 | -0.001 | -0.010 | -0.004 | -0.002 | 208.000 | -0.100 |

| | | CALCIUM MG/L | CADMIUM MG/L | CHLORIDE MG/L | SPECIFIC CONDUCTANCE UMHC | CHROMIUM MG/L | COPPER MG/L | CYANIDE UG/L | FLUORIDE MG/L | IRON MG/L |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| INFLUENT | 030785 | 9.300 | 0.004 | 12.100 | 2240.000 | 0.114 | 0.167 | 16.000 | 1.440 | 2.370 |
| EFFLUENT | 030785 | 1.850 | -0.002 | 4.950 | 1150.000 | -0.004 | 0.011 | 27.000 | 1.920 | 0.110 |

| | | MERCURY UG/L | POTASSIUM MG/L | MAGNESIUM MG/L | MANGANESE MG/L | SODIUM MG/L | AMMONIA NITROGEN MG/L | NICKEL MG/L | NITRITE AS NITROGEN MG/L | NITRATE AS NITROGEN MG/L |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| INFLUENT | 030785 | 0.610 | 426.000 | 0.621 | 0.066 | 251.000 | 1.960 | 0.247 | -0.500 | 235.000 |
| EFFLUENT | 030785 | 0.260 | 61.800 | 0.130 | 0.005 | 232.000 | 1.120 | 0.533 | -0.500 | 125.000 |

| | | LEAD MG/L | PH | ANTIMONY MG/L | SELENIUM MG/L | TIN MG/L | SULPHATE MG/L | SPECIFIC GRAVITY | SULFIDE MG/L | TOTAL DISSOLVED SOLIDS MG/L |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| INFLUENT | 030785 | 0.396 | 9.200 | 0.052 | -0.001 | -0.010 | | 0.991 | -1.000 | 2486.000 |
| EFFLUENT | 030785 | 0.008 | 9.300 | 0.030 | -0.001 | 0.020 | 20.000 | 0.990 | -1.000 | 1134.000 |

| | | TITANIUM MG/L | TOTAL ORGANIC CARBON MG/L | TOTAL RADIUM PC/L | TOTAL ORGANIC HALOGENS UG/L | TOTAL PHOSPHATES MG/L | URANIUM MG/L | ZINC MG/L |
|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | |
| INFLUENT | 030785 | 0.024 | 27.680 | 4.000 | 877.400 | 70.860 | 20.000 | 0.212 |
| EFFLUENT | 030785 | -0.010 | 3.766 | -1.000 | 31.700 | 12.190 | 17.000 | 0.010 |

INORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, LIMITED ANALYSES

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINIUM MG/L | CALCIUM MG/L | CADMIUM MG/L | CHLORIDE MG/L | SPECIFIC CONDUCTANCE UMHC | CHROMIUM MG/L | COPPER MG/L | IRON MG/L | MERCURY UG/L |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| INFLUENT | 030785 | 14.600 | 9.300 | 0.004 | 12.100 | 2240.000 | 0.114 | 0.167 | 2.370 | 0.610 |
| | 031585 | 82.100 | 0.171 | 0.003 | 9.300 | 2390.000 | 0.023 | 0.054 | 0.870 | -0.200 |
| | 032185 | 93.300 | 0.046 | -0.001 | 7.300 | 7910.000 | -0.004 | 0.015 | 0.079 | -0.200 |
| | 032985 | 402.000 | 0.084 | 0.007 | 7.100 | 18490.000 | 0.020 | 0.220 | 2.110 | 0.250 |
| | 040485 | 367.000 | 0.152 | 0.007 | 12.630 | 8690.000 | 0.056 | 0.322 | 3.350 | 0.220 |
| | 041185 | 142.000 | 0.228 | 0.003 | 22.340 | 2540.000 | 0.014 | 0.116 | 1.430 | 0.380 |
| | 041885 | 186.000 | 0.066 | 0.004 | 2.930 | 7570.000 | 0.025 | 0.116 | 1.420 | 0.220 |
| | 042585 | 188.000 | 1.580 | 0.004 | 7.770 | 10410.000 | -0.004 | 0.021 | 0.364 | -0.200 |
| | 050285 | 129.000 | 5.760 | 0.005 | 11.660 | 3300.000 | 0.073 | 0.086 | 1.300 | -0.200 |
| | 050985 | 208.000 | 14.900 | 0.005 | 73.000 | 2690.000 | 0.072 | 0.429 | 6.320 | 0.380 |
| EFFLUENT | 030785 | 30.400 | 1.850 | -0.002 | 4.950 | 1150.000 | -0.004 | 0.011 | 0.110 | 0.260 |
| | 031485 | 68.800 | 0.026 | -0.001 | 5.400 | 1709.000 | -0.004 | 0.010 | 0.041 | -0.200 |
| | 032185 | 173.000 | 0.073 | 0.005 | 7.200 | 1877.000 | 0.022 | 0.122 | 1.390 | 0.220 |
| | 032985 | 44.900 | 0.031 | 0.003 | 7.500 | 2320.000 | -0.004 | 0.011 | 0.026 | -0.200 |
| | 040485 | 155.000 | 0.030 | 0.003 | 20.400 | 2980.000 | -0.004 | 0.025 | 0.203 | -0.200 |
| | 041185 | 226.000 | 0.027 | 0.003 | 5.830 | 3570.000 | -0.004 | 0.028 | 0.130 | 0.250 |
| | 041885 | 163.000 | 0.022 | 0.002 | 6.740 | 3390.000 | -0.004 | 0.027 | 0.062 | -0.200 |
| | 042585 | 137.000 | 0.912 | 0.004 | 16.510 | 945.000 | -0.004 | 0.012 | 0.037 | -0.200 |
| | 050285 | 181.000 | 0.928 | 0.004 | 19.420 | 2900.000 | -0.004 | 0.014 | 0.050 | -0.200 |
| | 050985 | 152.000 | 1.610 | 0.006 | 24.000 | 3290.000 | 0.005 | 0.026 | 0.215 | 0.300 |

INORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, LIMITED ANALYSES

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | POTASSIUM MG/L | MAGNESIUM MG/L | MANGANESE MG/L | SODIUM MG/L | AMMONIA NITROGEN MG/L | NICKEL MG/L | NITRITE AS NITROGEN MG/L | NITRATE AS NITROGEN MG/L | LEAD MG/L |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| INFLUENT | 030785 | 426.000 | 0.621 | 0.066 | 251.000 | 1.960 | 0.247 | -0.500 | 235.000 | 0.396 |
| | 031585 | 71.400 | 0.088 | 0.015 | 589.000 | 1.400 | 2.807 | . | 380.000 | 0.026 |
| | 032185 | 90.300 | 0.019 | 0.005 | 361.000 | 1.120 | 0.169 | . | 425.000 | 0.011 |
| | 032985 | 4041.000 | 0.083 | 0.039 | 466.000 | 2.240 | 11.690 | . | 218.200 | 0.259 |
| | 040485 | 1675.000 | 0.108 | 0.051 | 658.000 | 1.400 | 11.310 | . | 196.640 | 1.634 |
| | 041185 | 313.000 | 0.125 | 0.029 | 383.000 | 1.680 | 10.280 | . | 185.000 | 0.642 |
| | 041885 | 1926.000 | 0.084 | 0.034 | 270.000 | 1.400 | 6.843 | . | 758.950 | 0.412 |
| | 042585 | 1942.000 | 0.099 | 0.018 | 171.000 | 2.800 | 0.480 | . | 390.800 | 0.102 |
| | 050285 | 93.700 | 0.660 | 0.049 | 725.000 | 1.400 | 9.720 | . | 456.000 | 0.177 |
| | 050985 | 7.960 | 2.750 | 0.215 | 682.000 | 3.360 | 44.100 | . | 200.600 | 0.228 |
| EFFLUENT | 030785 | 62.800 | 0.130 | 0.005 | 232.000 | 1.120 | 0.533 | -0.500 | 125.000 | 0.008 |
| | 031485 | 90.300 | 0.026 | 0.003 | 304.000 | 0.280 | 0.245 | . | 150.000 | 0.006 |
| | 032185 | 1596.000 | 0.073 | 0.032 | 333.000 | -0.280 | 3.145 | . | 143.900 | 0.934 |
| | 032985 | 225.000 | 0.035 | 0.003 | 490.000 | 0.280 | 0.117 | . | 165.000 | 0.011 |
| | 040485 | 236.000 | 0.016 | 0.006 | 526.000 | 3.920 | 0.542 | . | 1133.800 | 0.018 |
| | 041185 | 277.000 | 0.010 | 0.008 | 698.000 | 1.960 | 0.255 | . | 146.900 | 0.027 |
| | 041885 | 263.000 | 0.009 | 0.005 | 587.000 | 1.680 | 0.118 | . | 220.100 | 0.017 |
| | 042585 | 267.000 | 0.071 | 0.006 | 459.000 | 2.240 | 0.104 | . | 231.230 | -0.004 |
| | 050285 | 303.000 | 0.092 | 0.006 | 528.000 | 1.680 | 0.095 | . | 268.500 | 0.037 |
| | 050985 | 231.000 | 0.109 | 0.007 | 794.000 | 1.680 | 0.386 | . | 326.000 | 0.219 |

INORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, LIMITED ANALYSES

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PH | SPECIFIC GRAVITY | TOTAL DISSOLVED SOLIDS MG/L | TOTAL ORGANIC CARBON MG/L | TOTAL ORGANIC HALOGENS UG/L | TOTAL PHOSPHATES MG/L | URANIUM MG/L | ZINC MG/L |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | |
| INFLUENT | 030785 | 9.200 | 0.991 | 2486.000 | 27.680 | 877.400 | 70.860 | 20.000 | 0.212 |
| | 031585 | 10.650 | 0.994 | 6358.000 | 12.020 | 37.900 | 62.470 | 12.500 | 0.125 |
| | 032185 | 12.200 | 0.988 | 4870.000 | 4.494 | 68.300 | 1.732 | 37.500 | 0.055 |
| | 032985 | 12.400 | 0.999 | . | 21.300 | 60.600 | 45.140 | 3.500 | 0.200 |
| | 040485 | 4.400 | 0.994 | . | 4.810 | 55.400 | 30.760 | 185.000 | 0.227 |
| | 041185 | 10.720 | 0.990 | 2010.000 | 8.614 | 63.000 | 39.710 | 25.000 | 0.141 |
| | 041885 | 10.530 | 0.998 | 7044.000 | 5.860 | 34.900 | 3.370 | 3.800 | 0.123 |
| | 042585 | 12.300 | 0.991 | 5838.000 | 6.688 | 11.600 | 22.280 | 161.300 | 0.044 |
| | 050285 | 10.000 | 1.003 | 3334.000 | 8.722 | 17.400 | 92.910 | 9.300 | 0.140 |
| | 050985 | 11.800 | 0.987 | 2520.000 | 16.690 | 17.700 | 23.200 | 137.000 | 0.598 |
| EFFLUENT | 030785 | 9.300 | 0.990 | 1134.000 | 3.768 | 31.700 | 12.190 | 17.000 | 0.010 |
| | 031485 | 9.850 | 0.994 | 1538.000 | 4.180 | 104.000 | 13.870 | 18.000 | 0.006 |
| | 032185 | 10.400 | 0.993 | 1556.000 | 6.130 | 65.800 | 17.250 | 115.000 | 0.108 |
| | 032985 | 10.500 | 0.984 | 1948.000 | 3.747 | 33.700 | 22.620 | 175.000 | 0.044 |
| | 040485 | 10.600 | 0.983 | . | 12.900 | 31.400 | 32.660 | 48.500 | 0.027 |
| | 041185 | 10.900 | 0.996 | 2908.000 | 8.677 | 27.300 | 34.020 | 90.000 | 0.013 |
| | 041885 | 10.510 | 1.007 | 3326.000 | 16.100 | 22.400 | 26.390 | 42.500 | 0.005 |
| | 042585 | 10.580 | 1.002 | 2618.000 | 4.259 | 16.400 | 25.570 | 47.800 | -0.002 |
| | 050285 | 10.750 | 0.995 | 2992.000 | 3.896 | 26.900 | 23.750 | 46.800 | -0.002 |
| | 050985 | 11.000 | 0.999 | 3384.000 | 8.717 | 15.400 | 35.660 | 59.100 | 0.012 |

TABLE 6-14.
ORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, COMPLETE ROUND

RESULTS REPORTED IN MICROGRAMS PER LITER

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ALPHA-BENZENEHEXACHLORIDE | ACROLEIN | ACRYLONITRILE | ALPHA-ENDOSULFAN | ALDRIN | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO(A)ANTHRACENE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | -100.000 | -100.000 | . | . | . | . | . | . |
| INFLUENT | 030785 | -0.001 | -100.000 | -100.000 | -0.003 | -0.002 | -10.000 | -10.000 | -10.000 | -10.000 |
| EFFLUENT | 030785 | -0.001 | -100.000 | -100.000 | -0.003 | -0.002 | -10.000 | -10.000 | -10.000 | -10.000 |

| | | BENZO(A)PYRENE | BETA-BENZENEHEXACHLORIDE | BUTYLBENZYL PHTHALATE | BETA-ENDOSULFAN | BENZIDINE | BENZO(G,H,I)PERYLENE | BENZO(K)FLUORANTHENE | BROMODICHLOROMETHANE | BIS(2-CHLOROETHOXY) METHANE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | . | . | . | . | -5.000 | . |
| INFLUENT | 030785 | -20.000 | -0.002 | -10.000 | -0.002 | -40.000 | -20.000 | -20.000 | -5.000 | -20.000 |
| EFFLUENT | 030785 | -20.000 | -0.002 | -10.000 | -0.002 | -40.000 | -20.000 | -20.000 | -5.000 | -20.000 |

| | | BIS(2-CHLOROISOPROPYL) ETHER | BIS(2-CHLOROETHYL) ETHER | BIS(2-ETHYLHEXYL) PHTHALATE | TRICHLOROFLUOROMETHANE | CARBON TETRACHLORIDE | BROMOFORM | CHLOROFORM | CHRYSENE | METHYLENE CHLORIDE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | -5.000 | -5.000 | -10.000 | -5.000 | . | 31.000 |
| INFLUENT | 030785 | -20.000 | -10.000 | 433.000 | -5.000 | -5.000 | -10.000 | -5.000 | -20.000 | -5.000 |
| EFFLUENT | 030785 | -20.000 | -10.000 | -10.000 | -5.000 | -5.000 | -10.000 | -5.000 | -20.000 | 12.000 |

| | | BROMOMETHANE | CHLOROMETHANE | CHLOROBENZENE | CHLORDANE | HEXACHLOROBENZENE | HEXACHLOROCYCLOPENTADIENE | HEXACHLOROETHANE | CHLOROETHENE | CHLOROETHANE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | -10.000 | -10.000 | -5.000 | . | . | . | . | -10.000 | -10.000 |
| INFLUENT | 030785 | -10.000 | -10.000 | -5.000 | -0.015 | -10.000 | -10.000 | -10.000 | -10.000 | -10.000 |
| EFFLUENT | 030785 | -10.000 | -10.000 | -5.000 | -0.015 | -10.000 | -10.000 | -10.000 | -10.000 | -10.000 |

TABLE 6-14.
ORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, COMPLETE ROUND

RESULTS REPORTED IN MICROGRAMS PER LITER

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | BENZENE | DIBENZO(A-,H)ANTHRACENE | DELTA-BENZENEHEXACHLORIDE | DIBROMOCHLOROMETHANE | DIETHYL PHTHALATE | DIELDRIN | DIMETHYL PHTHALATE | DI-N-BUTYL PHTHALATE | DI-N-OCTYL PHTHALATE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | -5.000 | . | . | -5.000 | . | . | . | . | . |
| INFLUENT | 030785 | -5.000 | -20.000 | -0.002 | -5.000 | -10.000 | -0.002 | -10.000 | -10.000 | 14.000 |
| EFFLUENT | 030785 | -5.000 | -20.000 | -0.002 | -5.000 | -10.000 | -0.002 | -10.000 | -10.000 | -10.000 |

| | | ENDRIN ALDEHYDE | ENDRIN | ENDOSULFAN SULFATE | ETHYL BENZENE | FLUORANTHENE | FLUORENE | HEXACHLOROBUTADIENE | HEXANE | HEPTACHLOR |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | -5.000 | . | . | . | 11.000 | . |
| INFLUENT | 030785 | -0.003 | -0.002 | -0.003 | -5.000 | -10.000 | -10.000 | -10.000 | 12.000 | -0.002 |
| EFFLUENT | 030785 | -0.003 | -0.002 | -0.003 | -5.000 | -10.000 | -10.000 | -10.000 | 10.000 | -0.002 |

| | | HEPTACHLOR EPOXIDE | INDENO(1,-2,3-C,D)PYRENE | ISOPHORONE | LINDANE | TOLUENE | NAPHTHALENE | NITROBENZENE | N-NITROSODIMETHYLAMINE | NITROSODI-N-PROPYL AMINE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | . | -5.000 | . | . | . | . |
| INFLUENT | 030785 | -0.002 | -20.000 | -10.000 | -0.002 | -5.000 | -10.000 | -10.000 | -10.000 | -10.000 |
| EFFLUENT | 030785 | -0.002 | -20.000 | -10.000 | -0.002 | -5.000 | -10.000 | -10.000 | -10.000 | -10.000 |

| | | N-NITROSODIPHENYL AMINE | PCB 1016 | PCB 1221 | PCB 1232 | PCB 1242 | PCB 1248 | PCB 1254 | PCB 1260 | PENTACHLOROPHENOL |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | . | . | . | . | . | . |
| INFLUENT | 030785 | -10.000 | -0.034 | -0.133 | -0.062 | -0.036 | -0.023 | -0.013 | -0.012 | -10.000 |
| EFFLUENT | 030785 | -10.000 | -0.034 | -0.133 | -0.062 | -0.036 | -0.023 | -0.013 | -0.012 | -10.000 |

TABLE 6-14.
ORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, COMPLETE ROUND

RESULTS REPORTED IN MICROGRAMS PER LITER

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PHENANTHRENE | PHENOL | 2,2-BIS(PARACHLOROPHENOXYL)-1,1 CL,C2H2 | 2,2-BIS(PARACHLOROPHENOXYL)-1,1 CL,C2 | 2,2-BIS(PARACHLOROPHENOXYL)-111 CL,C2H | PYRENE | 1,1,2,2-TETRACHLOROETHANE | TETRACHLOROETHYLENE | TRICHLOROETHYLENE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | . | . | . | -10.000 | -5.000 | 6.000 |
| INFLUENT | 030785 | -10.000 | -10.000 | -0.001 | -0.001 | -0.003 | -10.000 | -10.000 | -5.000 | -5.000 |
| EFFLUENT | 030785 | -10.000 | -10.000 | -0.001 | -0.001 | -0.003 | -10.000 | -10.000 | -5.000 | -5.000 |

| | | TOXAPHENE | TRANS-1,2-DICHLOROETHENE | UNK001 | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,1,1-TRICHLOROETHANE | 1,1,2-TRICHLOROETHANE | 1,2-DICHLOROBENZENE | 1,2-DICHLOROETHANE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | -5.000 | . | -5.000 | -5.000 | -5.000 | -5.000 | . | -1.000 |
| INFLUENT | 030785 | -0.437 | -5.000 | . | 5.000 | -5.000 | 183.000 | -5.000 | -10.000 | -1.000 |
| EFFLUENT | 030785 | -0.437 | -5.000 | 30.000 | -5.000 | -5.000 | 73.000 | -5.000 | -10.000 | -1.000 |

| | | 1,2-DICHLOROPROPANE | 1,2-DIPHENYLHYDRAZINE | 1,2,3-TRICHLOROBENZENE | 1,3-DICHLOROBENZENE | 1,3-DICHLOROPROPYLENE | 1,4-DICHLOROBENZENE | 2-(2-N-BUTOXYETHOXY) ETHANOL | 2-BUTOXYETHANOL | 2-CHLOROETHYLVINYL ETHER |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | -10.000 | . | . | . | -5.000 | . | . | . | -10.000 |
| INFLUENT | 030785 | -10.000 | -20.000 | -10.000 | -10.000 | -5.000 | -10.000 | . | 34.000 | -10.000 |
| EFFLUENT | 030785 | -10.000 | -20.000 | -10.000 | -10.000 | -5.000 | -10.000 | 250.000 | 18.000 | -10.000 |

| | | 2-CHLOROPHENOL | 2-CHLORONAPHTHALENE | 2-NITROPHENOL | 2,4-DICHLOROPHENOL | 2,4-DIMETHYL PHENOL | 2,4-DINITROPHENOL | 2,4-DINITROTOLUENE | 2,4,6-TRICHLOROPHENOL | 2,6-DINITROTOLUENE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | . | . | . | . | . | . | . | . | . |
| INFLUENT | 030785 | -10.000 | -10.000 | -20.000 | -10.000 | -10.000 | -50.000 | -20.000 | -10.000 | -20.000 |
| EFFLUENT | 030785 | -10.000 | -10.000 | -20.000 | -10.000 | -10.000 | -50.000 | -20.000 | -10.000 | -20.000 |

| | | 3,3-DICHLOROBENZIDENE | 3,4-BENZOFLUORANTHENE | 4-BROMOPHENYLPHENYL ETHER | 4-CHLOROPHENYLPHENYL ETHER | 3-METHYL-4-CHLOROPHENOL | 4-NITROPHENOL | 2-METHYL-4,6-DINITROPHENOL |
|---|---|---|---|---|---|---|---|---|
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | |
| FB | 030785 | . | . | . | . | . | . | . |
| INFLUENT | 030785 | -20.000 | -20.000 | -10.000 | -10.000 | -10.000 | -50.000 | -20.000 |
| EFFLUENT | 030785 | -20.000 | -20.000 | -10.000 | -10.000 | -10.000 | -50.000 | -20.000 |

TABLE 6-14.
ORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, LIMITED ANALYSES

RESULTS REPORTED IN MICROGRAMS PER LITER

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ACROLEIN | ACRYLONITRILE | BROMODICHLOROMETHANE | TRICHLOROFLUOROMETHANE | CARBON TETRACHLORIDE | BROMOFORM | CHLOROFORM | METHYLENE CHLORIDE | BROMOMETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 31.000 | -10.000 |
| | 031485 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 11.000 | -10.000 |
| | 031585 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 16.000 | -10.000 |
| | 032185 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 57.000 | -10.000 |
| | 032985 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 8.000 | -10.000 |
| | 040485 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 11.000 | -10.000 |
| | 050985 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 8.000 | -10.000 |
| INFLUENT | 030785 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | -5.000 | -10.000 |
| | 031585 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 8.000 | -10.000 |
| | 032185 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 25.000 | -10.000 |
| | 032985 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | -5.000 | -10.000 |
| | 040485 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 7.000 | -10.000 |
| | 041185 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 12.000 | -10.000 |
| | 041885 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 6.000 | -10.000 |
| | 042585 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 6.000 | -10.000 |
| | 050285 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | -5.000 | -10.000 |
| | 050985 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 5.000 | -10.000 |
| EFFLUENT | 030785 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 12.000 | -10.000 |
| | 031485 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 7.000 | -10.000 |
| | 032185 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 14.000 | -10.000 |
| | 032985 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 6.000 | -10.000 |
| | 040485 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 7.000 | -10.000 |
| | 041185 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 12.000 | -10.000 |
| | 041885 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 13.000 | -10.000 |
| | 042585 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | 6.000 | -10.000 |
| | 050285 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | -5.000 | -10.000 |
| | 050985 | -100.000 | -100.000 | -5.000 | -5.000 | -5.000 | -10.000 | -5.000 | -5.000 | -10.000 |

TABLE 6-14.
ORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, LIMITED ANALYSES

RESULTS REPORTED IN MICROGRAMS PER LITER

| | | TESTNAME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | CHLOROMETHANE | CHLOROBENZENE | CHLOROETHENE | CHLOROETHANE | BENZENE | DIBROMOCHLOROMETHANE | ETHYL BENZENE | TOLUENE | 1,1,2,2-TETRACHLOROETHANE |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | |
| FB | 030785 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 031485 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 031585 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 032185 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 032985 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 040485 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 050985 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| INFLUENT | 030785 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 031585 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 032185 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 032985 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 040485 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 041185 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 041885 | -10.000 | -5.000 | -10.000 | -10.000 | 16.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 042585 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 050285 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 050985 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| EFFLUENT | 030785 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 031485 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 032185 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 032985 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 040485 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 041185 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 041885 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 042585 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 050285 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |
| | 050985 | -10.000 | -5.000 | -10.000 | -10.000 | -5.000 | -5.000 | -5.000 | -5.000 | -10.000 |

TABLE 6-14.
ORGANIC ANALYSES OF BASIN INFLUENTS AND EFFLUENTS, LIMITED ANALYSES

RESULTS REPORTED IN MICROGRAMS PER LITER

| | | TESTNAME | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TETRACHLOROETHYLENE | TRICHLOROETHYLENE | TRANS-1,2-DICHLOROETHENE | 1,1-DICHLOROETHYLENE | 1,1-DICHLOROETHANE | 1,1,1-TRICHLOROETHANE | 1,1,2-TRICHLOROETHANE | 1,2-DICHLOROETHANE | 1,2-DICHLOROPROPANE | 1,3-DICHLOROPROPYLENE | 2-CHLOROETHYLVINYL ETHER |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| SERIES | SAMPLE DATE | | | | | | | | | | | |
| FB | 030785 | -5.000 | 6.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 031485 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 031585 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 032185 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 032985 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 040485 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 050985 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| INFLUENT | 030785 | -5.000 | -5.000 | -5.000 | 5.000 | -5.000 | 183.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 031585 | -5.000 | 6.000 | -5.000 | 8.000 | -5.000 | 218.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 032185 | 41.000 | 51.000 | -5.000 | 9.000 | -5.000 | 225.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 032985 | 5.000 | 5.000 | -5.000 | 6.000 | -5.000 | 113.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 040485 | 8.000 | 7.000 | -5.000 | -5.000 | -5.000 | 78.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 041185 | 5.000 | 7.000 | -5.000 | -5.000 | -5.000 | 217.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 041885 | 9.000 | -5.000 | -5.000 | -5.000 | -5.000 | 15.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 042585 | 5.000 | 7.000 | -5.000 | -5.000 | -5.000 | 183.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 050285 | 7.000 | -5.000 | -5.000 | -5.000 | -5.000 | 66.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 050985 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | 71.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| EFFLUENT | 030785 | -5.000 | -5.000 | -5.000 | -5.000 | -5.000 | 73.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 031485 | 26.000 | 30.000 | -5.000 | 6.000 | -5.000 | 181.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 032185 | 5.000 | 7.000 | -5.000 | -5.000 | -5.000 | 120.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 032985 | 10.000 | 16.000 | -5.000 | 11.000 | -5.000 | 161.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 040485 | 6.000 | 17.000 | -5.000 | 16.000 | -5.000 | 189.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 041185 | 8.000 | 15.000 | -5.000 | 26.000 | -5.000 | 283.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 041885 | 8.000 | 28.000 | -5.000 | 15.000 | -5.000 | 167.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 042585 | 6.000 | 13.000 | -5.000 | -5.000 | -5.000 | 66.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 050285 | 9.000 | 30.000 | -5.000 | 5.000 | -5.000 | 115.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |
| | 050985 | 6.000 | 14.000 | -5.000 | 8.000 | -5.000 | 114.000 | -5.000 | -1.000 | -10.000 | -5.000 | -10.000 |

TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ALUMINUM UNITS=UGG

BLOCK CHART OF RESULT

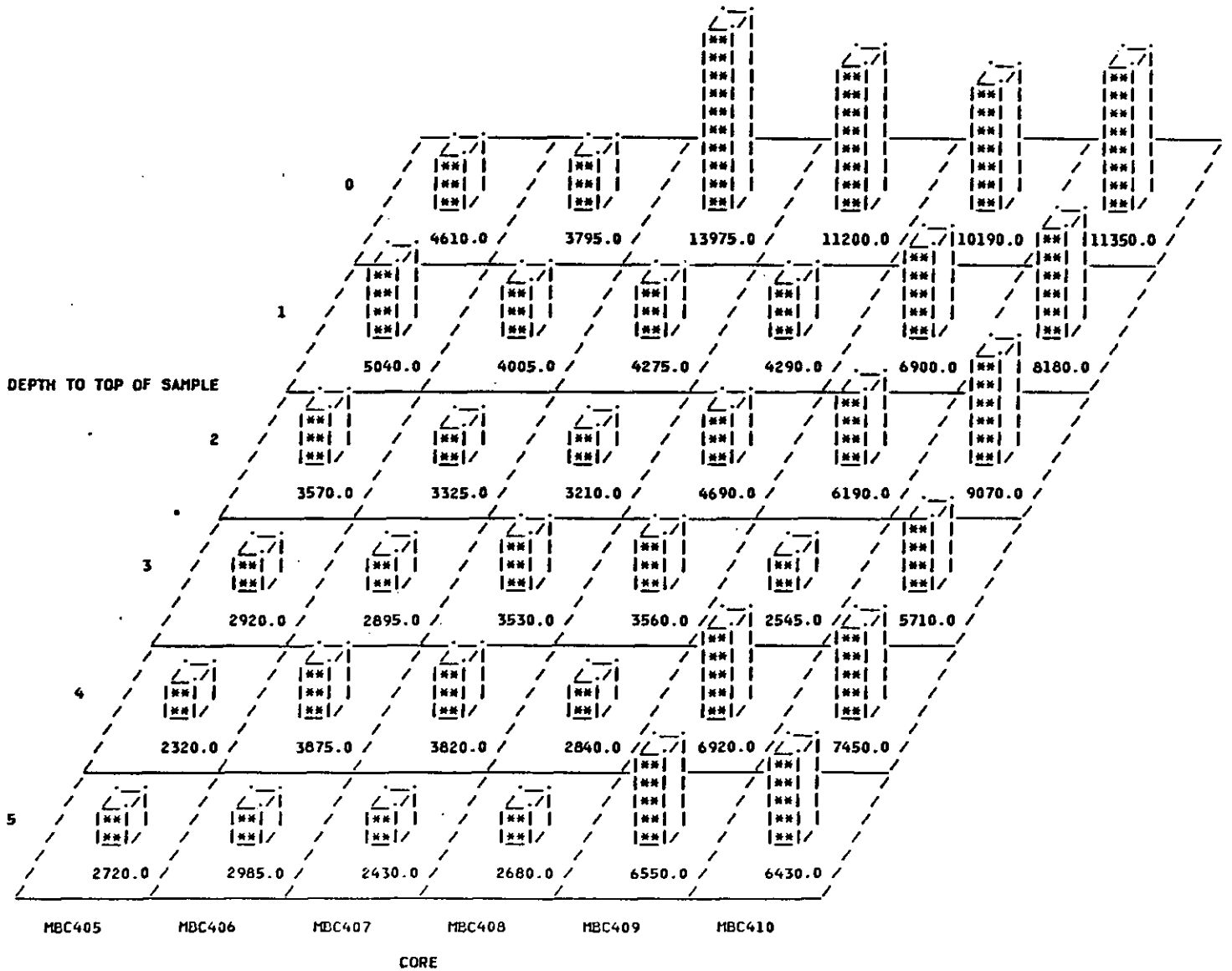


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=CALCIUM UNITS=UGG

BLOCK CHART OF RESULT

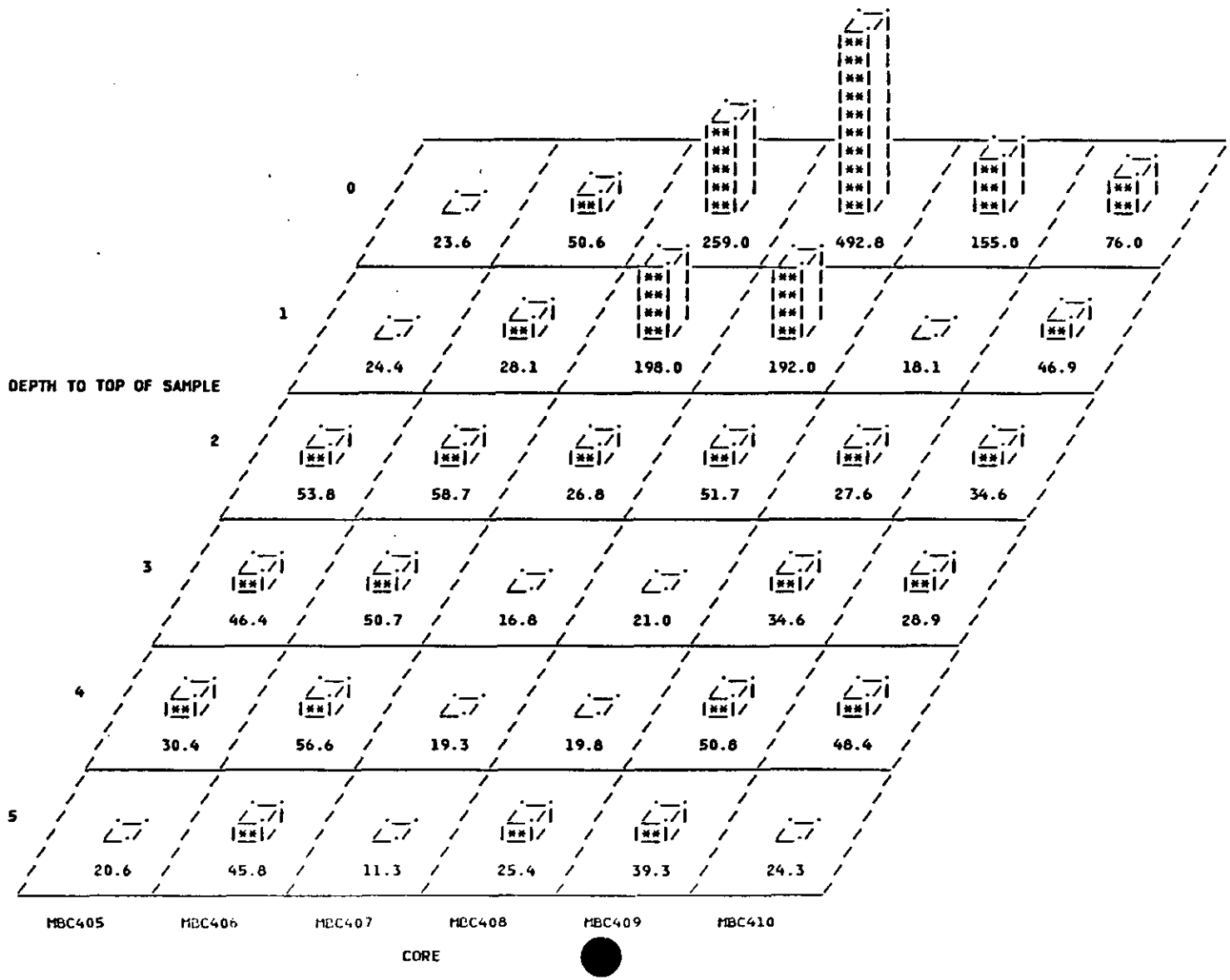


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME= CHLORIDE UNITS=UGG

BLOCK CHART OF RESULT

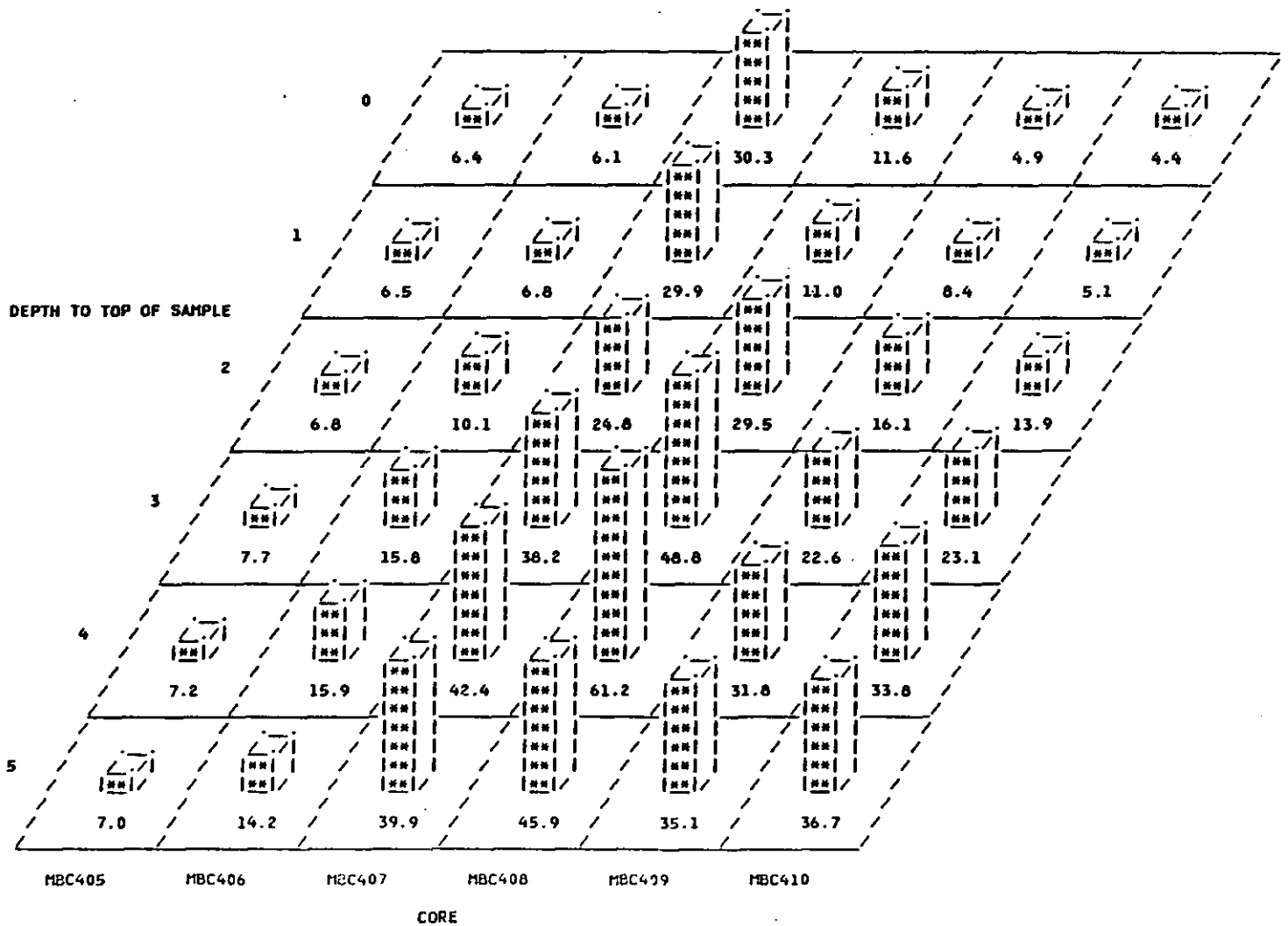


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=CHROMIUM UNITS=UGG

BLOCK CHART OF RESULT

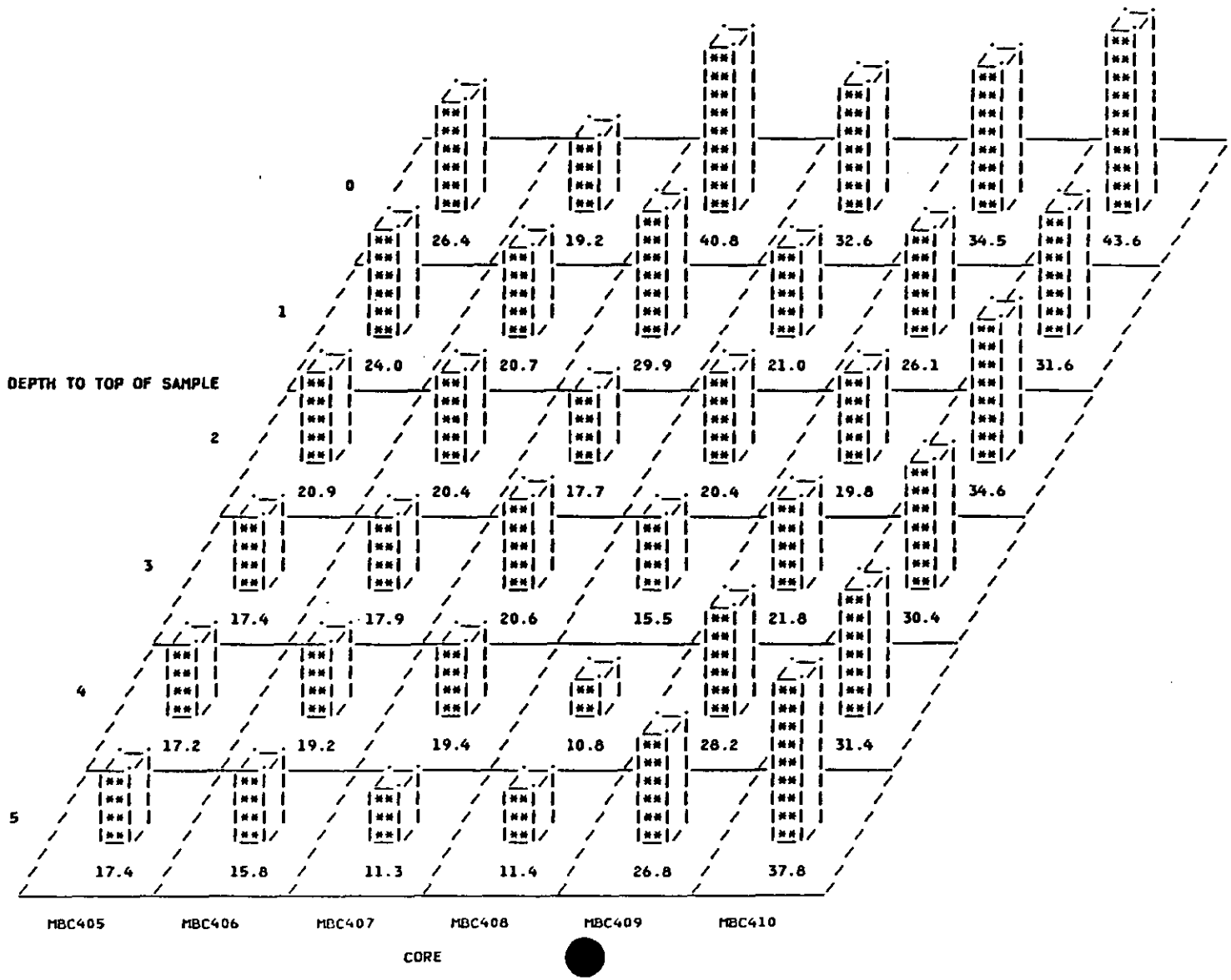


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=COPPER UNITS=UGG

BLOCK CHART OF RESULT

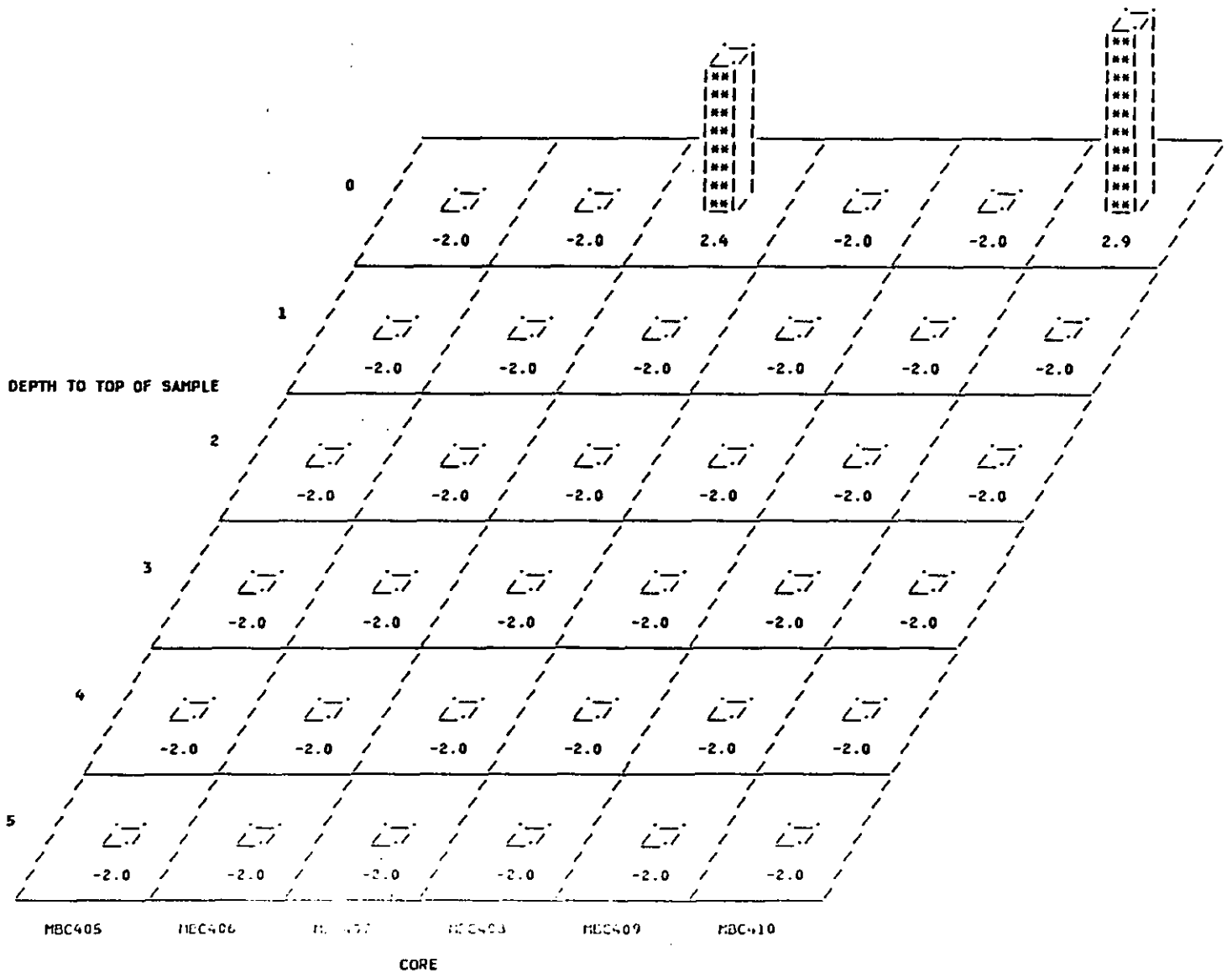


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=IRON UNITS=UGG

BLOCK CHART OF RESULT

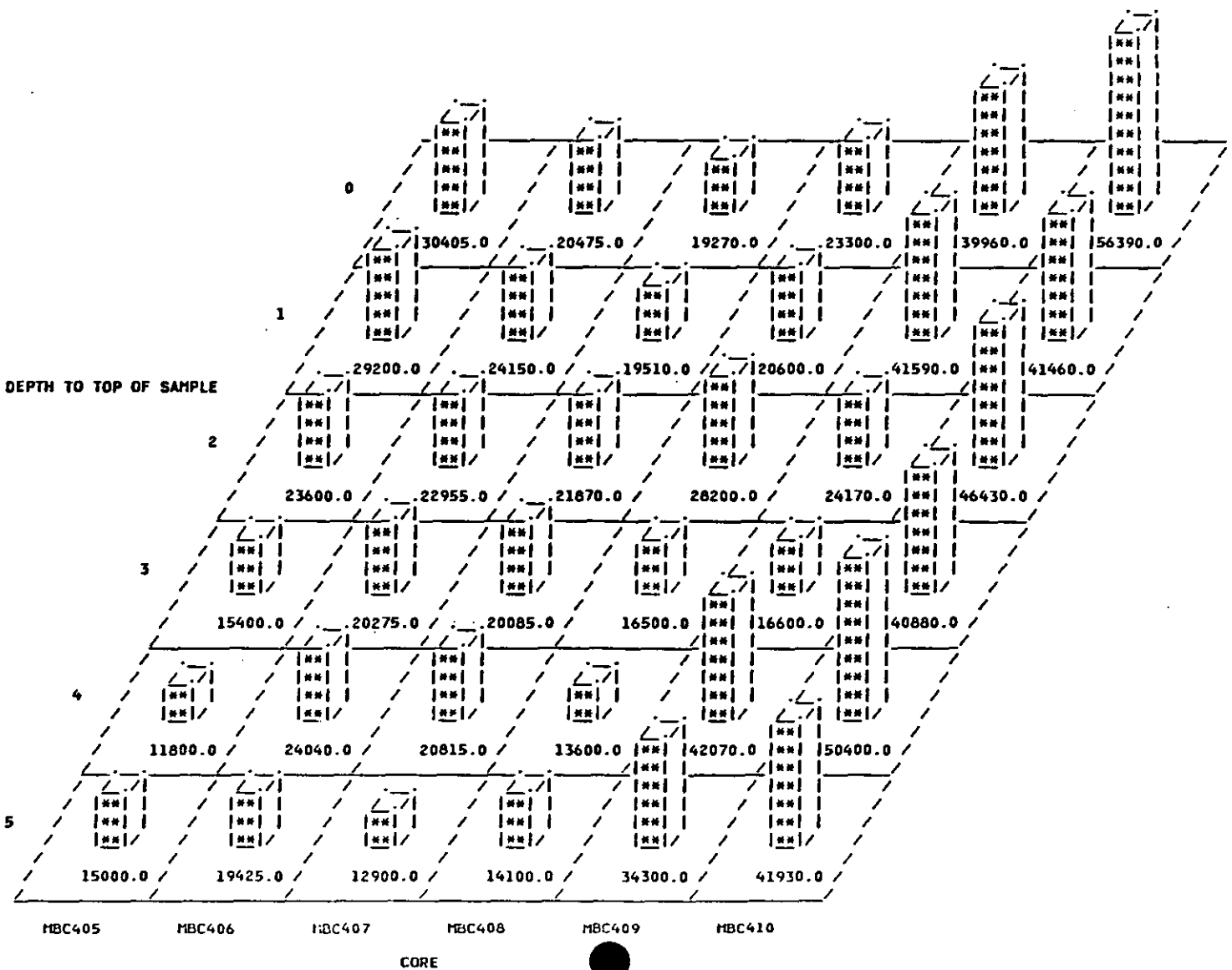


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=POTASSIUM UNITS=UGG

BLOCK CHART OF RESULT

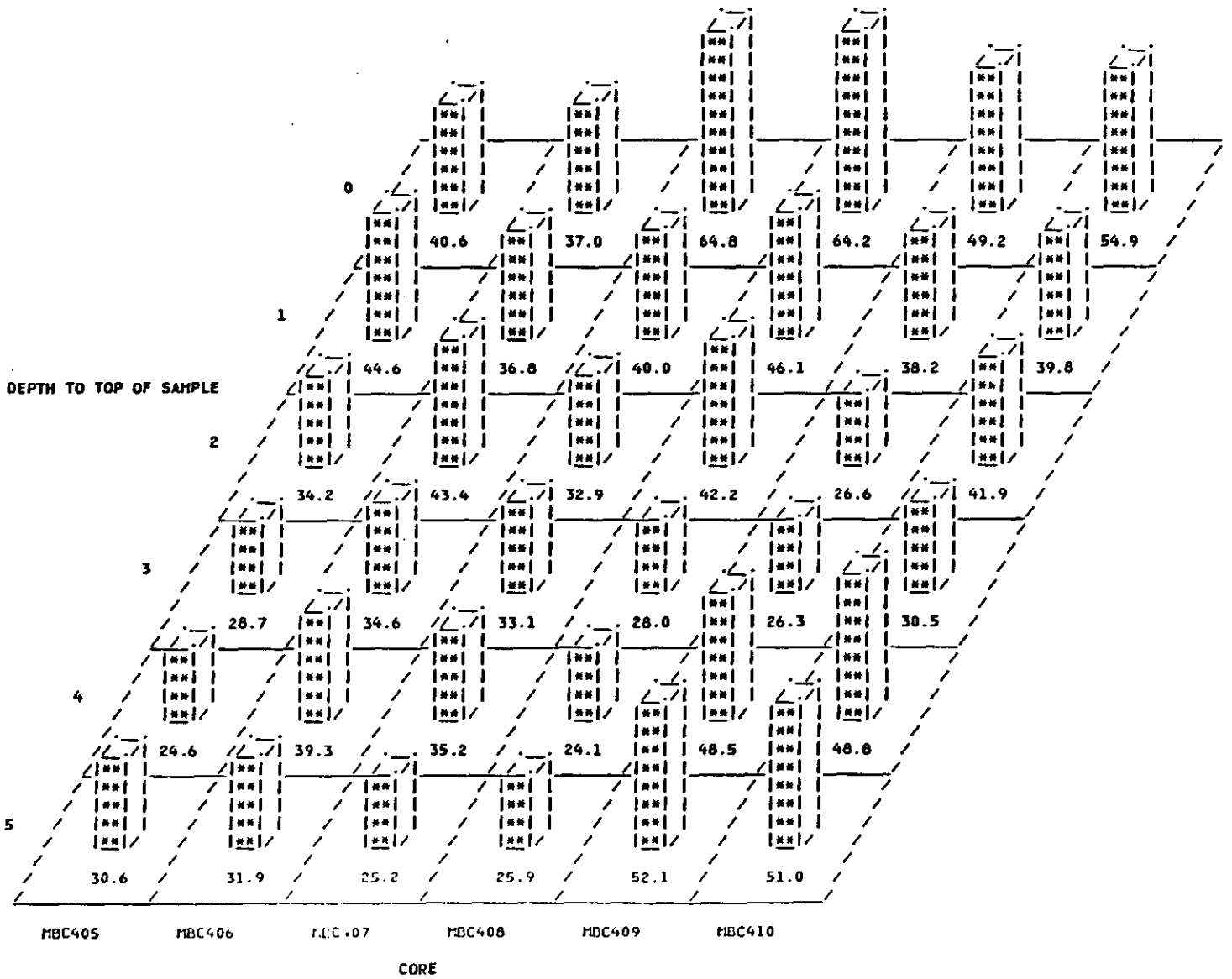


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=MAGNESIUM  UNITS=UGG

BLOCK CHART OF RESULT

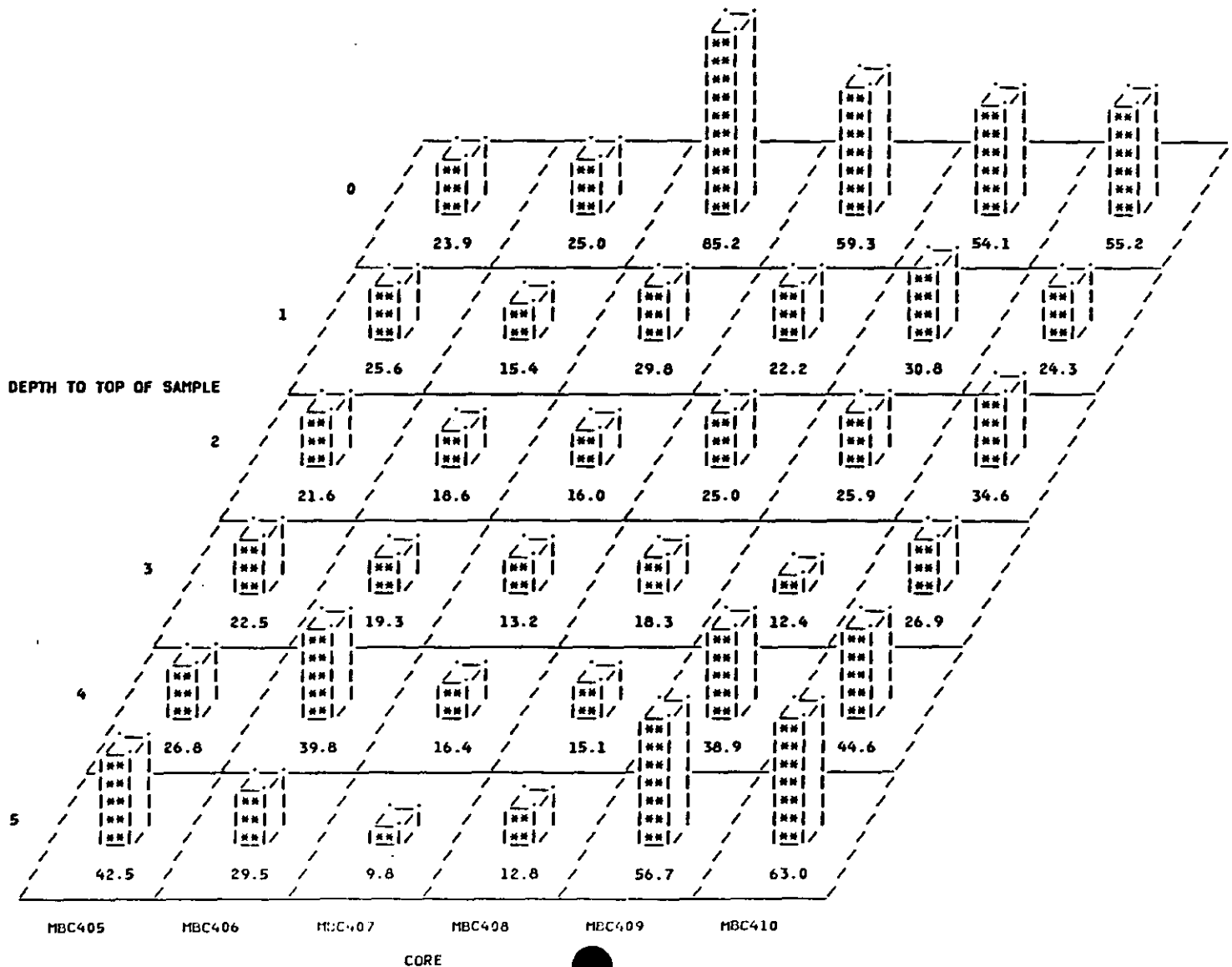


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=MANGANESE UNITS=UGG

BLOCK CHART OF RESULT

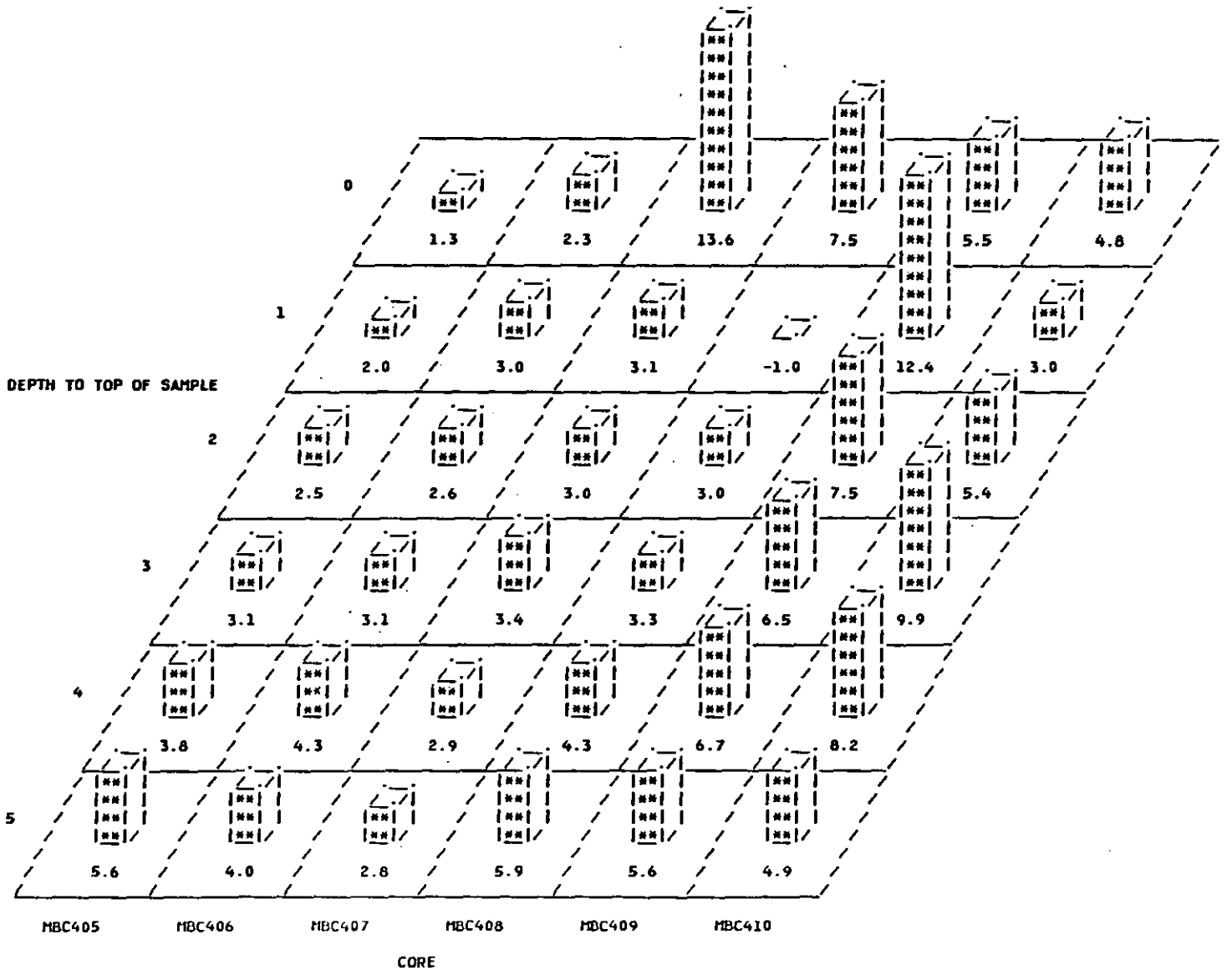


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=SODIUM UNITS=UGG

BLOCK CHART OF RESULT

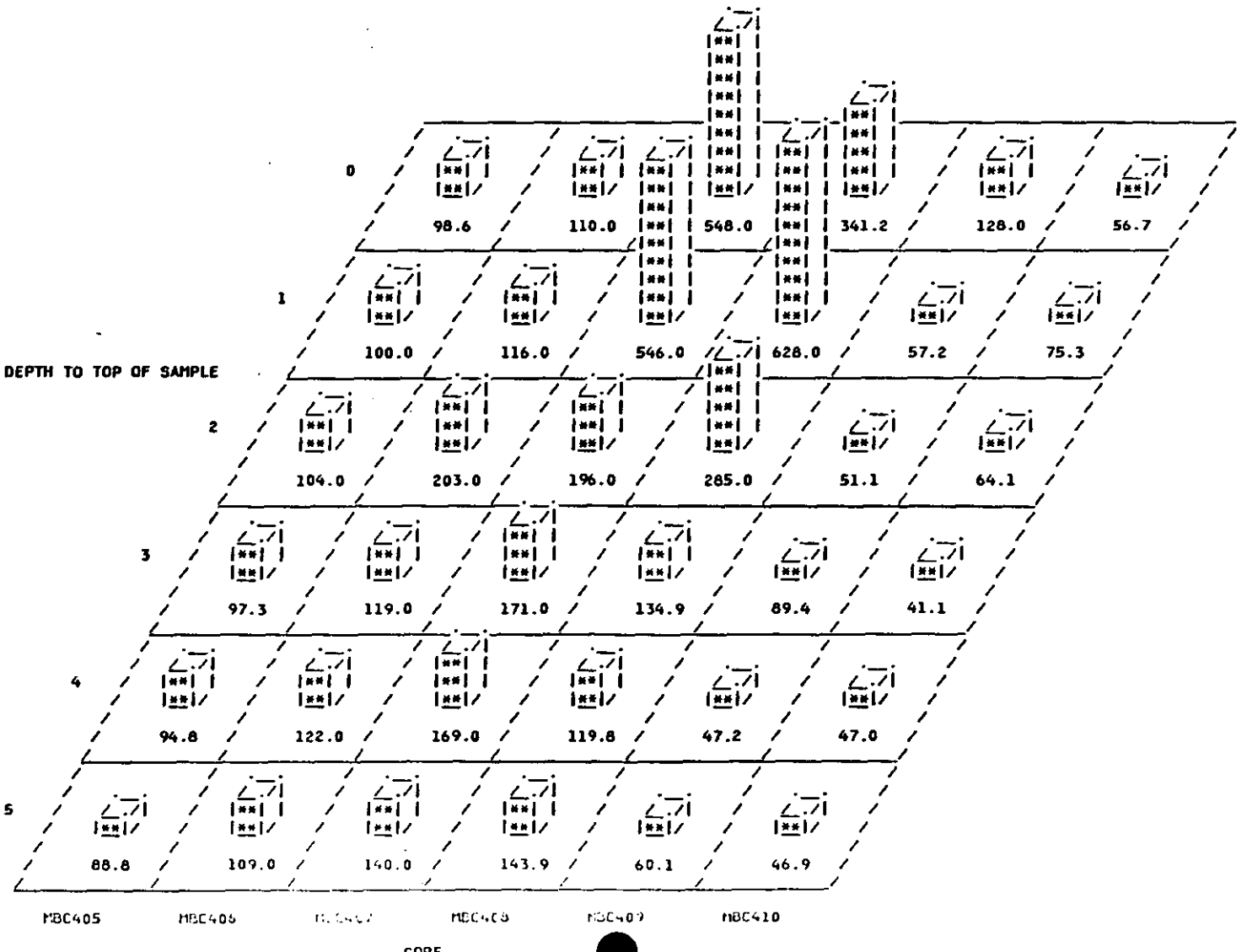


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=AMMONIA NITROGEN  UNITS=UGG

BLOCK CHART OF RESULT

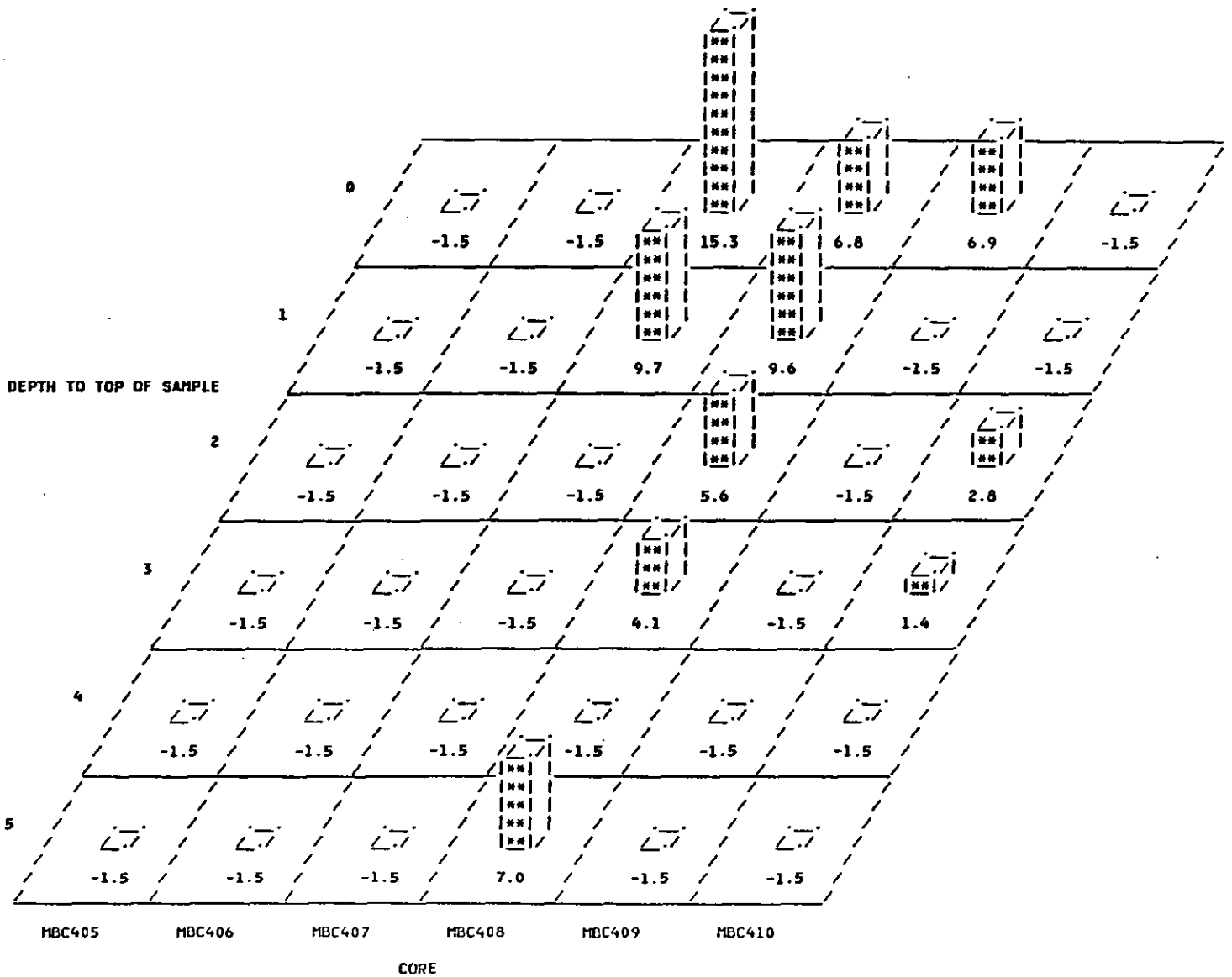


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=NITRATE UNITS=UGG

BLOCK CHART OF RESULT

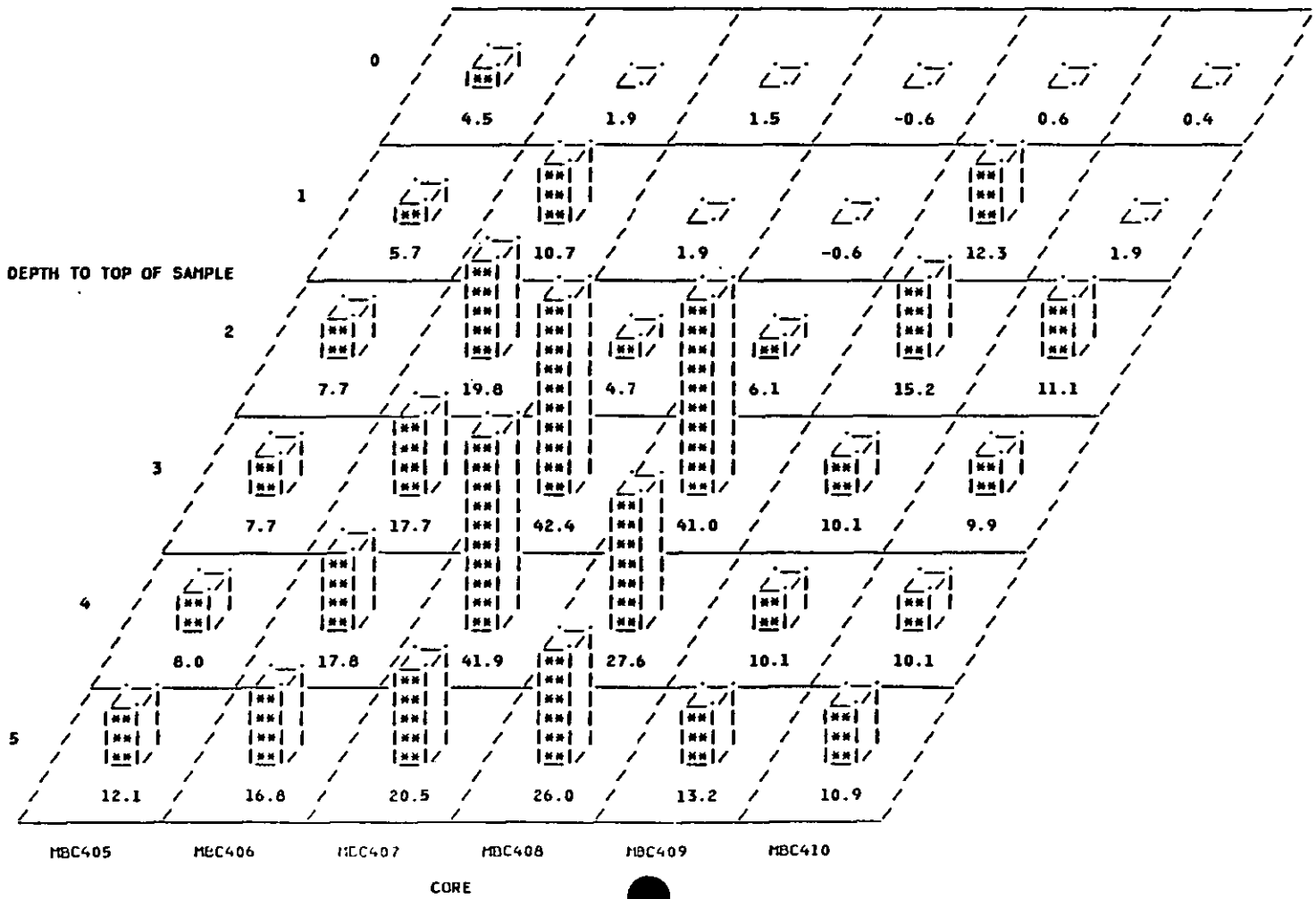


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=NICKEL UNITS=UGG

BLOCK CHART OF RESULT

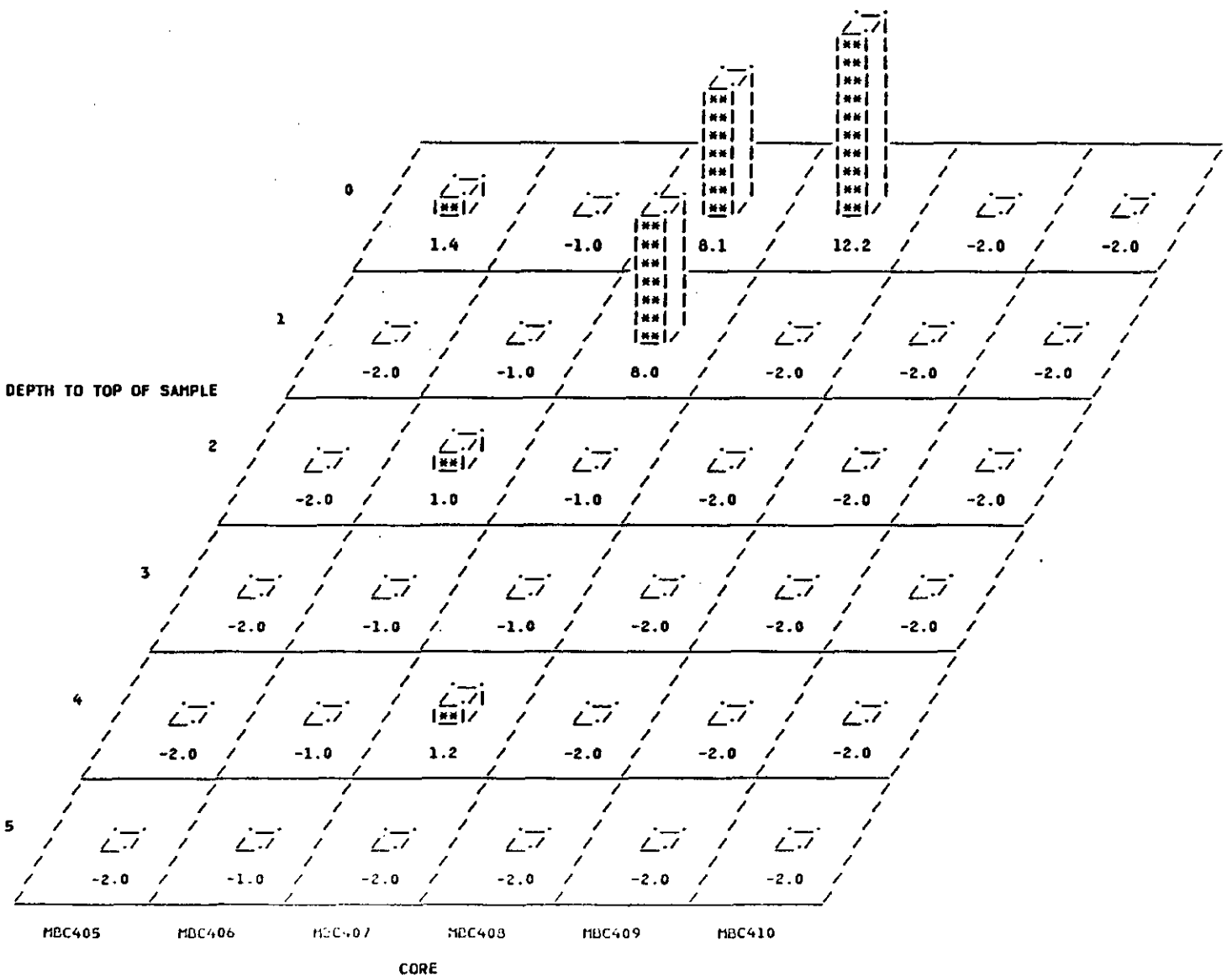


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=LEAD UNITS=UGG

BLOCK CHART OF RESULT

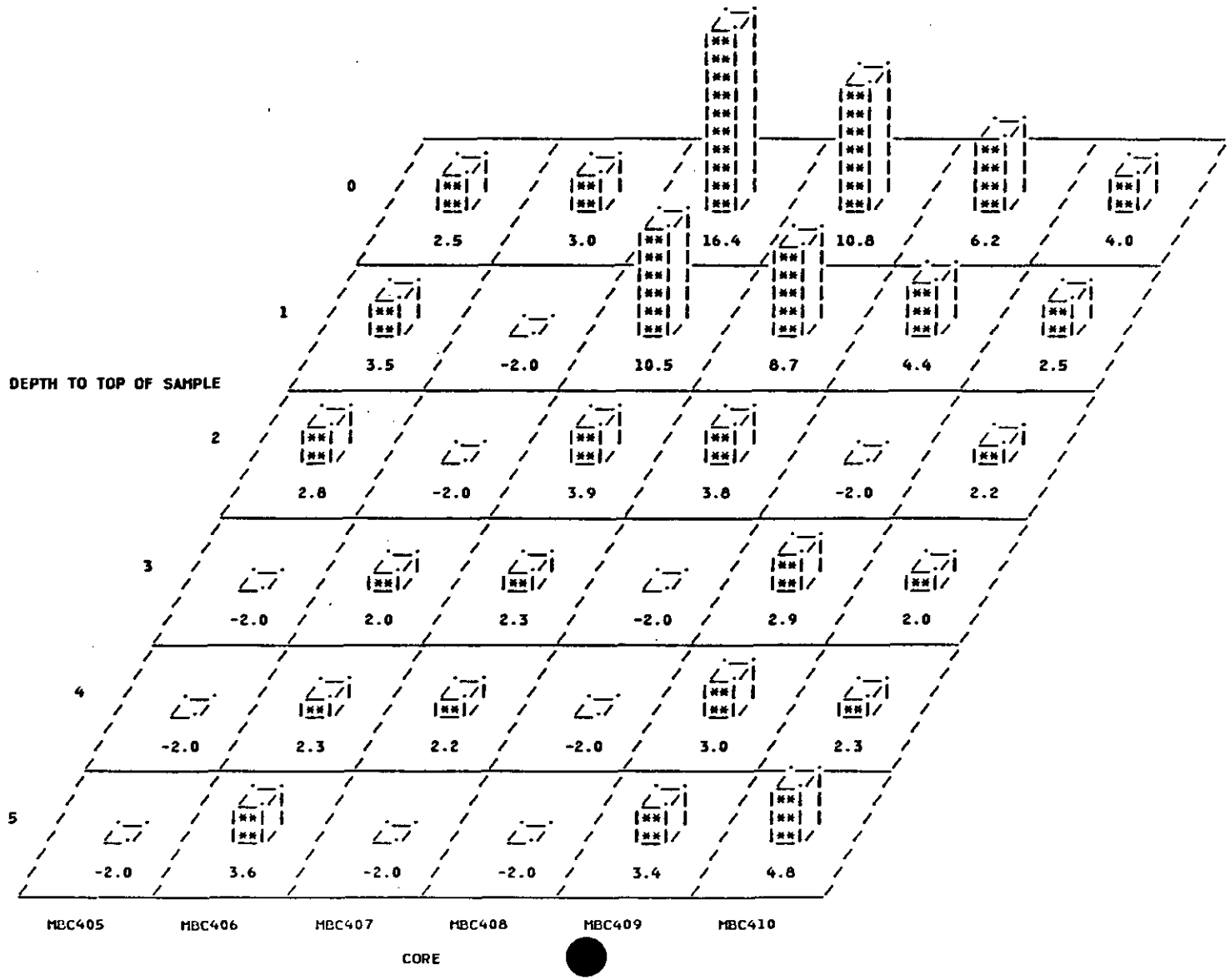


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ORGANIC CARBON  UNITS=UGG

BLOCK CHART OF RESULT

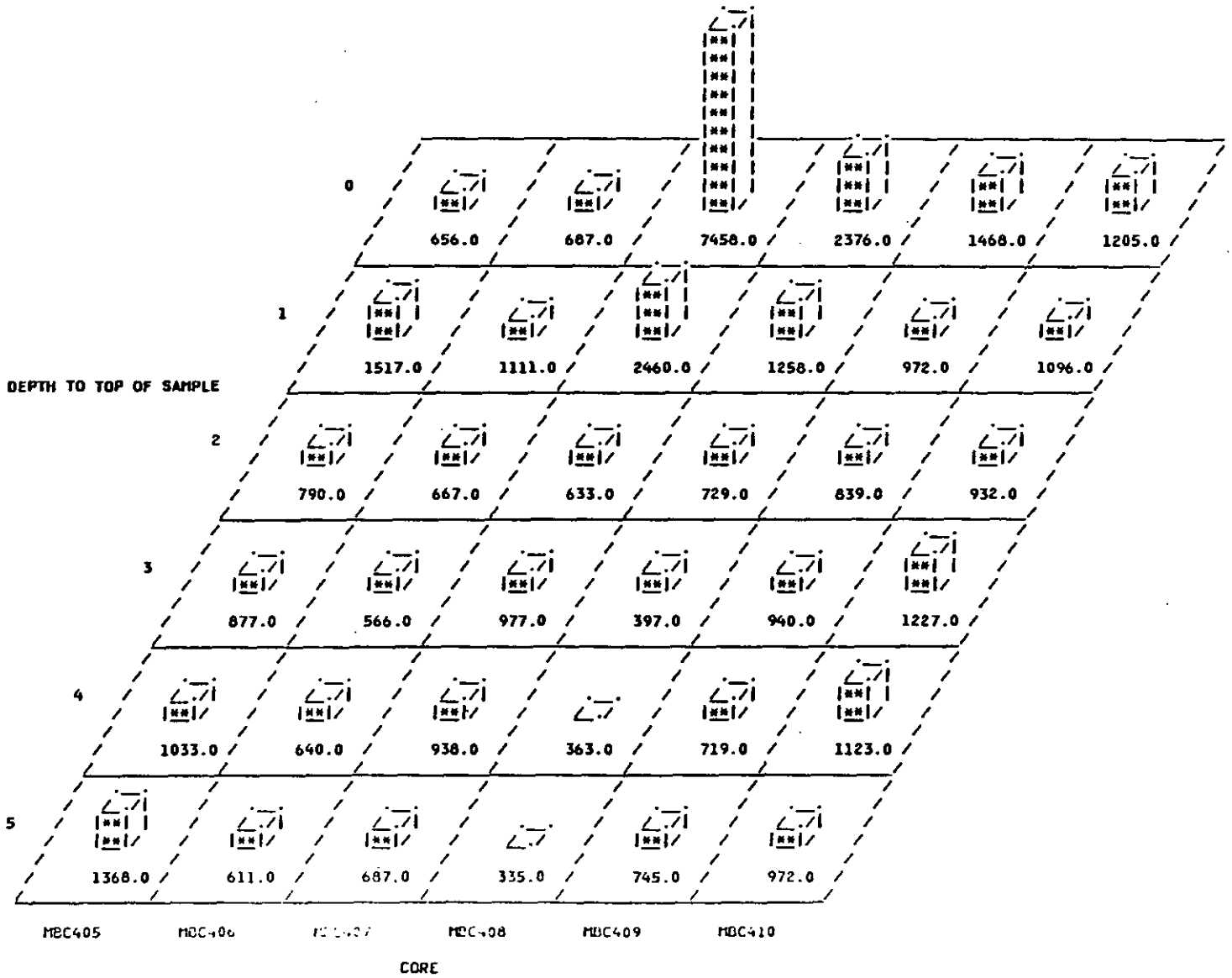


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ORGANIC HALOGENS UNITS=UGG

BLOCK CHART OF RESULT

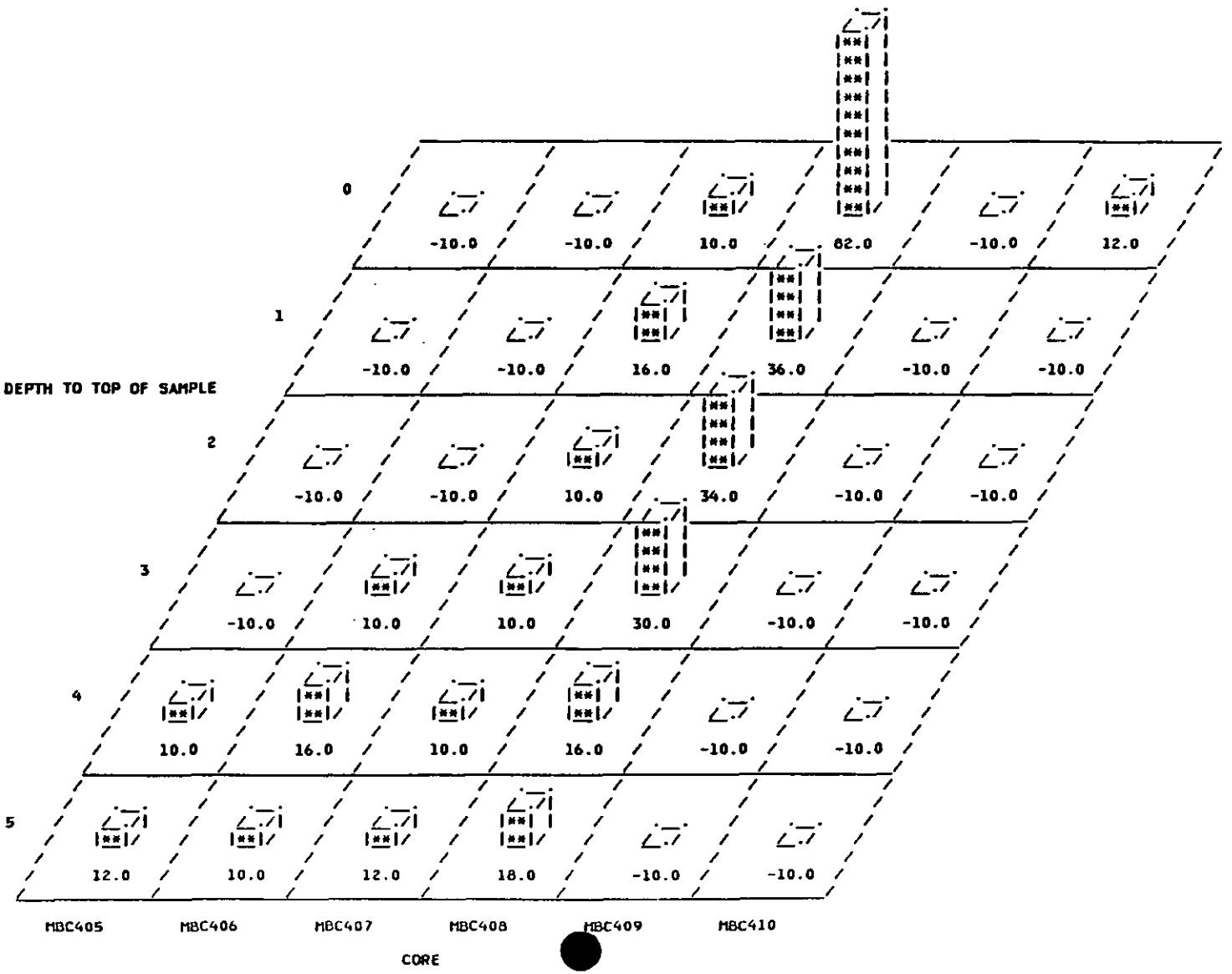


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=TOTAL PHOSPHATES UNITS=UGG

BLOCK CHART OF RESULT

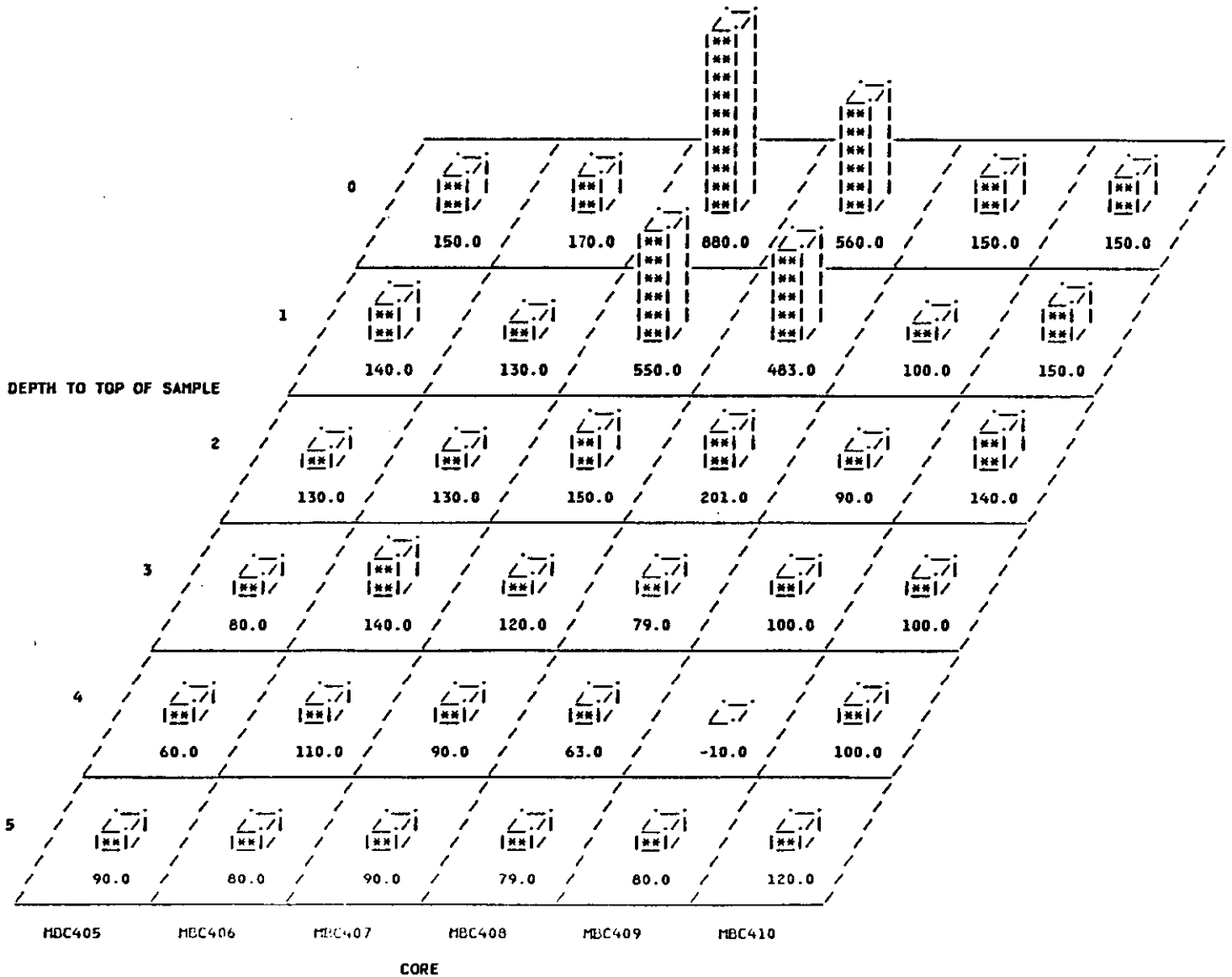


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=URANIUM UNITS=UGG

BLOCK CHART OF RESULT

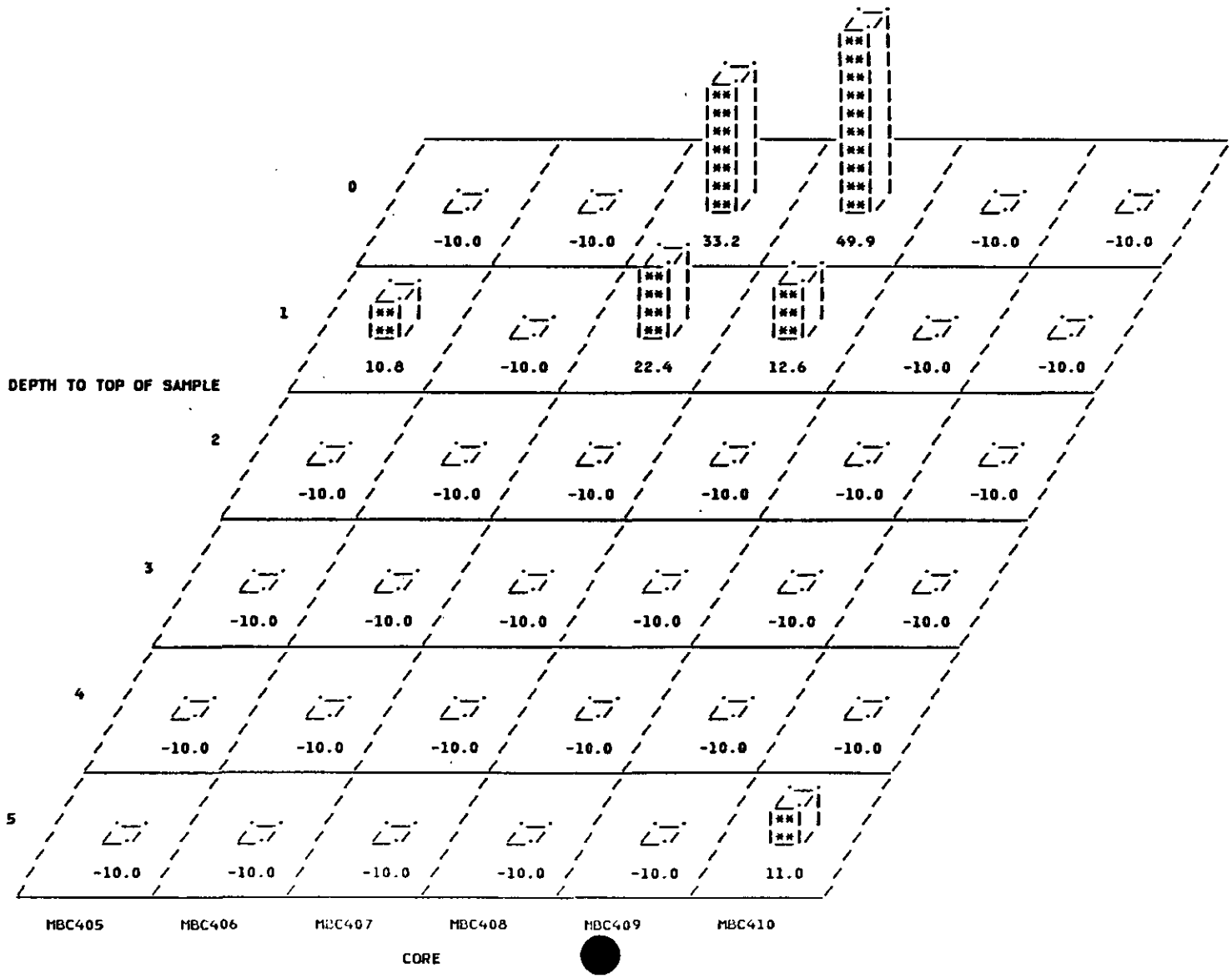


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ZINC UNITS=UGG

BLOCK CHART OF RESULT

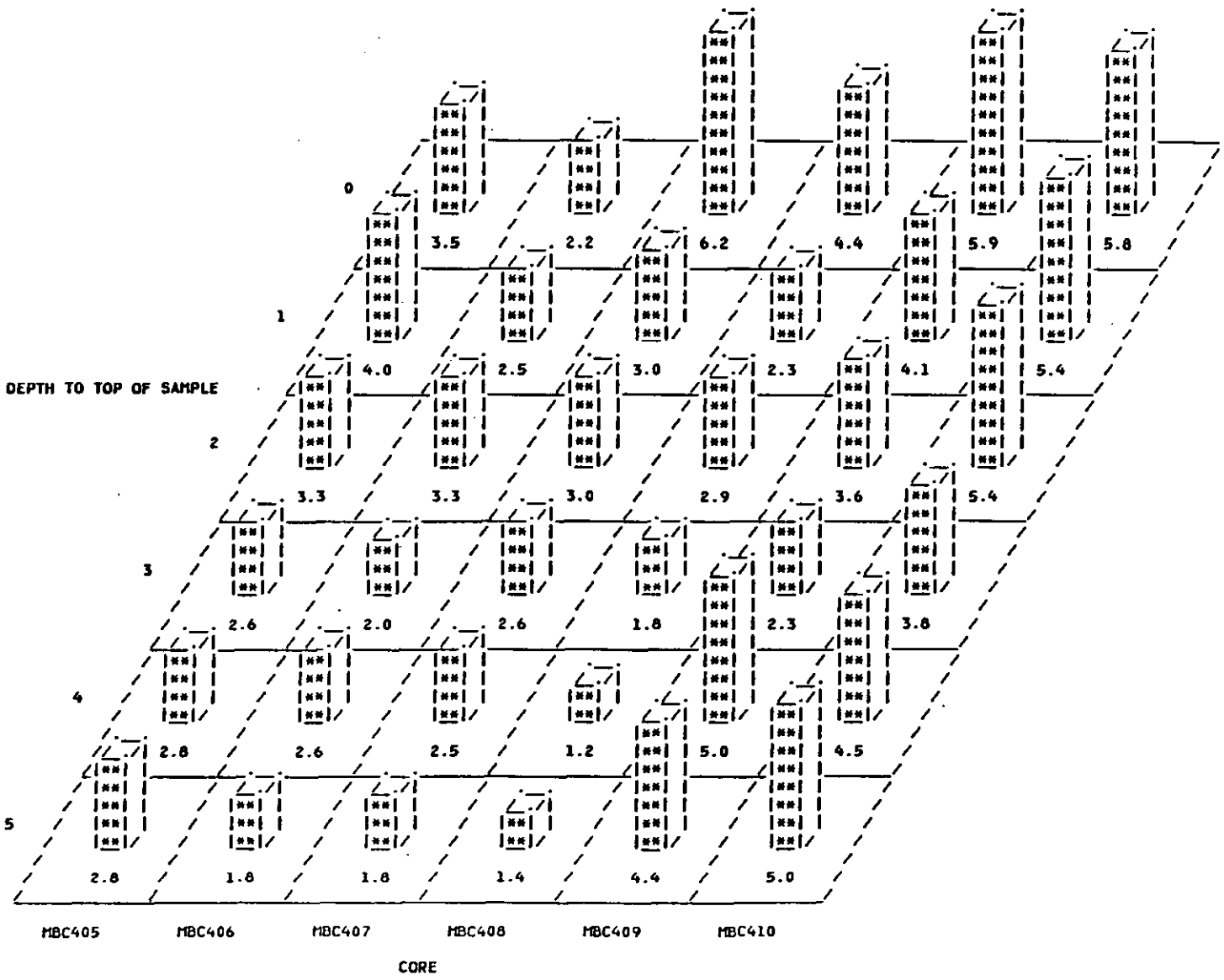


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ALUMINUM  UNITS=UGG

BLOCK CHART OF RESULT

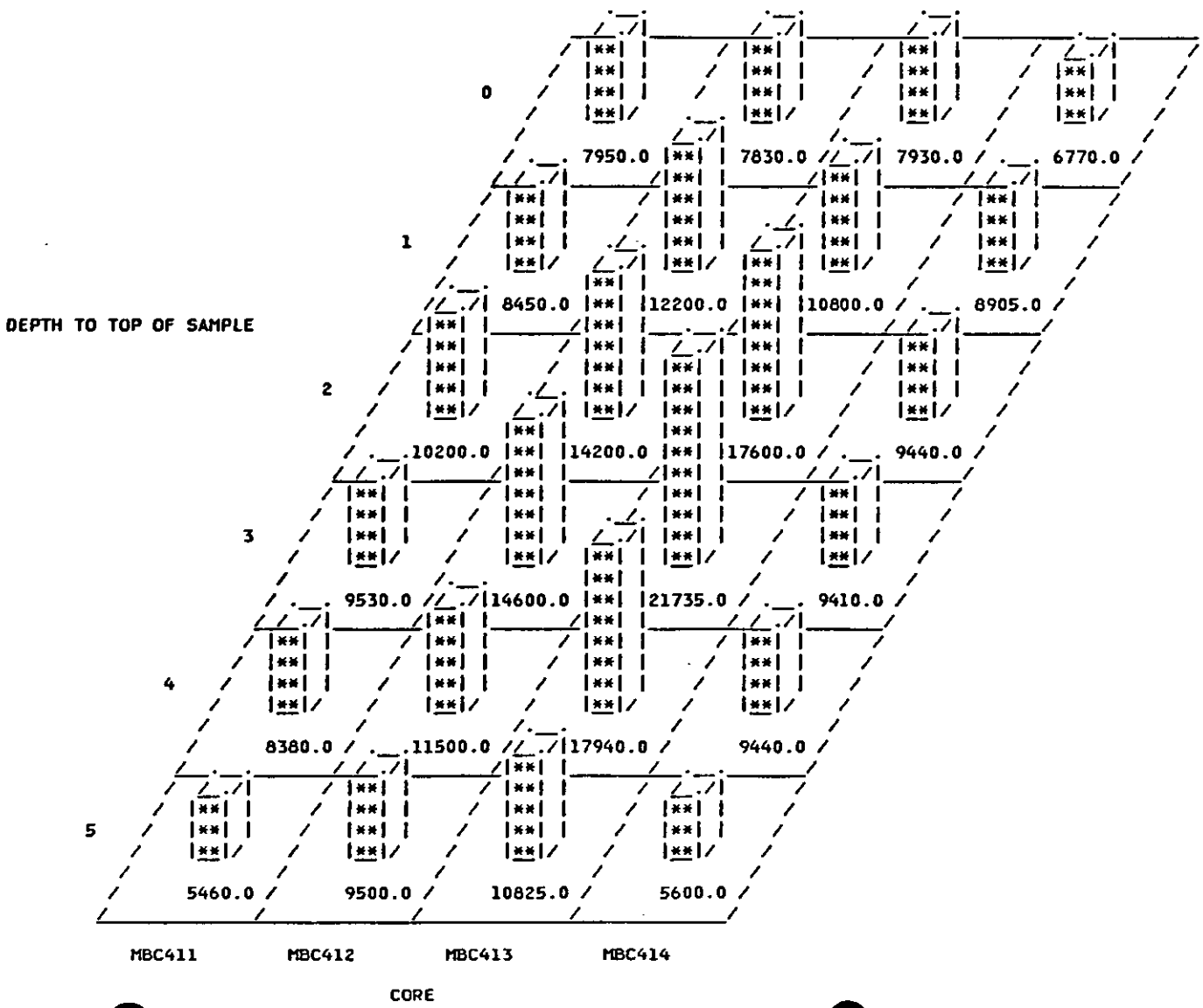


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=CALCIUM  UNITS=UGG

BLOCK CHART OF RESULT

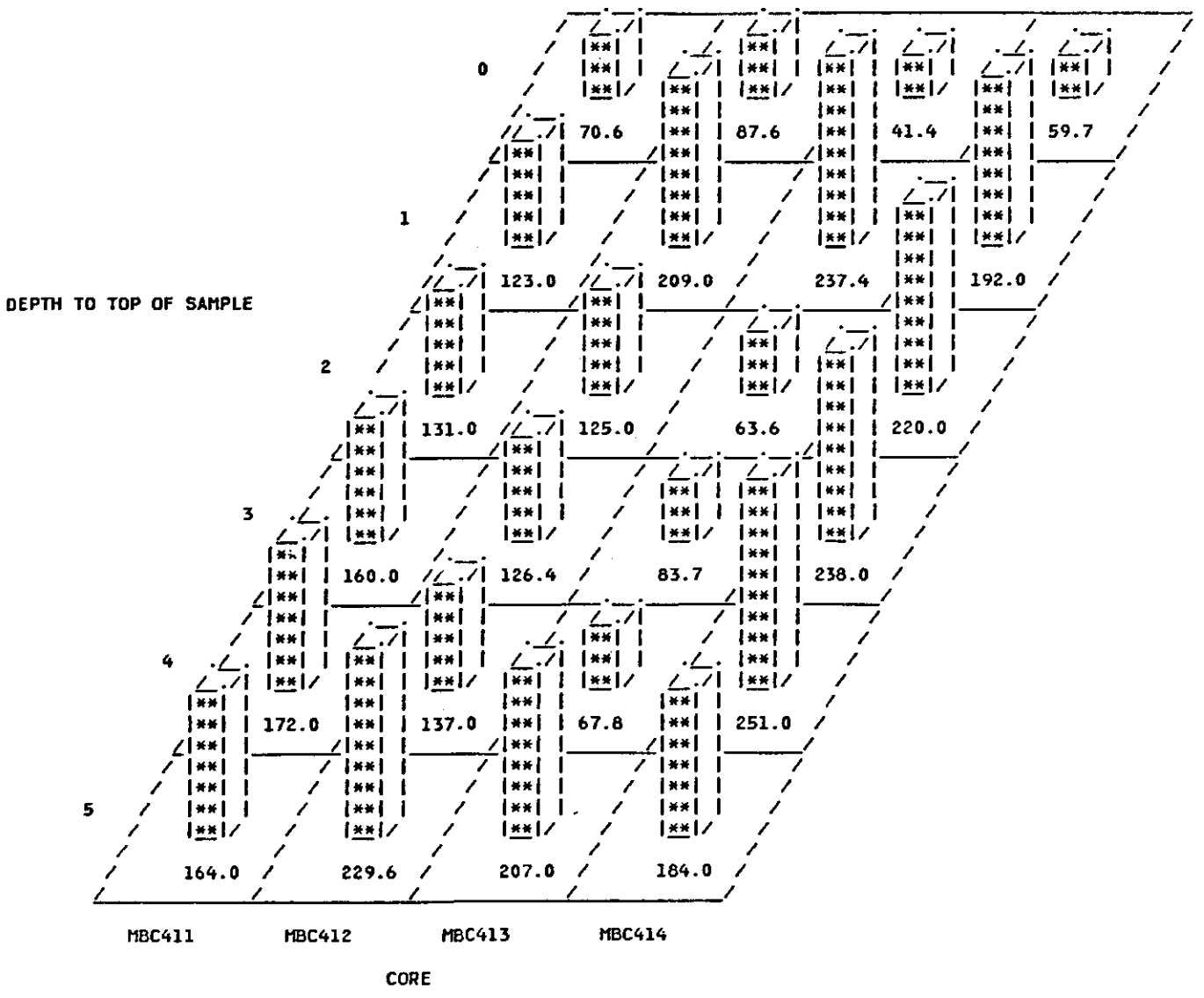


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=CHLORIDE UNITS=UGG

BLOCK CHART OF RESULT

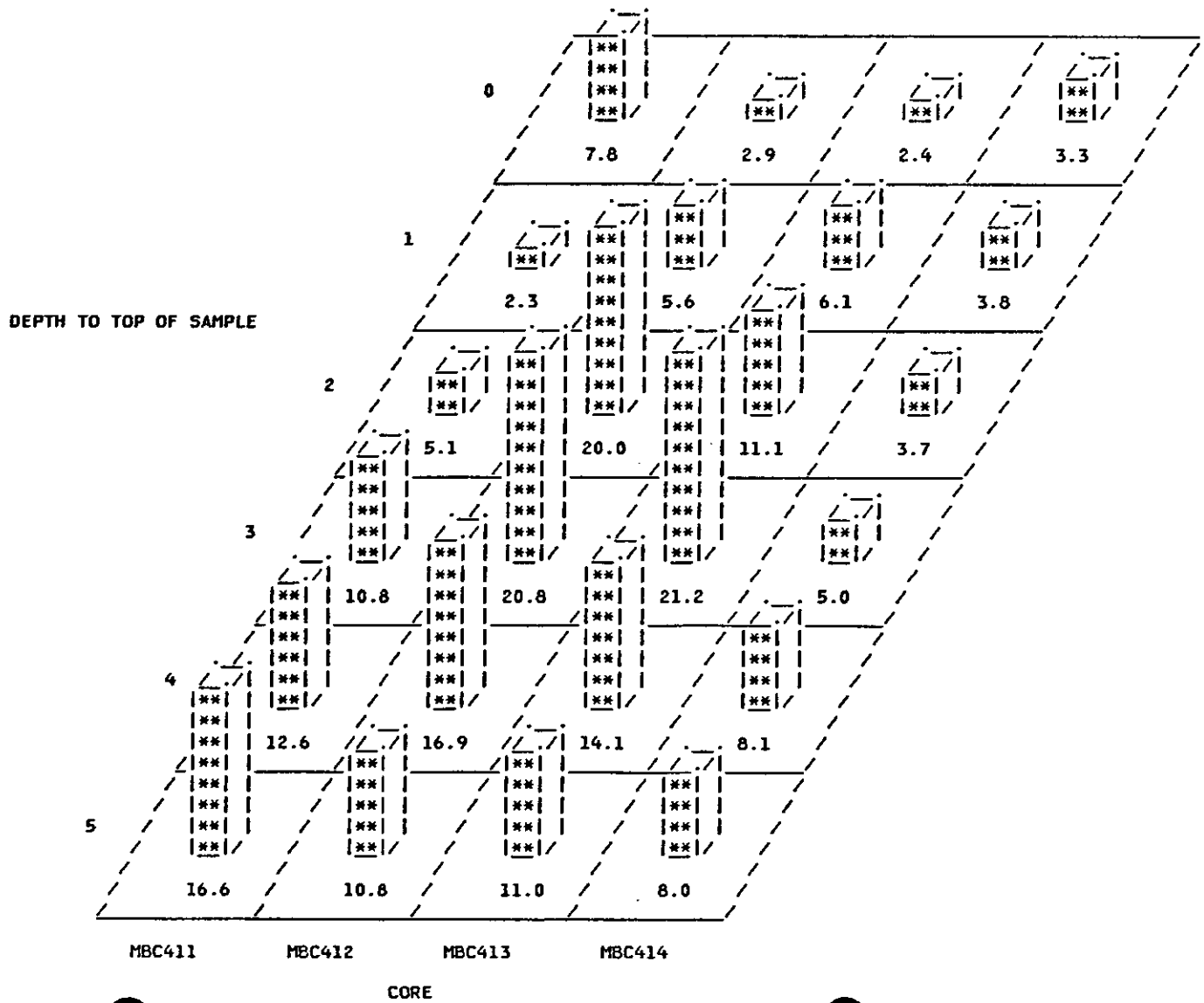


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=CHROMIUM  UNITS=UGG

BLOCK CHART OF RESULT

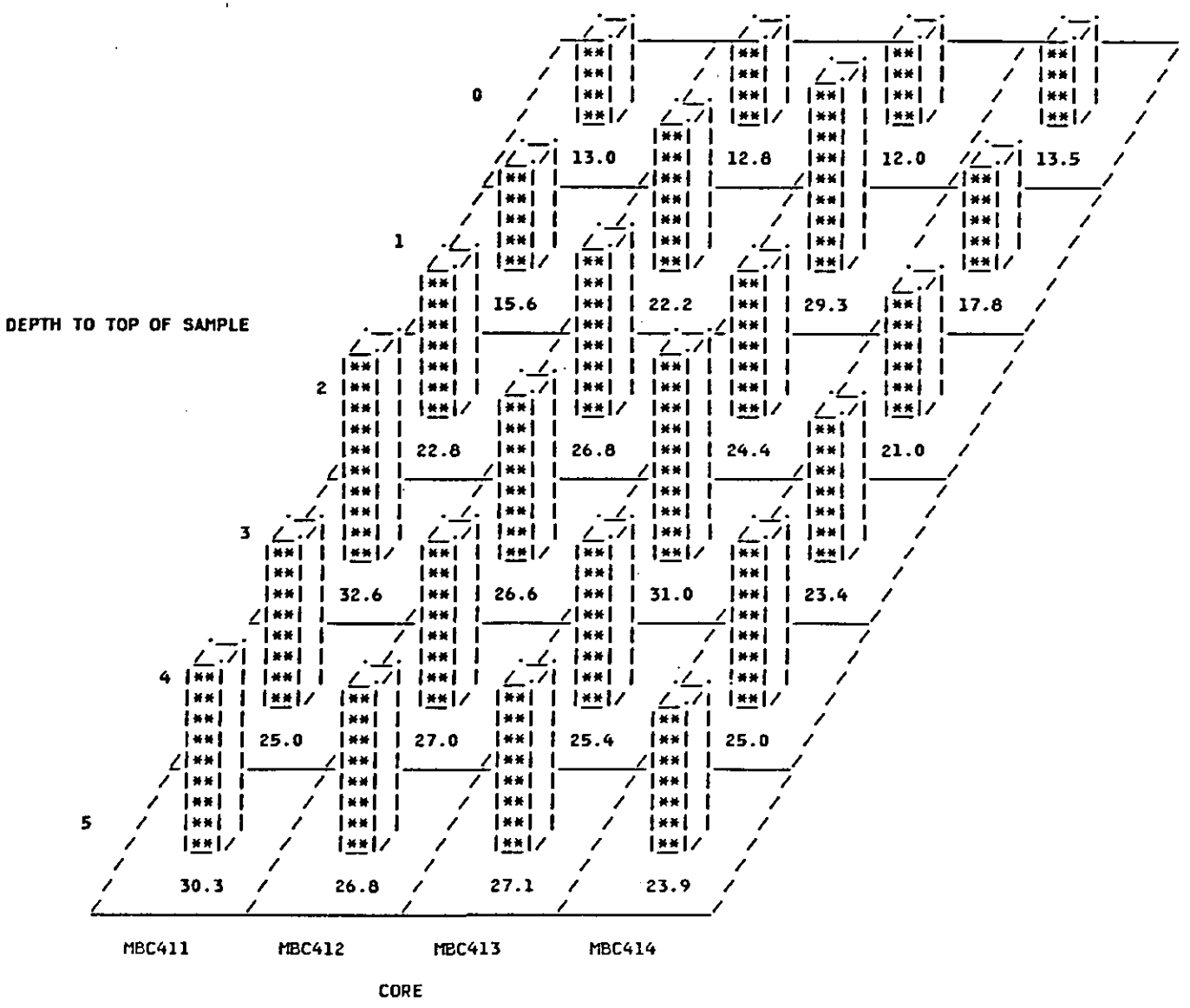


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=COPPER  UNITS=UGG

BLOCK CHART OF RESULT

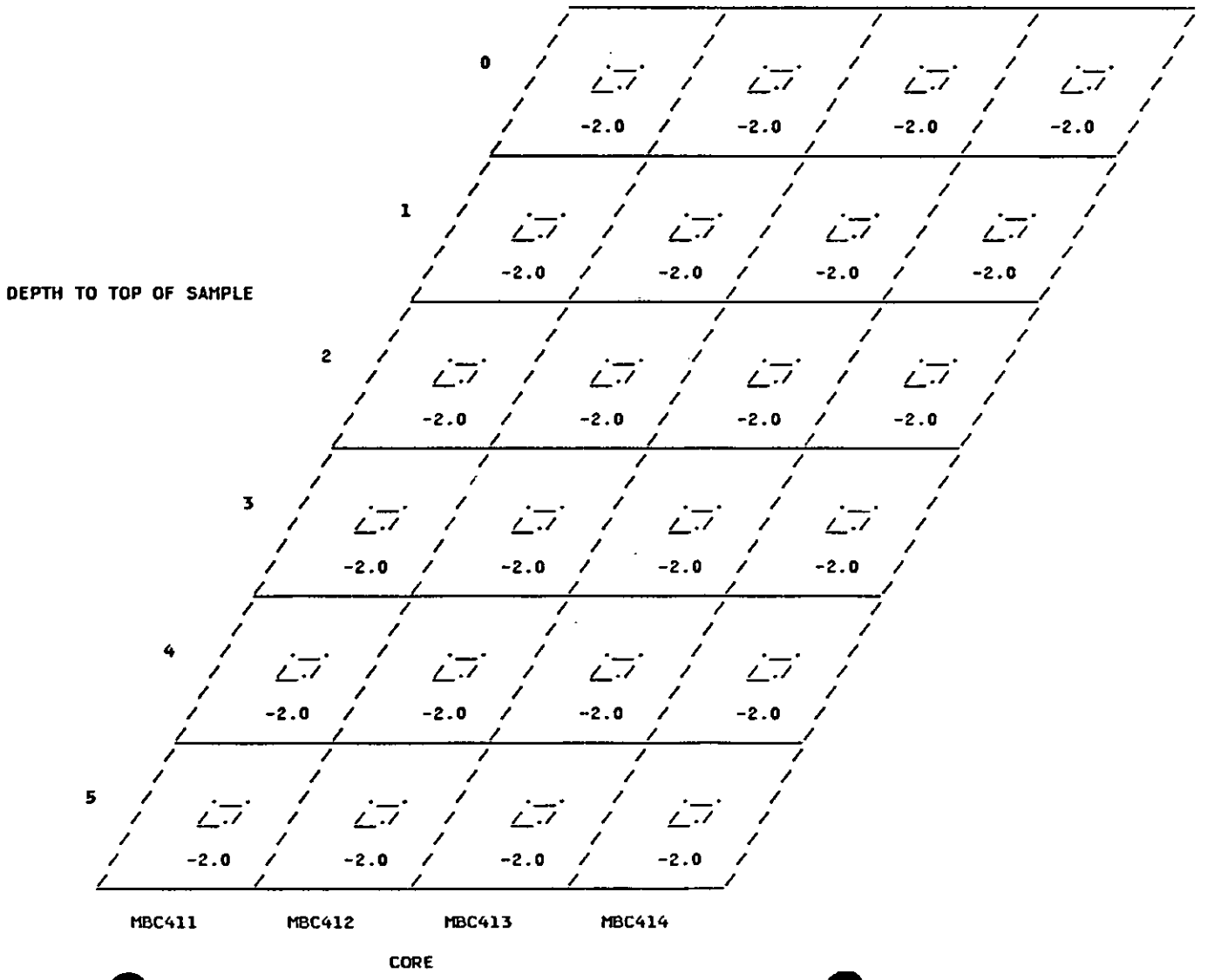


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=IRON  UNITS=UGG

BLOCK CHART OF RESULT

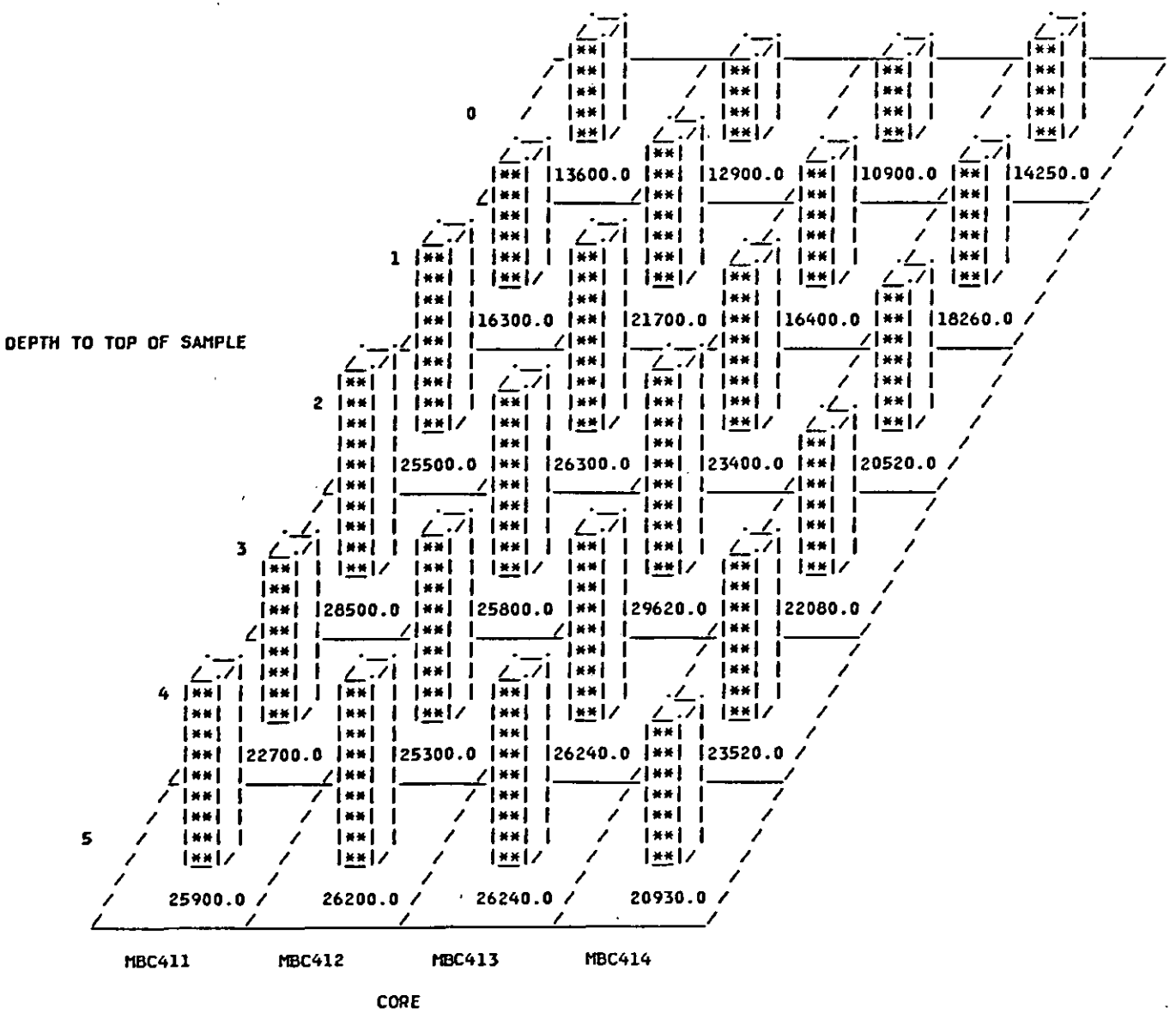


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=POTASSIUM UNITS=UGG

BLOCK CHART OF RESULT

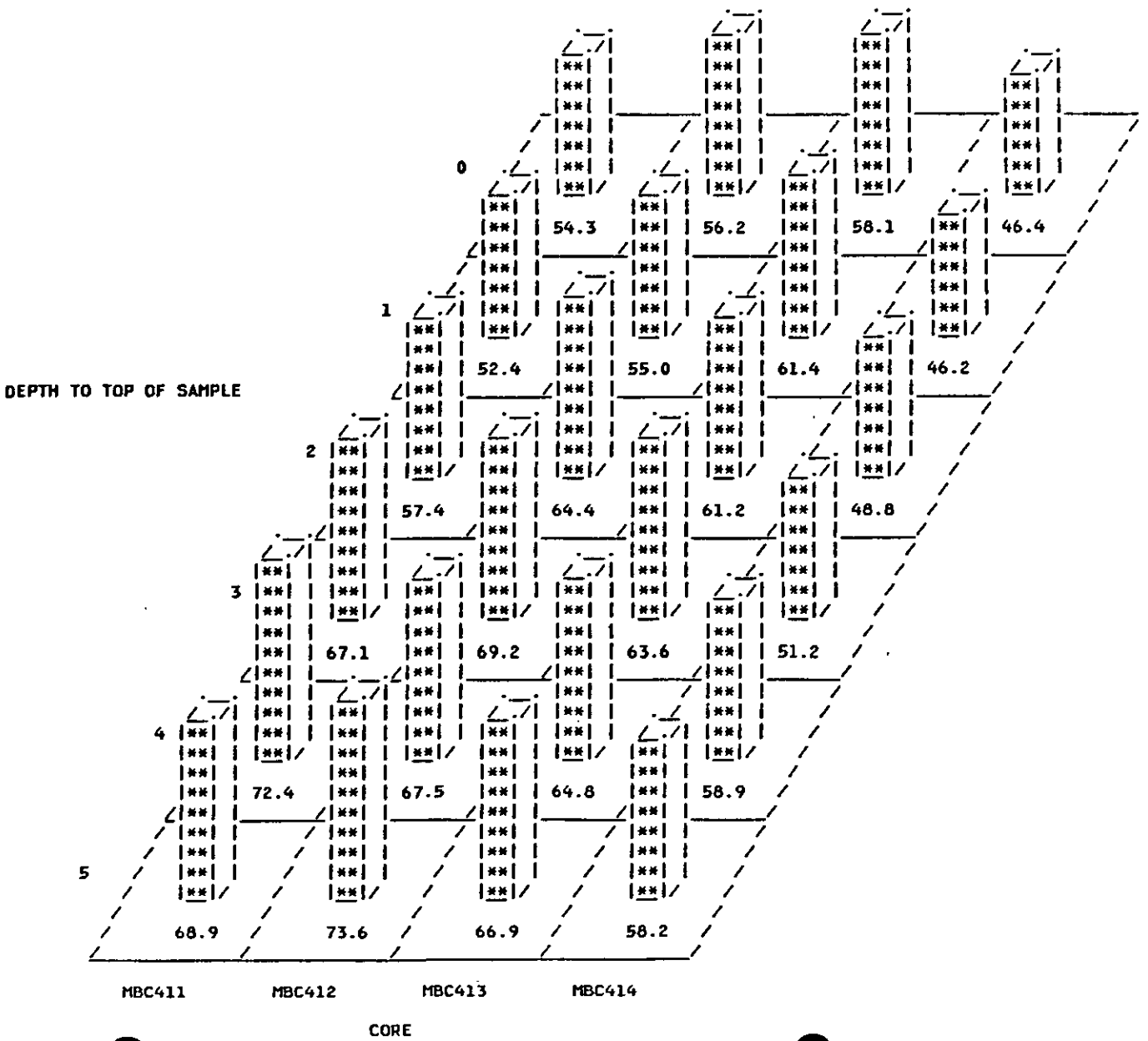


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=MAGNESIUM UNITS=UGG

BLOCK CHART OF RESULT

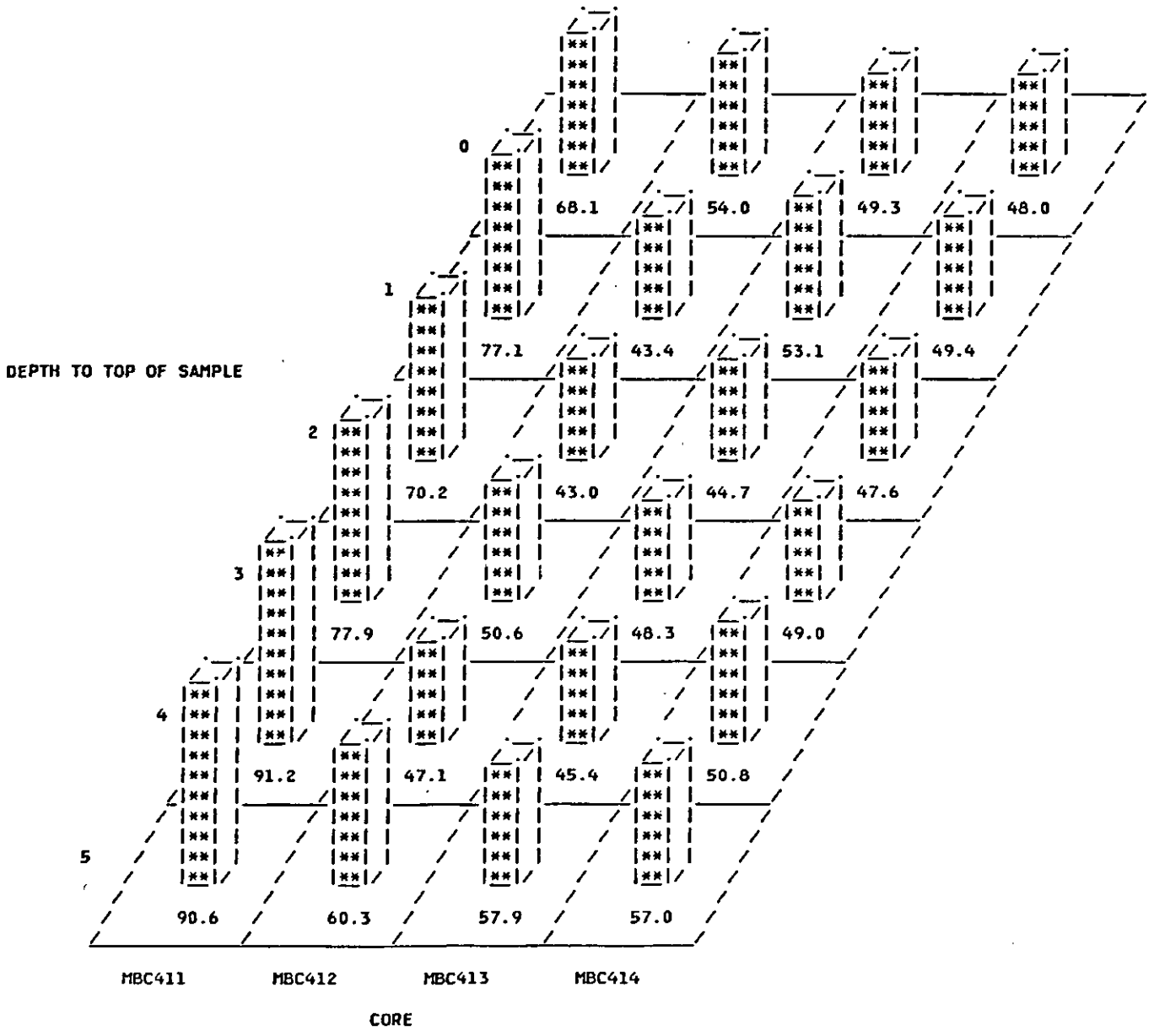


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=MANGANESE  UNITS=UGG

BLOCK CHART OF RESULT

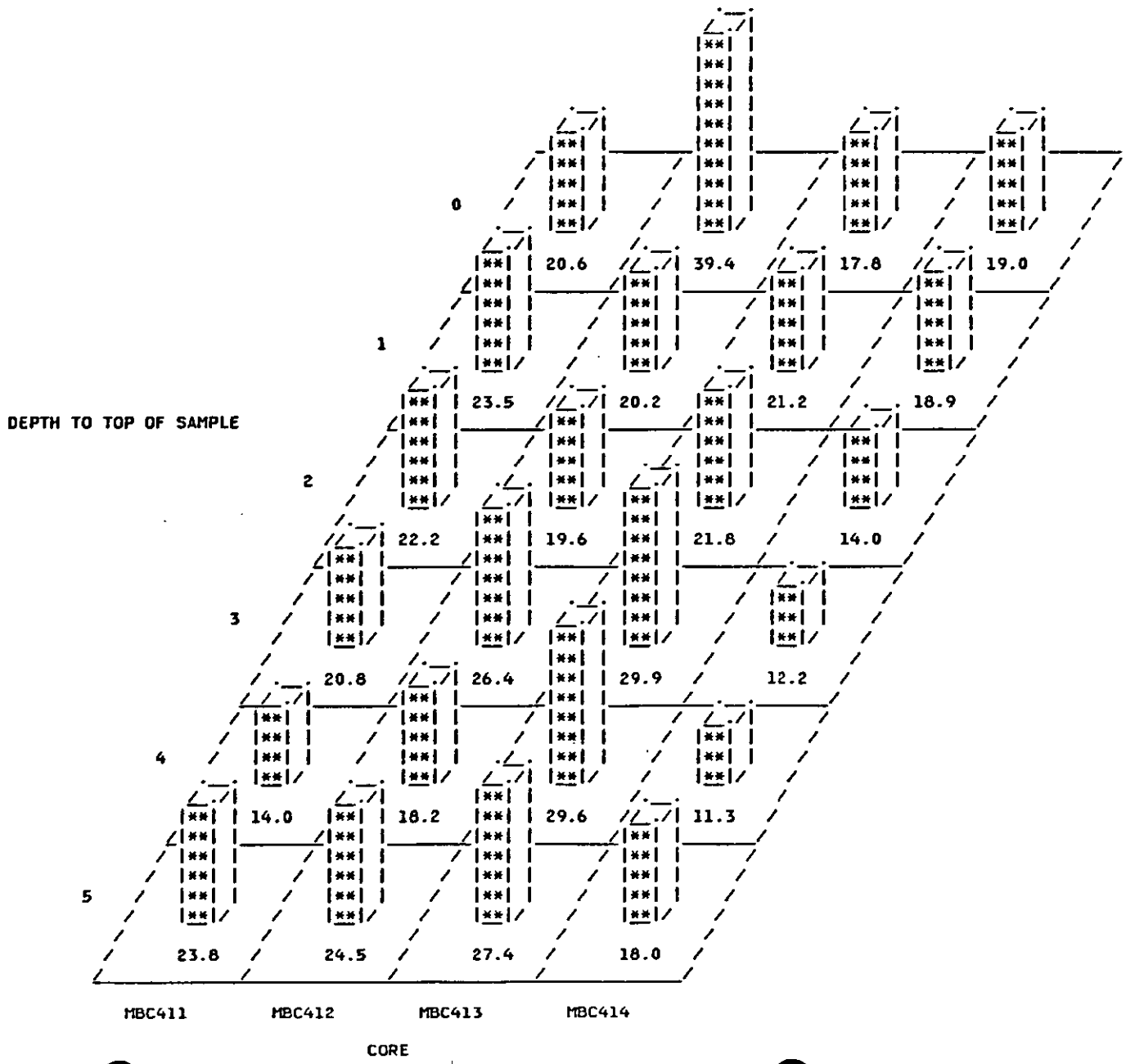


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=SODIUM  UNITS=UGG

BLOCK CHART OF RESULT

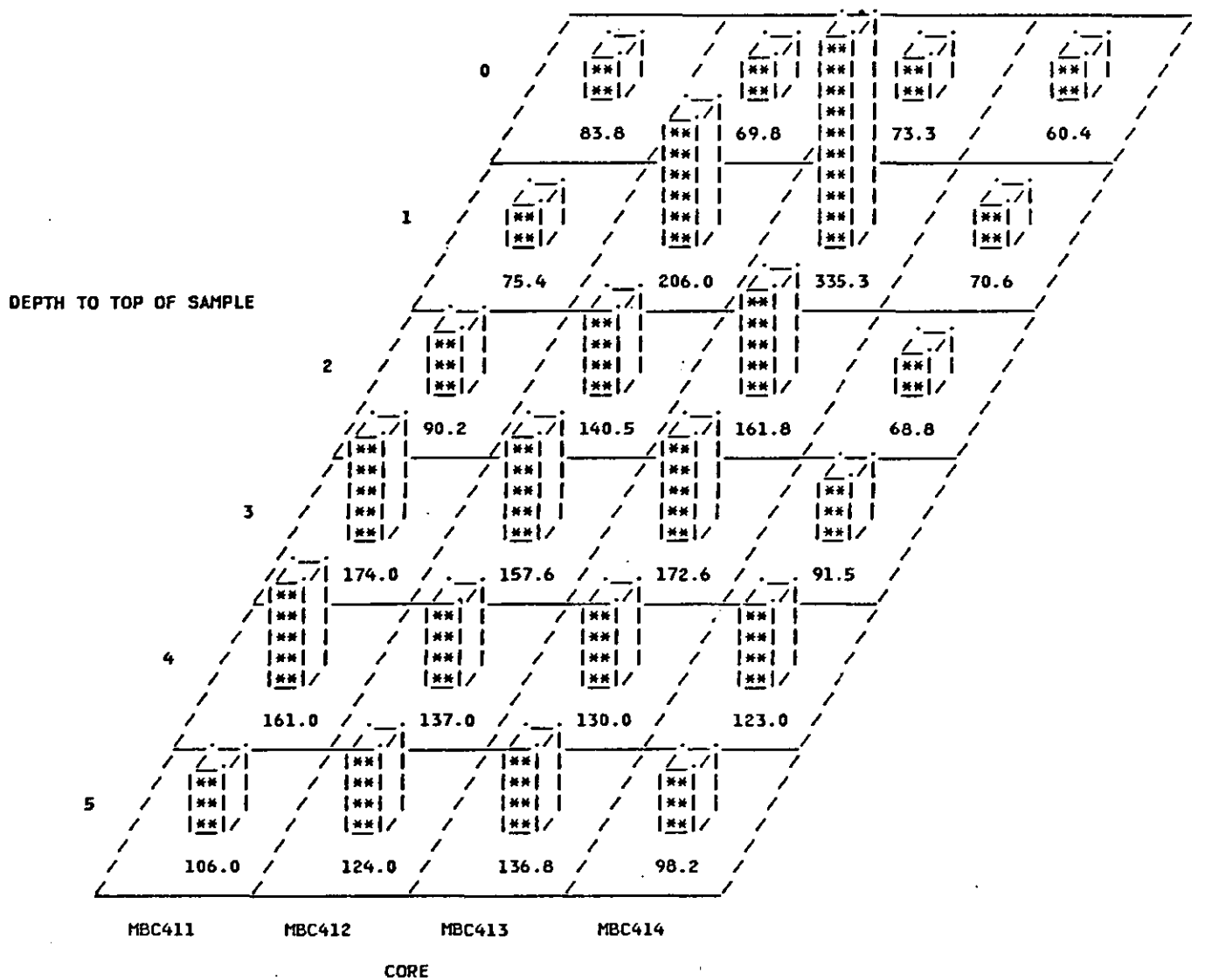


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=AMMONIA NITROGEN  UNITS=UGG

BLOCK CHART OF RESULT

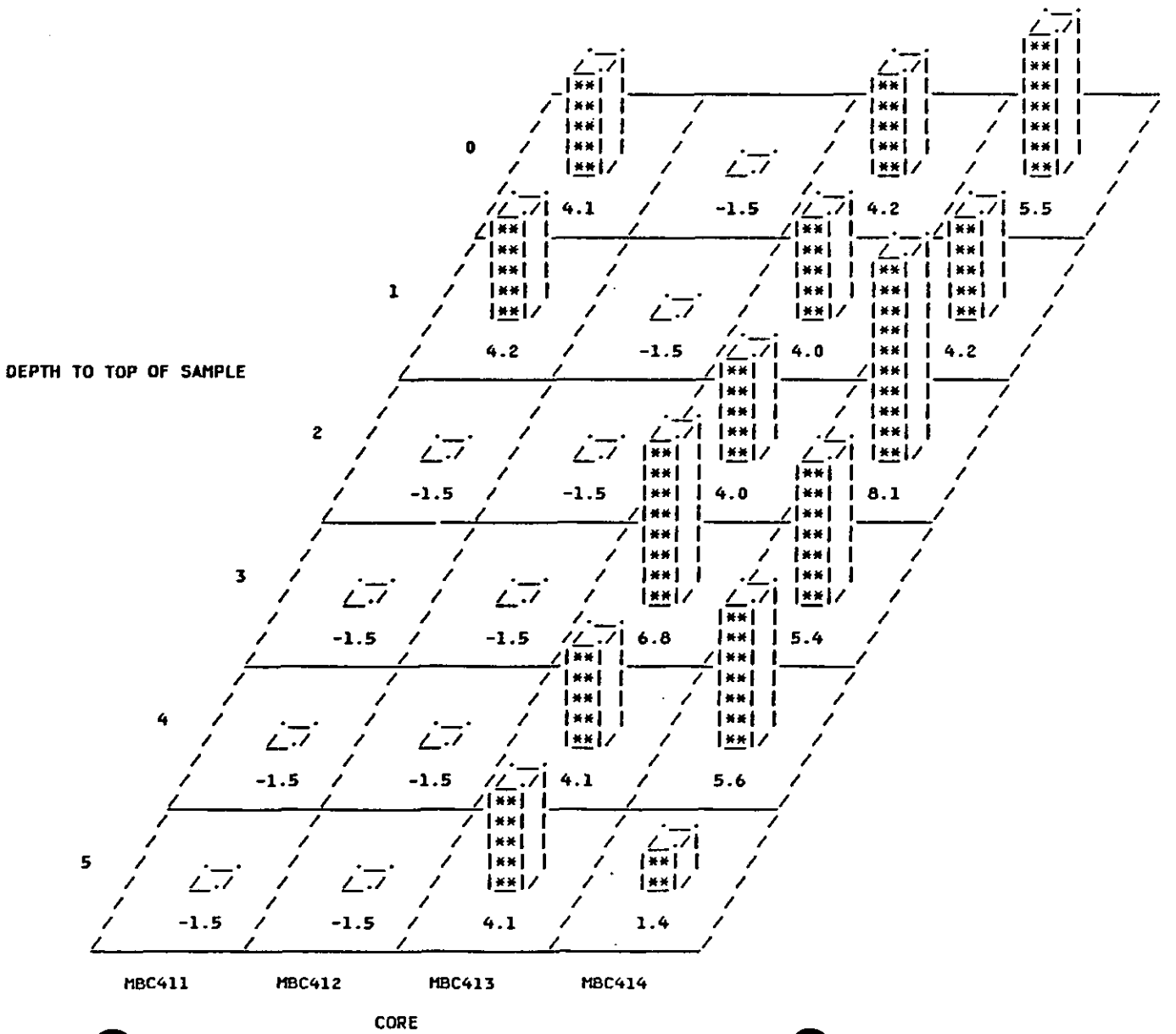


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=NITRATE UNITS=UGG

BLOCK CHART OF RESULT

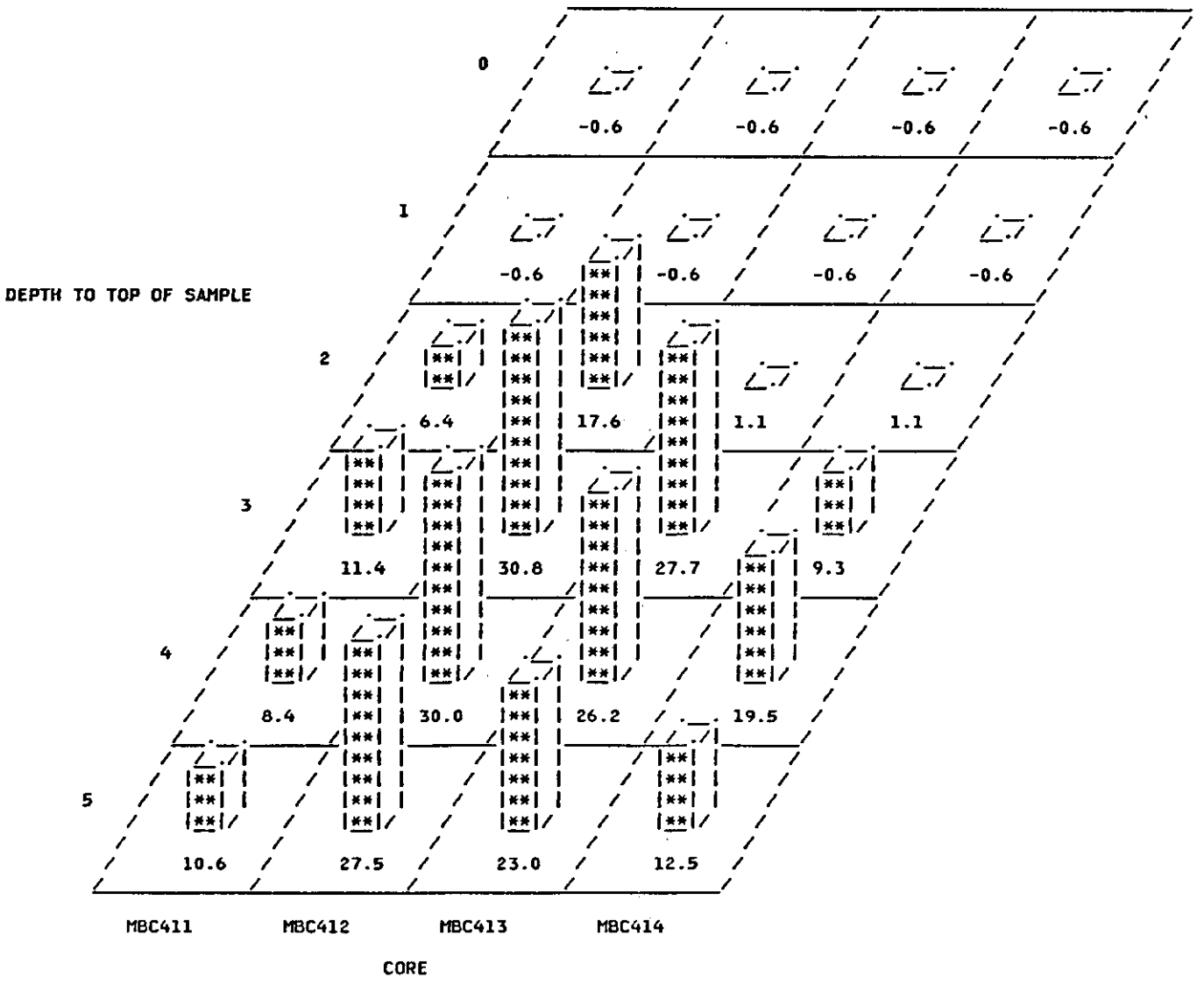


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=NICKEL UNITS=UGG

BLOCK CHART OF RESULT

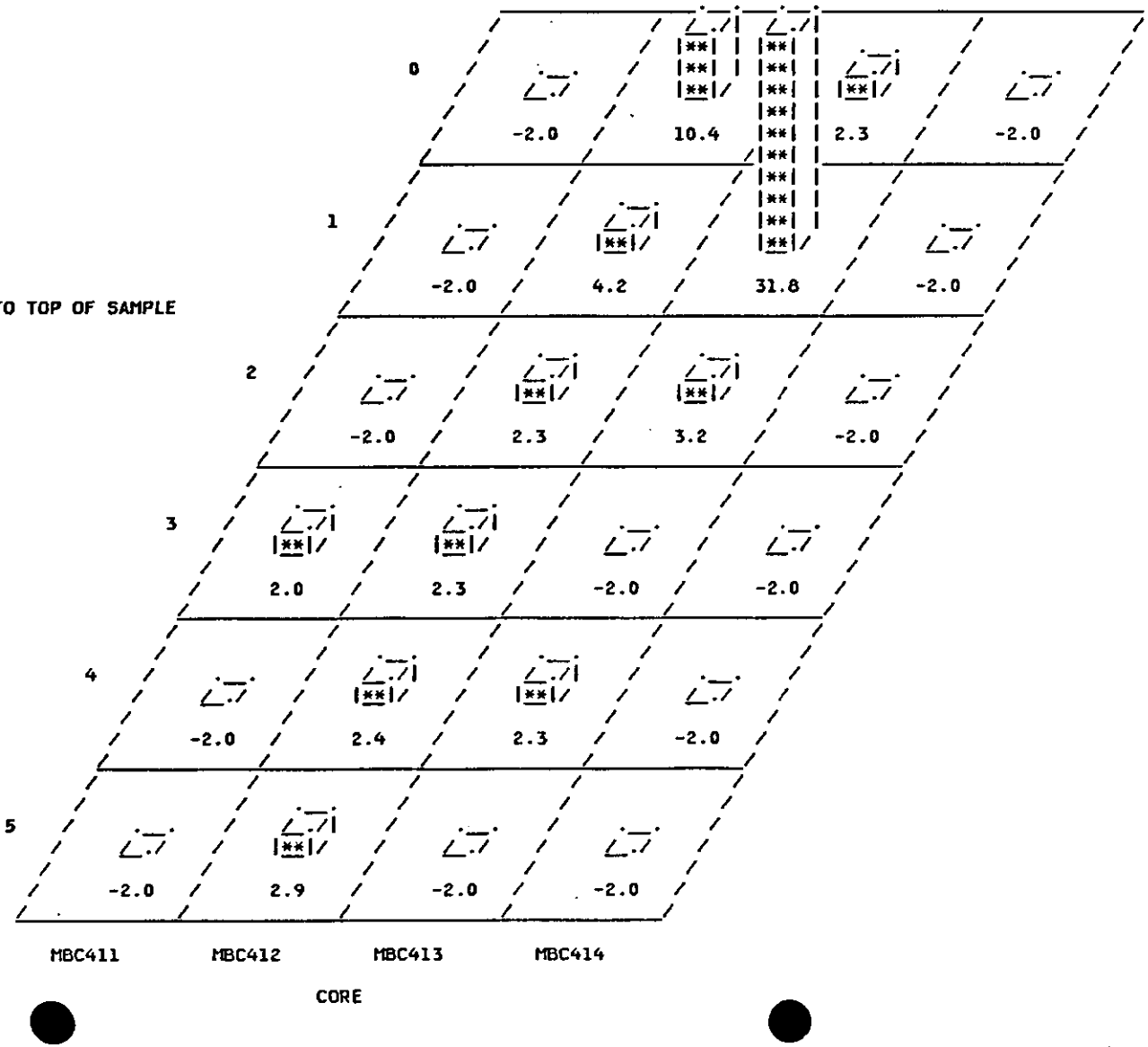


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=LEAD UNITS=UGG

BLOCK CHART OF RESULT

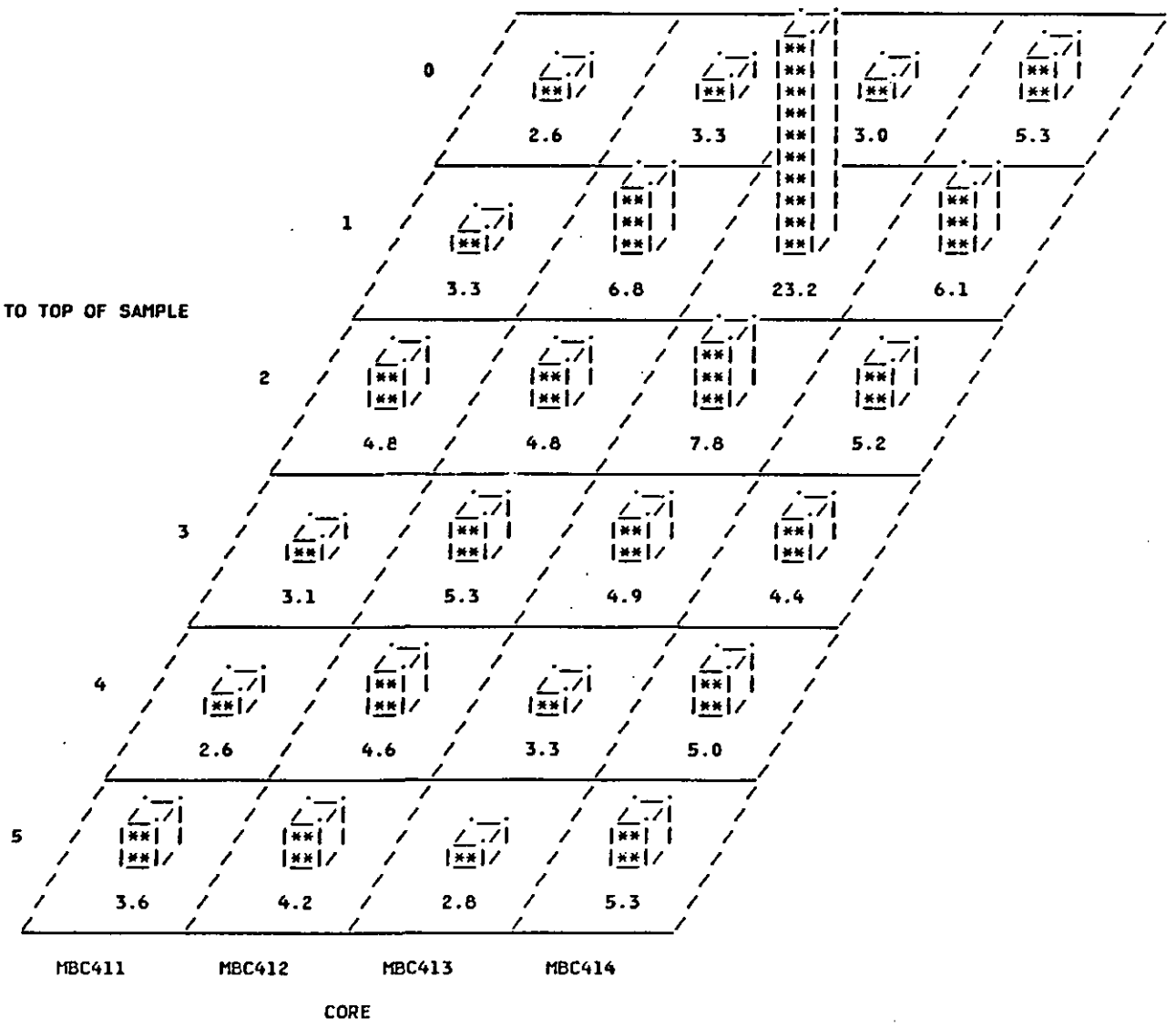


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ORGANIC CARBON  UNITS=UGG

BLOCK CHART OF RESULT

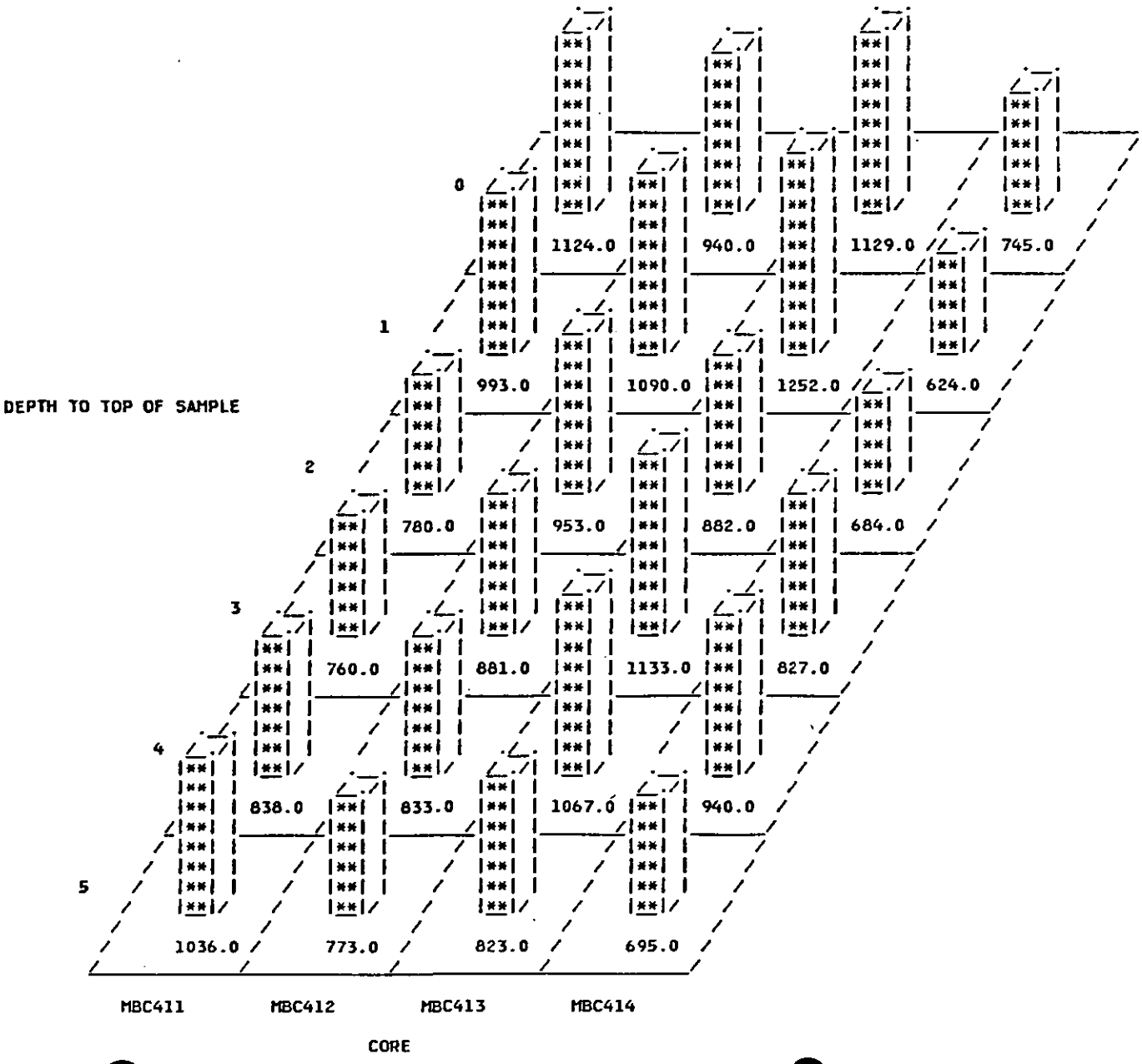


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ORGANIC HALOGENS  UNITS=UGG

BLOCK CHART OF RESULT

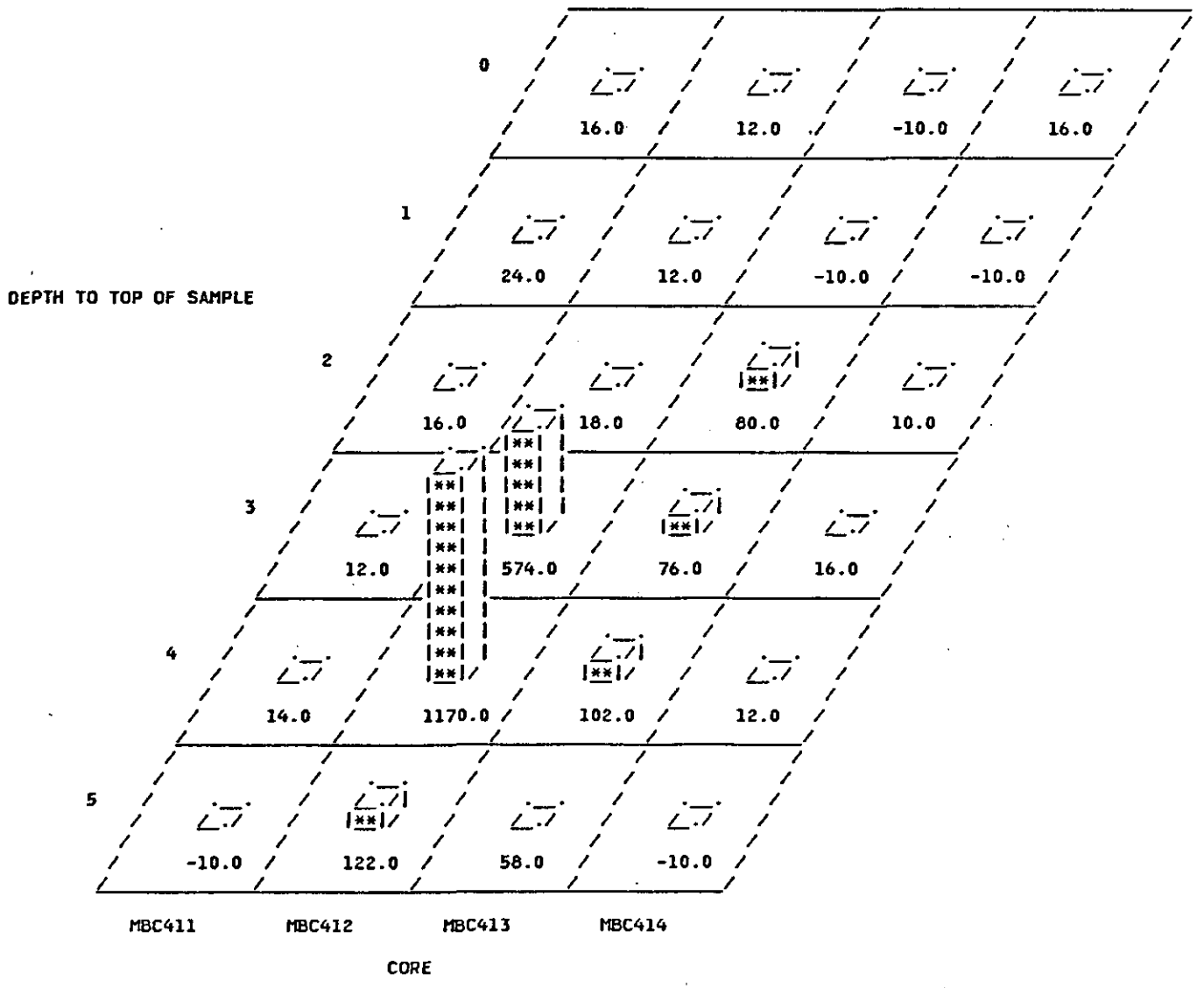


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=TOTAL PHOSPHATES  UNITS=UGG

BLOCK CHART OF RESULT

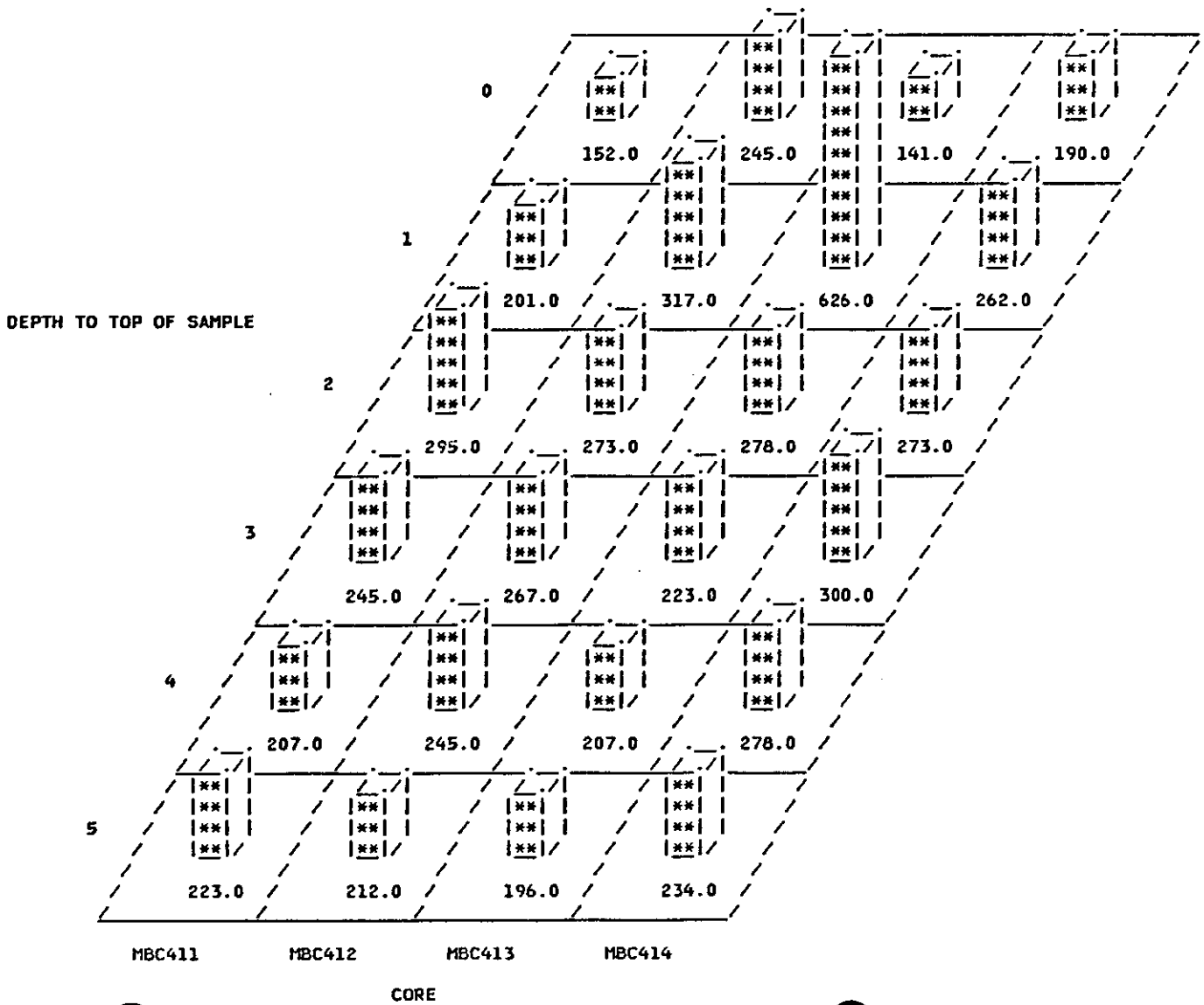


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=URANIUM UNITS=UGG

BLOCK CHART OF RESULT

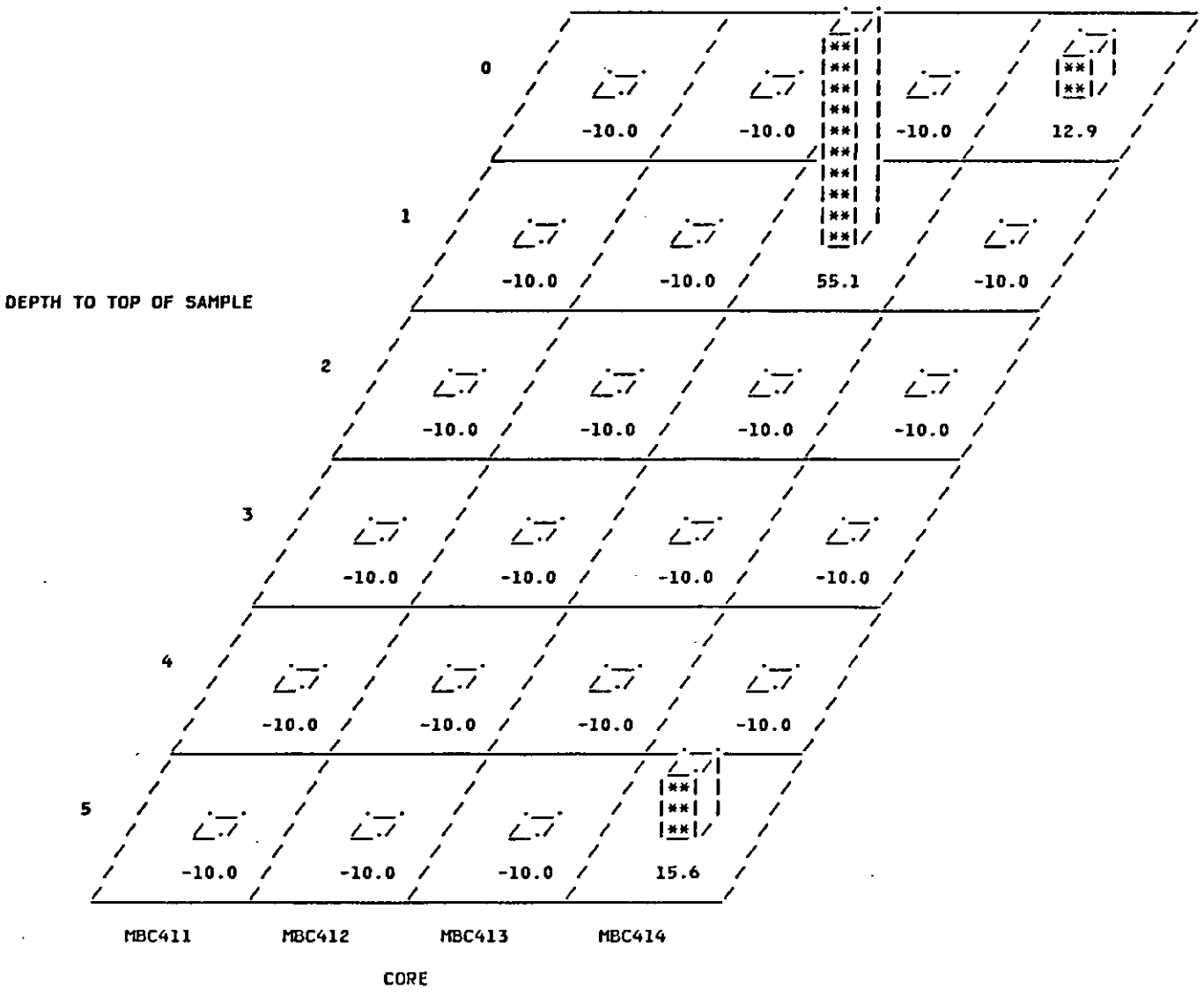


TABLE 6-15.
CROSS SECTIONS OF PROCESS SEWER, INORGANIC ANALYTES
TESTNAME=ZINC UNITS=UGG

BLOCK CHART OF RESULT

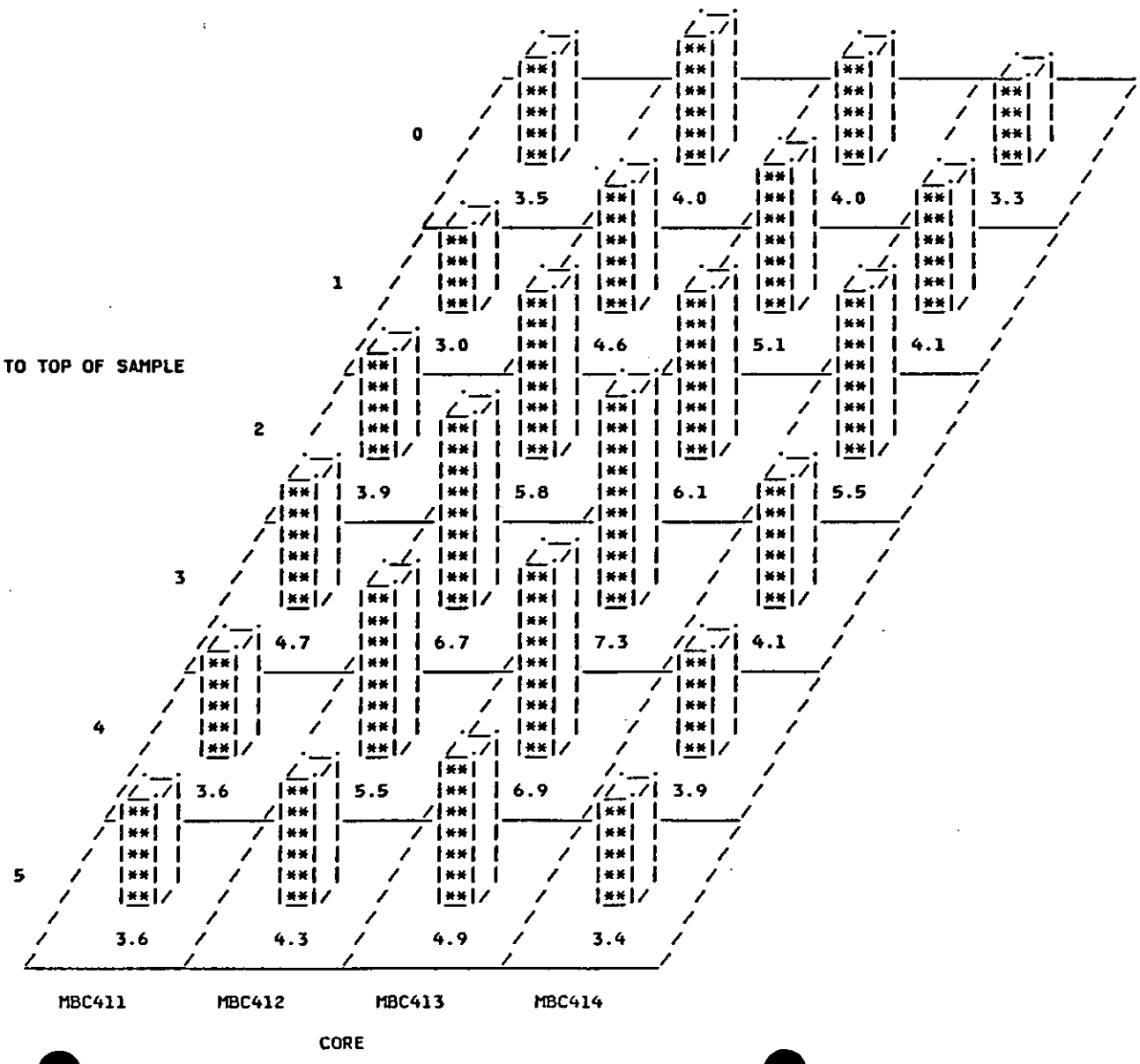


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=METHYLENE CHLORIDE  UNITS=NGG

BLOCK CHART OF RESULT

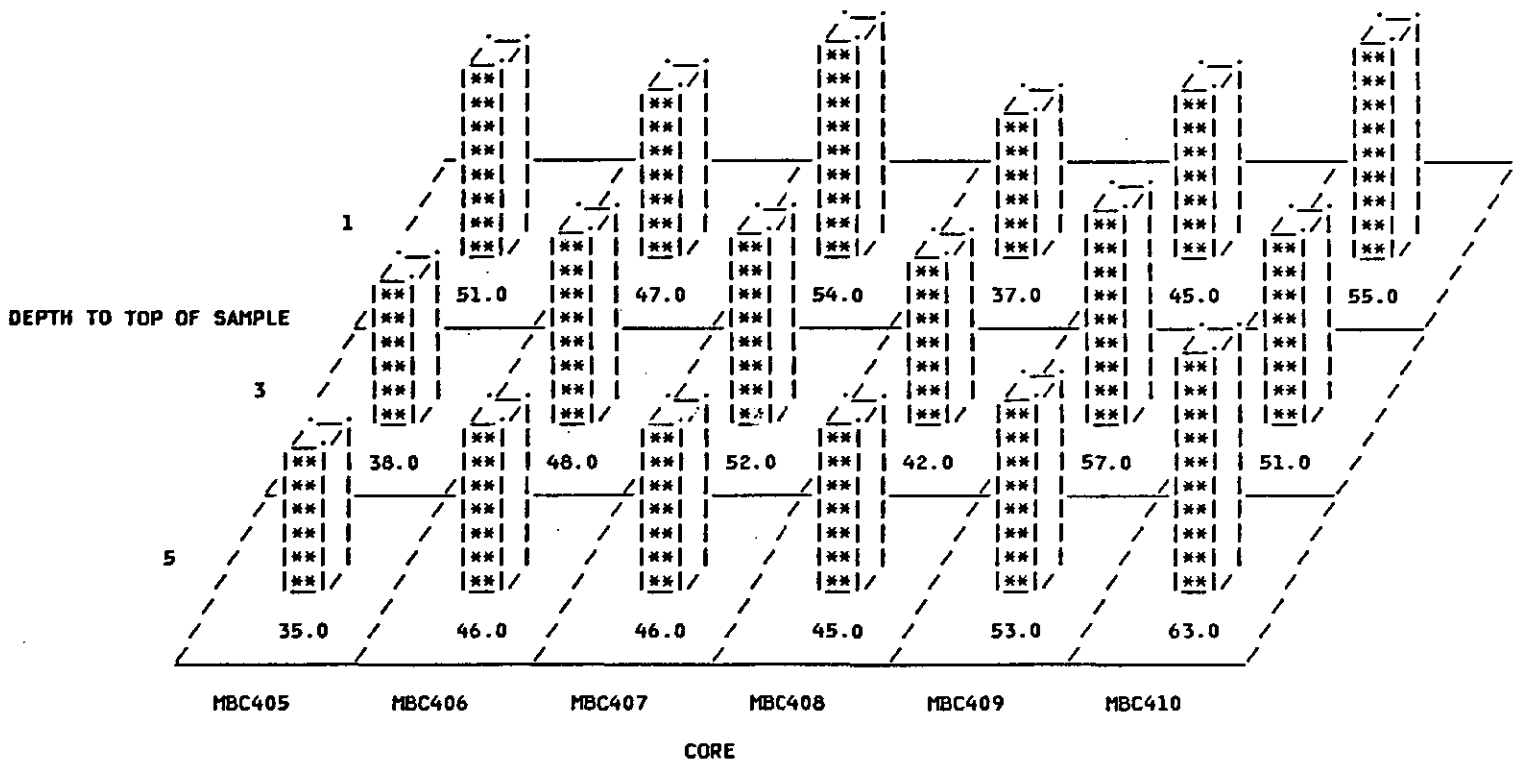


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=TOLUENE  UNITS=NGG

BLOCK CHART OF RESULT

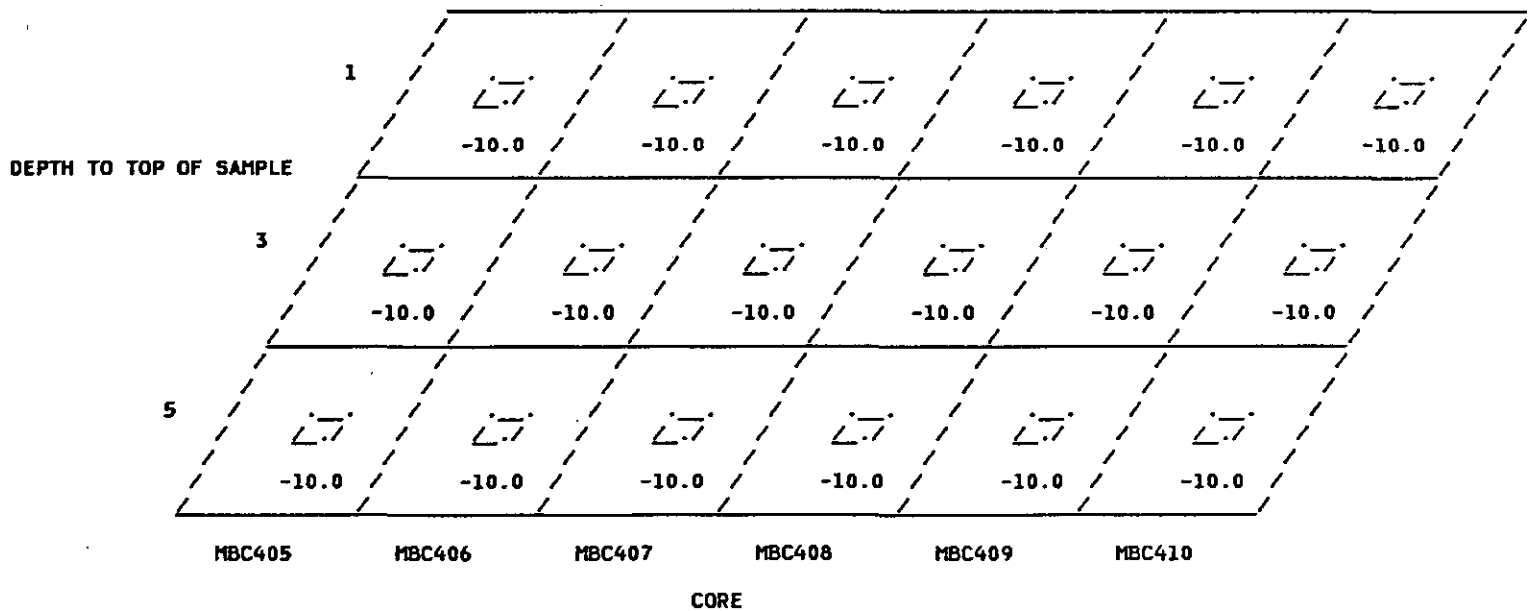


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=TETRACHLOROETHYLENE UNITS=NGG

BLOCK CHART OF RESULT

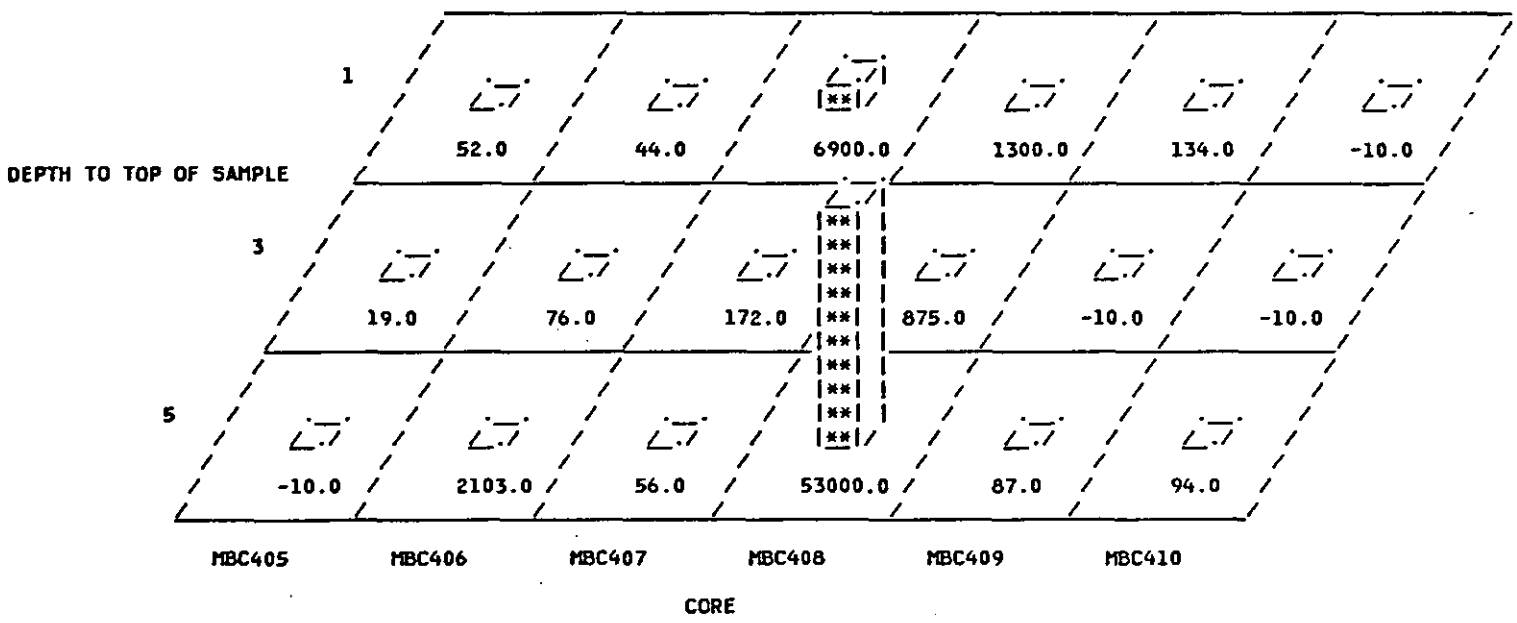


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=TRICHLOROETHYLENE UNITS=NGG

BLOCK CHART OF RESULT

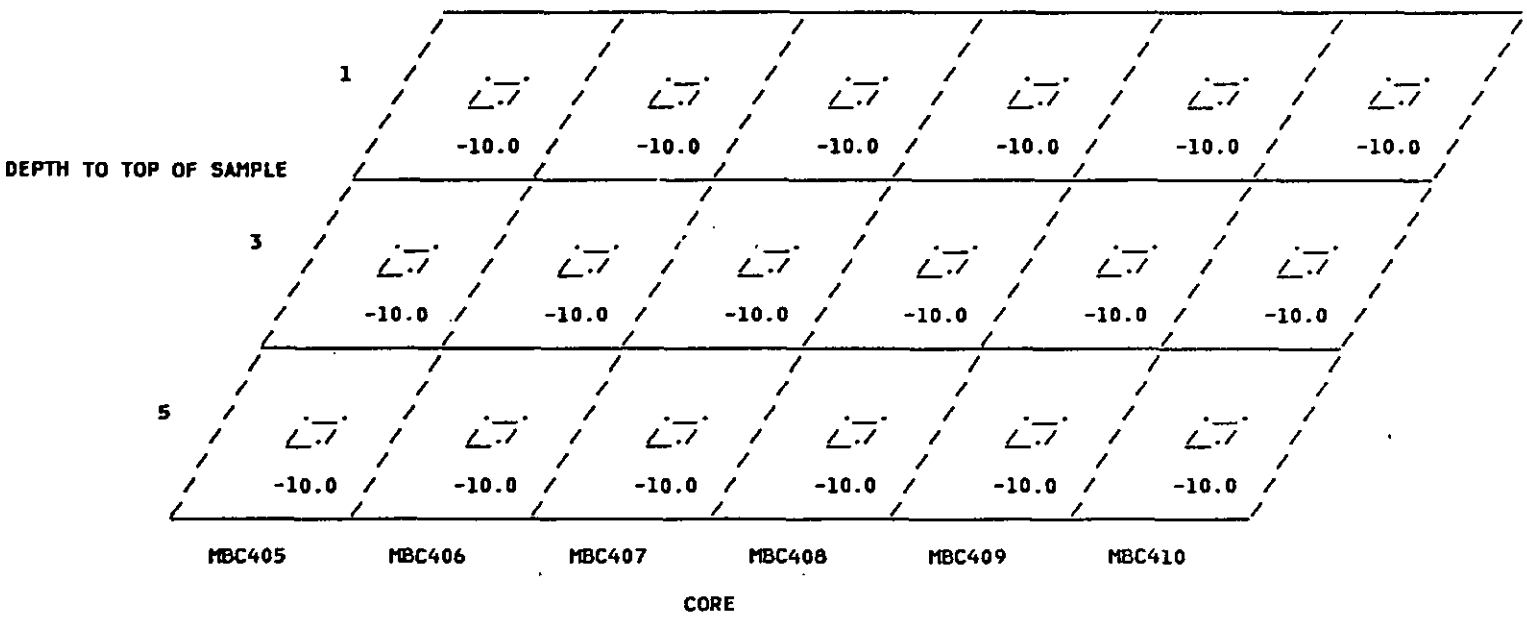


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=1,1,1-TRICHLOROETHANE UNITS=NGG

BLOCK CHART OF RESULT

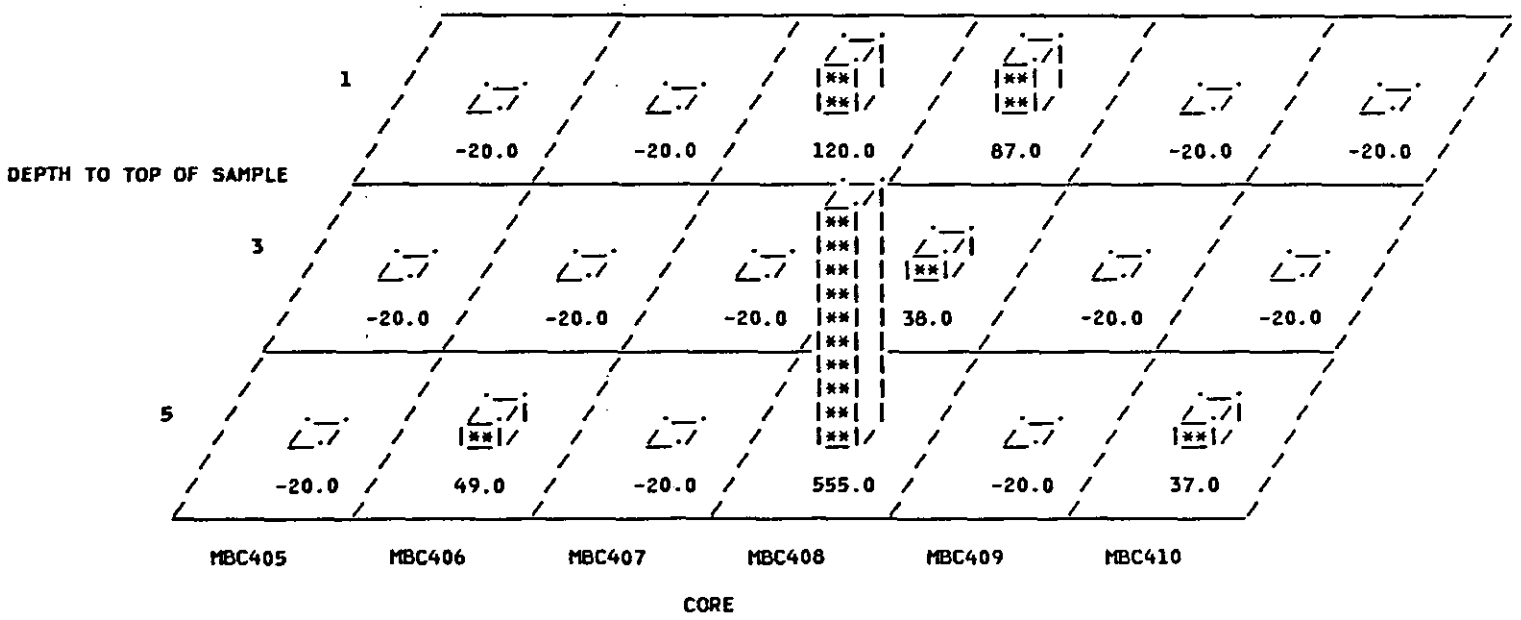


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=METHYLENE CHLORIDE  UNITS=NGG

BLOCK CHART OF RESULT

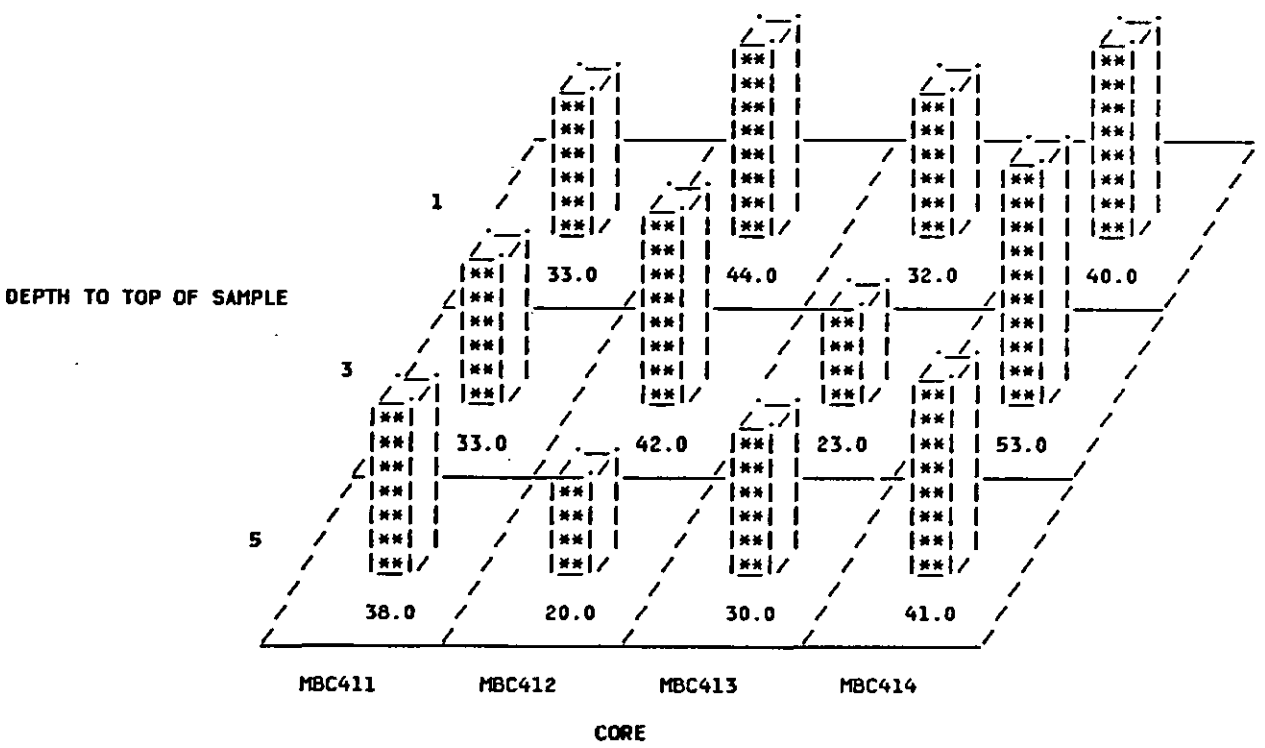


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=TOLUENE  UNITS=NGG

BLOCK CHART OF RESULT

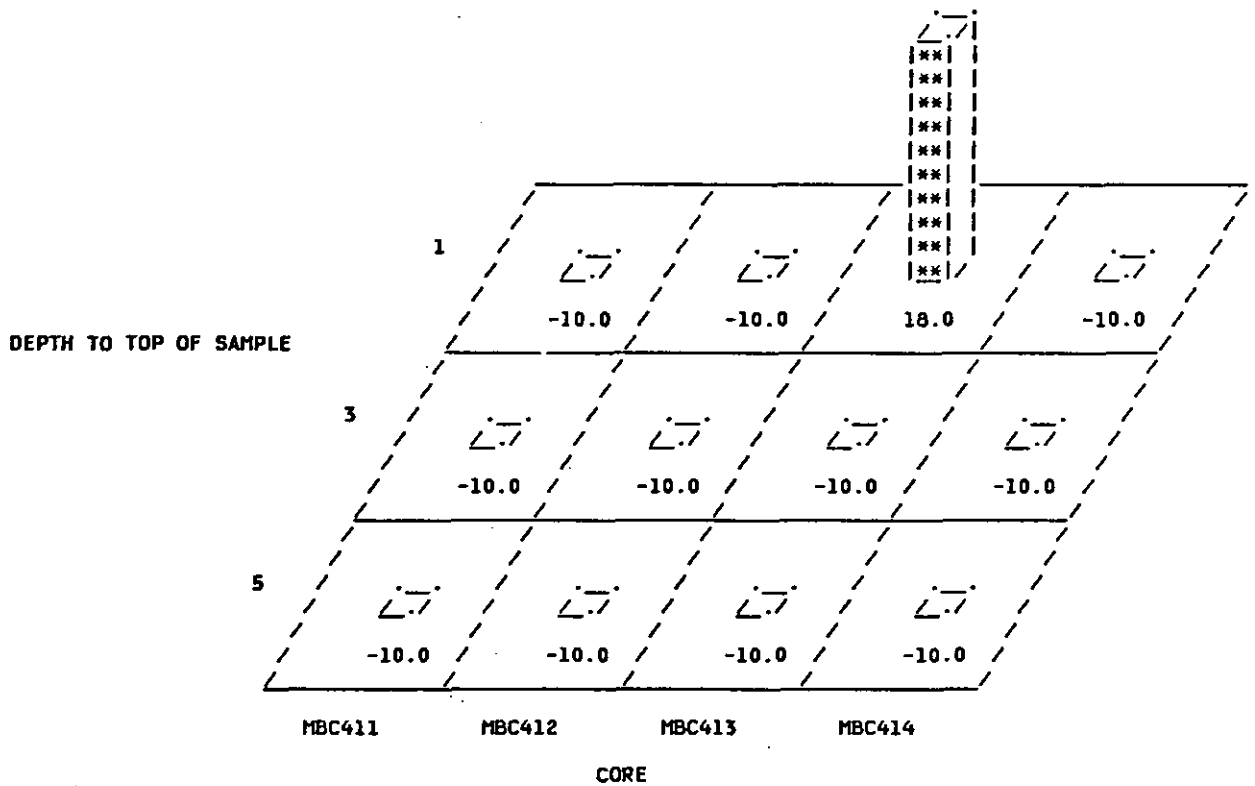


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=TETRACHLOROETHYLENE UNITS=NGG

BLOCK CHART OF RESULT

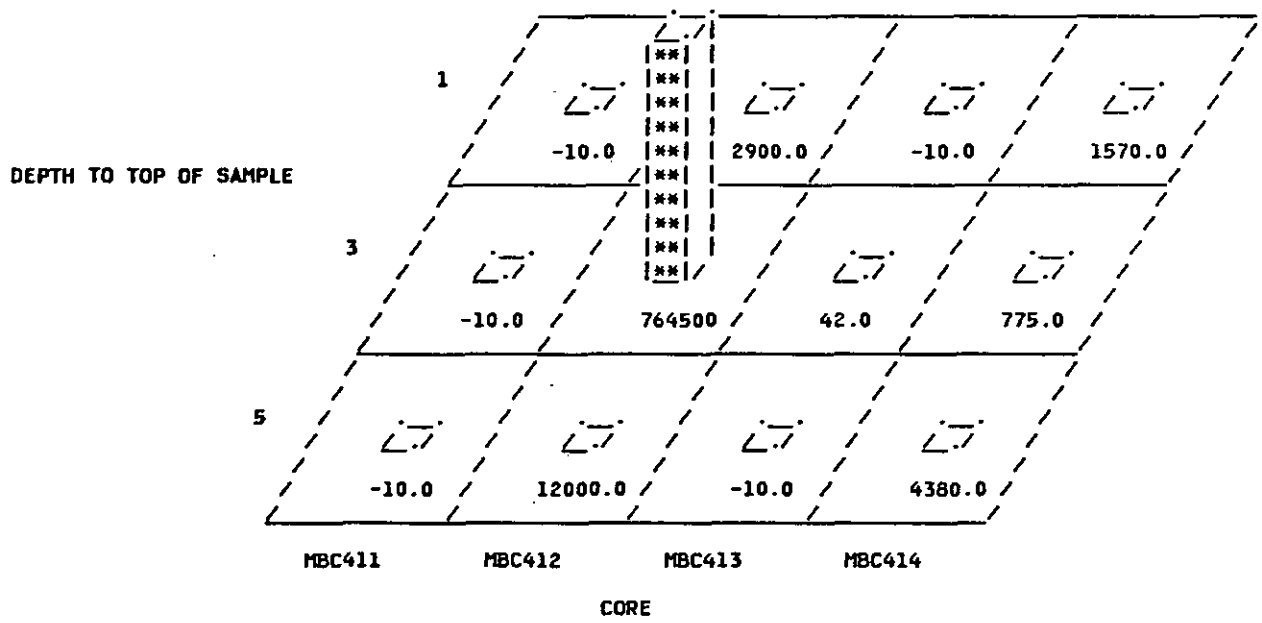


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=TRICHLOROETHYLENE UNITS=NGG

BLOCK CHART OF RESULT

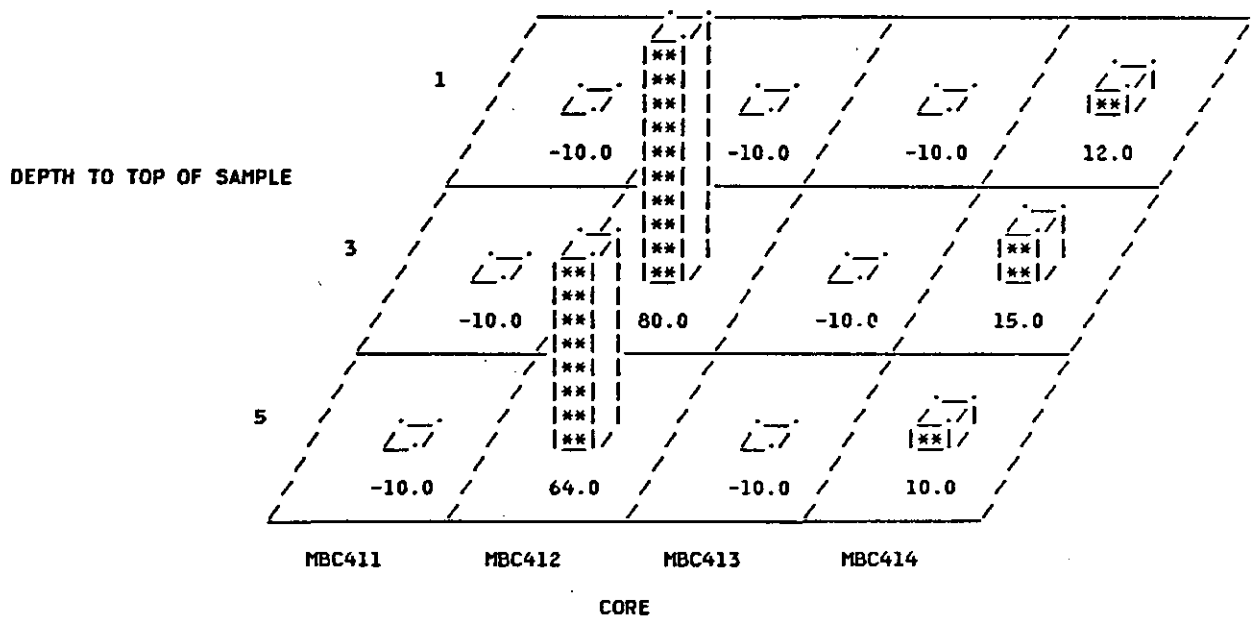


TABLE 6-16.
CROSS SECTIONS OF PROCESS SEWER, FIVE VOLATILE ORGANICS
TESTNAME=1,1,1-TRICHLOROETHANE  UNITS=NGG

BLOCK CHART OF RESULT

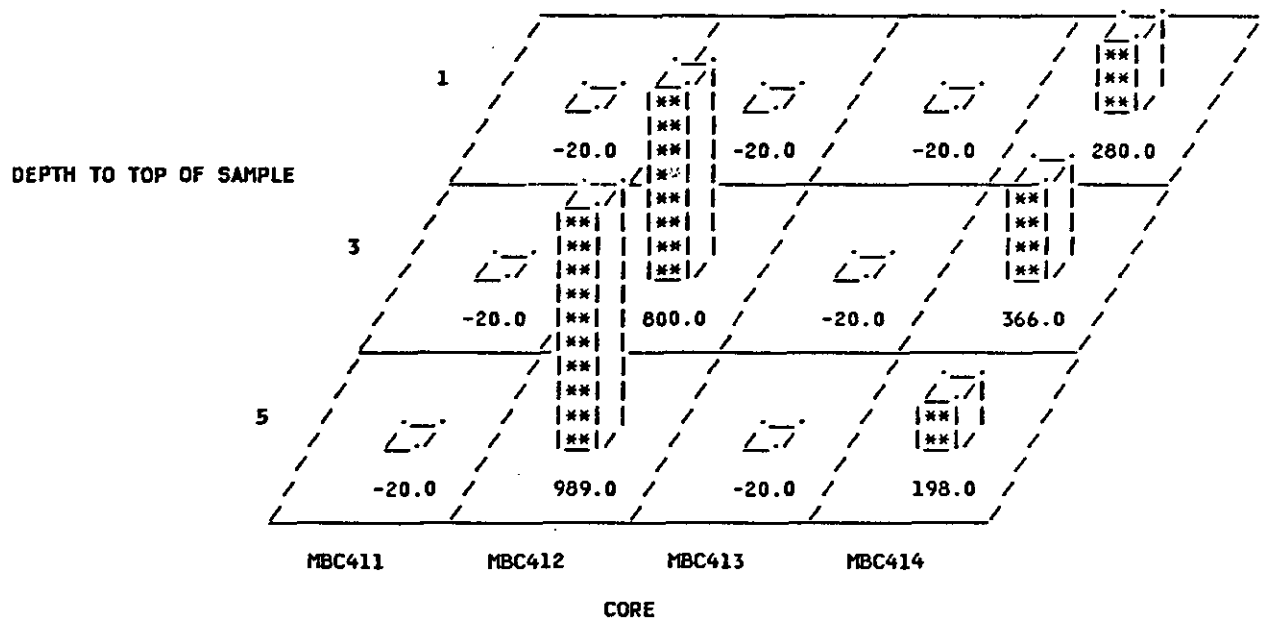


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=ALUMINUM UNITS=UGG

BLOCK CHART OF RESULT

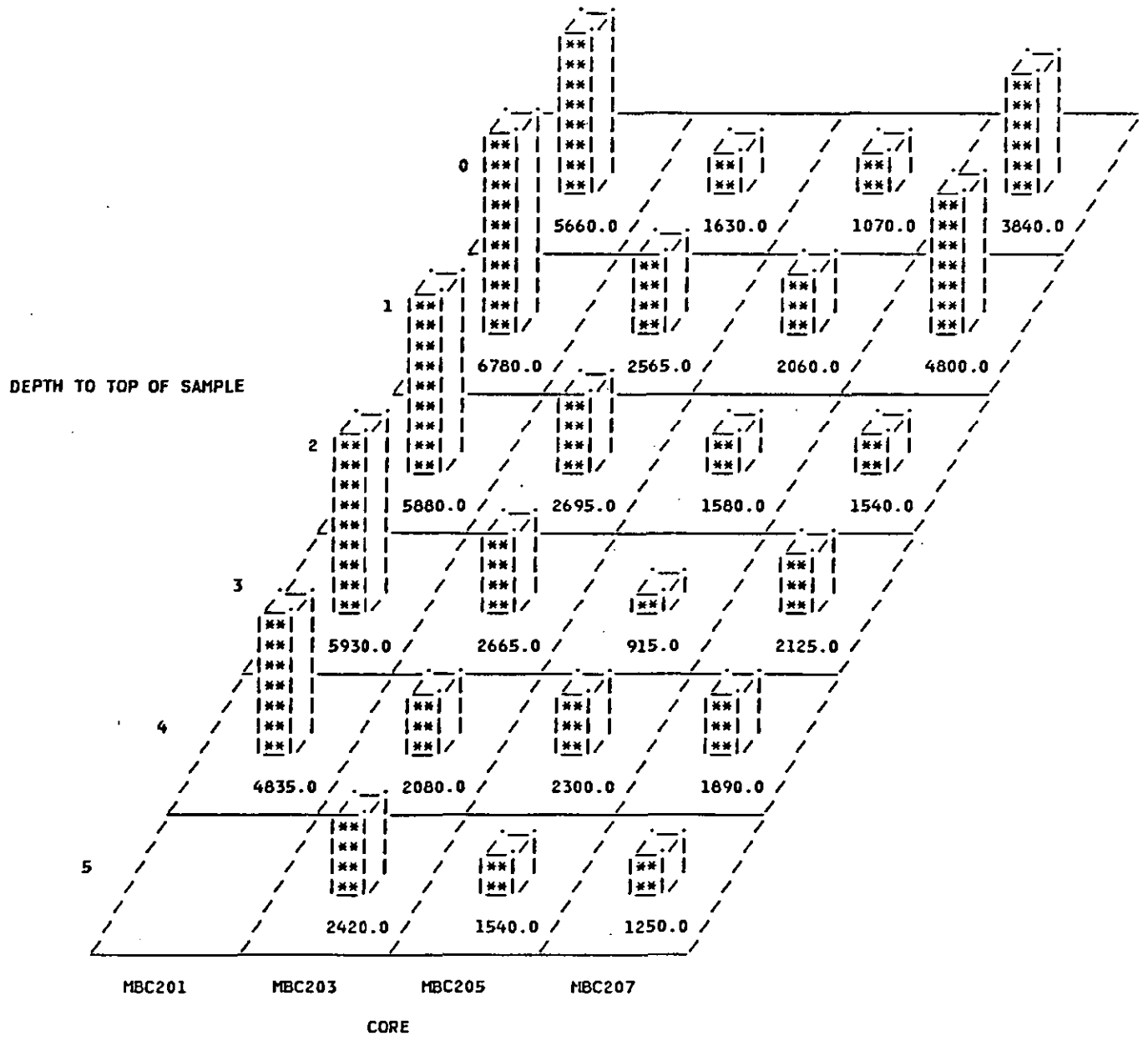


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=CALCIUM  UNITS=UGG

BLOCK CHART OF RESULT

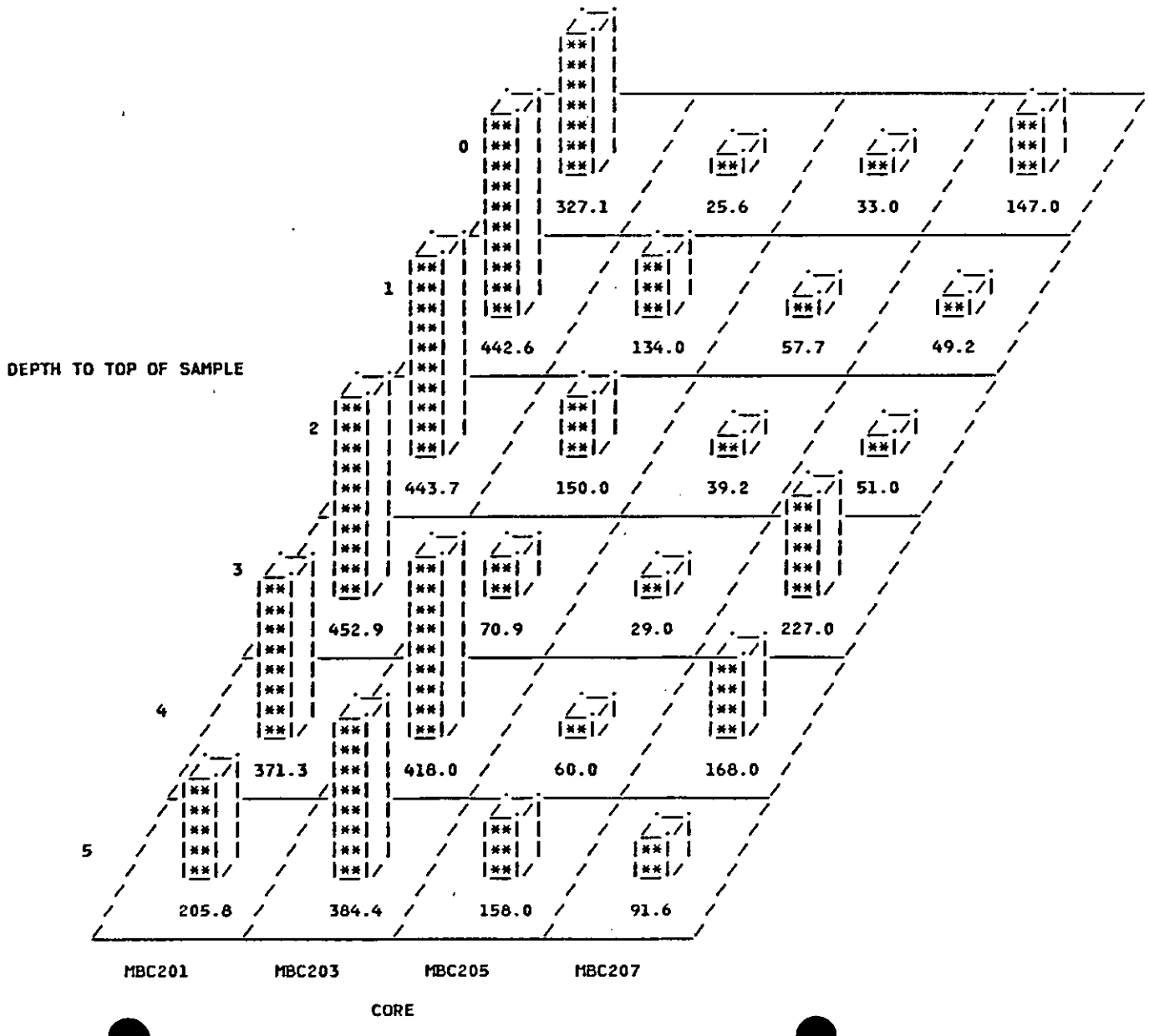


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=CHLORIDE UNITS=UGG

BLOCK CHART OF RESULT

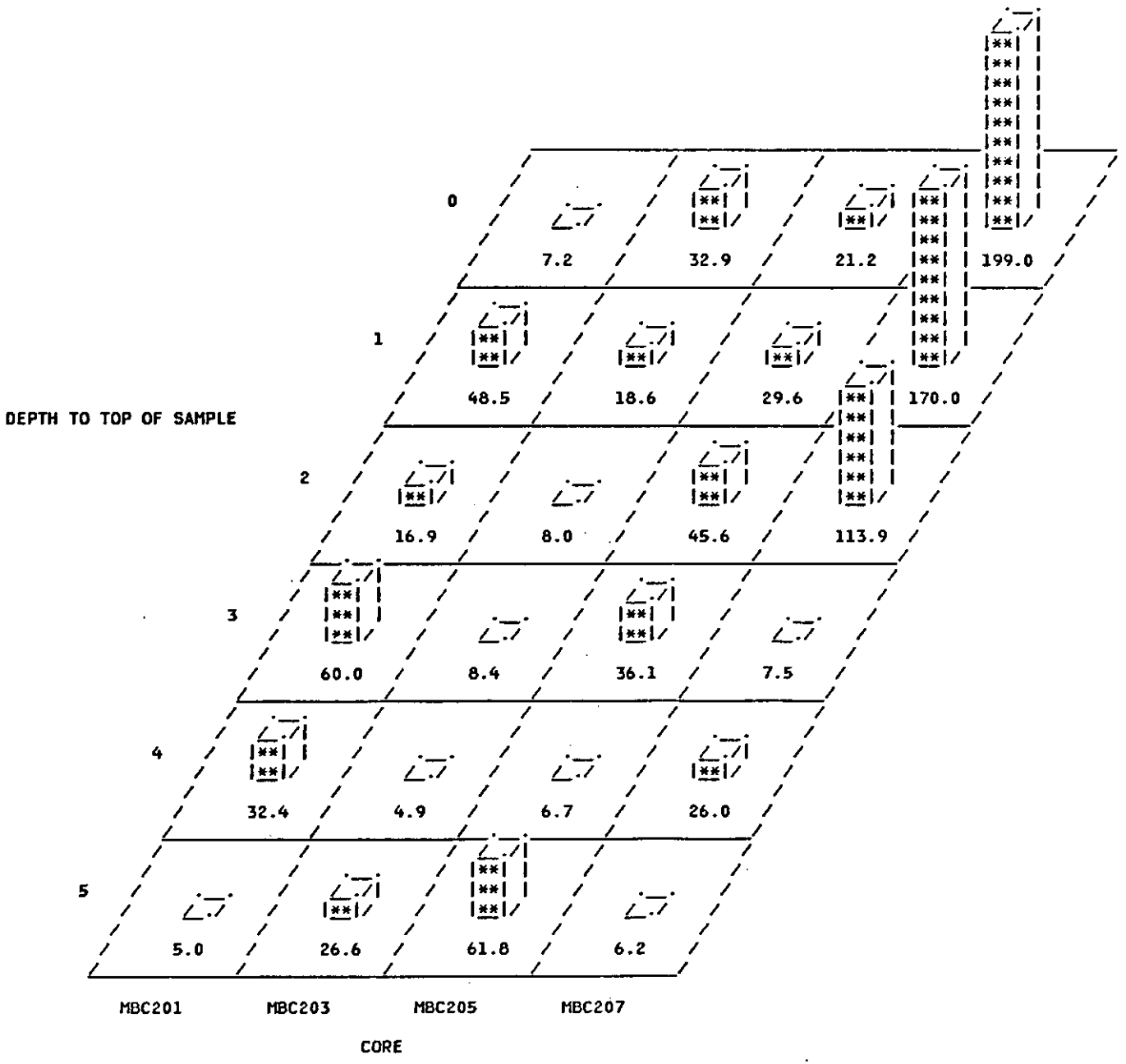


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=CHROMIUM  UNITS=UGG

BLOCK CHART OF RESULT

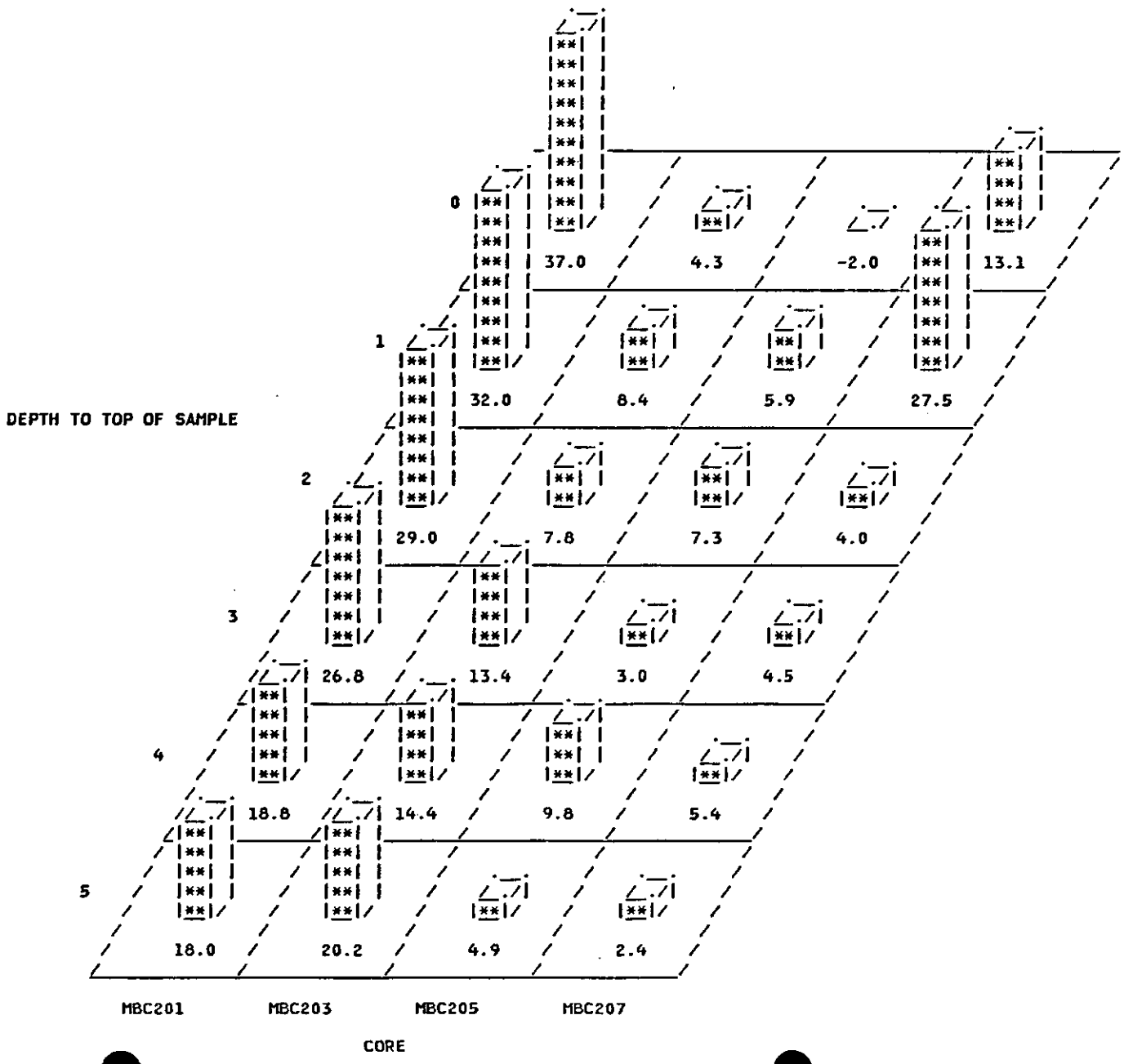


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=COPPER  UNITS=UGG

BLOCK CHART OF RESULT

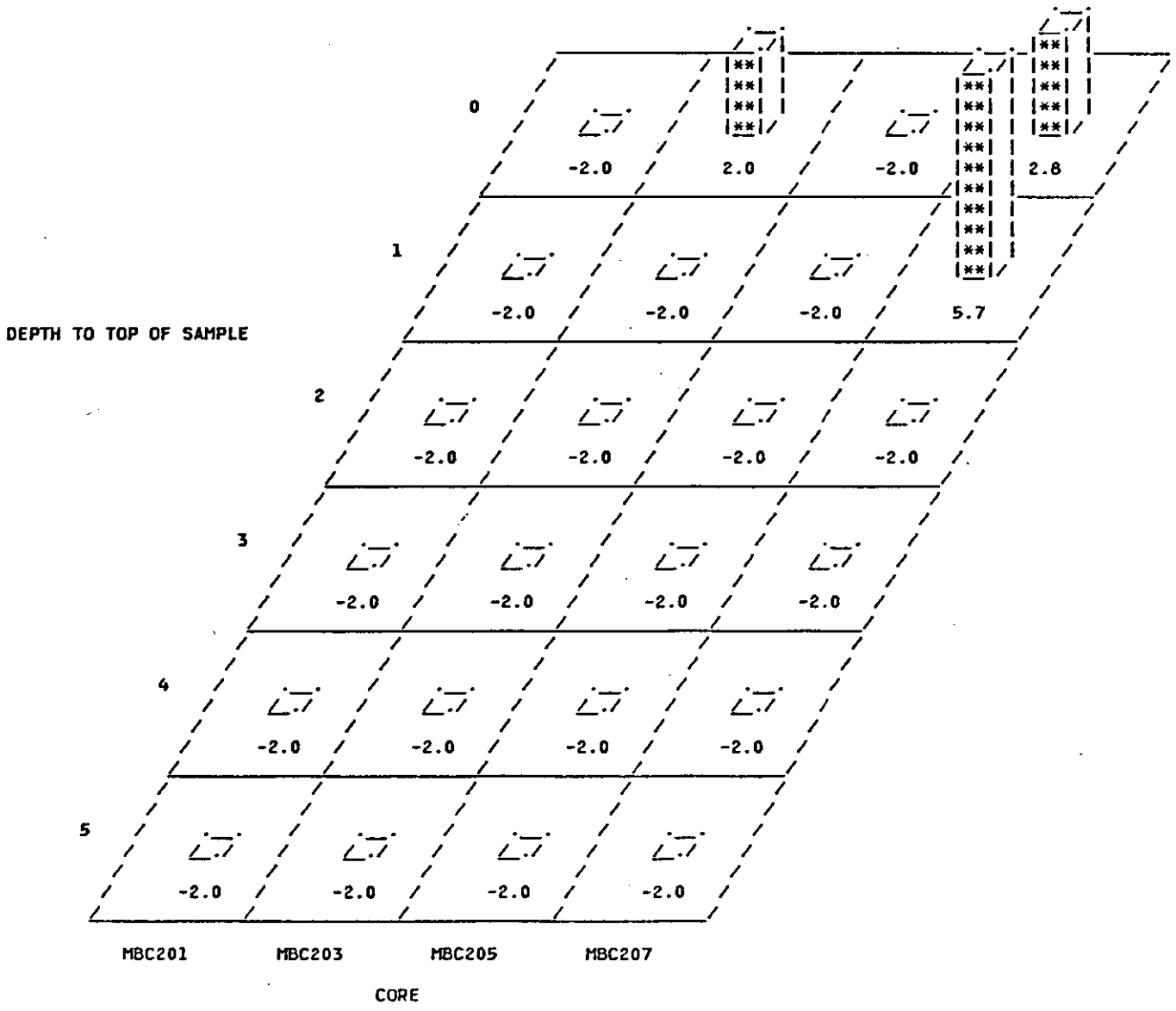


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=IRON  UNITS=UGG

BLOCK CHART OF RESULT

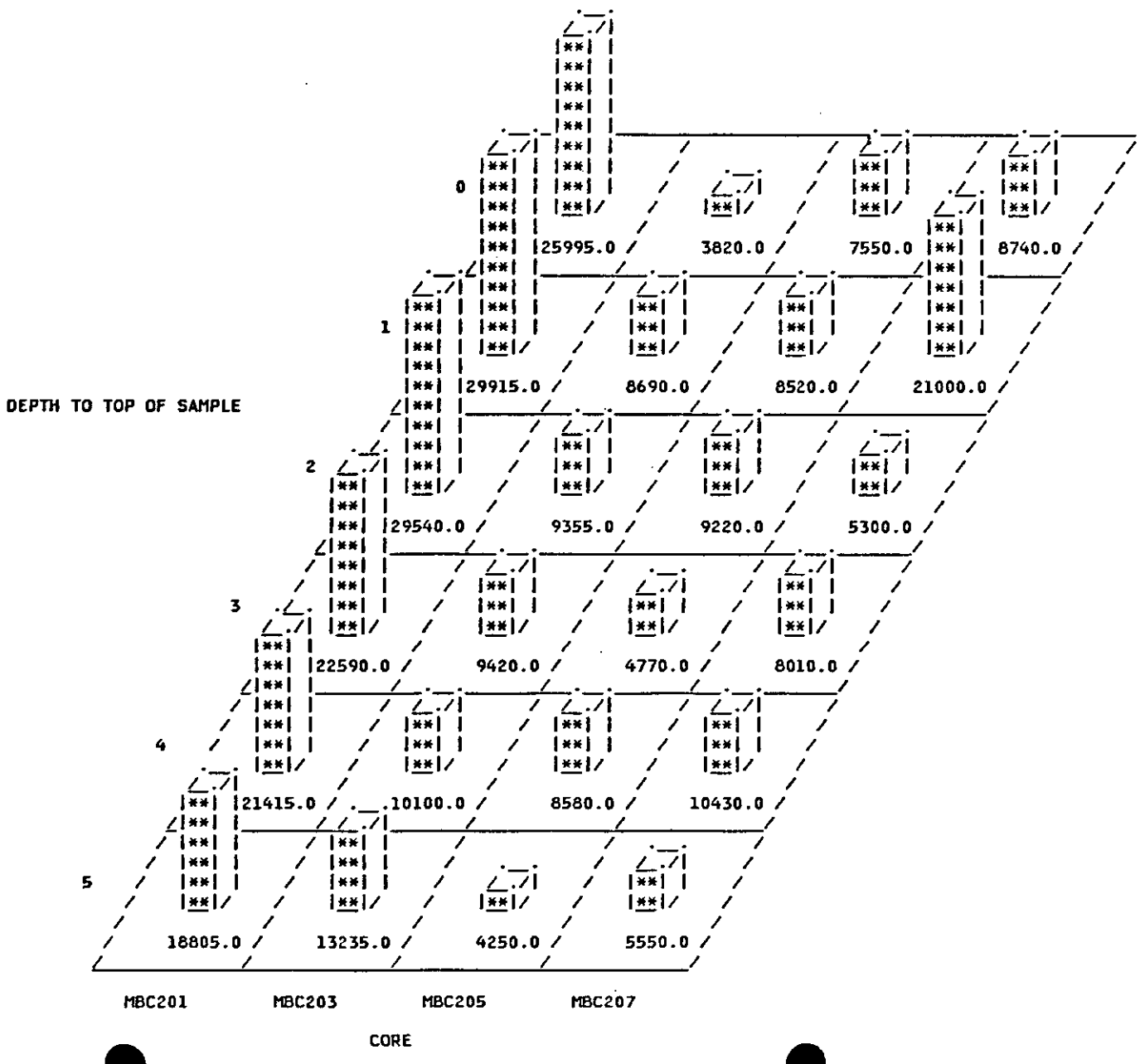


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=POTASSIUM  UNITS=UGG

BLOCK CHART OF RESULT

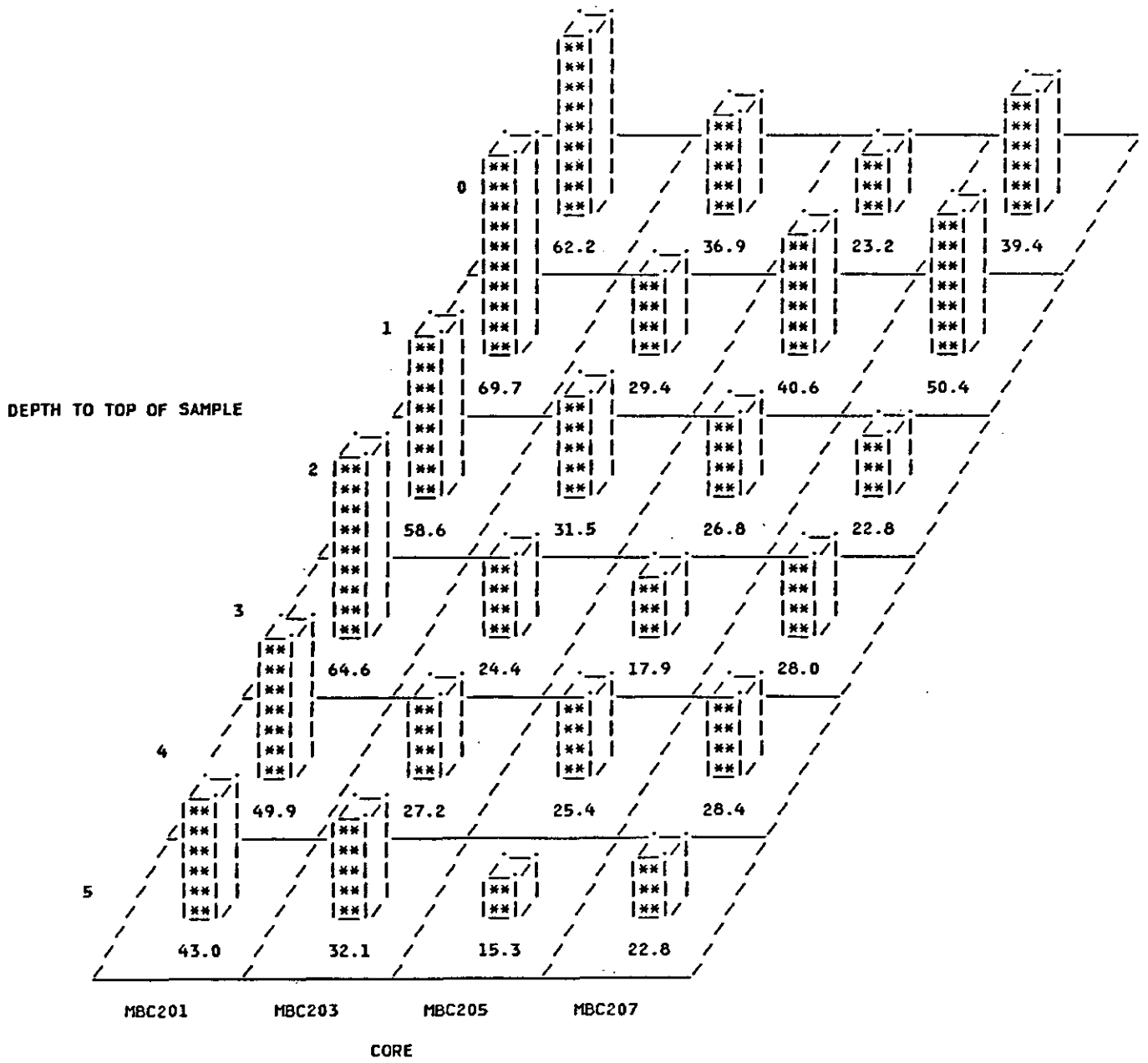


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=MAGNESIUM UNITS=UGG

BLOCK CHART OF RESULT

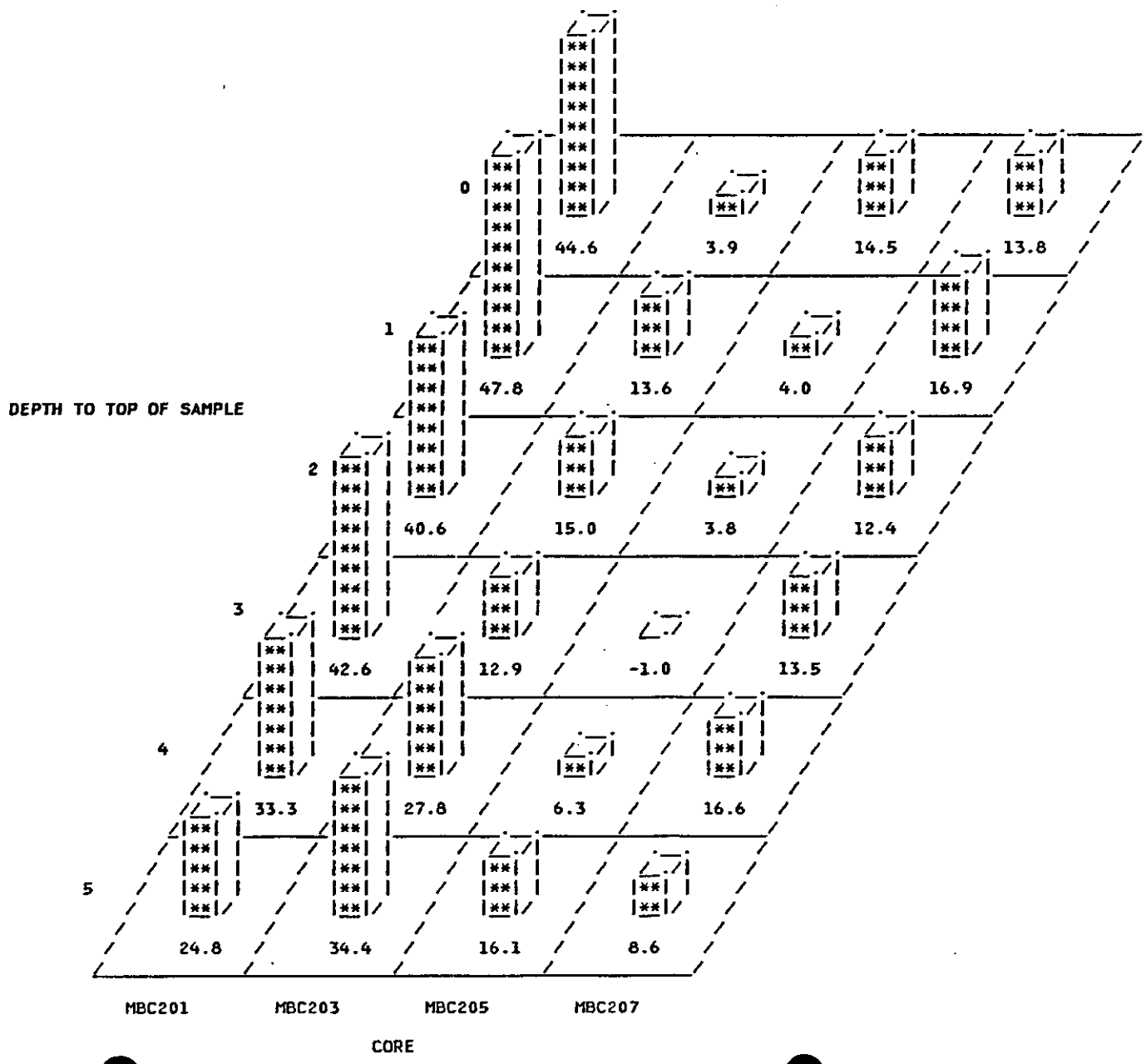


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=MANGANESE UNITS=UGG

BLOCK CHART OF RESULT

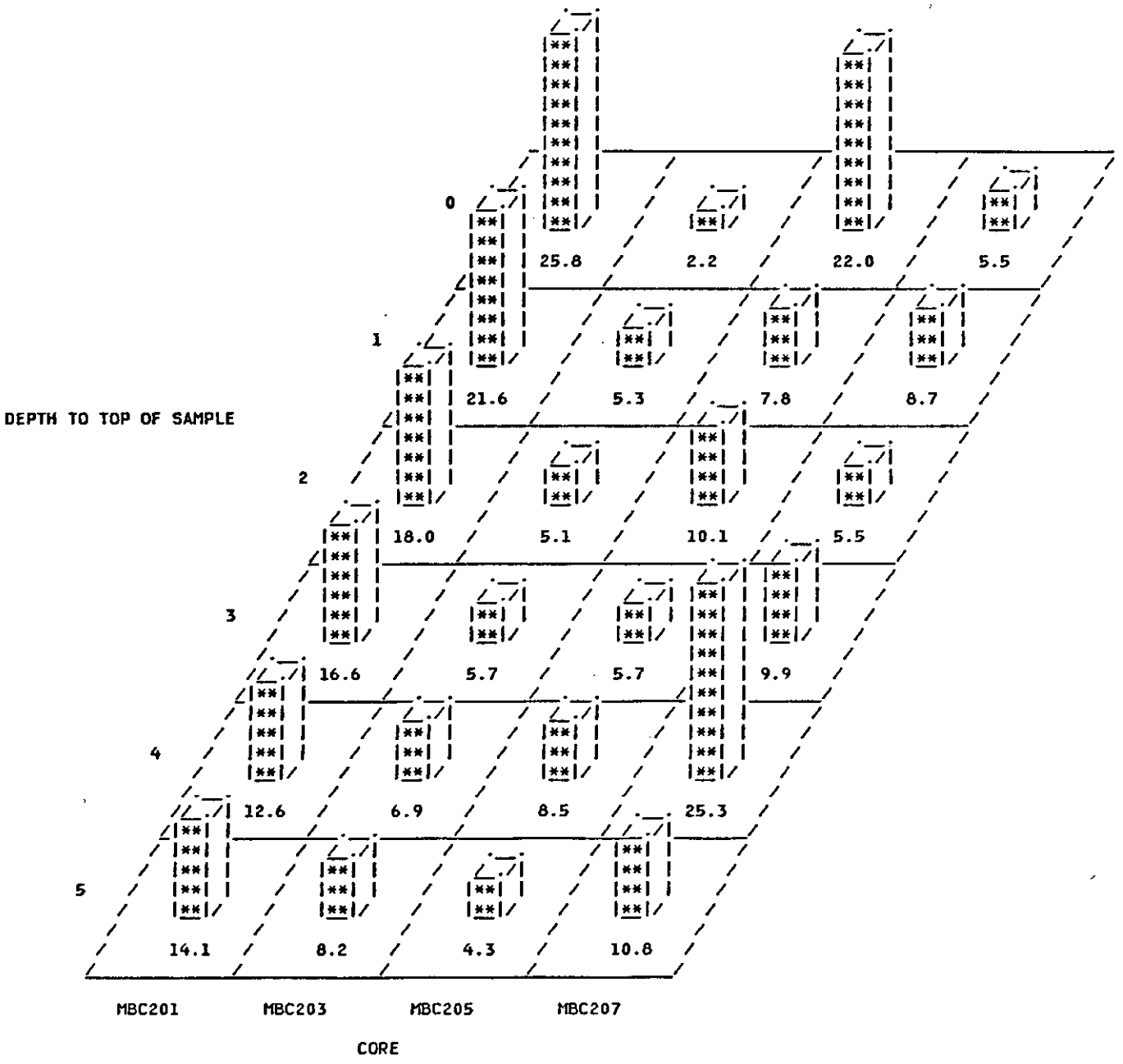


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=SODIUM UNITS=UGG

BLOCK CHART OF RESULT

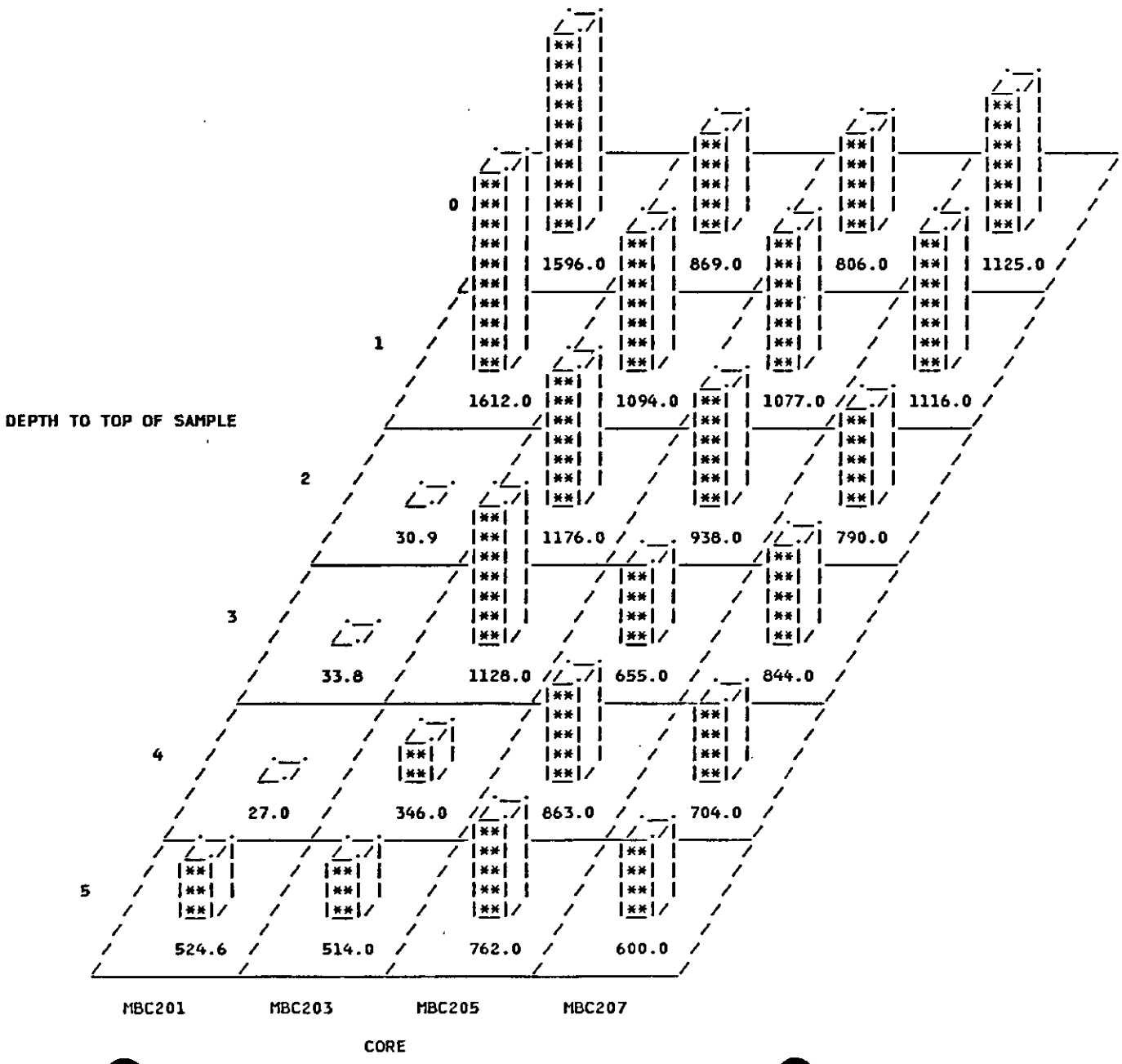


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=AMMONIA NITROGEN  UNITS=UGG

BLOCK CHART OF RESULT

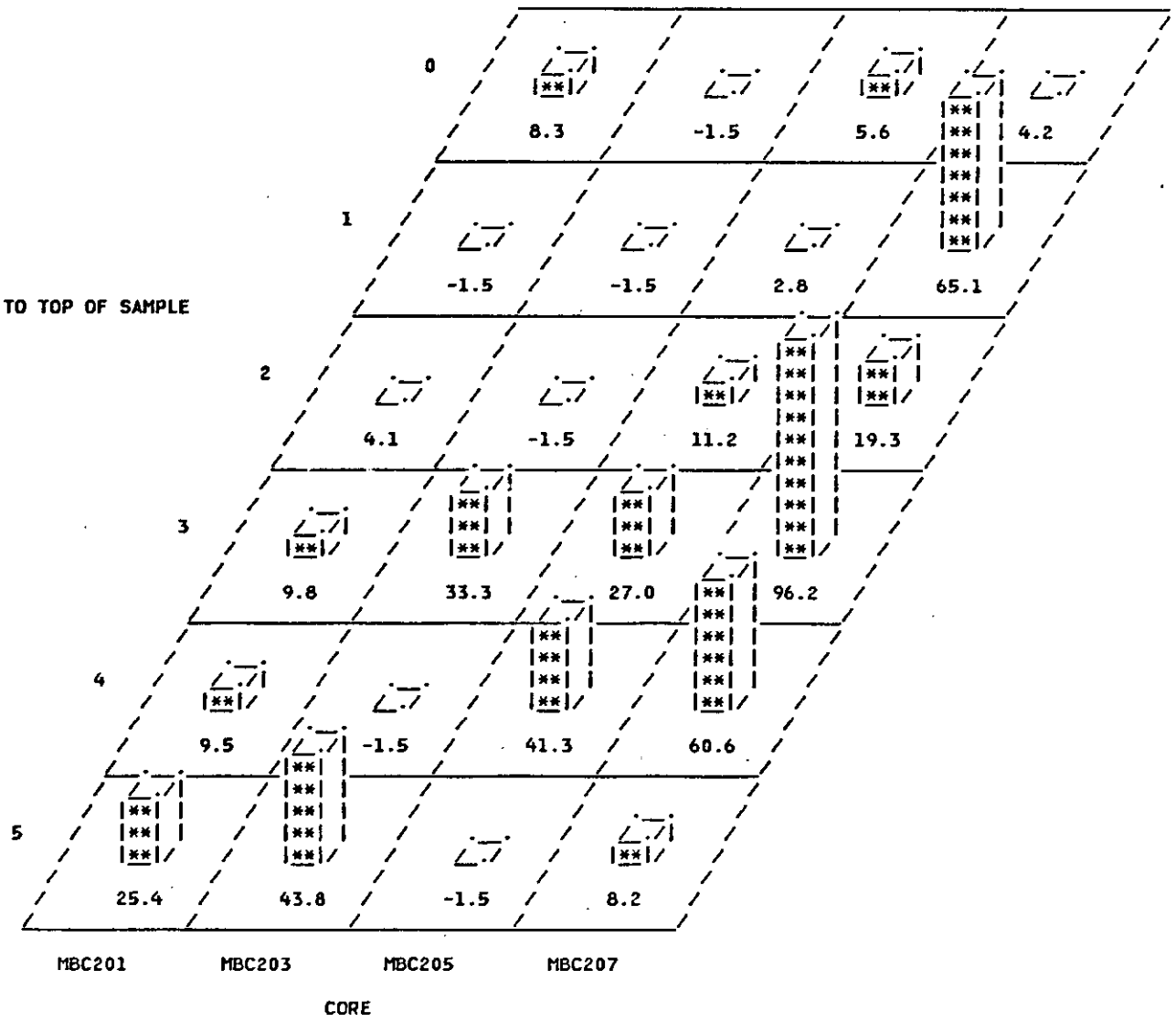


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=NITRATE  UNITS=UGG

BLOCK CHART OF RESULT

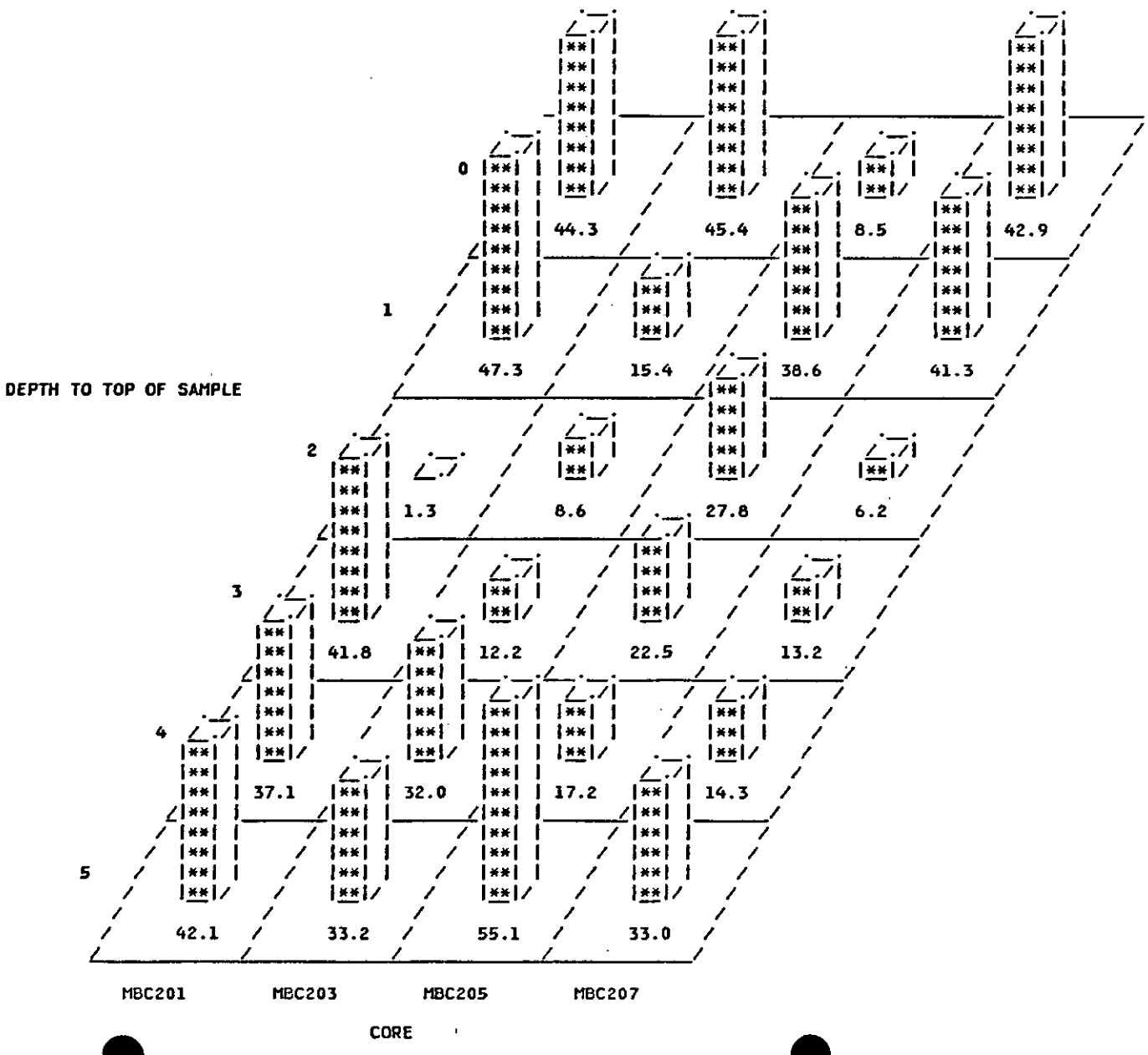


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=NICKEL UNITS=UGG

BLOCK CHART OF RESULT

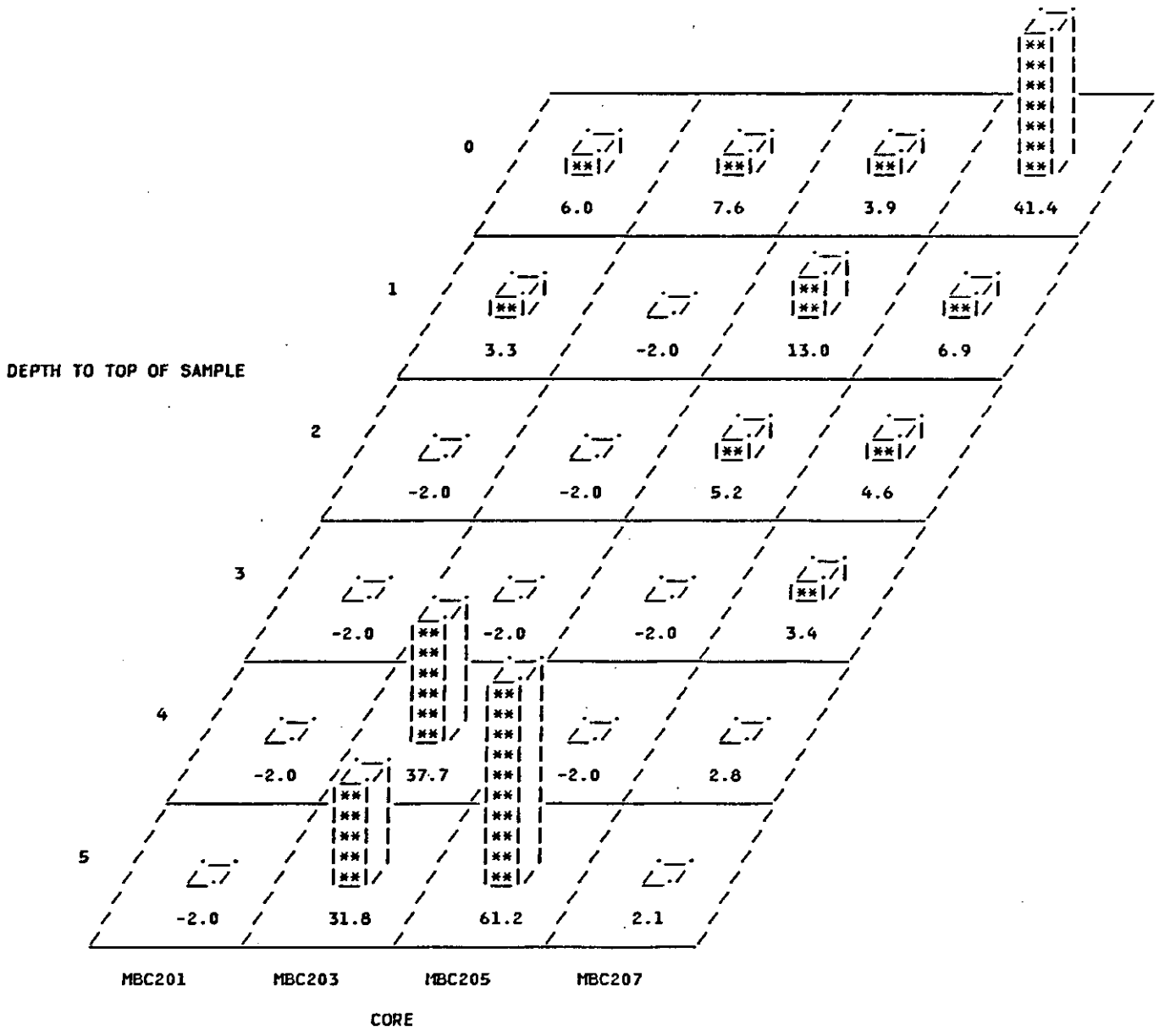


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=LEAD UNITS=UGG

BLOCK CHART OF RESULT

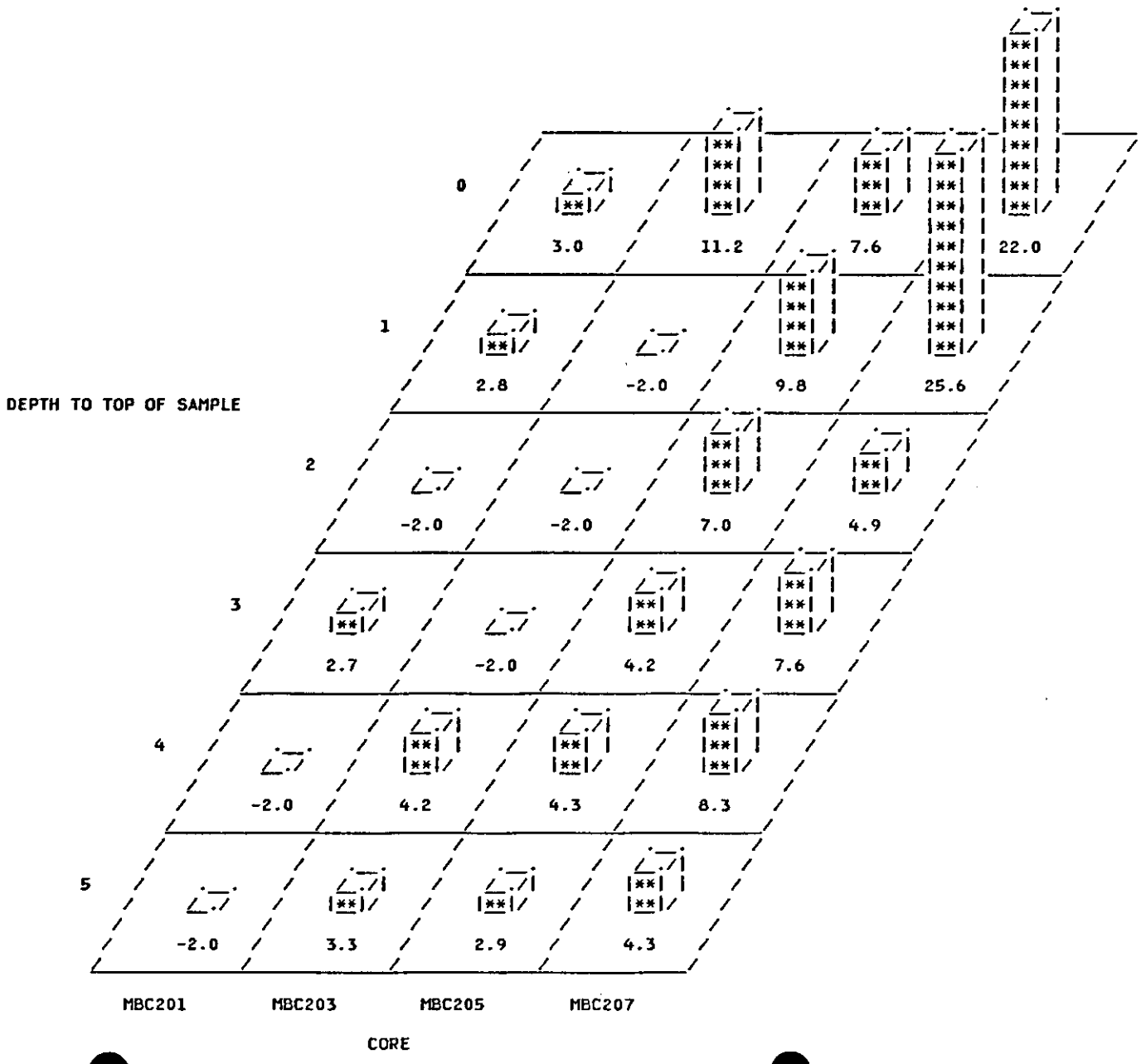


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=ORGANIC CARBON  UNITS=UGG

BLOCK CHART OF RESULT

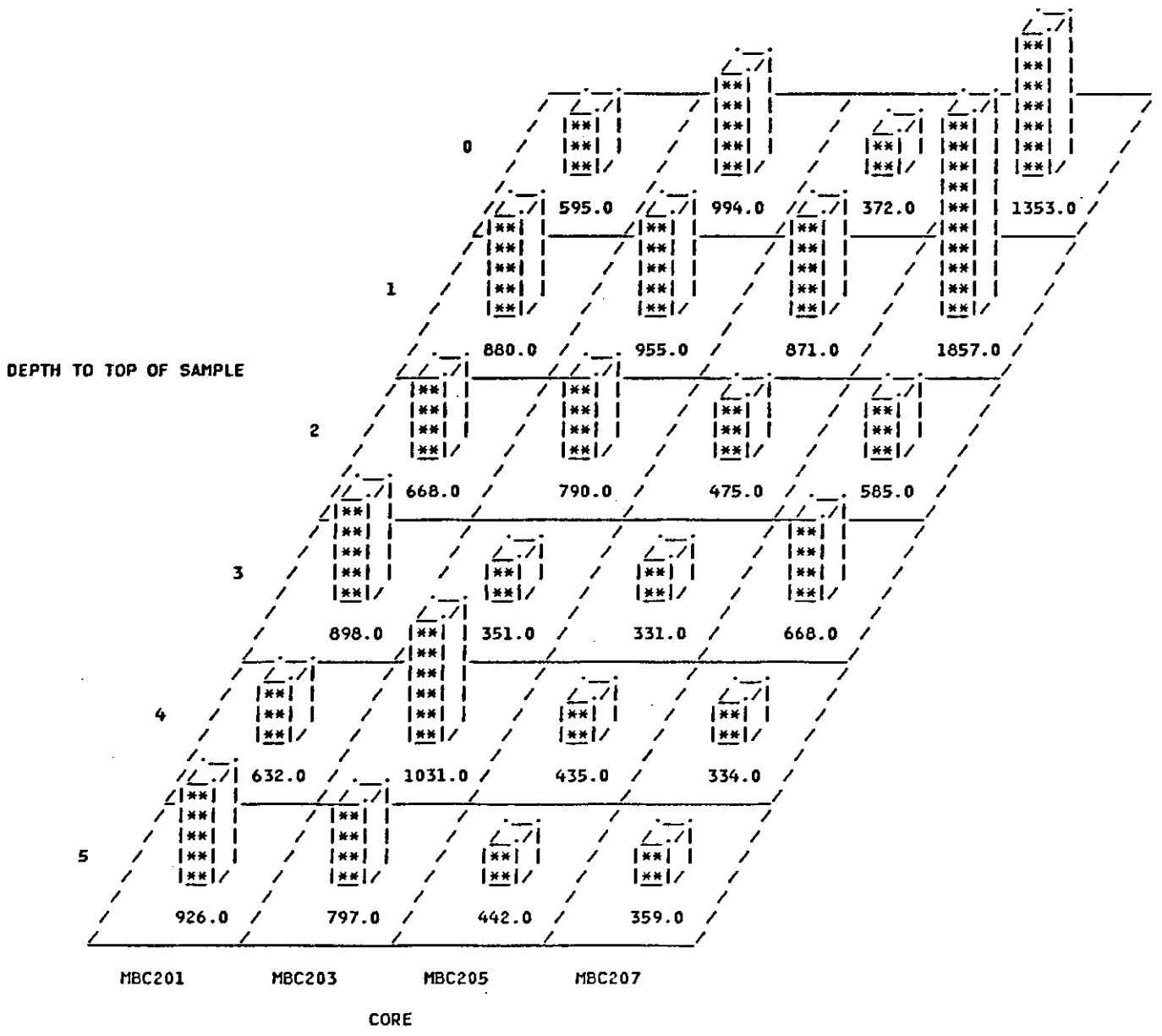


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=ORGANIC HALOGENS  UNITS=UGG

BLOCK CHART OF RESULT

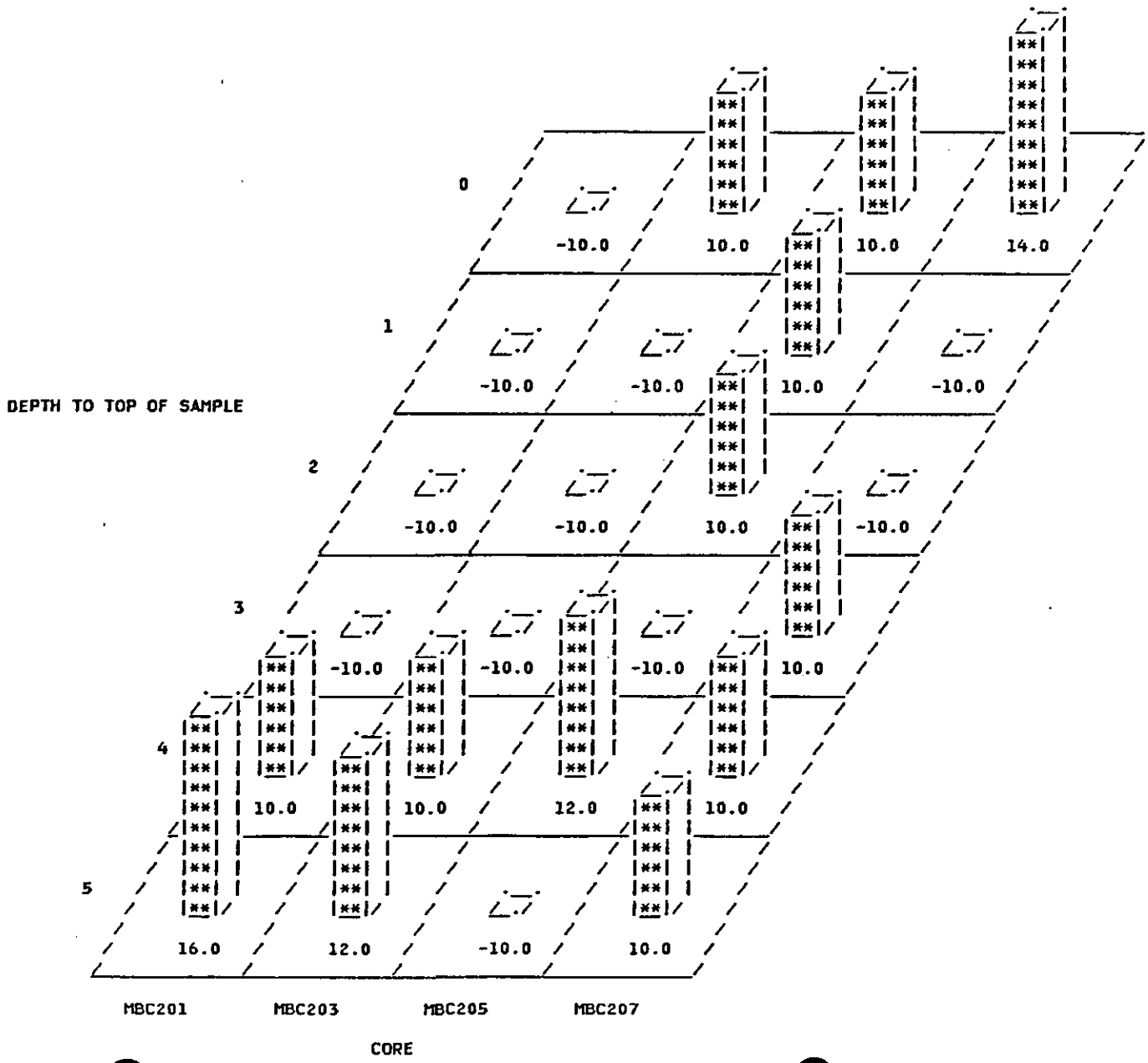


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=TOTAL PHOSPHATES  UNITS=UGG

BLOCK CHART OF RESULT

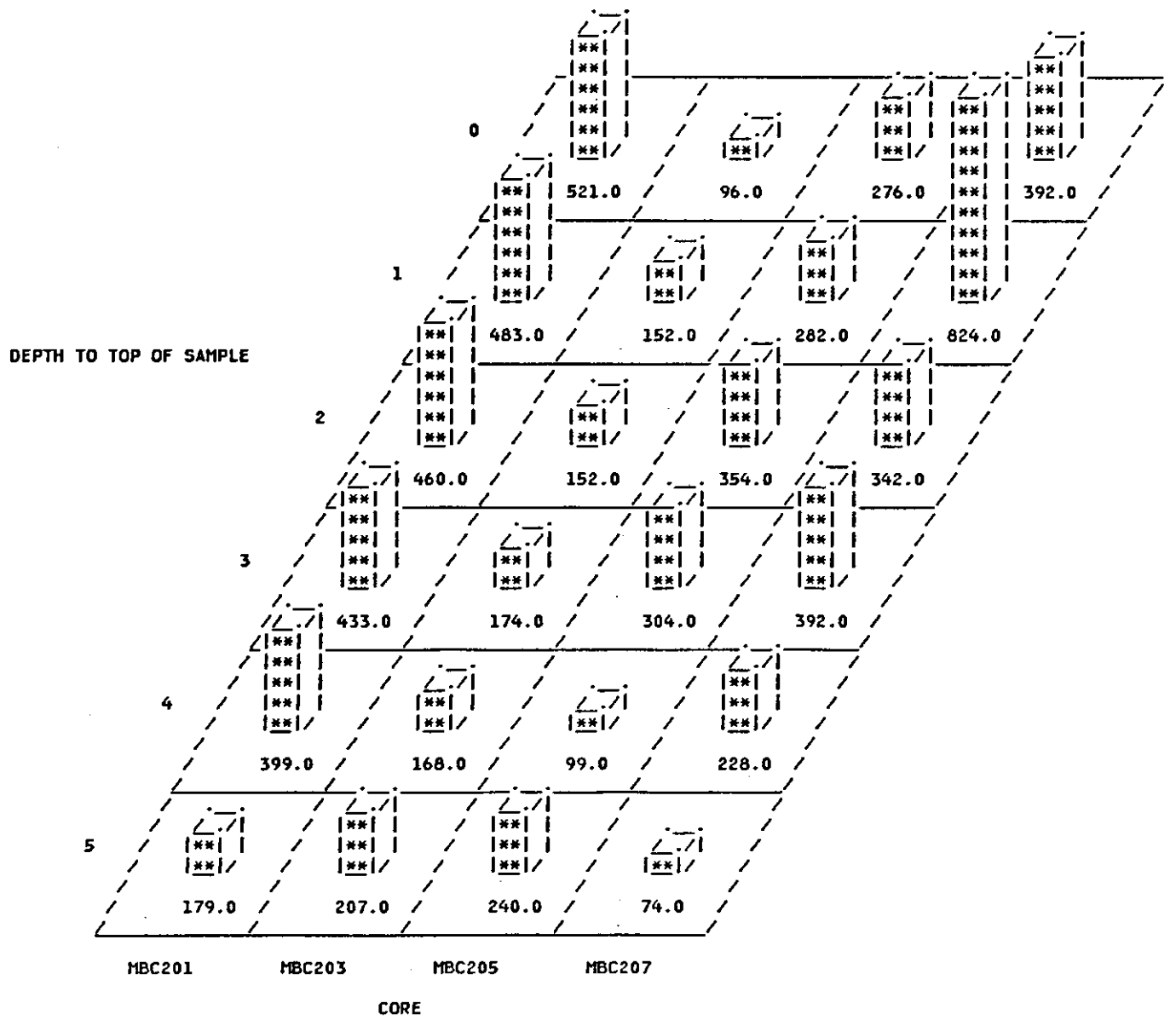


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=URANIUM  UNITS=UGG

BLOCK CHART OF RESULT

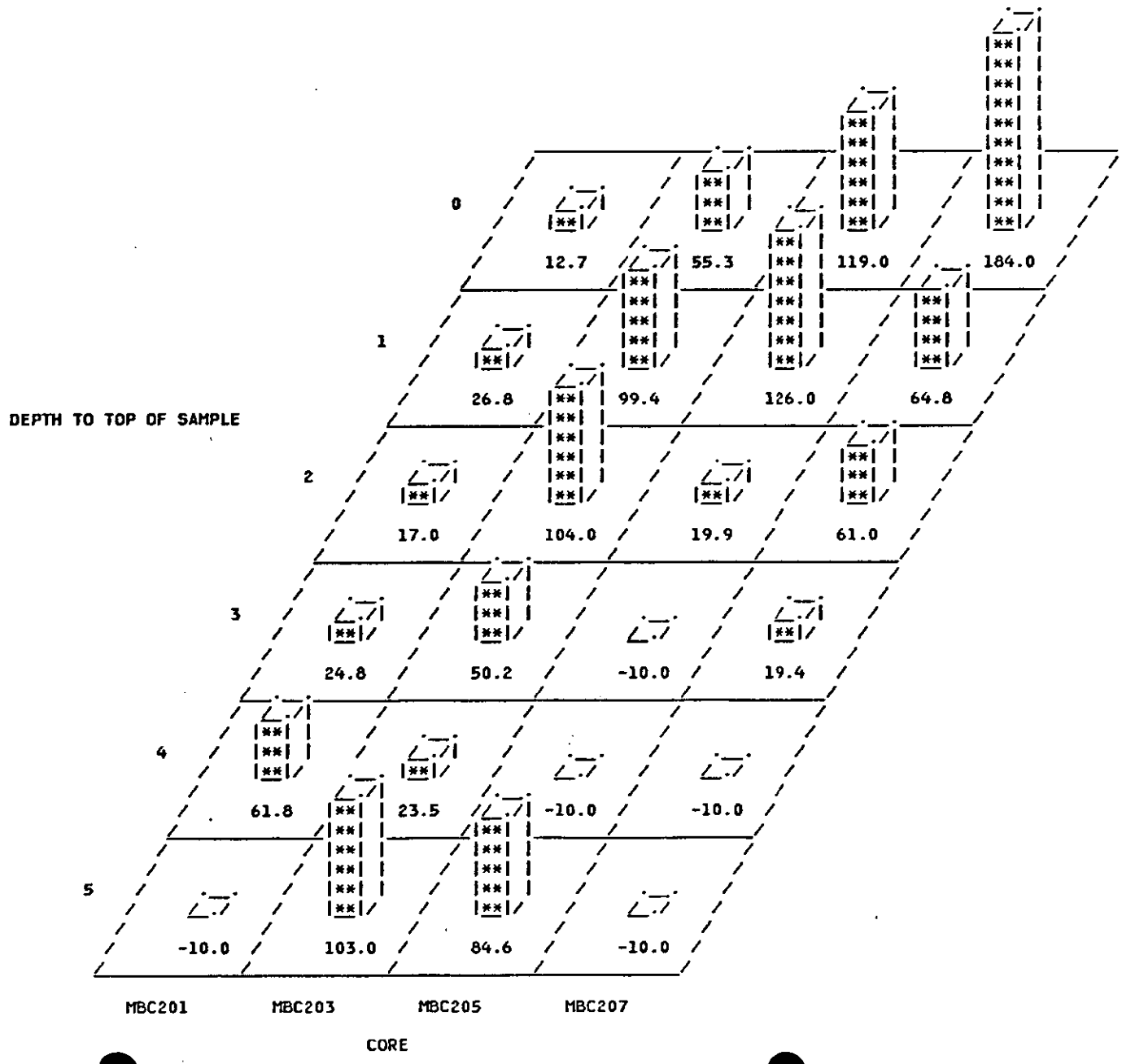


TABLE 6-17.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, INORGANIC ANALYTES
TESTNAME=ZINC  UNITS=UGG

BLOCK CHART OF RESULT

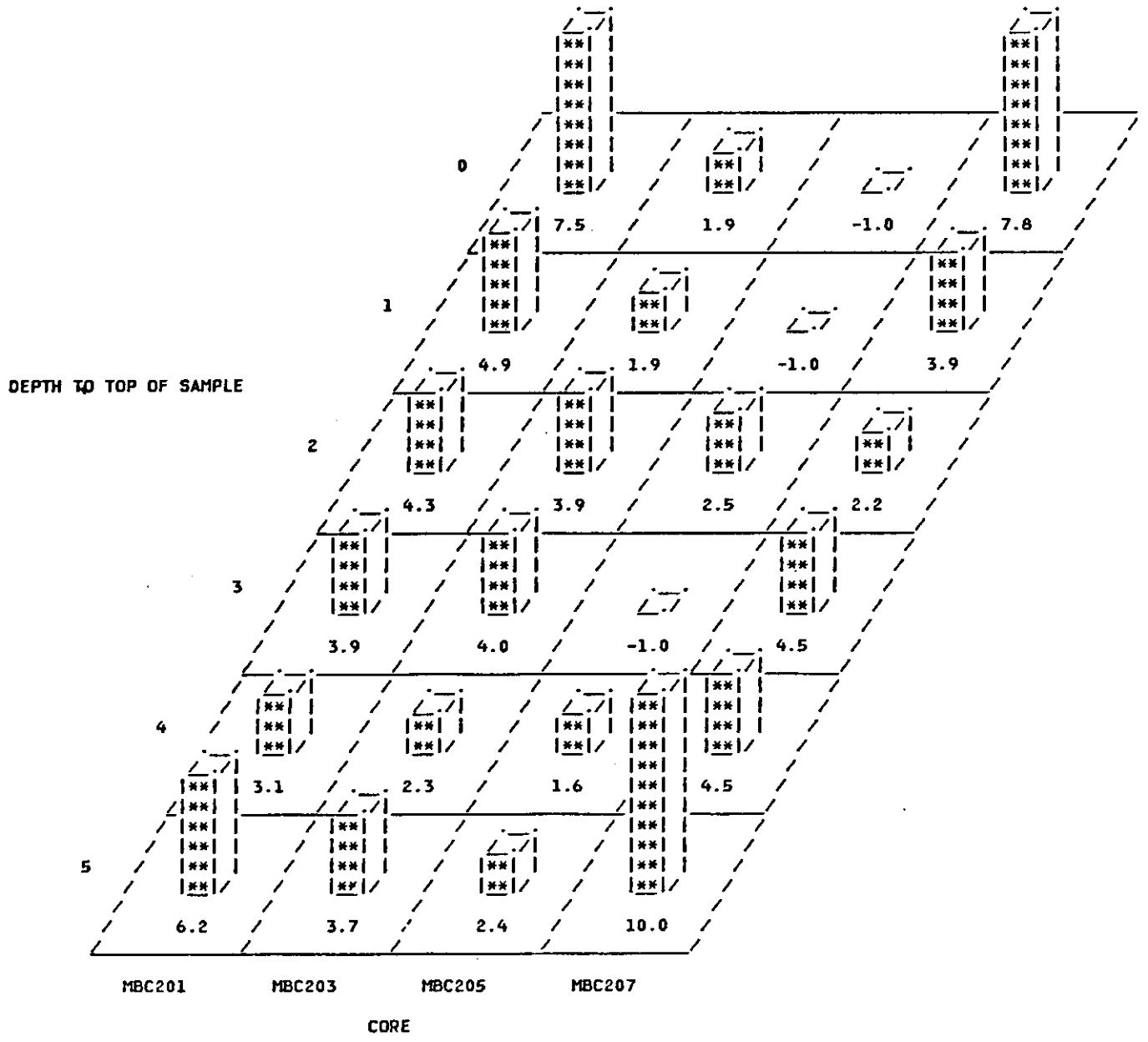


TABLE 6-18.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, FIVE VOLATILE ORGANICS
TESTNAME=METHYLENE CHLORIDE  UNITS=NGG

BLOCK CHART OF RESULT

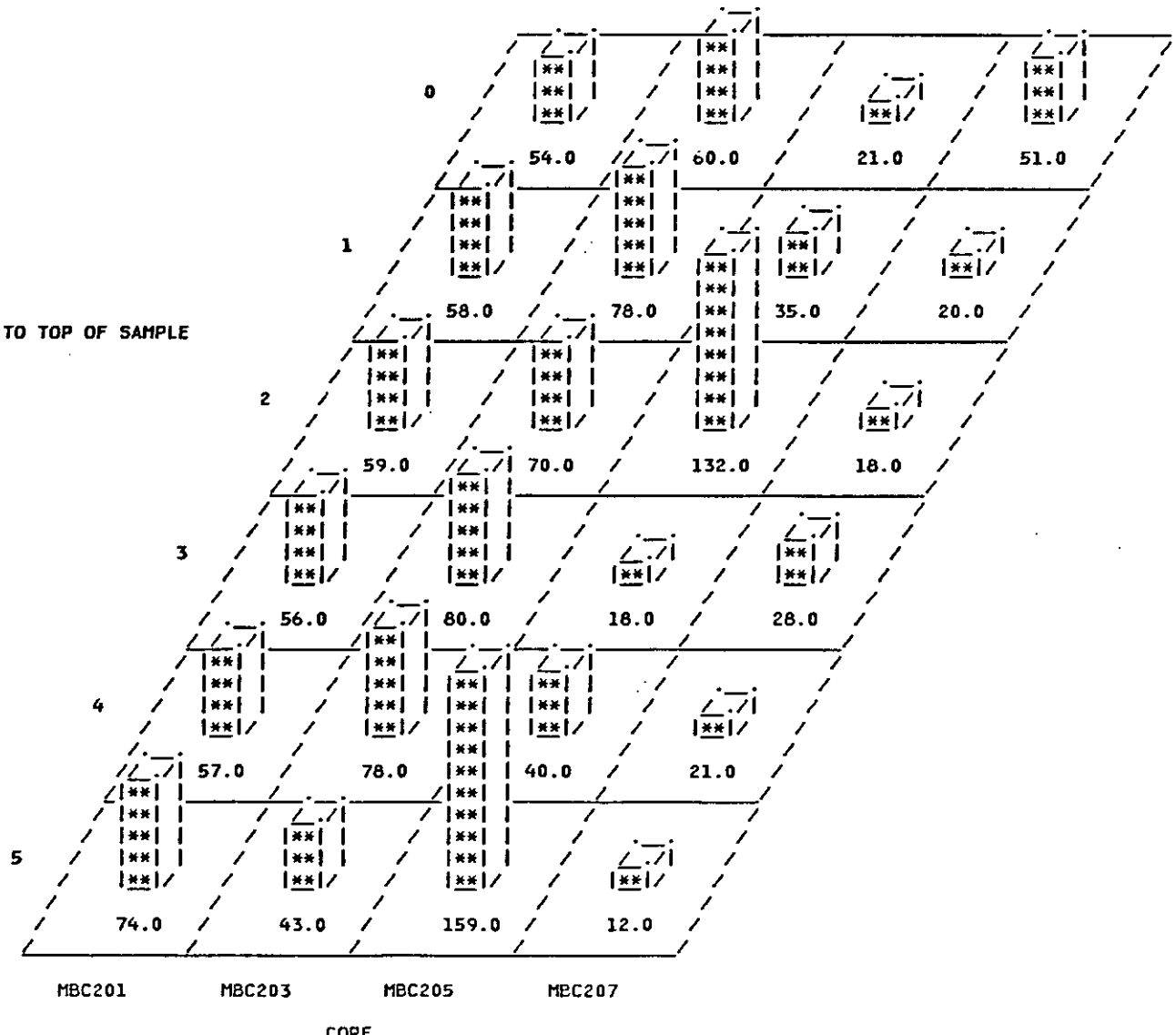


TABLE 6-18.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, FIVE VOLATILE ORGANICS
TESTNAME=TOLUENE  UNITS=NGG

BLOCK CHART OF RESULT

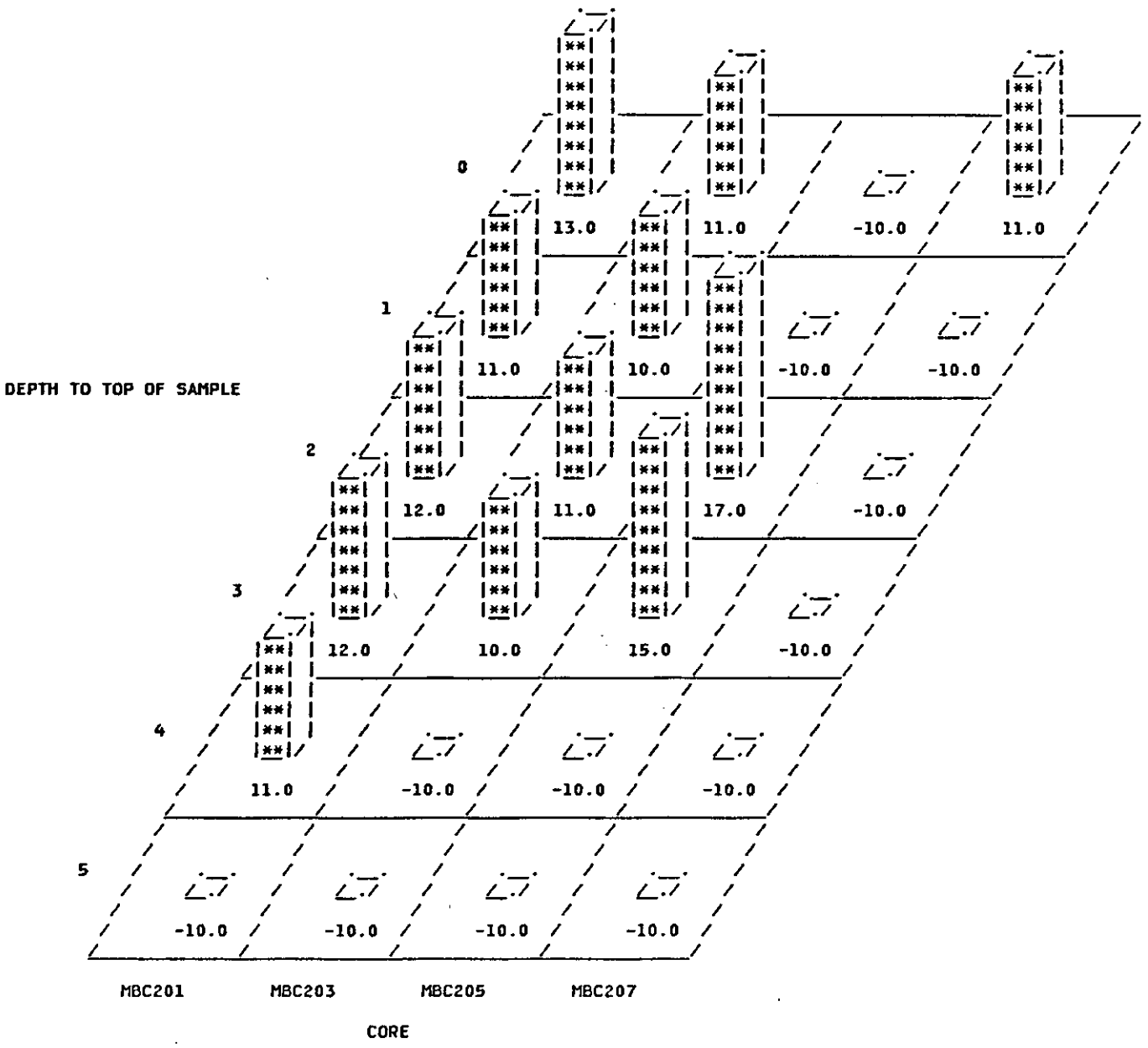


TABLE 6-18.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, FIVE VOLATILE ORGANICS
TESTNAME=TETRACHLOROETHYLENE UNITS=NGG

BLOCK CHART OF RESULT

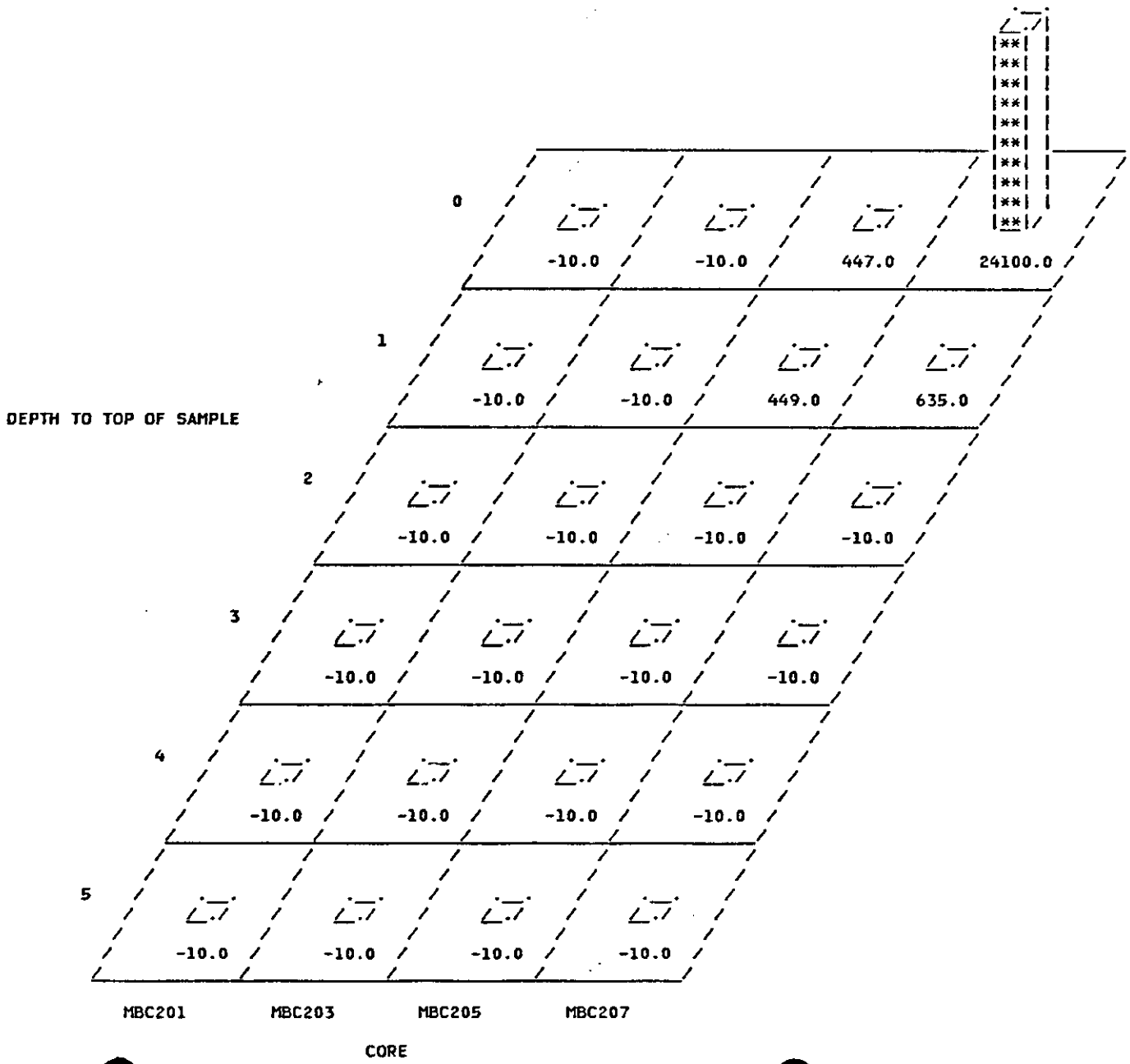


TABLE 6-18.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, FIVE VOLATILE ORGANICS
TESTNAME=TRICHLOROETHYLENE UNITS=NGG

BLOCK CHART OF RESULT

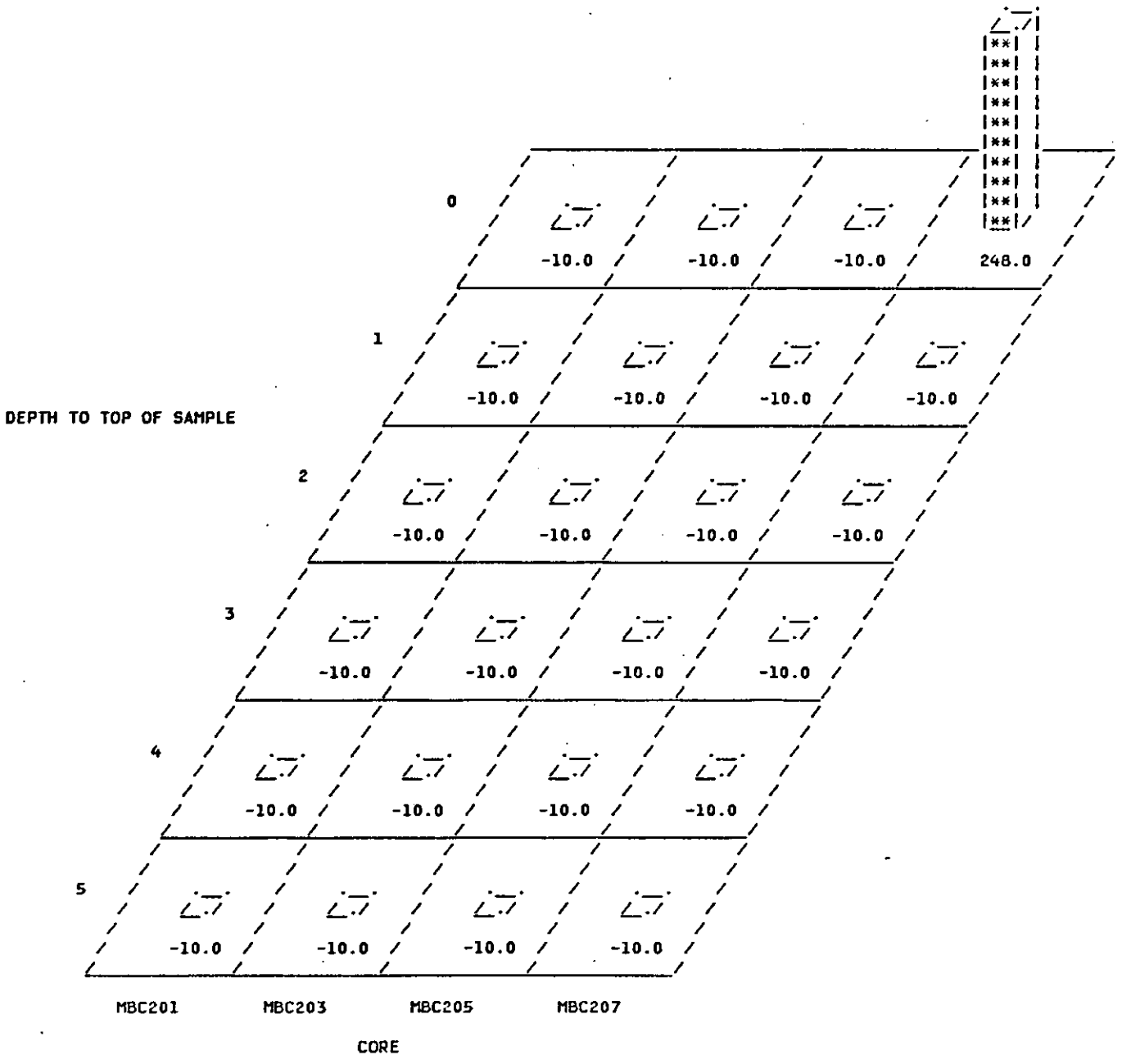


TABLE 6-18.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, FIVE VOLATILE ORGANICS
TESTNAME=1,1,1-TRICHLOROETHANE UNITS=NGG

BLOCK CHART OF RESULT

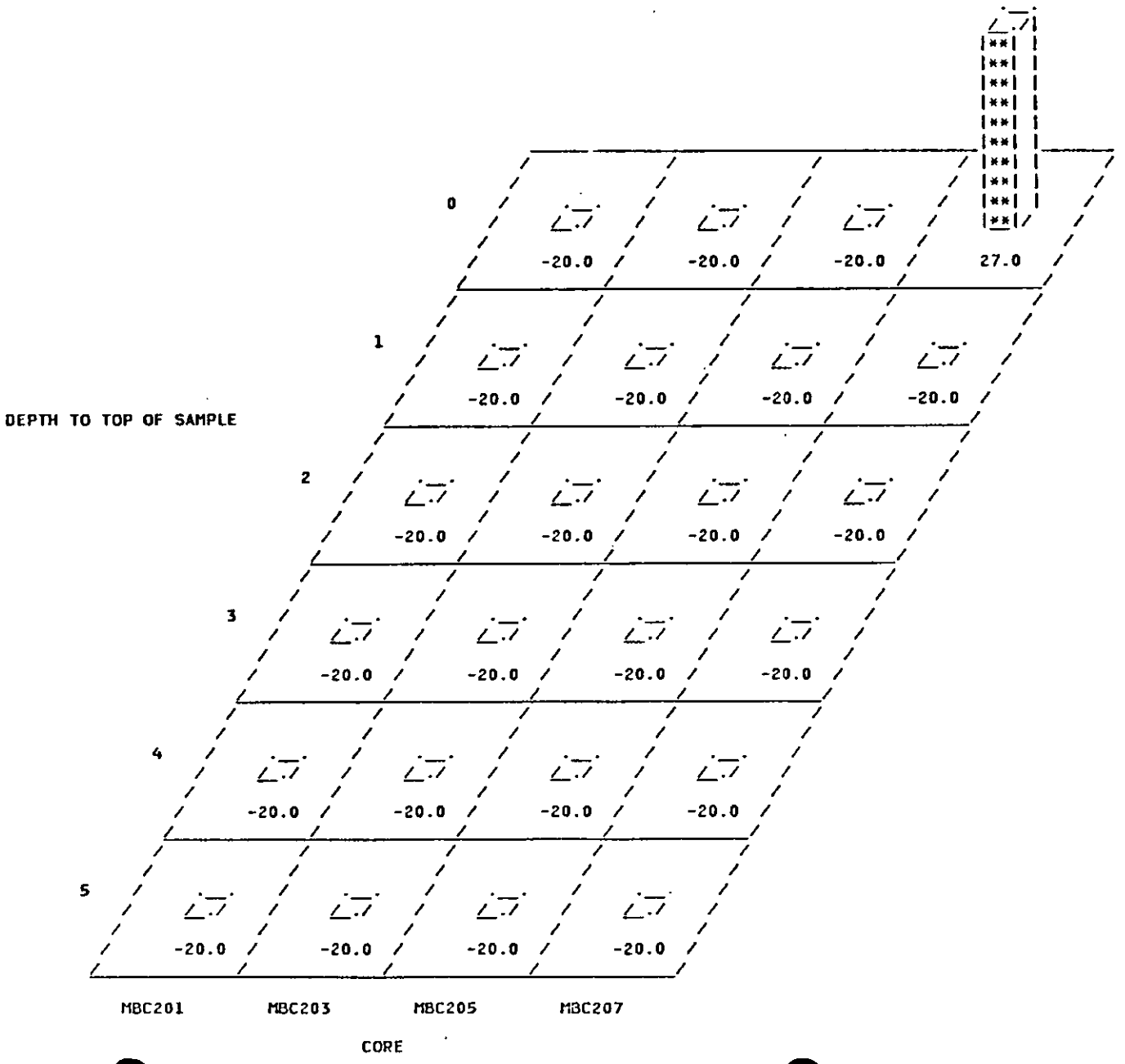


TABLE 6-18.
DEPTH PROFILES OF CORES FROM THE BOTTOM OF THE BASIN, FIVE VOLATILE ORGANICS
TESTNAME=1,1,1-TRICHLOROETHANE UNITS=NGG

BLOCK CHART OF RESULT

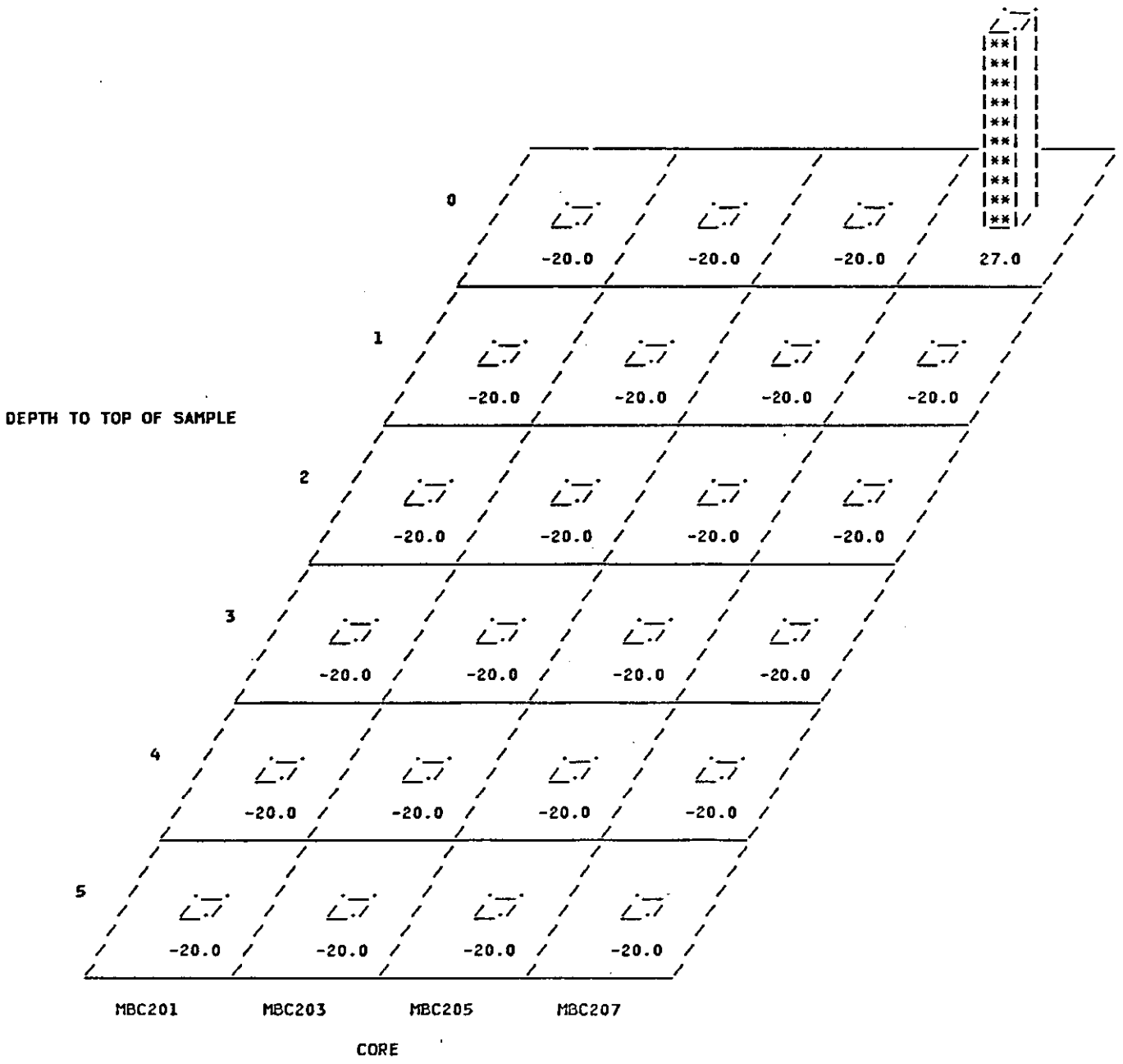


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CALCIUM UNITS=UGG

BLOCK CHART OF RESULT

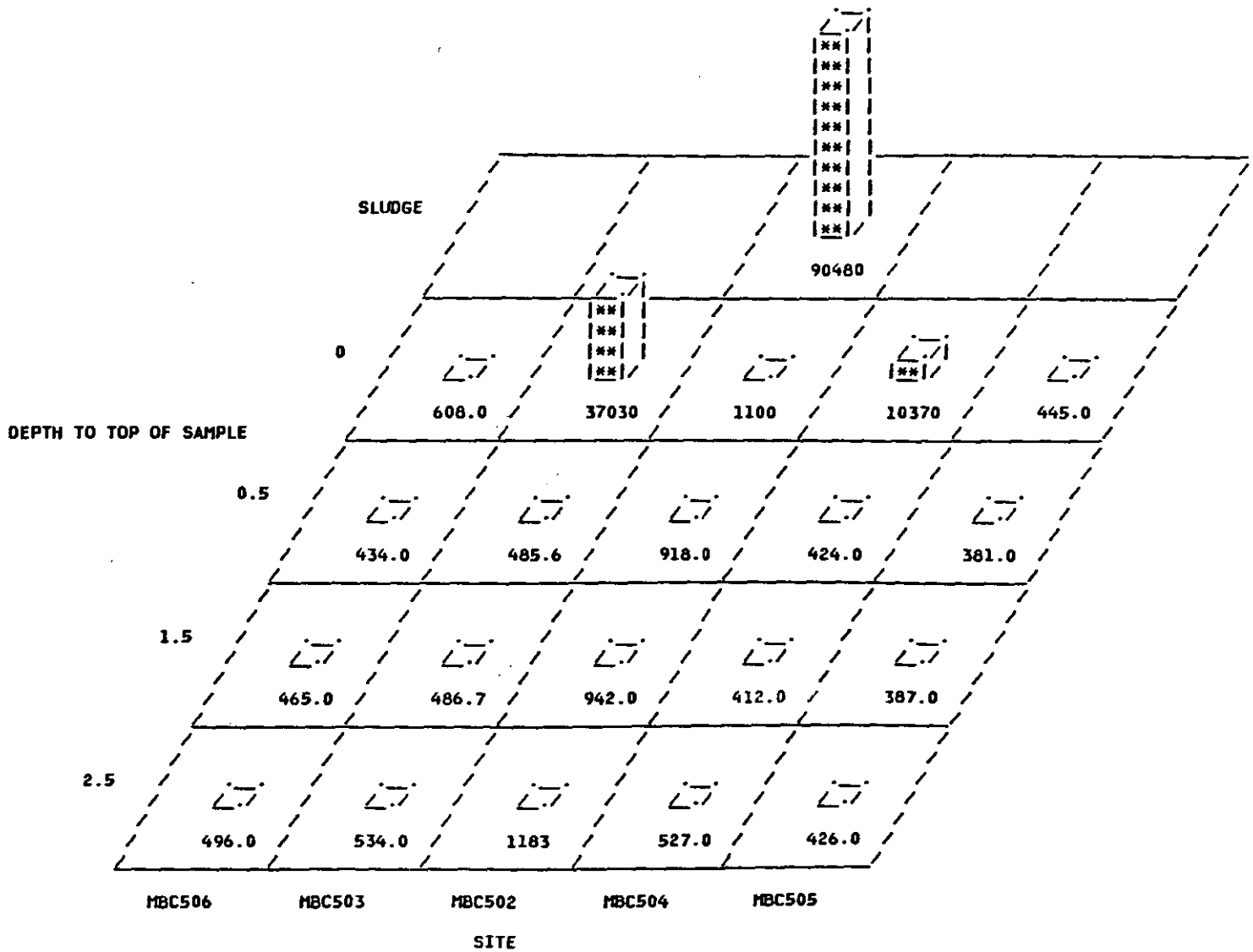


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CADMIUM UNITS=UGG

BLOCK CHART OF RESULT

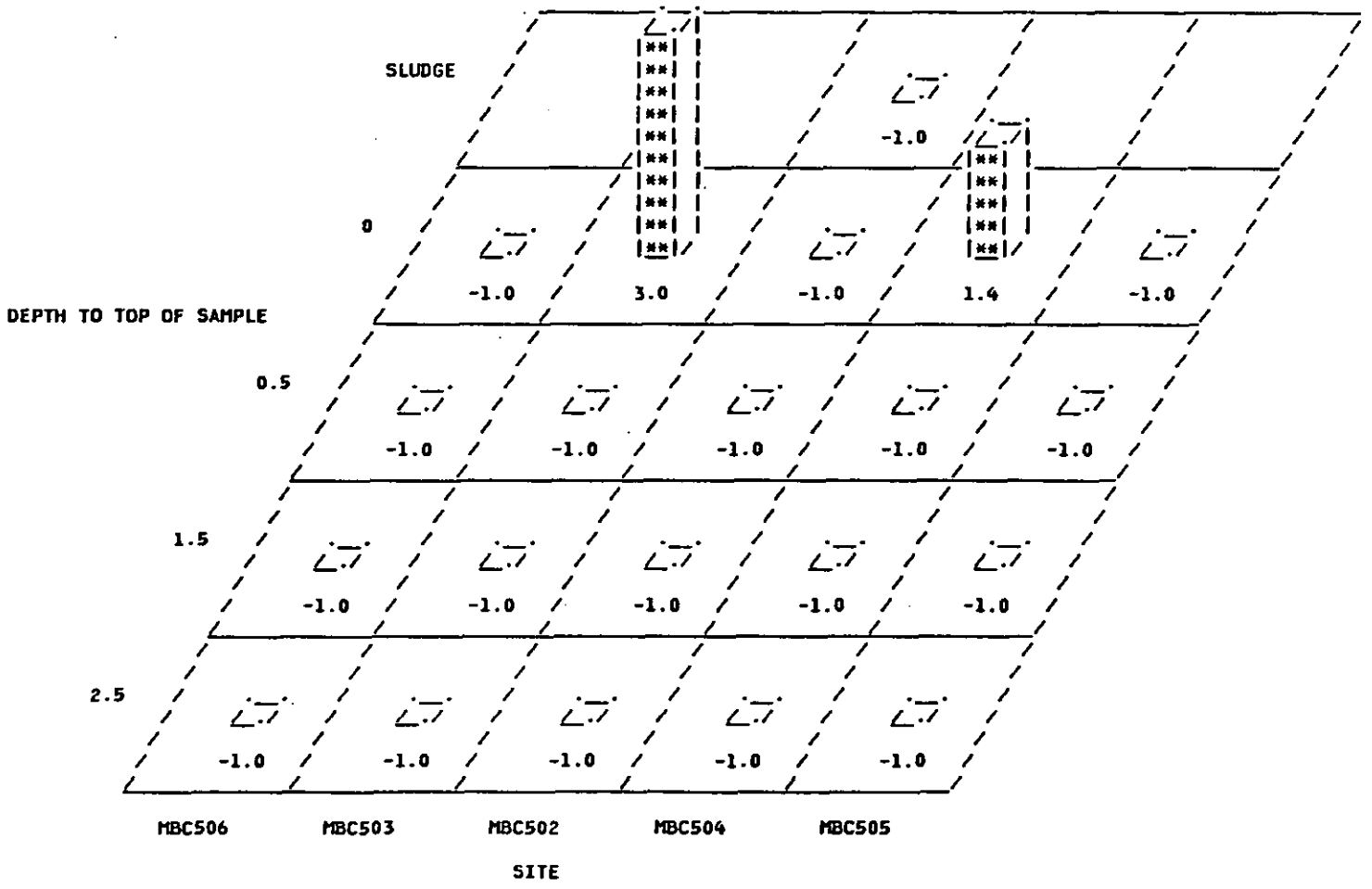


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME= CHLORIDE UNITS=UGG

BLOCK CHART OF RESULT

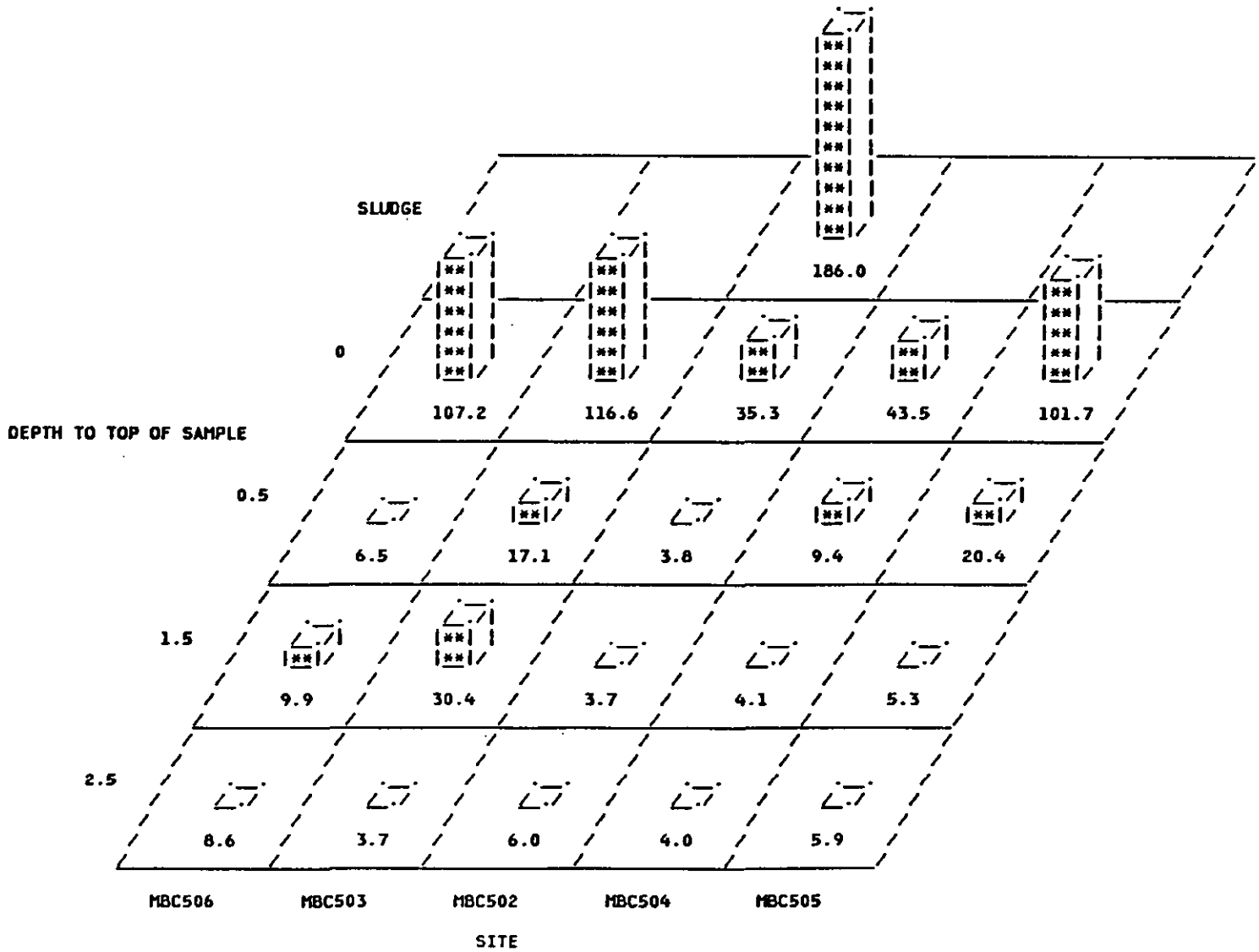


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CHROMIUM UNITS=UGG

BLOCK CHART OF RESULT

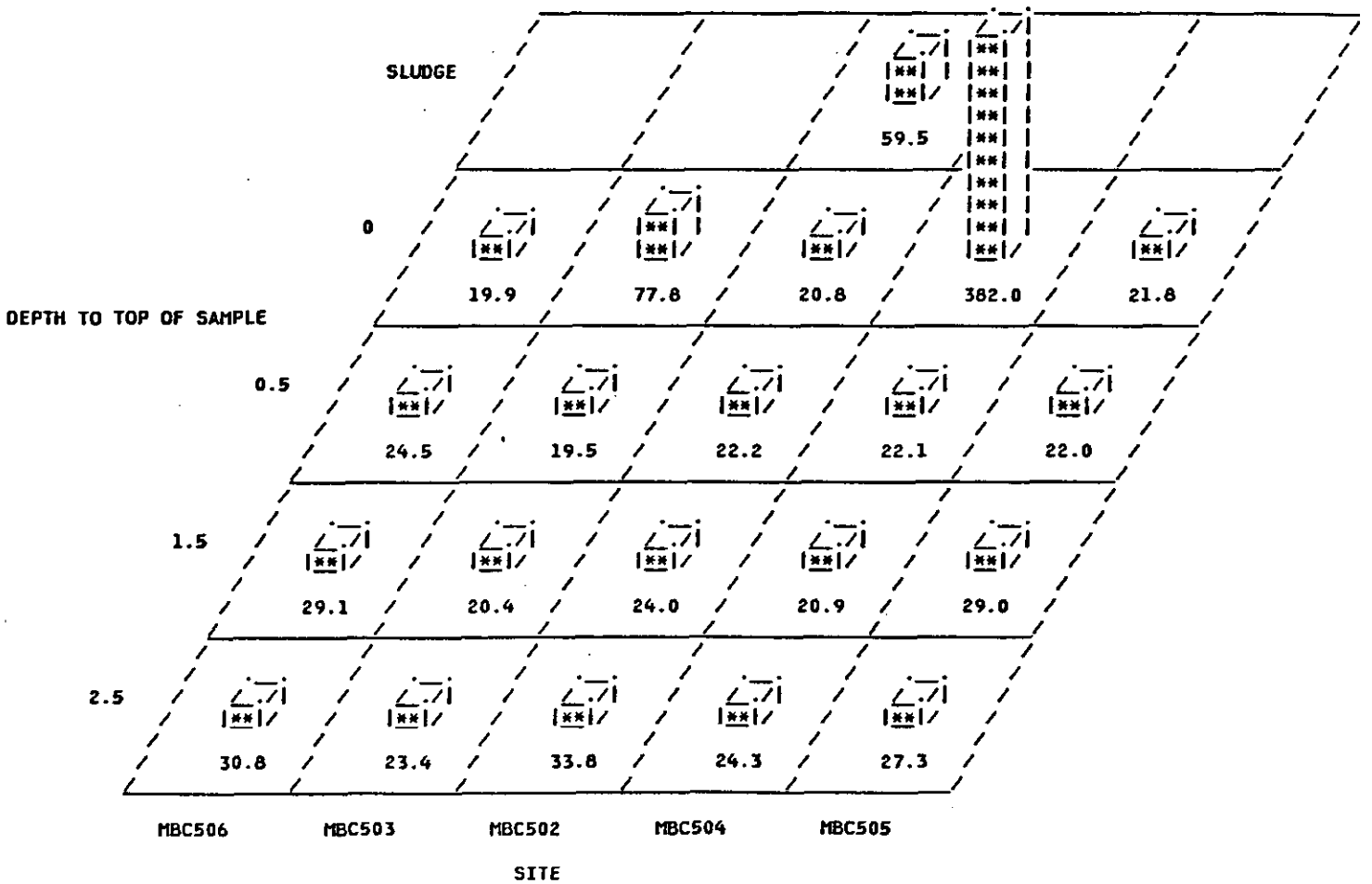


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=COPPER UNITS=UGG

BLOCK CHART OF RESULT

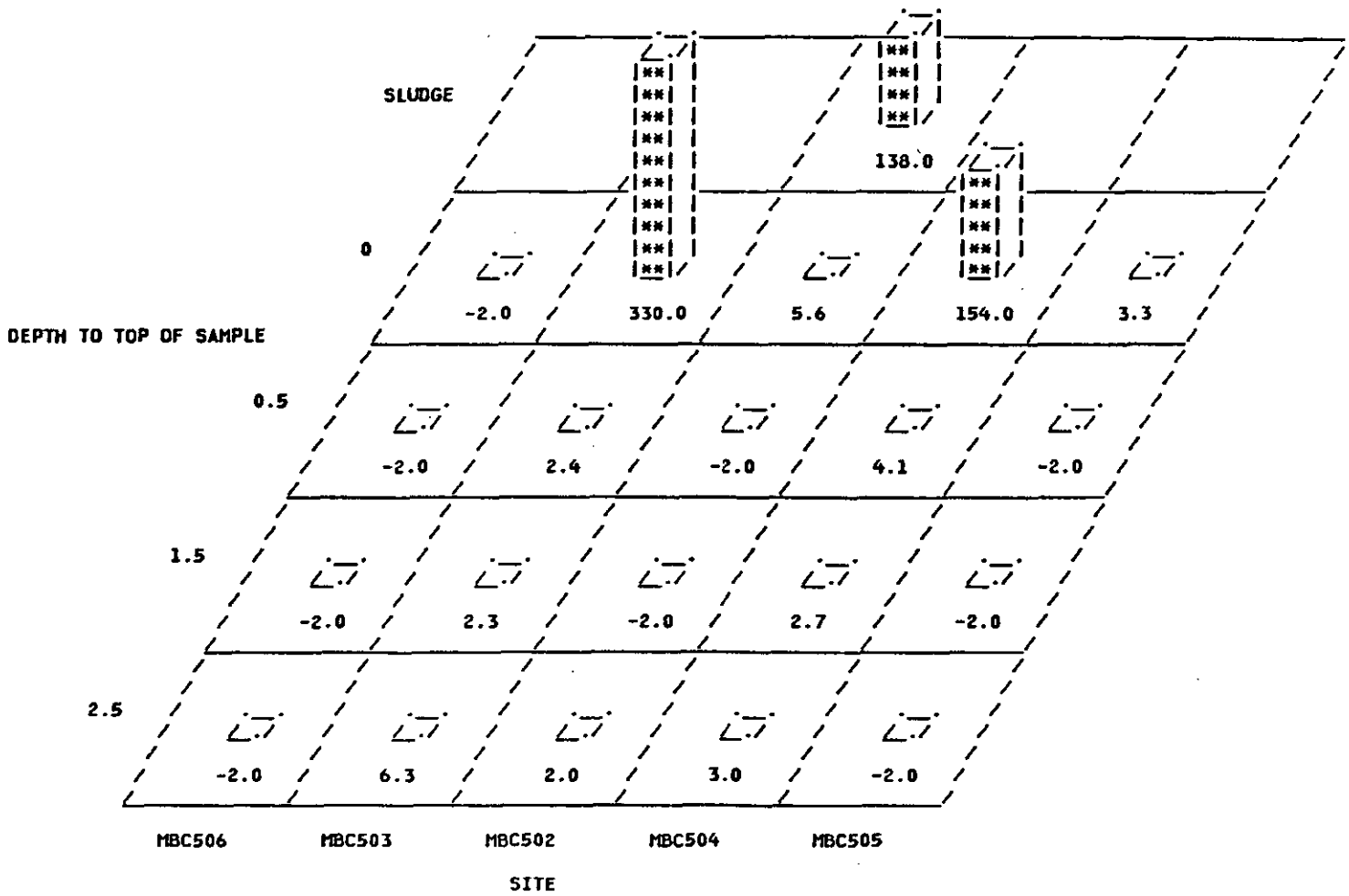


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=IRON UNITS=UGG

BLOCK CHART OF RESULT

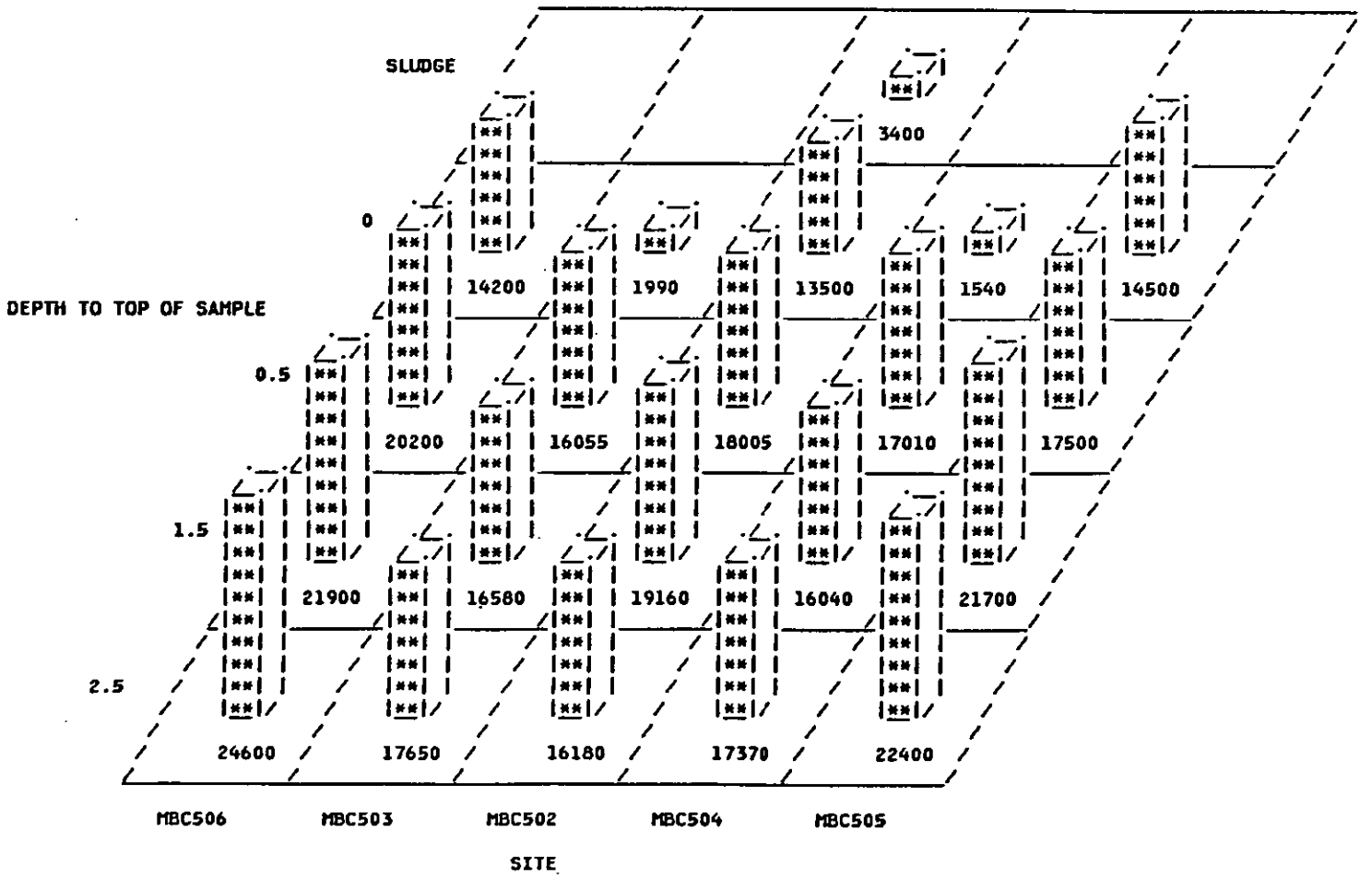


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=MERCURY UNITS=UGG

BLOCK CHART OF RESULT

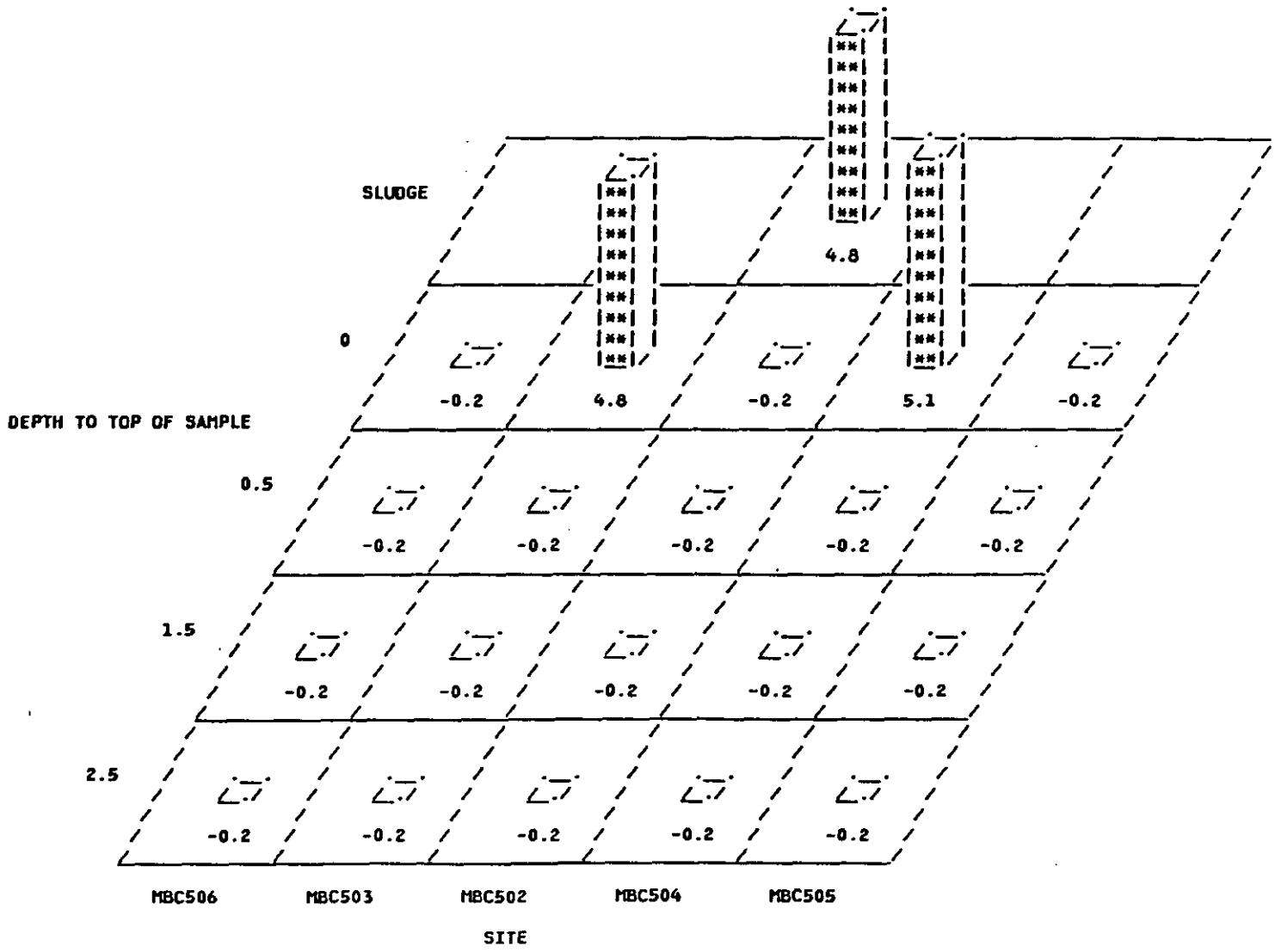


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=POTASSIUM UNITS=UGG

BLOCK CHART OF RESULT

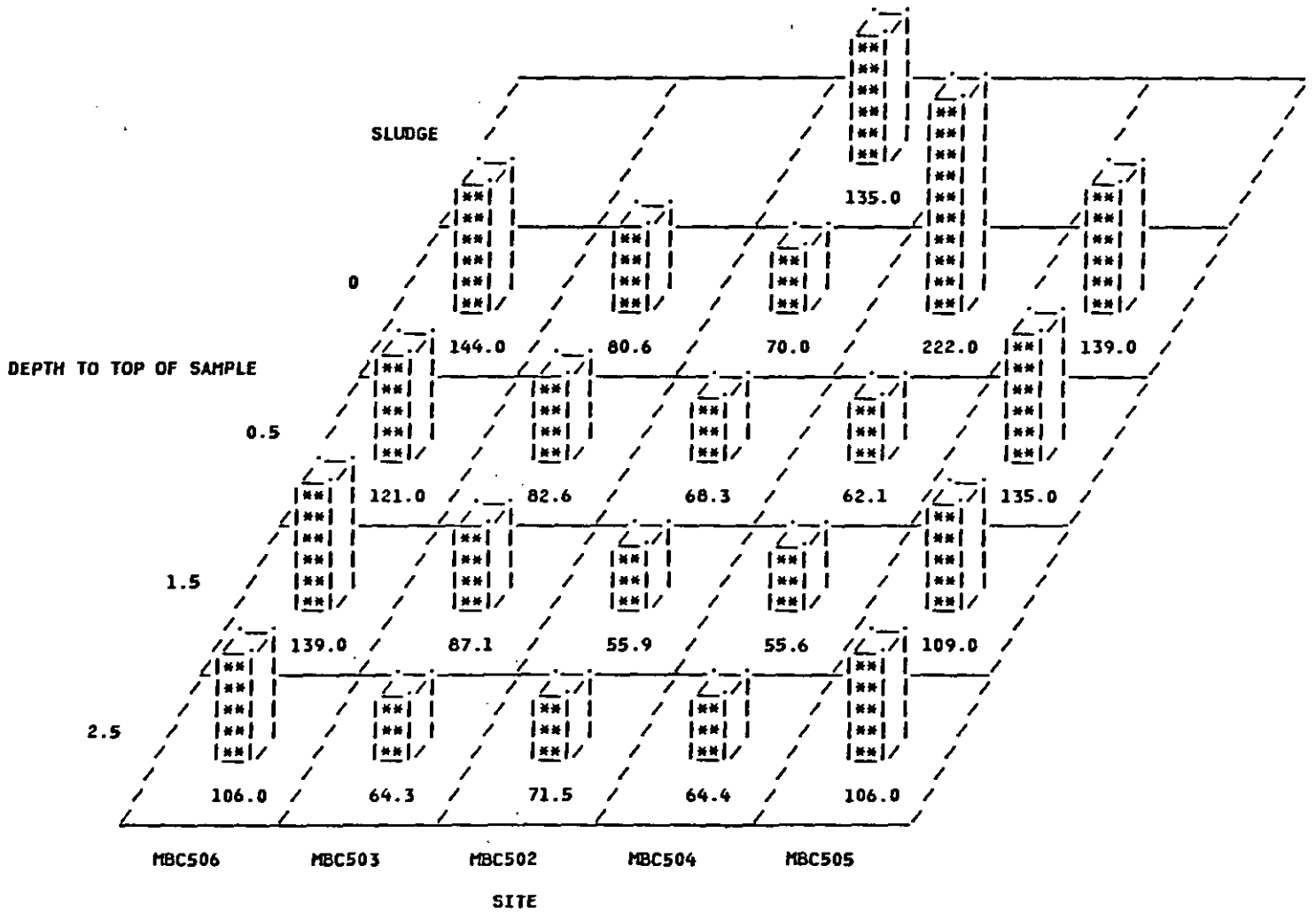


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=MAGNESIUM UNITS=UGG

BLOCK CHART OF RESULT

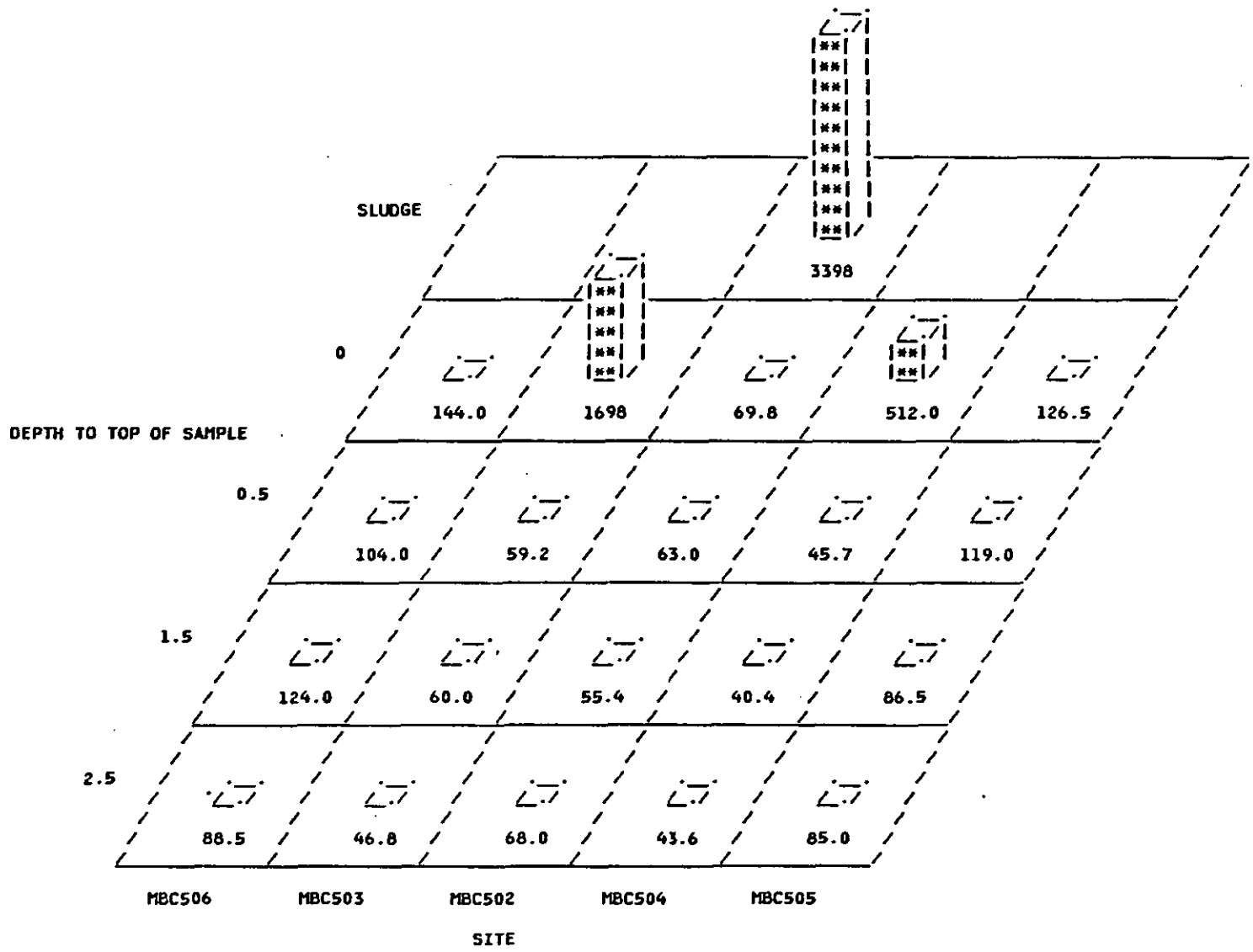


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=MANGANESE UNITS=UGG

BLOCK CHART OF RESULT

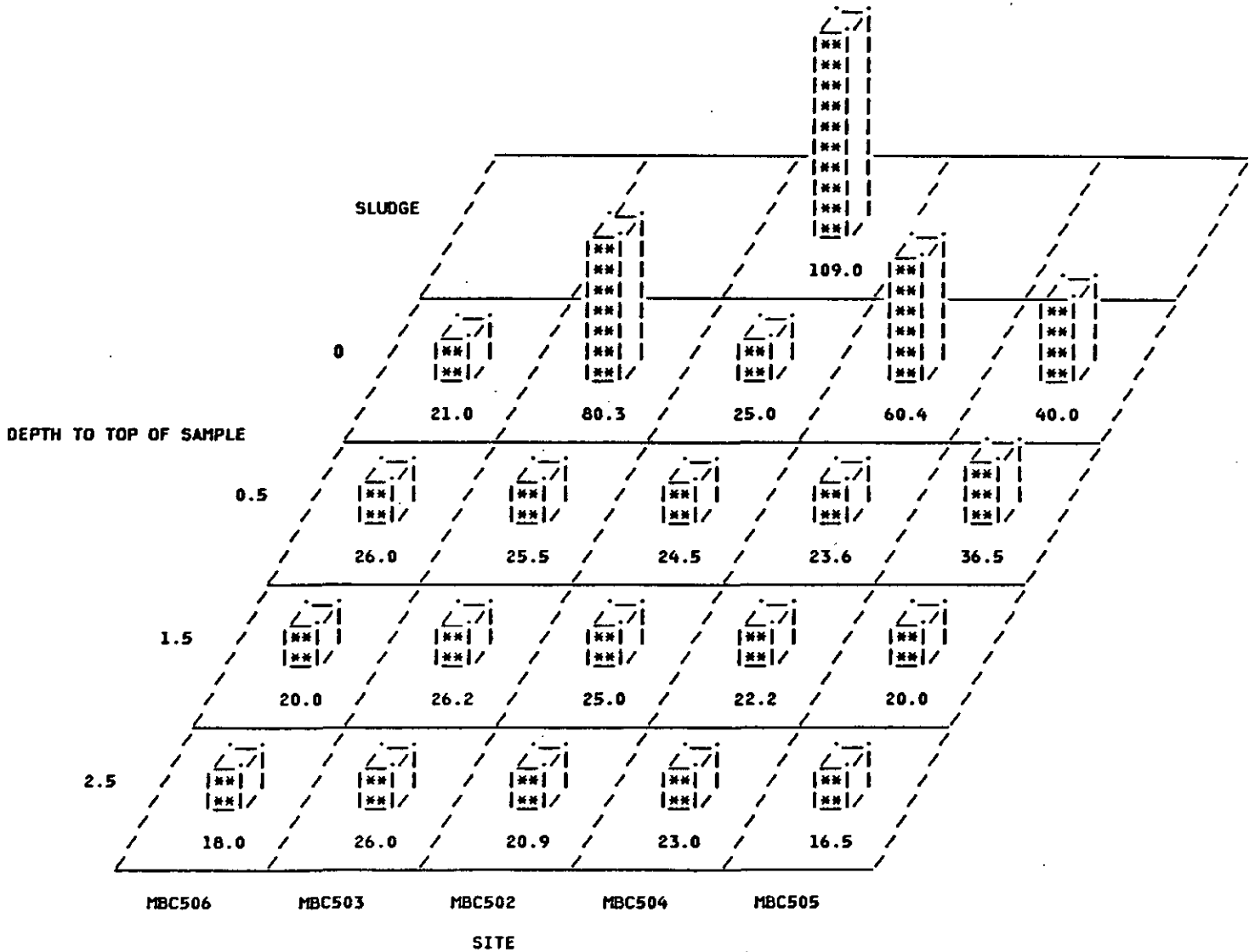


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=SODIUM UNITS=UGG

BLOCK CHART OF RESULT

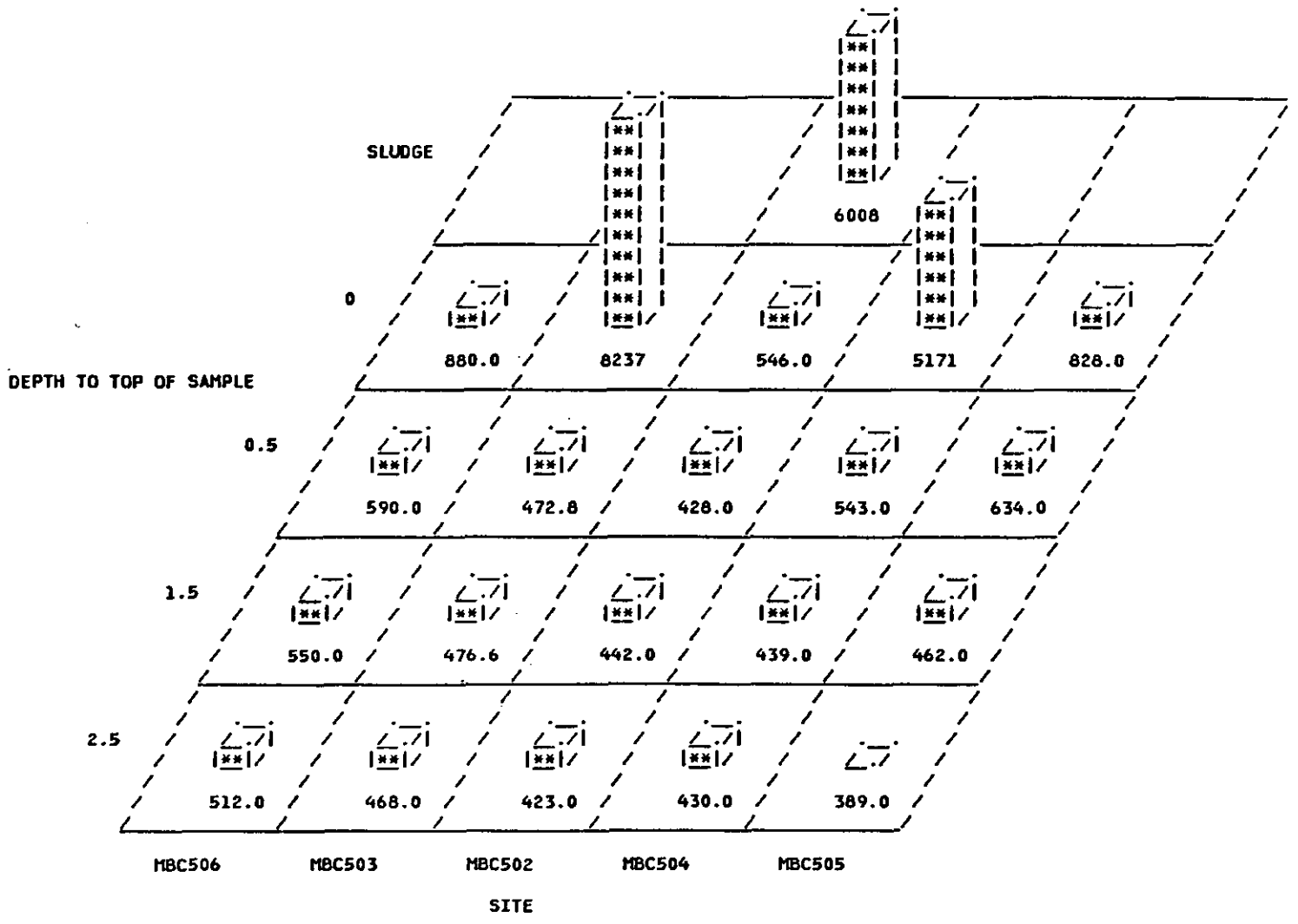


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=AMMONIA NITROGEN  UNITS=UGG

BLOCK CHART OF RESULT

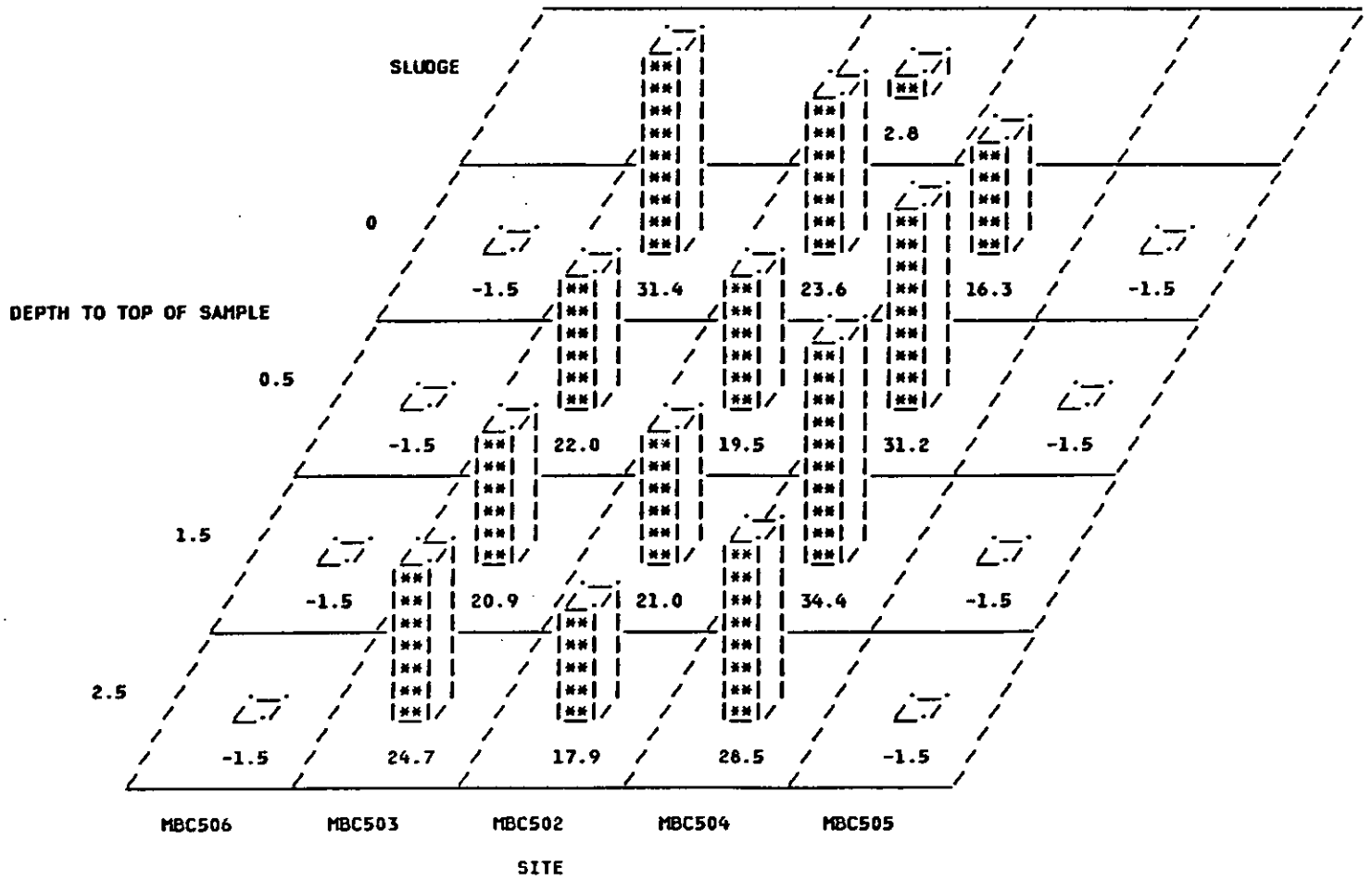


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=NITRATE UNITS=UGG

BLOCK CHART OF RESULT

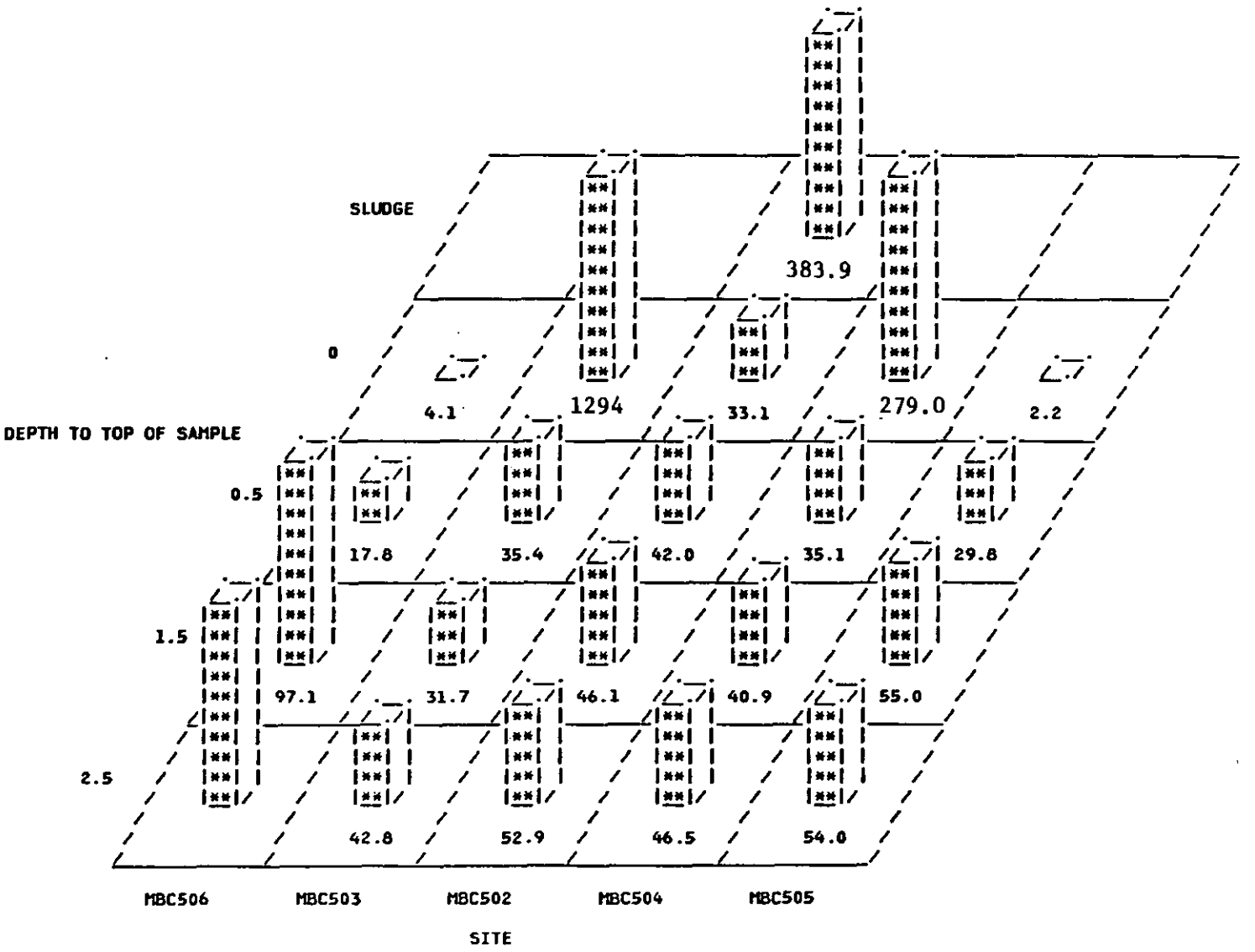


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=NICKEL UNITS=UGG

BLOCK CHART OF RESULT

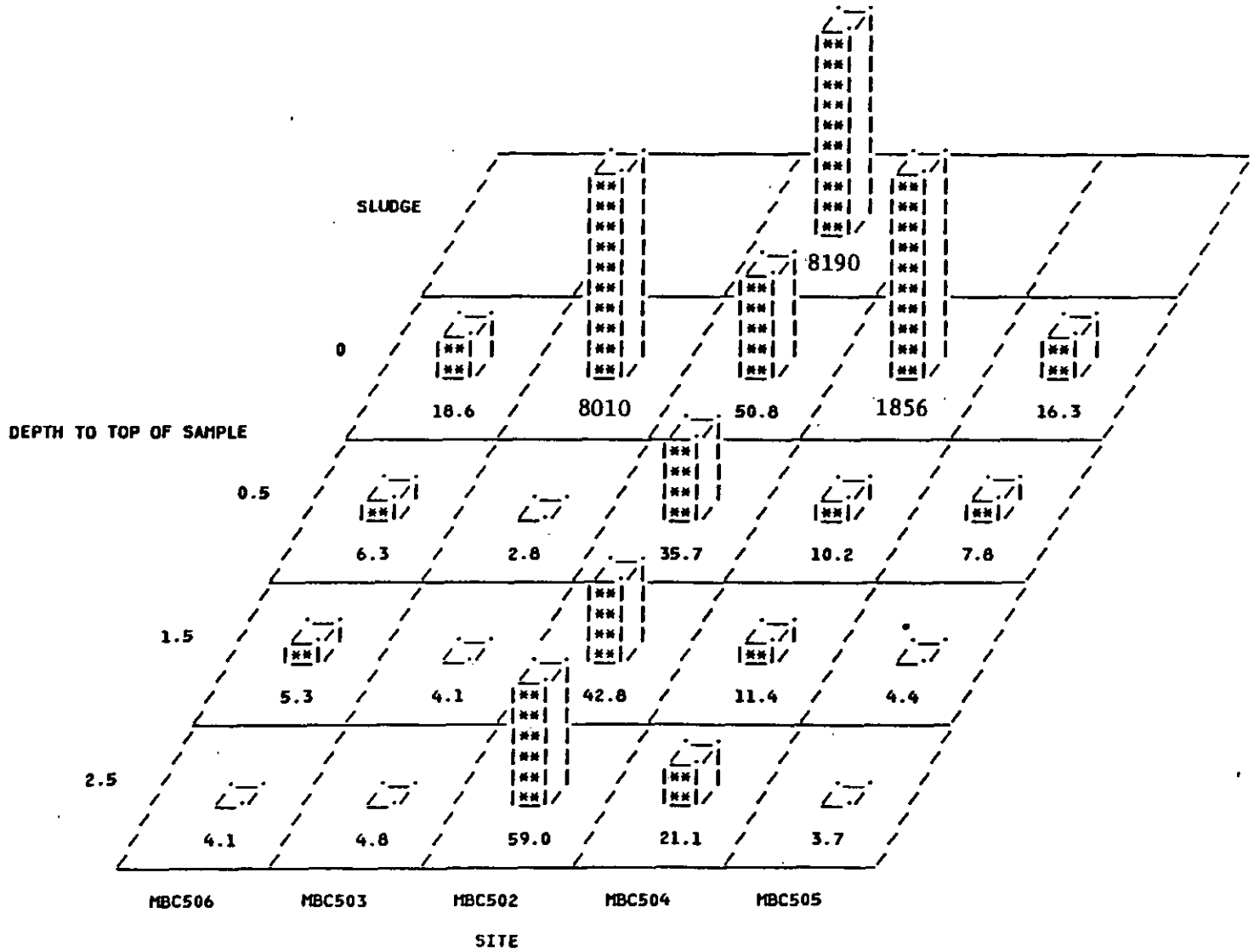


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=LEAD UNITS=UGG

BLOCK CHART OF RESULT

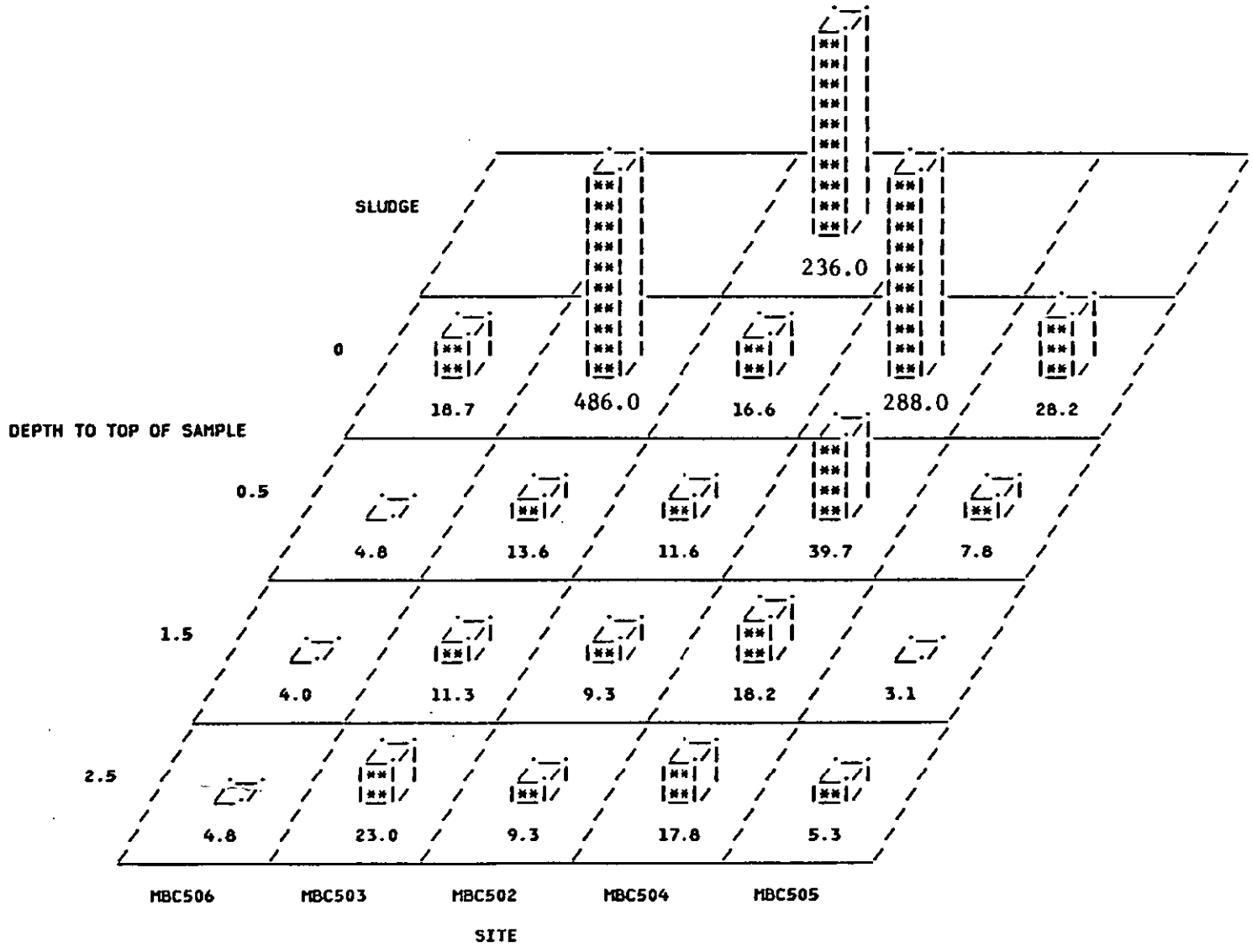


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ORGANIC CARBON UNITS=UGG

BLOCK CHART OF RESULT

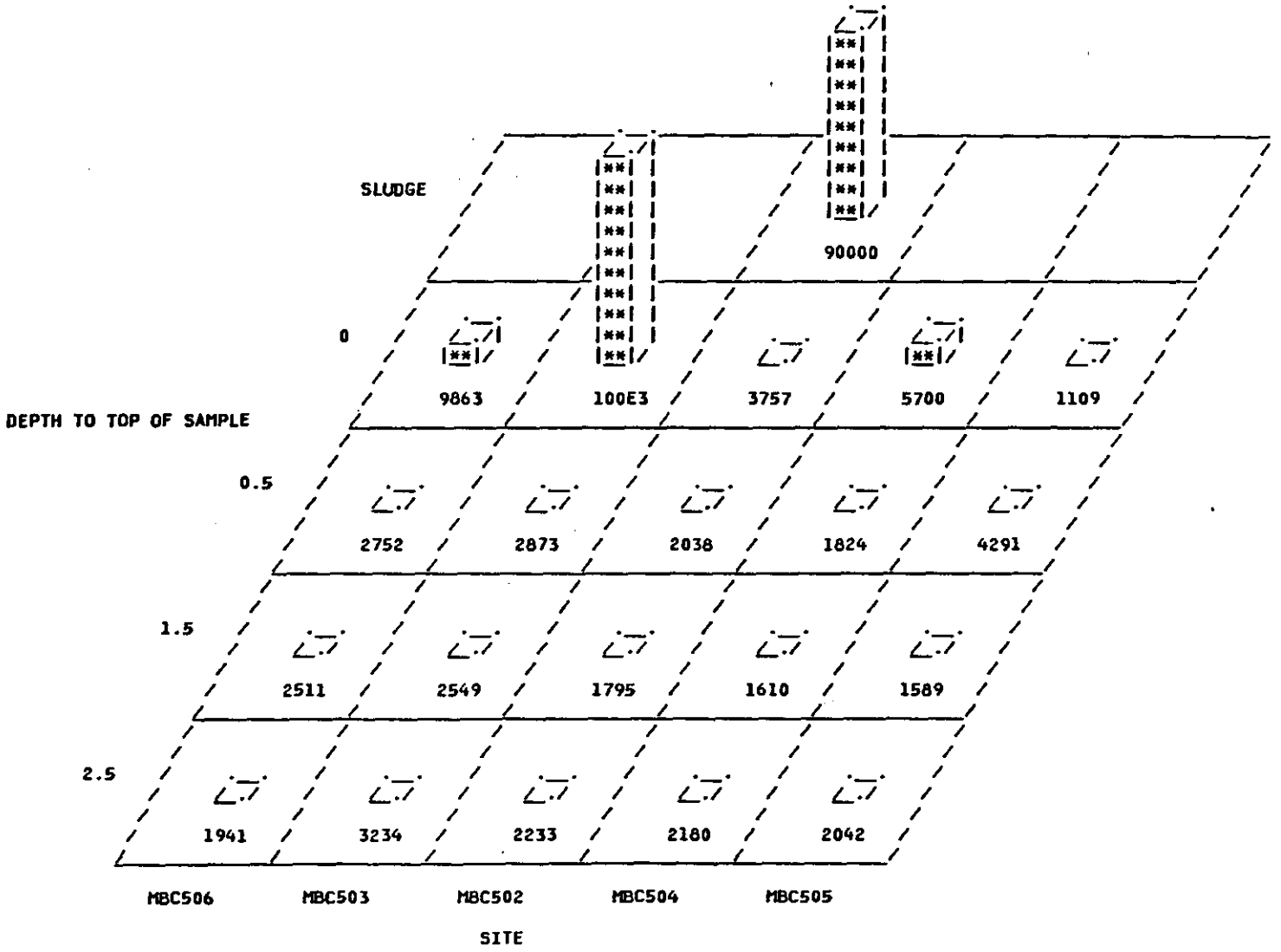


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ORGANIC HALOGENS  UNITS=UGG

BLOCK CHART OF RESULT

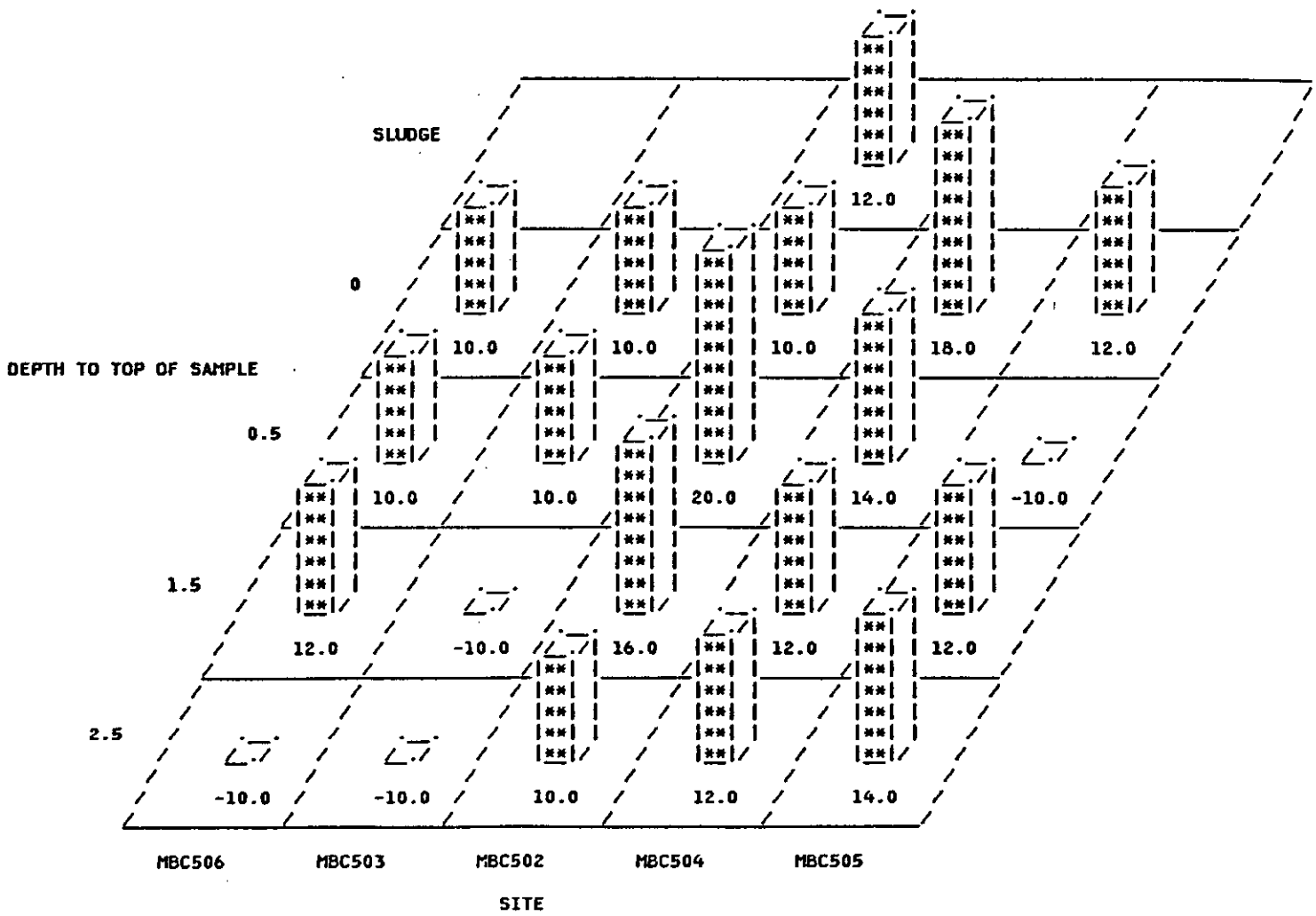


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=TOTAL PHOSPHATES UNITS=UGG

BLOCK CHART OF RESULT

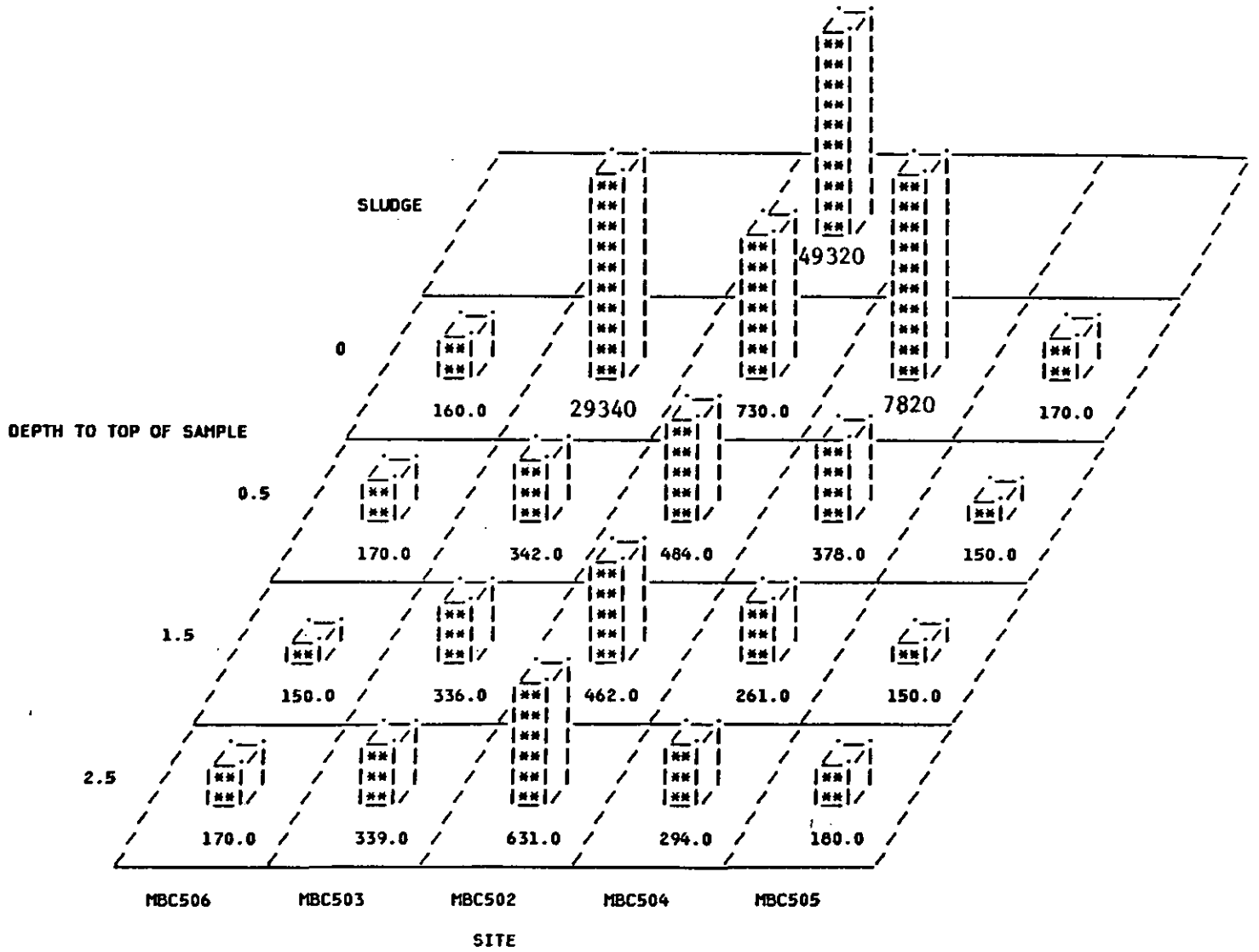
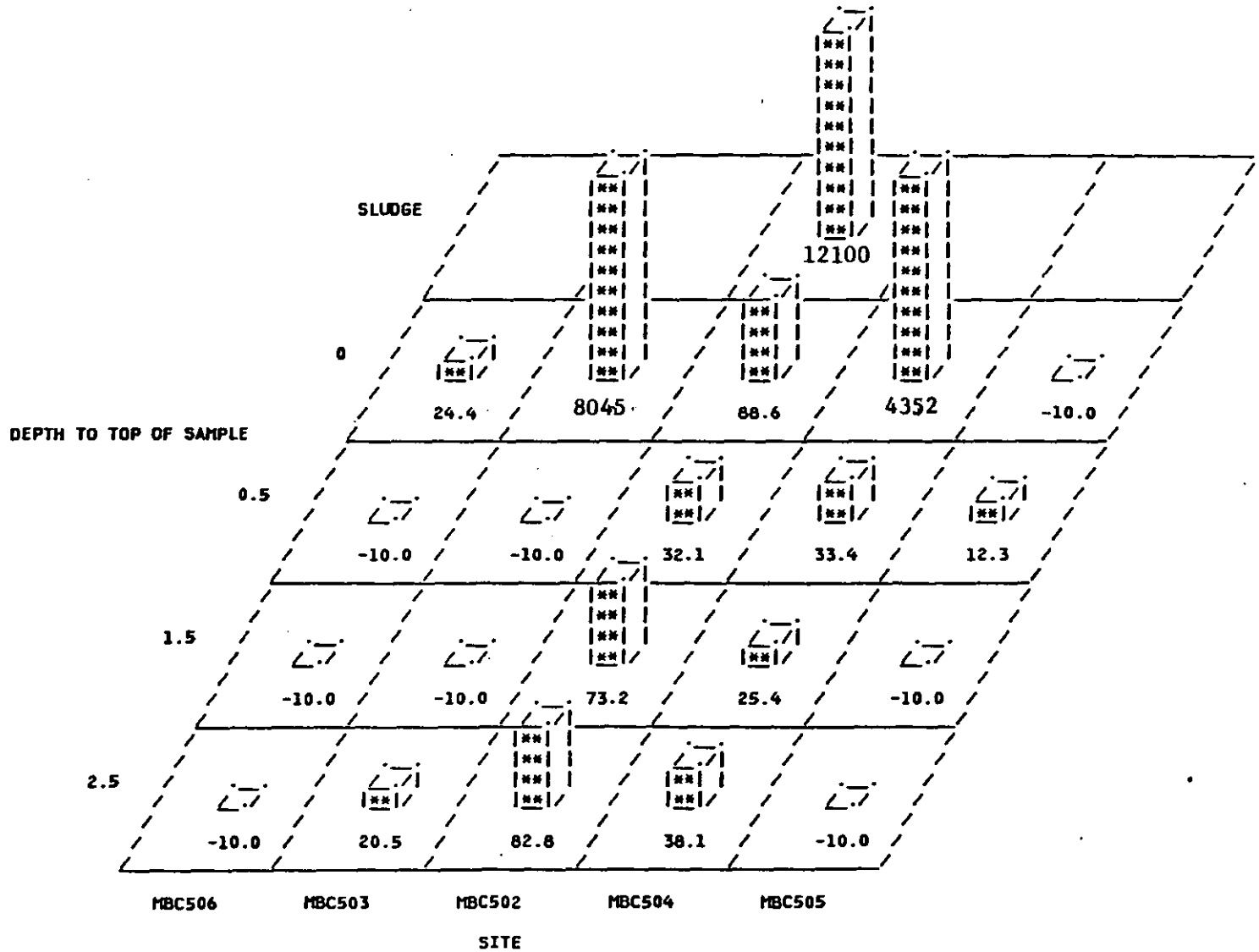
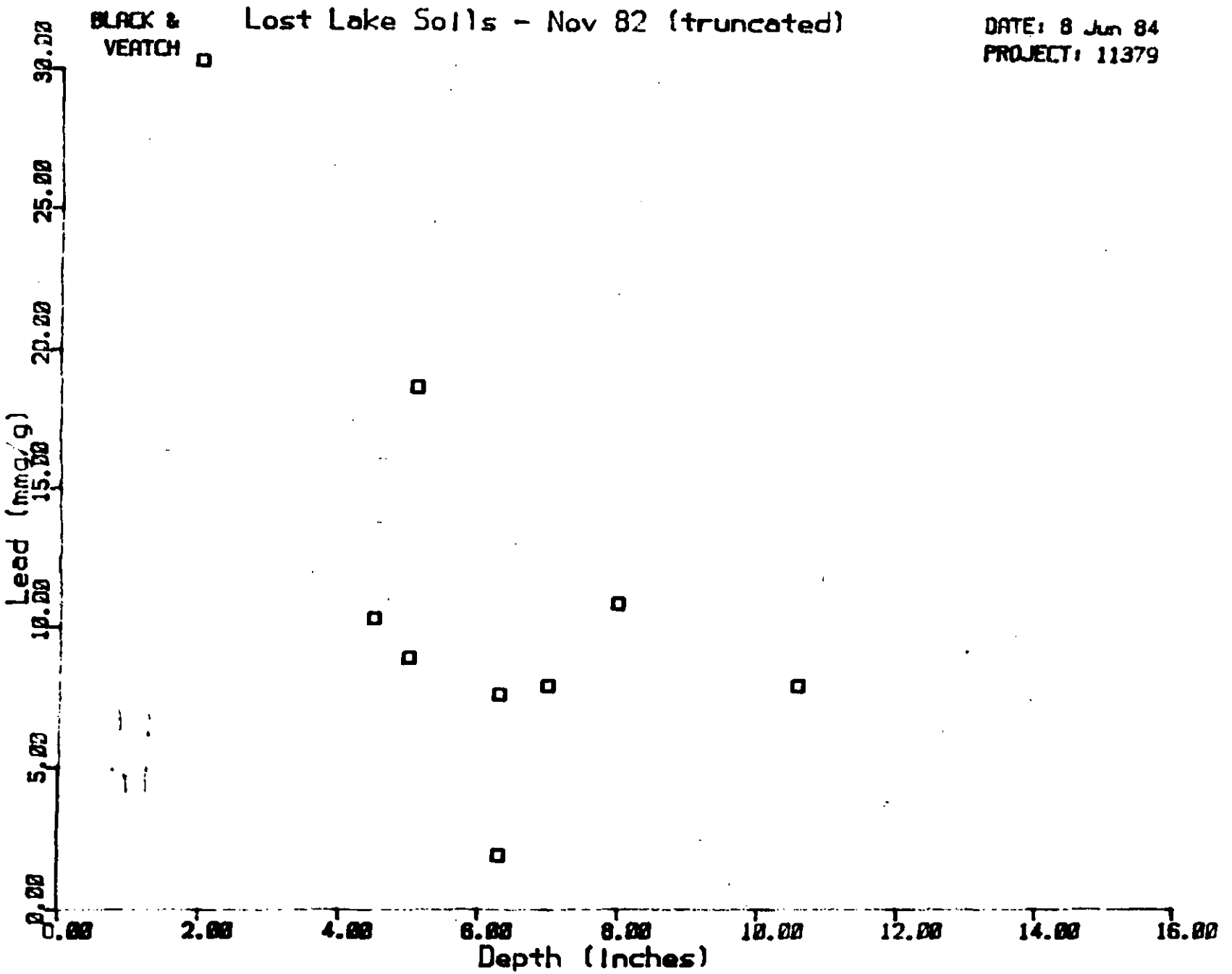
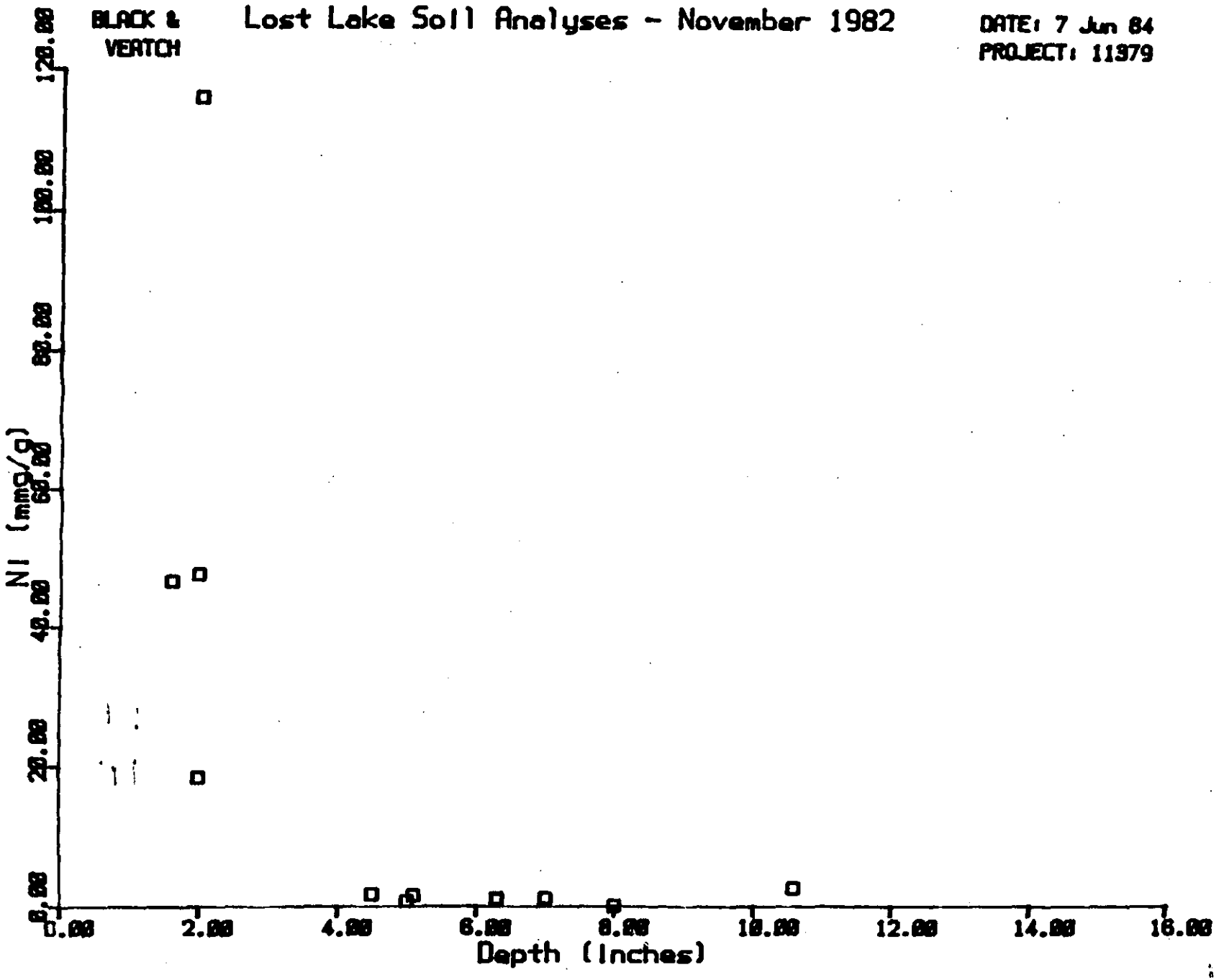


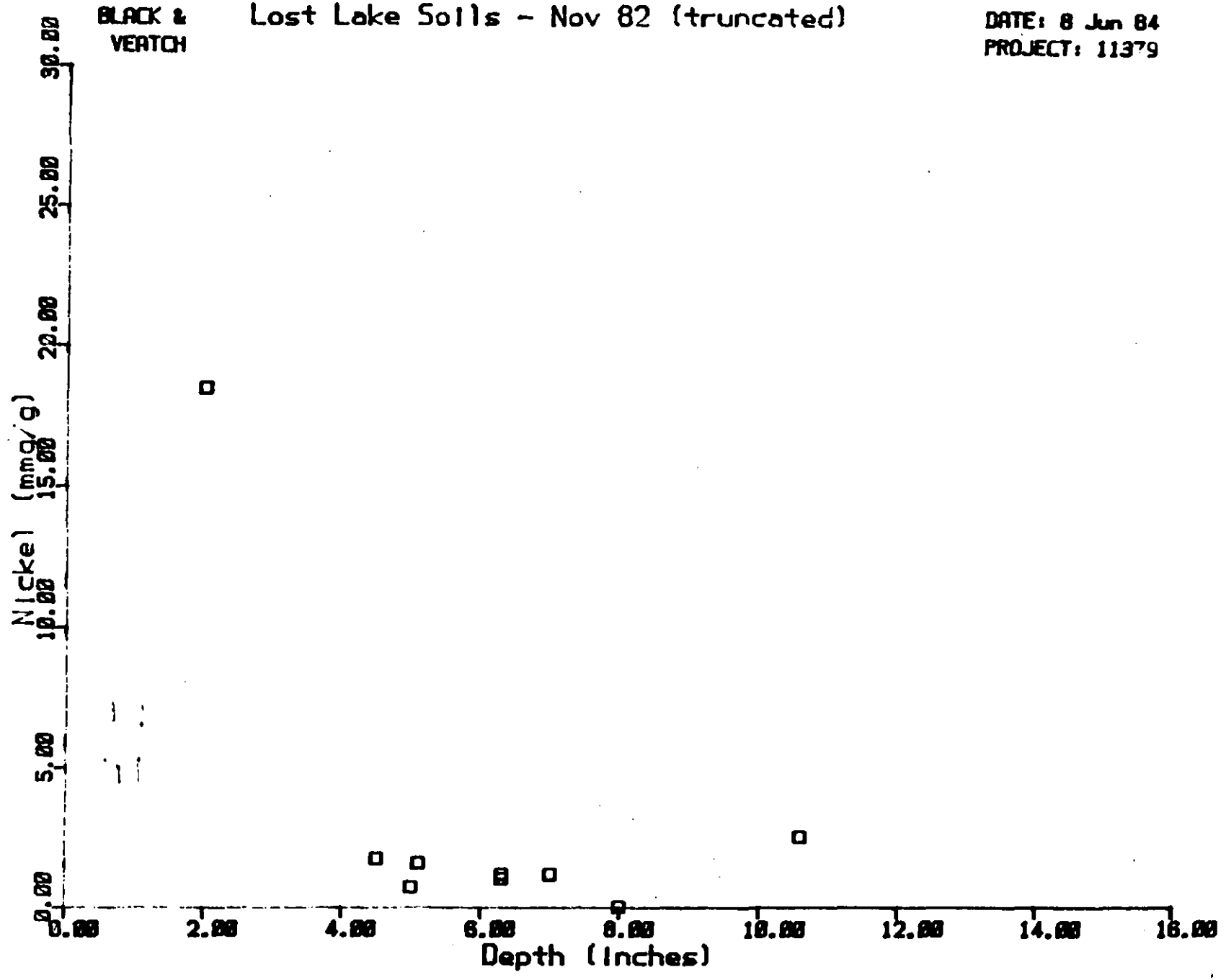
TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=URANIUM UNITS=UGG

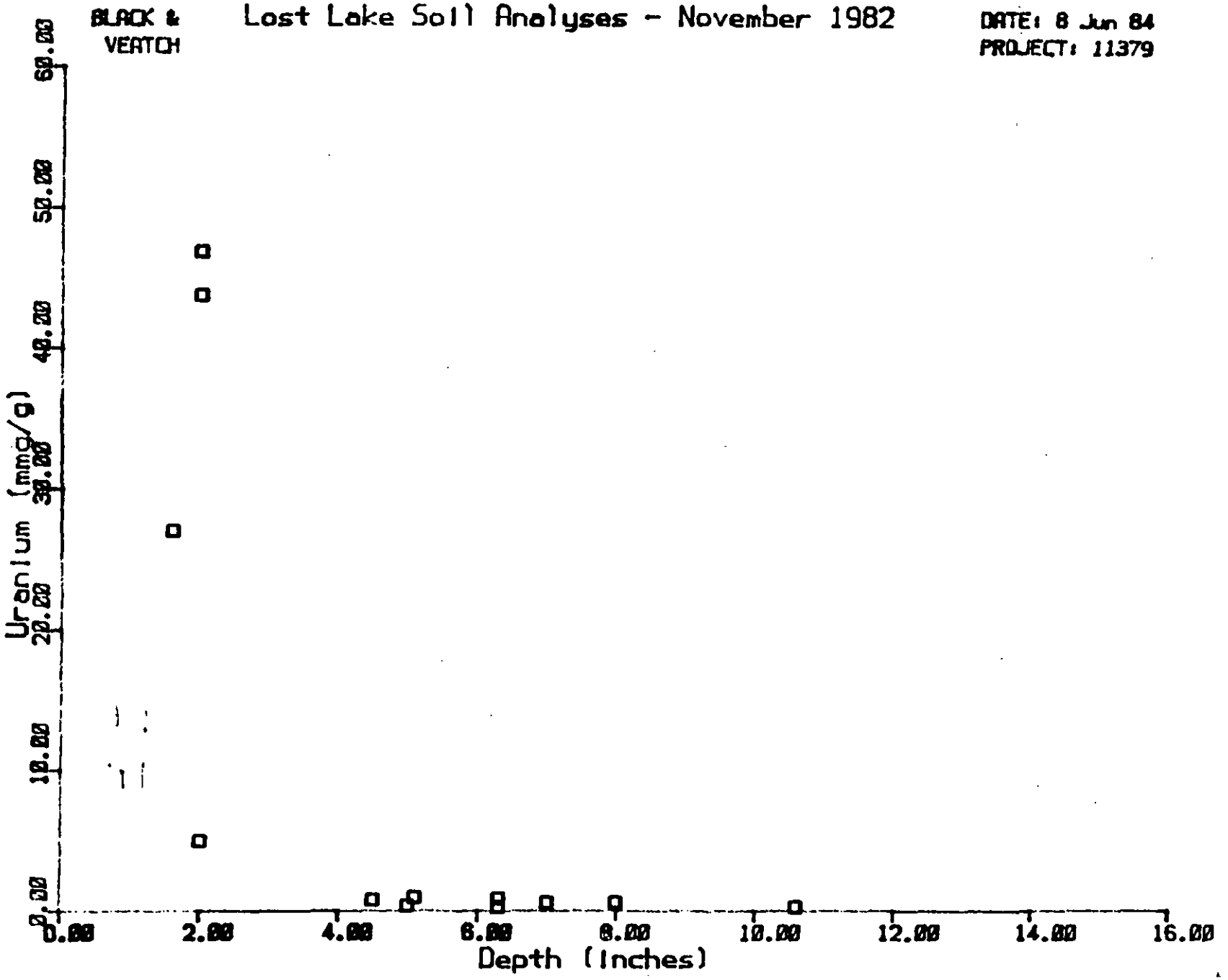
BLOCK CHART OF RESULT




BLACK & VEATCH
Lost Lake Soils - Nov 82 (truncated)
DATE: 8 Jun 84
PROJECT: 11379
Lead (mmg/g)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Depth (Inches)


BLACK & VEATCH
Lost Lake Soil Analyses - November 1982
DATE: 7 Jun 84
PROJECT: 11379
Ni (mmO/g)
120.00
100.00
80.00
60.00
40.00
20.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Depth (Inches)


BLACK & VEATCH
Lost Lake Soils - Nov 82 (truncated)
DATE: 8 Jun 84
PROJECT: 11379
Nickel (mmg/g)
30.00
25.00
20.00
15.00
10.00
5.000
0.000
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Depth (inches)


BLACK & VEATCH
Lost Lake Soil Analyses - November 1982
DATE: 8 Jun 84
PROJECT: 11379
Uranium (mmc/g)
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Depth (Inches)

The Suggested No Adverse Response Level (SNARL) for a 7-day exposure period for uranium, based on chemical toxicity, is 0.21 mg/L. (The radiotoxicity of ingested $^{238}U$ does not pose as great a hazard to humans as the chemical toxicity.)[9] The Environmental Protection Agency (EPA) water quality criterion for protection of human health from ingestion of water for nickel is 0.0134 mg/L.[10]

For these reasons, the design of the sampling plan is based on the chlorinated hydrocarbons, and nickel and uranium. The number of samples required to estimate the true mean of the heavy metals are calculated using the surface and bottom averages from December 1981 and the water profiles from February 1982. Basin effluent data for September 1981 to June 1982 are used to estimate the number of samples required for 1,1,1-TCE and tetrachloroethylene from the surface layers. Sufficient data are not available on volatile organics in the bottom layers. Since more than one constituent must be considered, the number of samples was assumed and the range of the mean that could be expected for each contaminant was calculated. The recommended number of samples is expected, based on the statistical calculations, to provide sufficiently precise estimates of the true mean concentrations for closure.

Since consideration of treatment and disposal alternatives for the liquid will not differentiate more than two liquid layers, sampling of more than two layers is not justified. Conductivity, pH, and dissolved oxygen profiles should be taken prior to sampling to determine if stratification exists and its depth. Based on previous data, stratification can be expected at approximately 4-foot depth with a total liquid depth of 12.5 feet. Eighteen samples of the basin liquid are recommended. If the

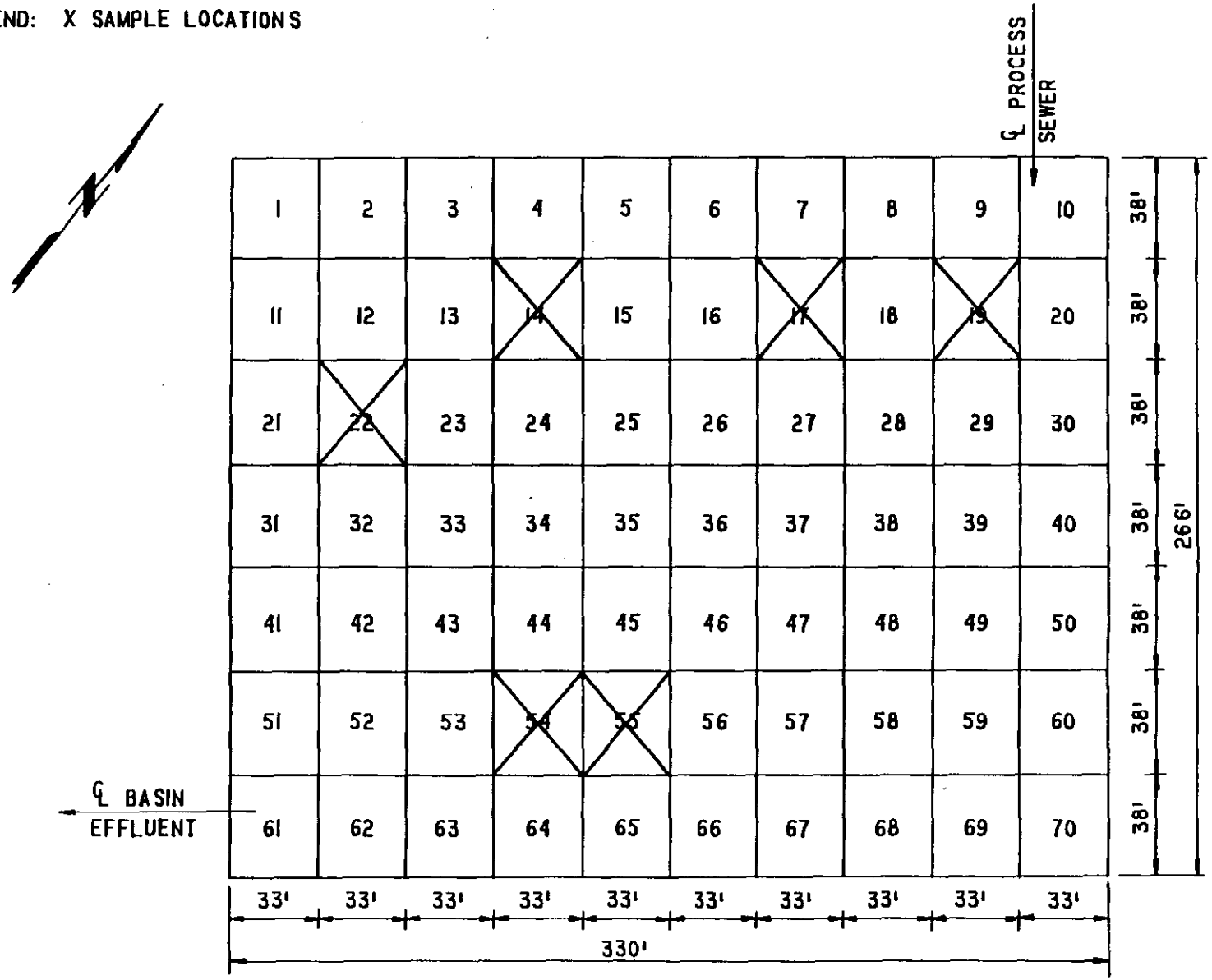
basin is stratified, random sampling is recommended, with the samples proportioned between the two layers. The proportion for each layer should be based on the ratio of depth of the layer to the overall depth. For stratification at 4 feet, six samples would be taken from the top and twelve from the bottom layer. Samples should be taken from various depths in each layer. The expected precision of the data will be as follows:

| Constituent | Predicted Range of Mean 80% CI | |
|---|---|---|
| | Top (0-4') (+ or -) | Bottom (4-12.5') (+ or -) |
| Uranium | 0.5 mg/L | 1.2 mg/L |
| Nickel | 0.2 mg/L | 0.2 mg/L |
| 1,1,1-TCE | 235 mg/L | NA |
| Tetrachloroethylene | 10 mg/1 | NA |

CI = Confidence Interval.
NA = Sufficient data not available for calculations.

The accuracy of these predicted concentrations depends on the degree of change of the basin chemical characteristics since early 1982. Sampling locations were selected randomly and are shown in Fig. 1 and 2. All samples should be analyzed for liquid physical parameters (Type A). Fourteen samples should be analyzed for selected volatile organics (Type D) and inorganics (Type E), and the remaining four, two from each layer, should be analyzed for all the listed inorganic (Type B) and organic chemicals (Type C). Compositing of surface or bottom samples from different locations is not recommended since an estimate of the variance of the mean as well as the mean is desired.

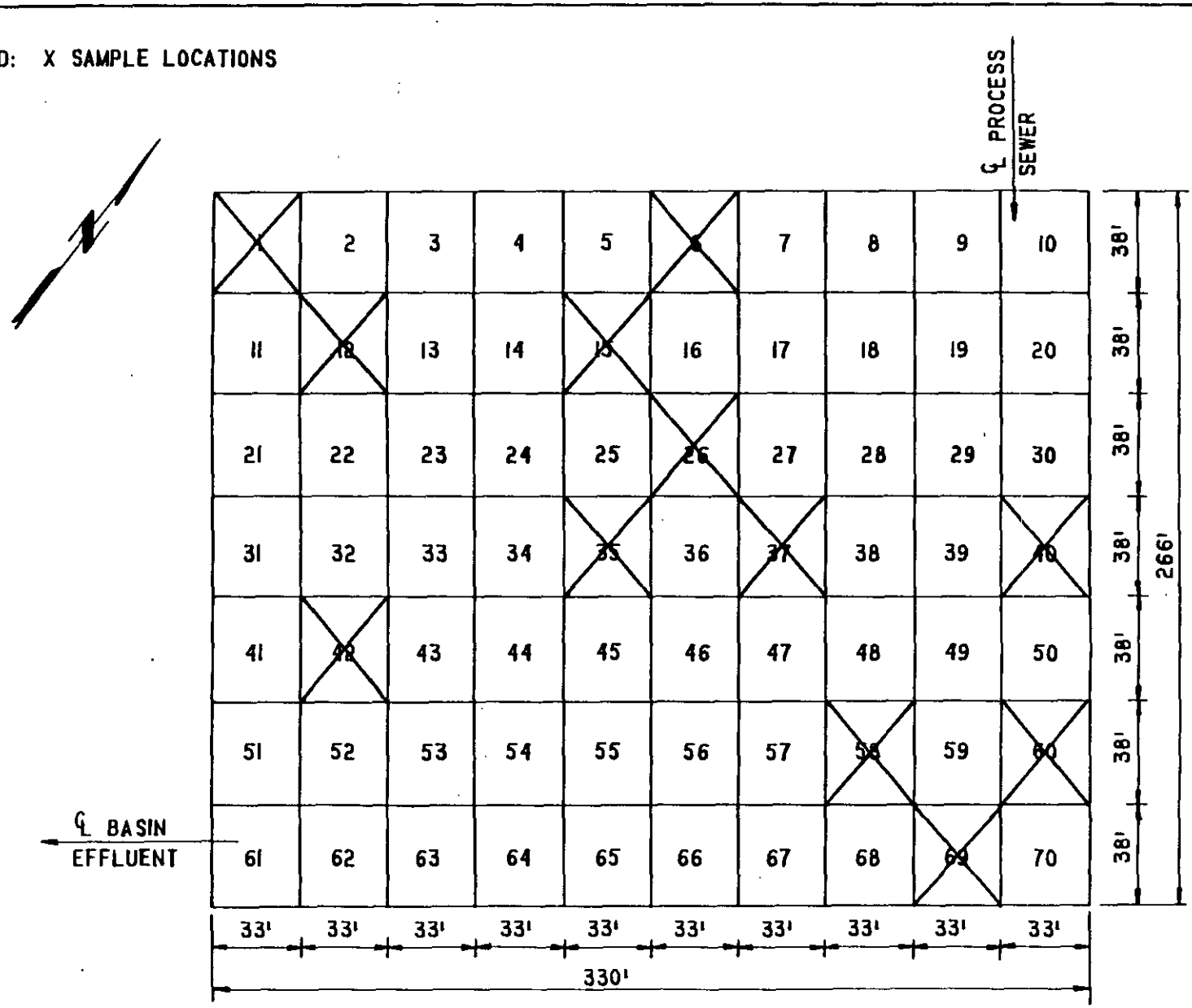
b. Sludge/Soils Underlying M-Area Basin. In March 1982, five 15-foot soil cores were taken from beneath the M-Area settling basin.[6] Cores were analyzed at 1-foot intervals for inorganics and the three chlorinated hydrocarbons. Plots for selected constituents are included in




## SETTLING BASIN LIQUID SAMPLING LOCATIONS 0-4'

SCALE: 1" = 60'

FIGURE 1

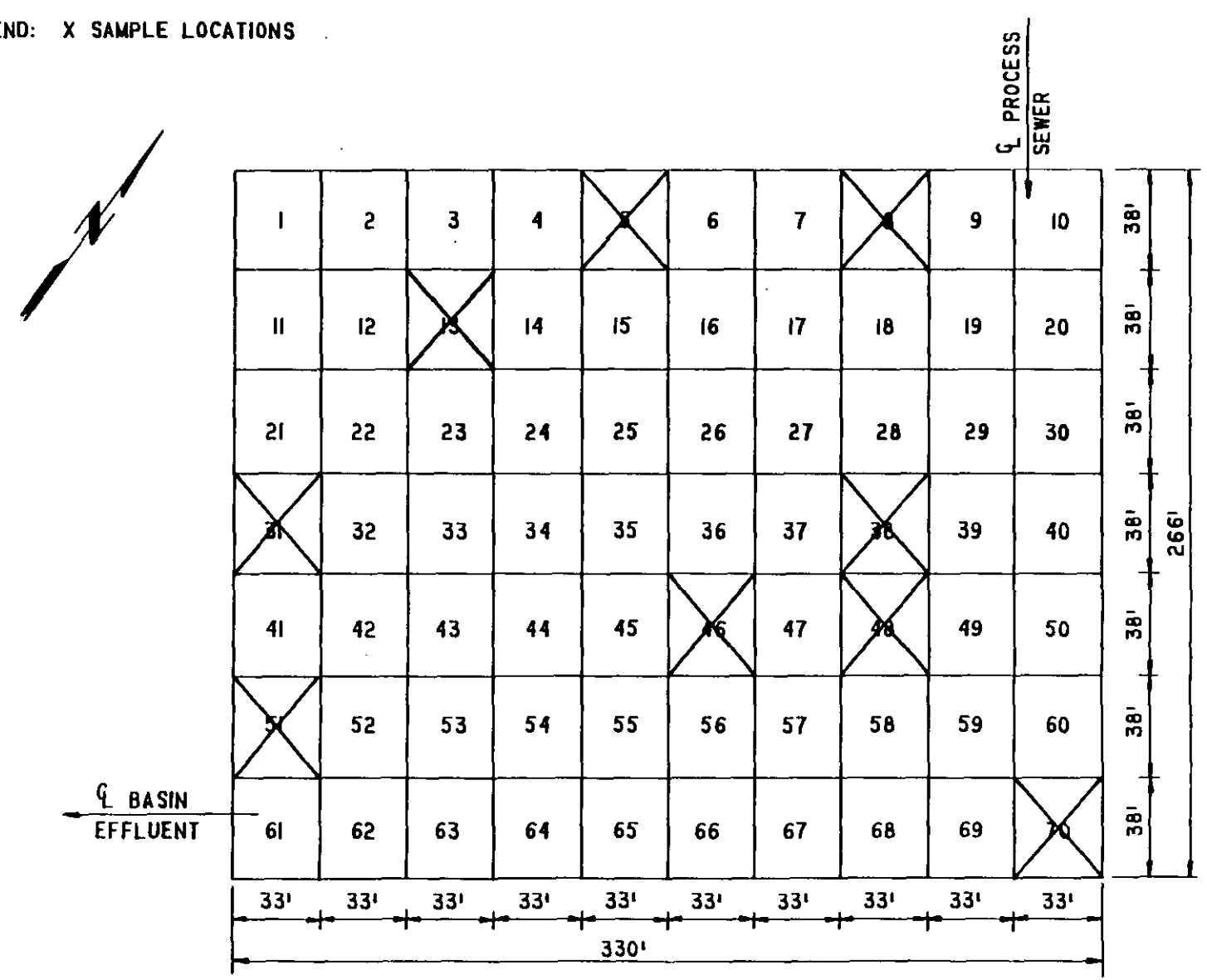



SETTLING BASIN LIQUID SAMPLING LOCATIONS 4'-12.5'

SCALE: 1" = 60'

FIGURE 2

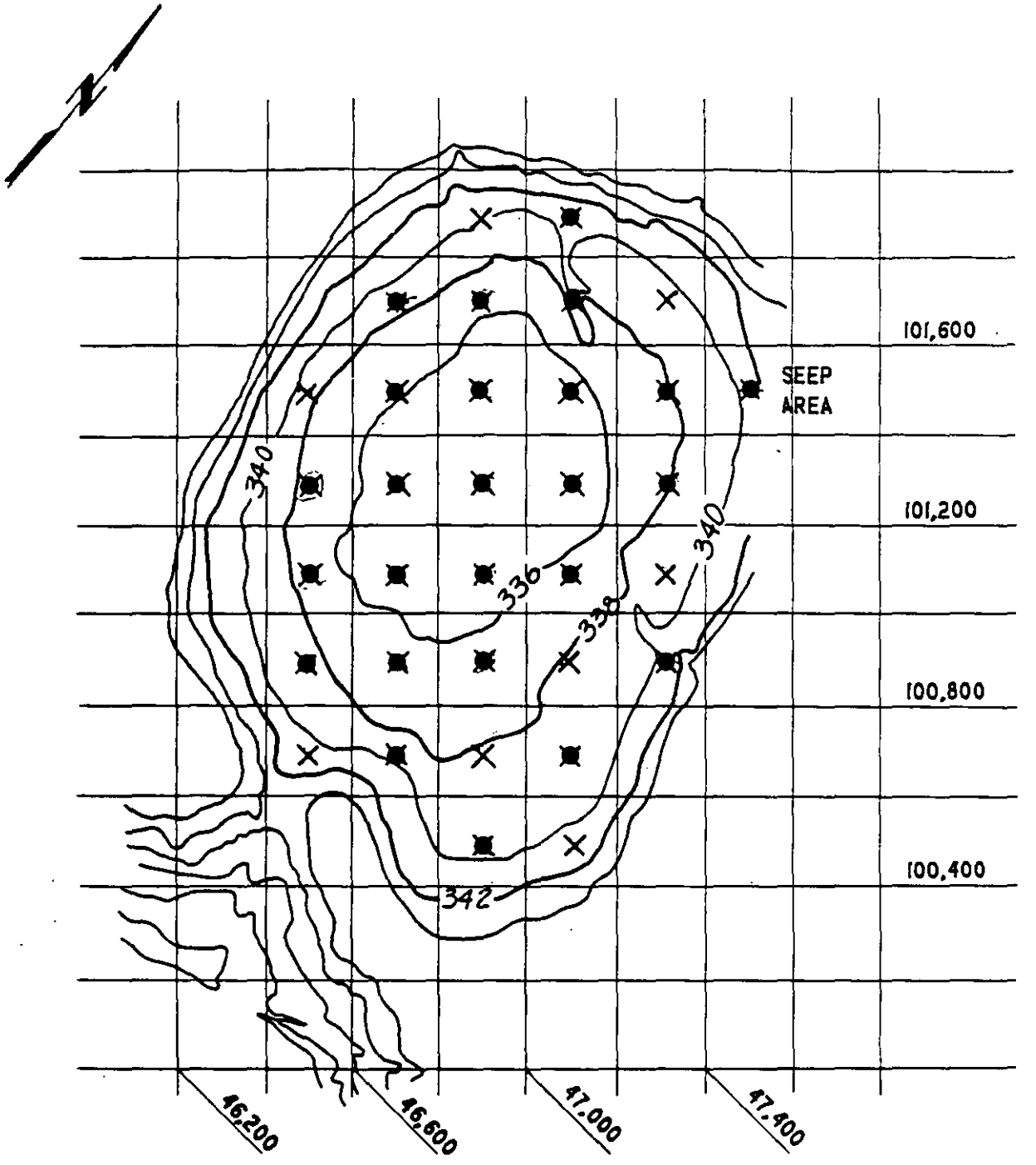
LEGEND: X SAMPLE LOCATIONS




## SETTLING BASIN SLUDGE/SOIL SAMPLING LOCATIONS

SCALE: 1" = 60'

FIGURE 3




## LOST LAKE SAMPLING LOCATIONS

TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ZINC  UNITS=UGG

BLOCK CHART OF RESULT

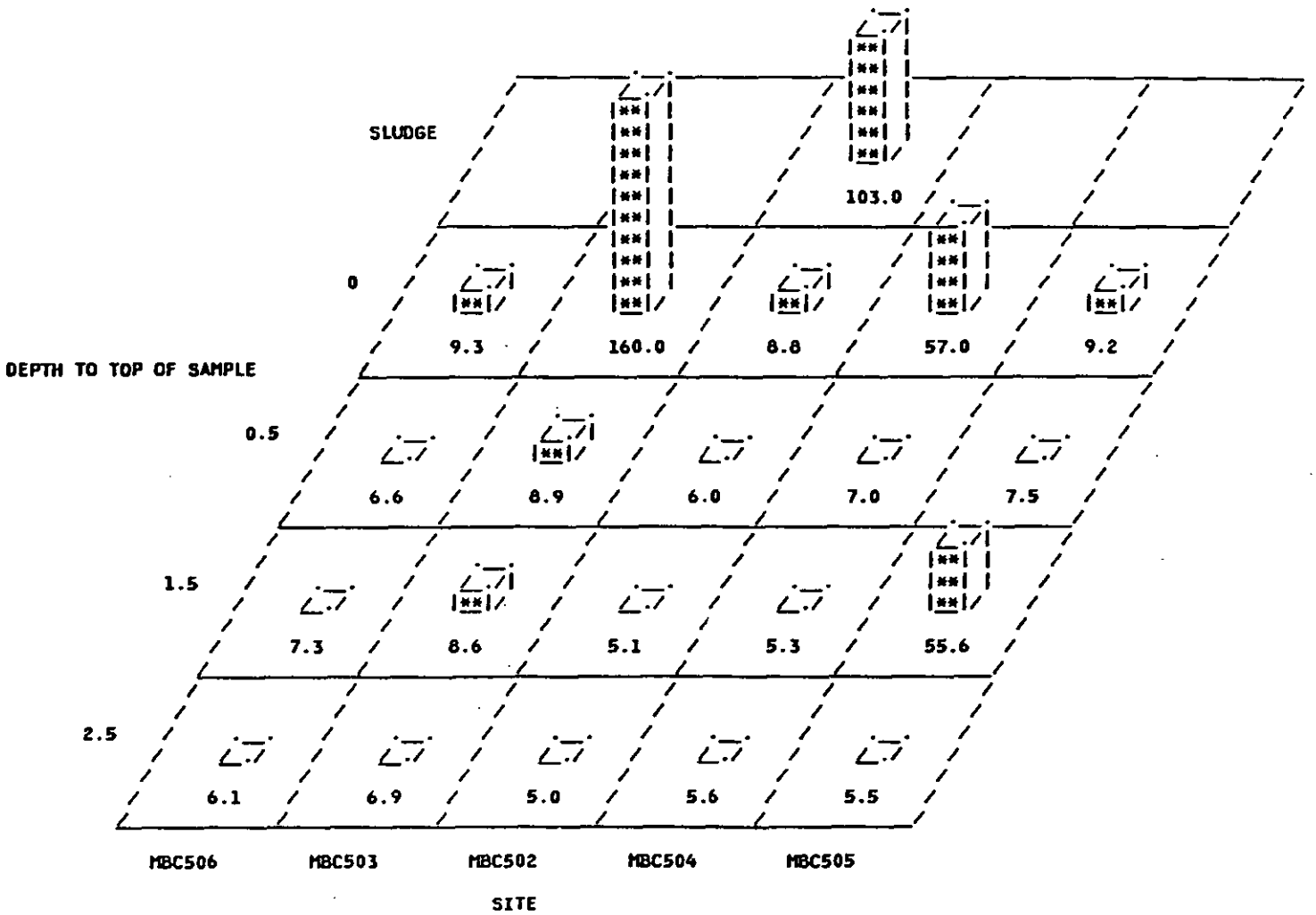


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ALUMINUM UNITS=UGG

BLOCK CHART OF RESULT

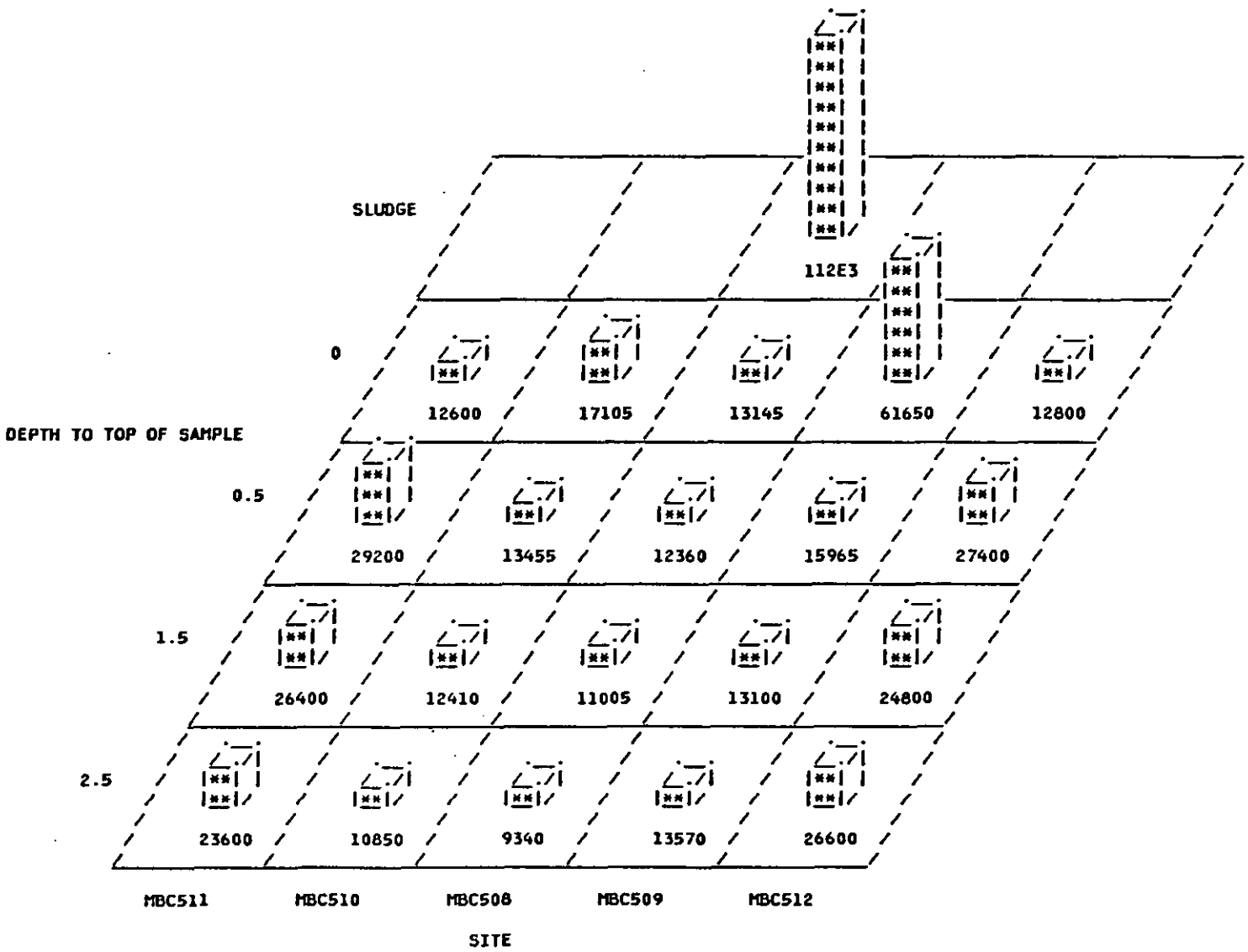


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CALCIUM  UNITS=UGG

BLOCK CHART OF RESULT

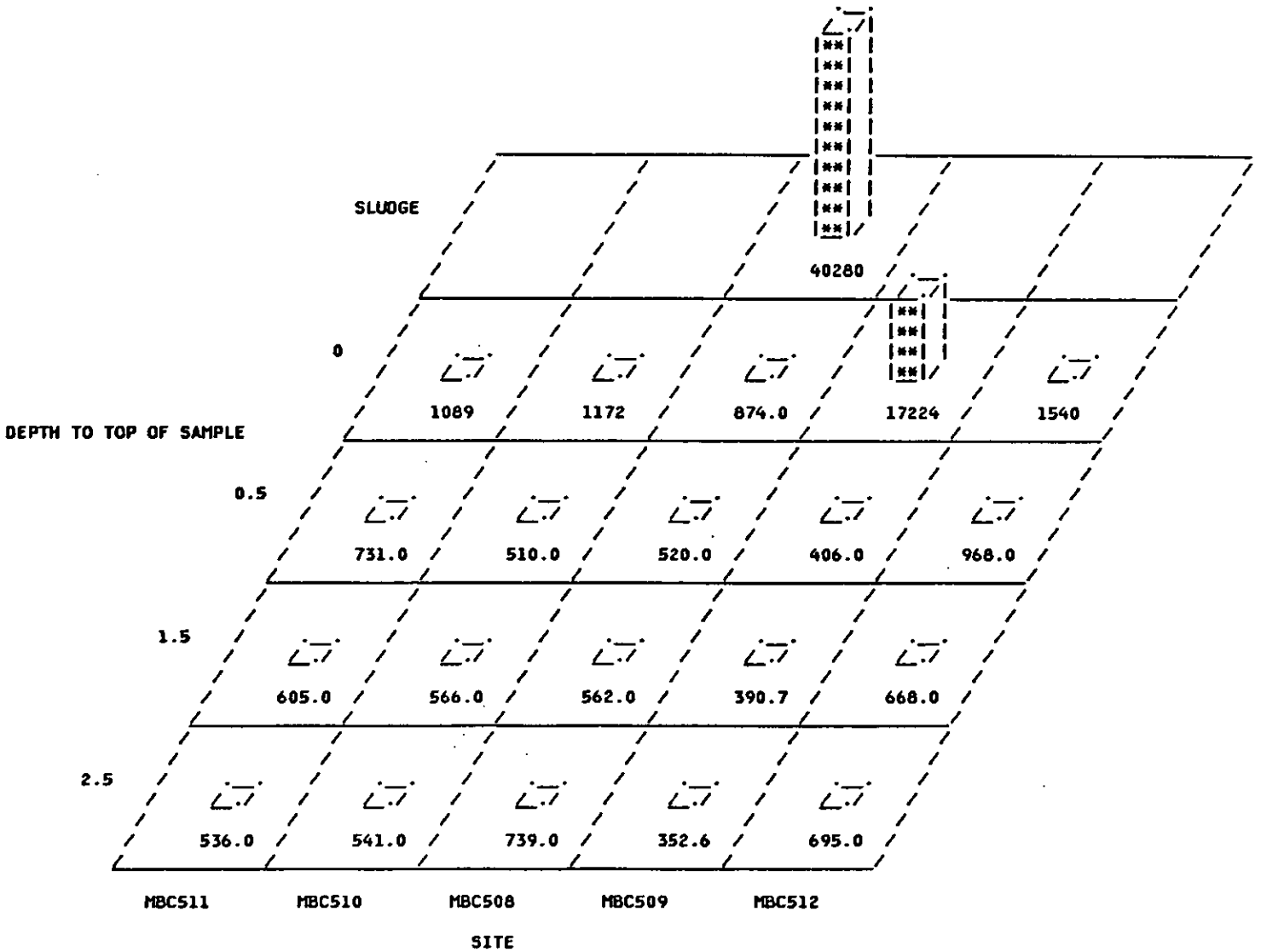


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CADMIUM UNITS=UGG

BLOCK CHART OF RESULT

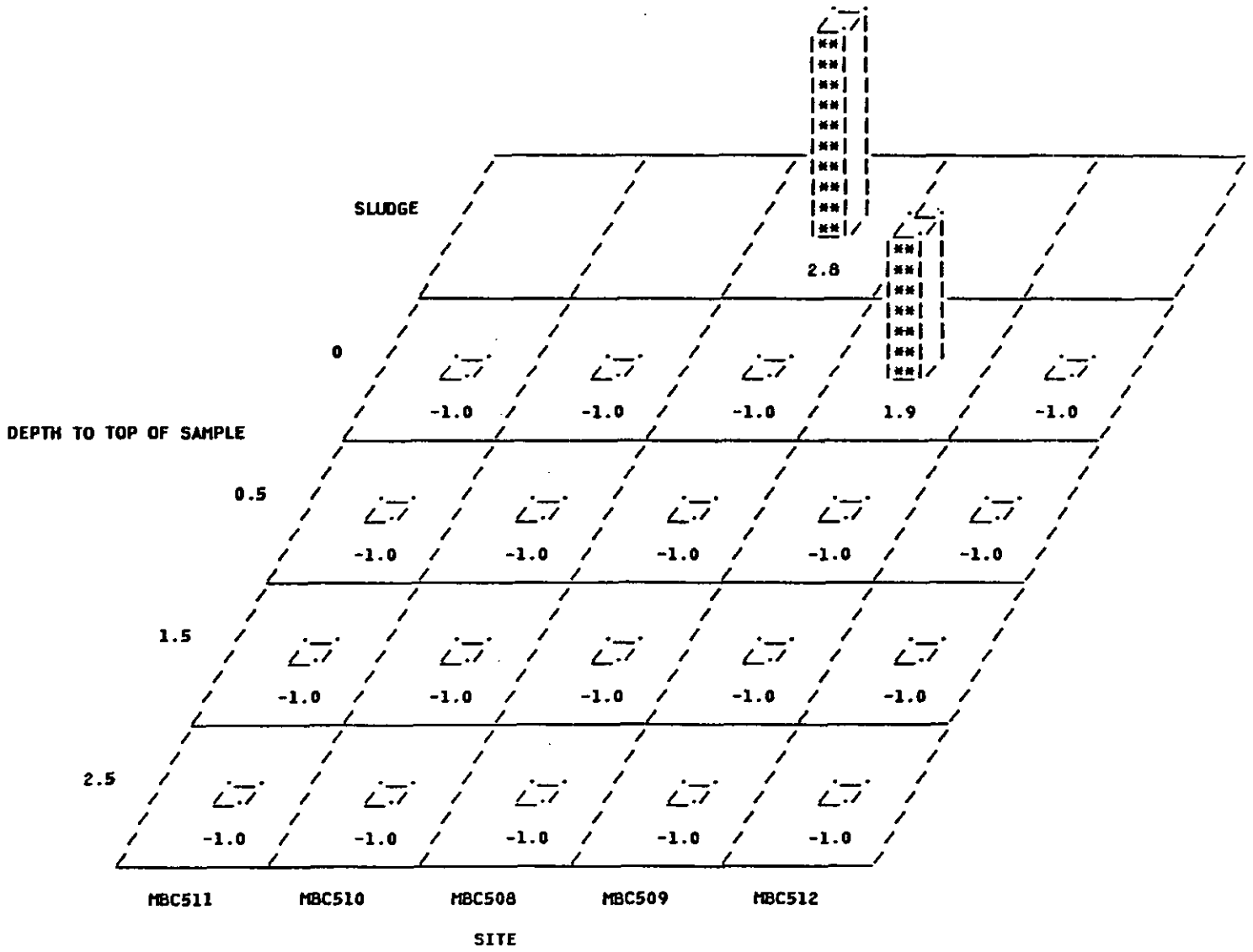


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CHLORIDE UNITS=UGG

BLOCK CHART OF RESULT

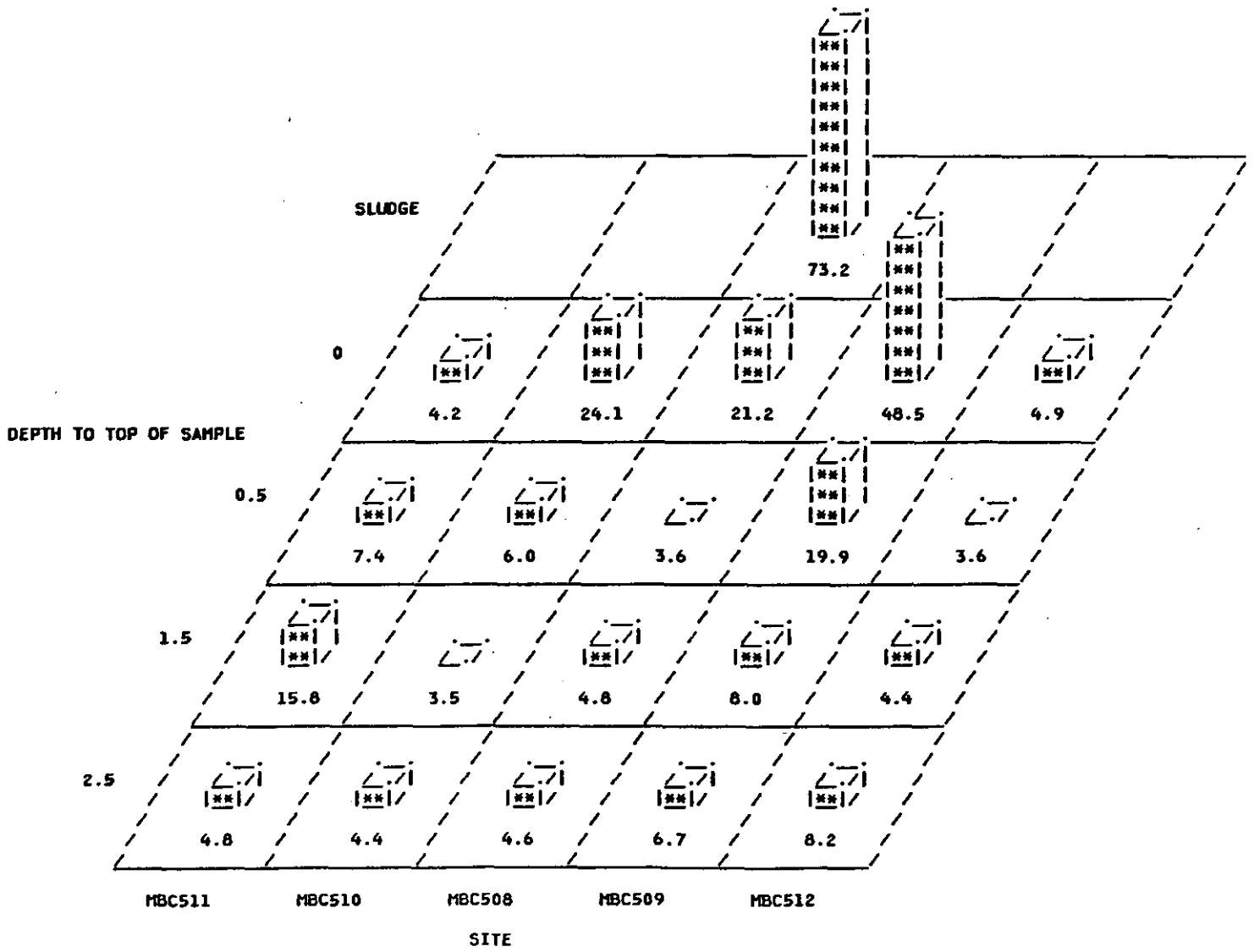


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=CHROMIUM  UNITS=UGG

BLOCK CHART OF RESULT

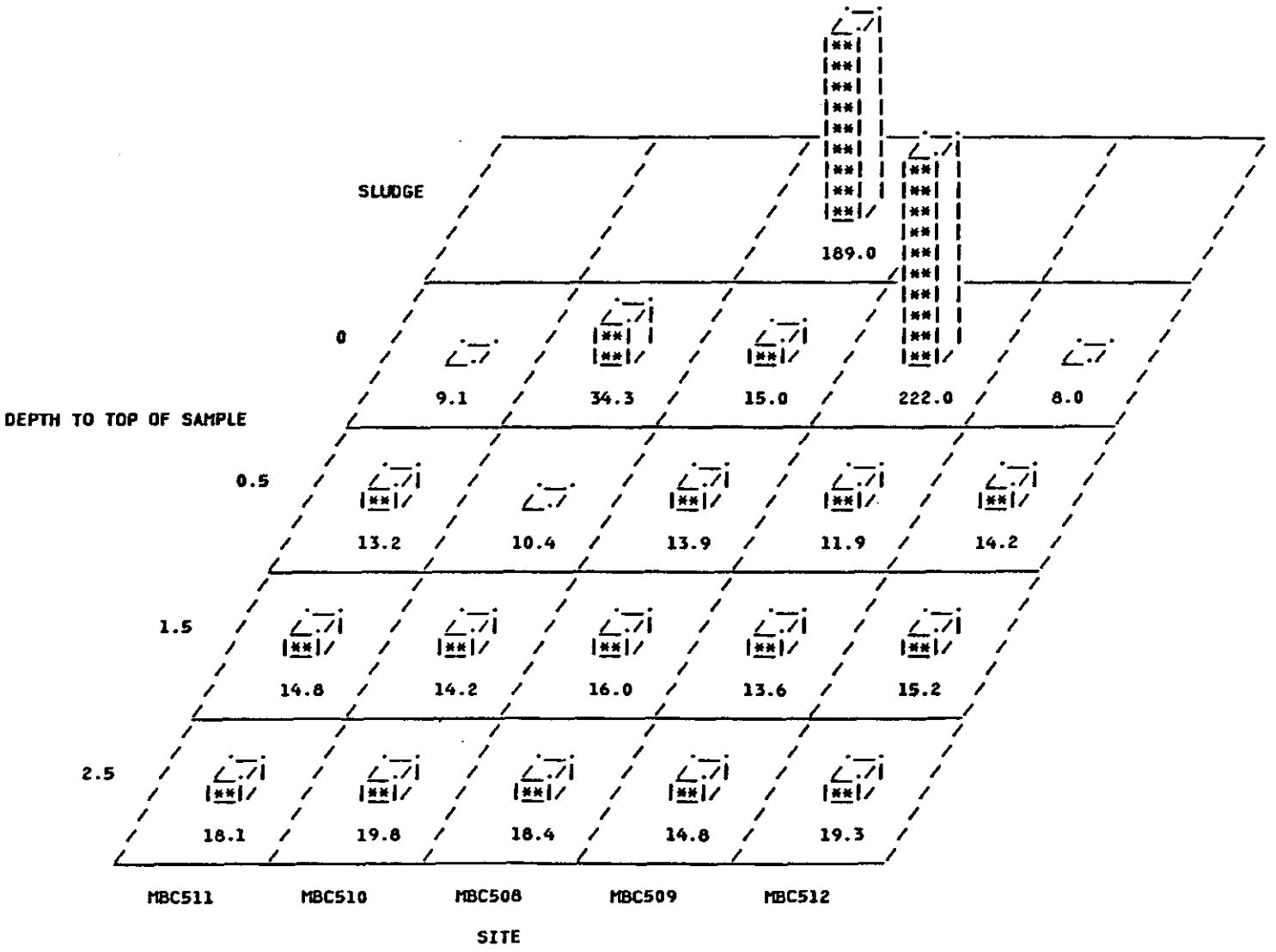


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=COPPER UNITS=UGG

BLOCK CHART OF RESULT

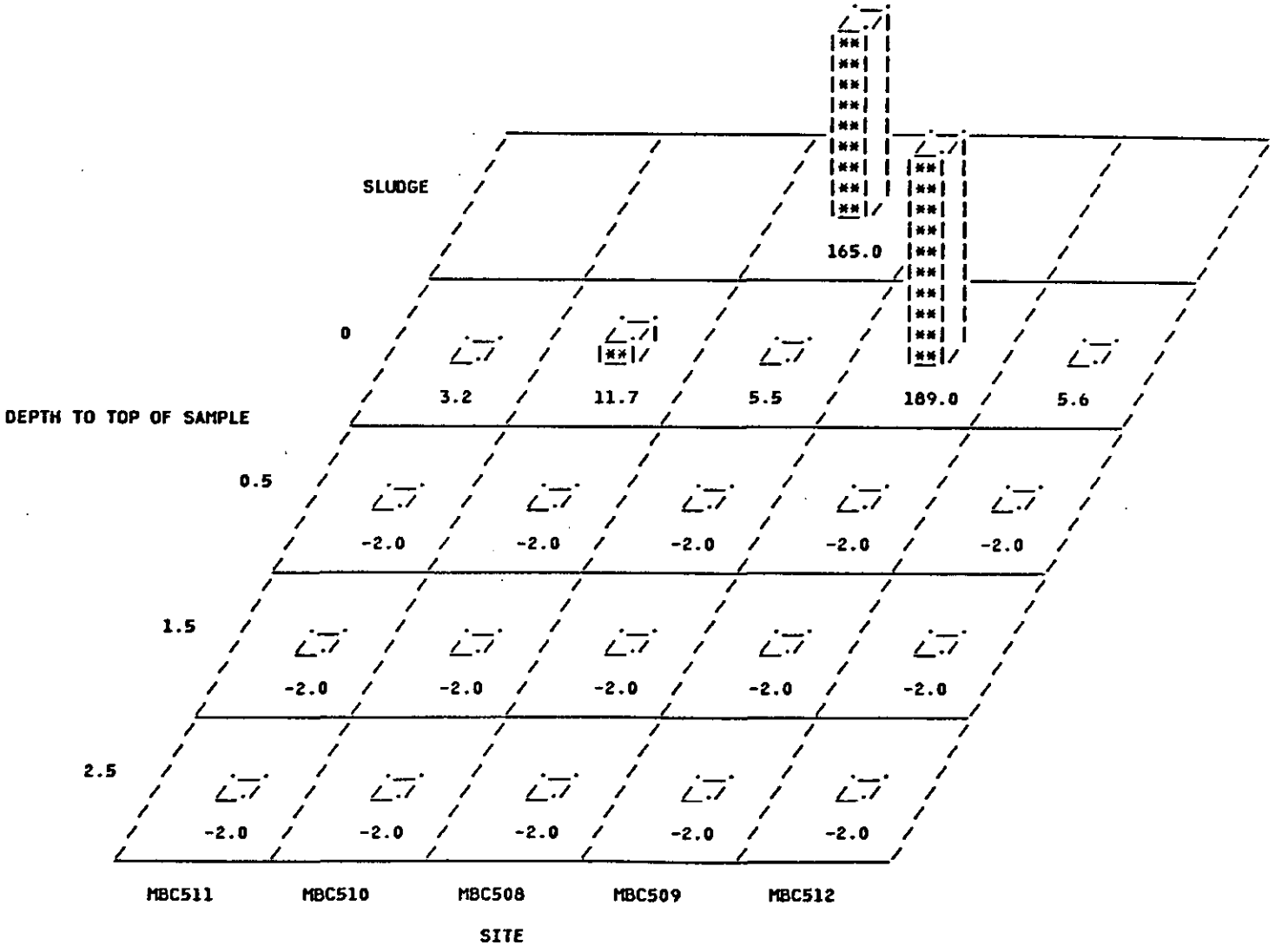


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=IRON  UNITS=UGG

BLOCK CHART OF RESULT

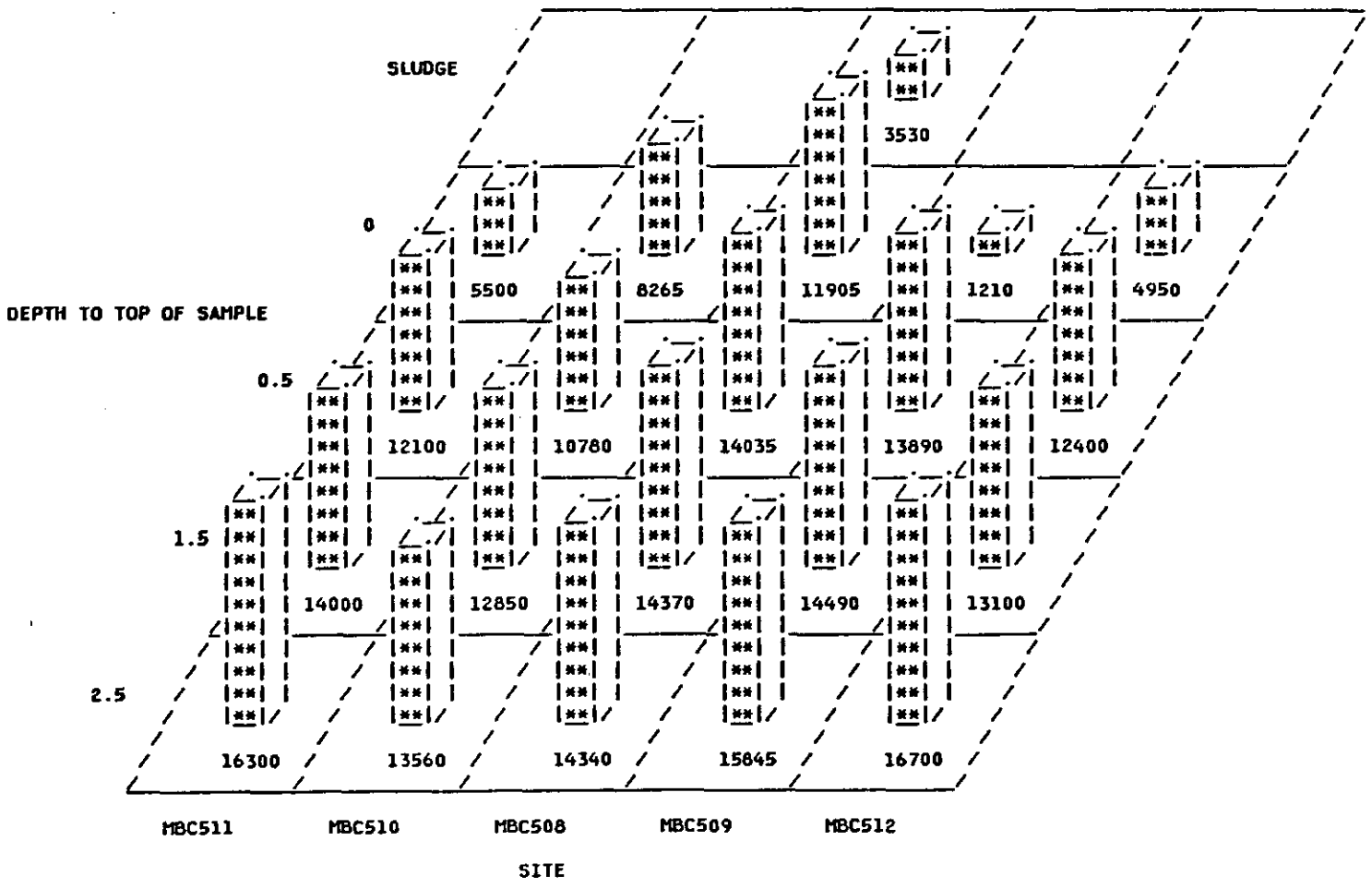


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=MERCURY UNITS=UGG

BLOCK CHART OF RESULT

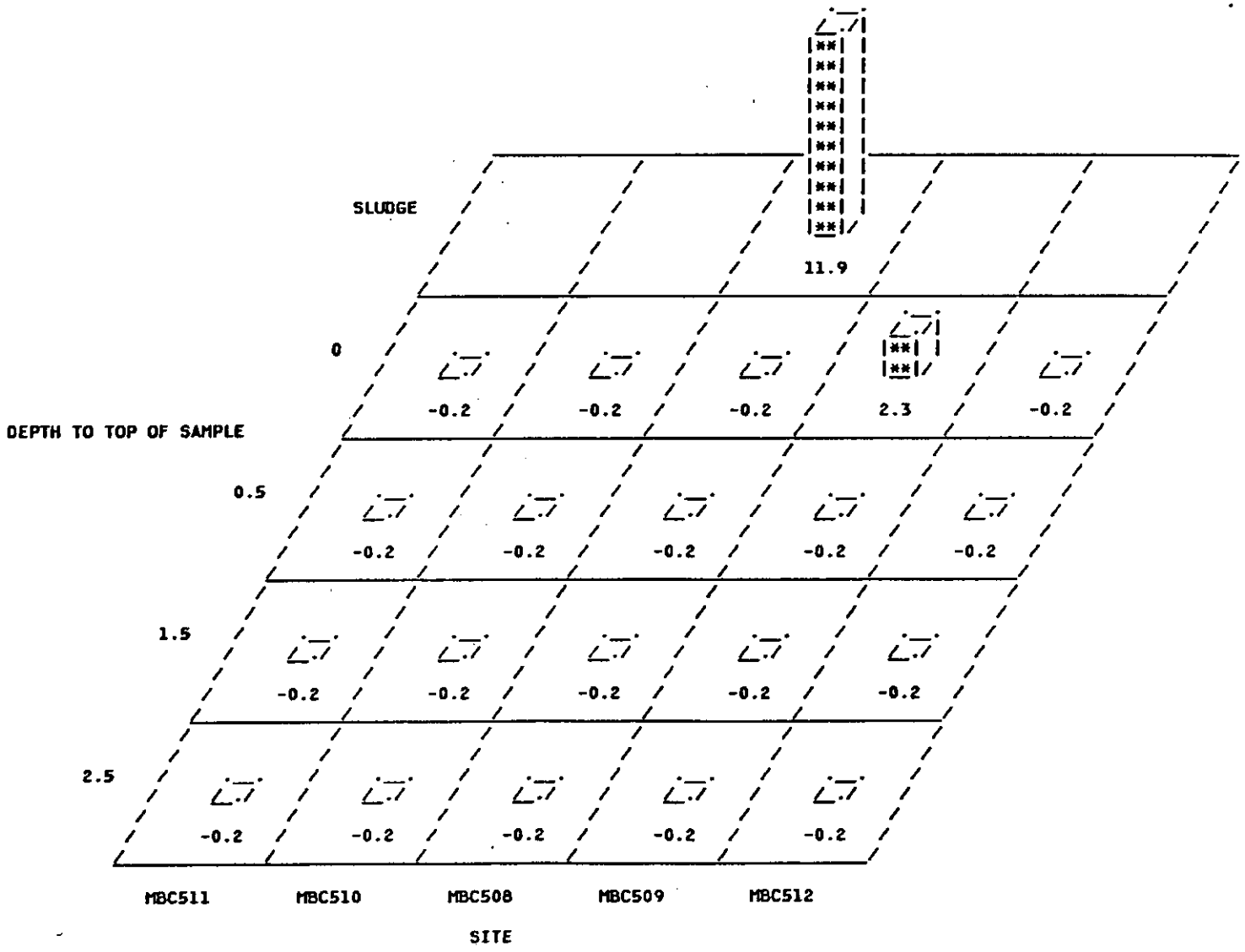


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=POTASSIUM UNITS=UGG

BLOCK CHART OF RESULT

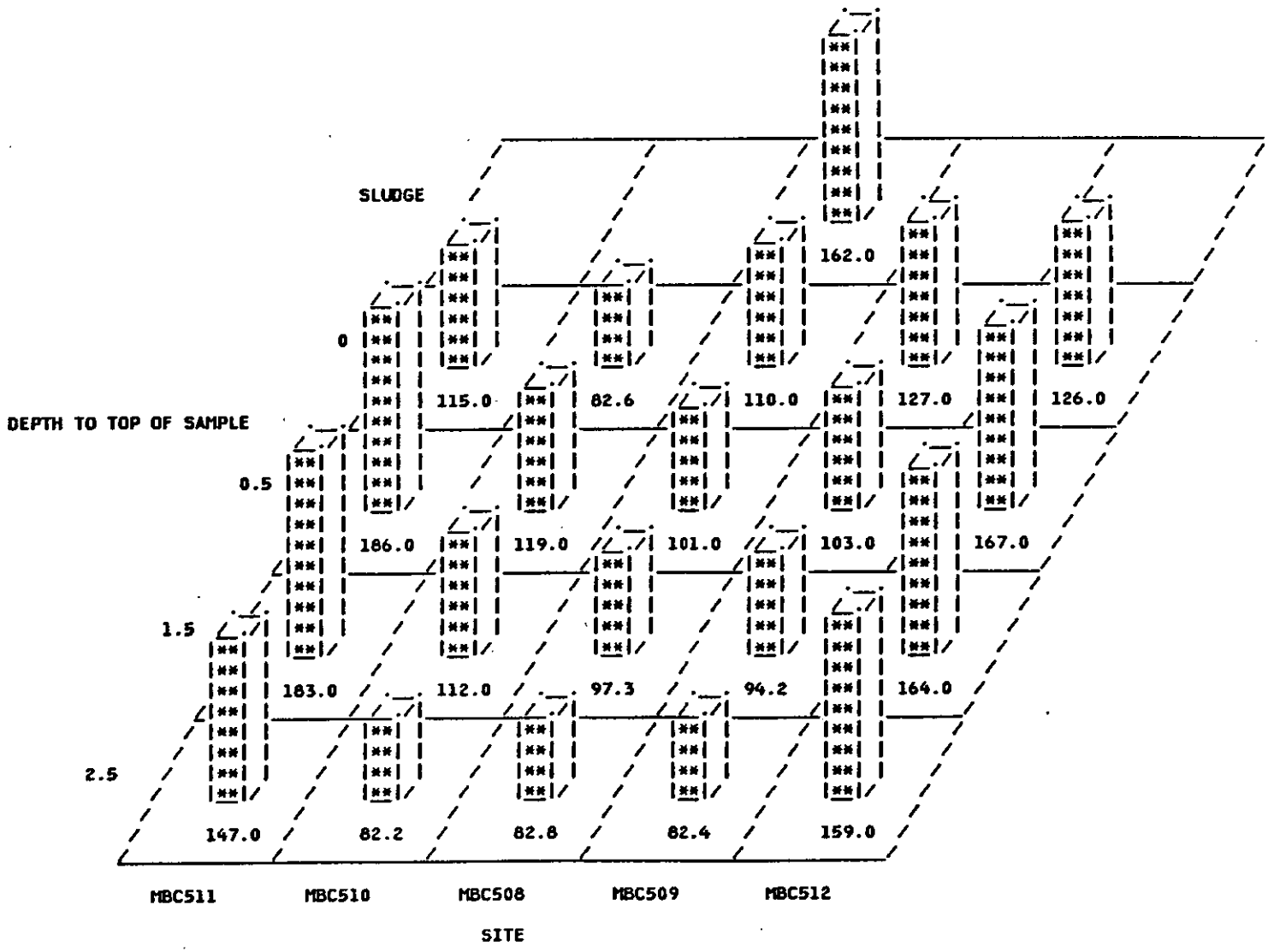


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=MAGNESIUM UNITS=UGG

BLOCK CHART OF RESULT

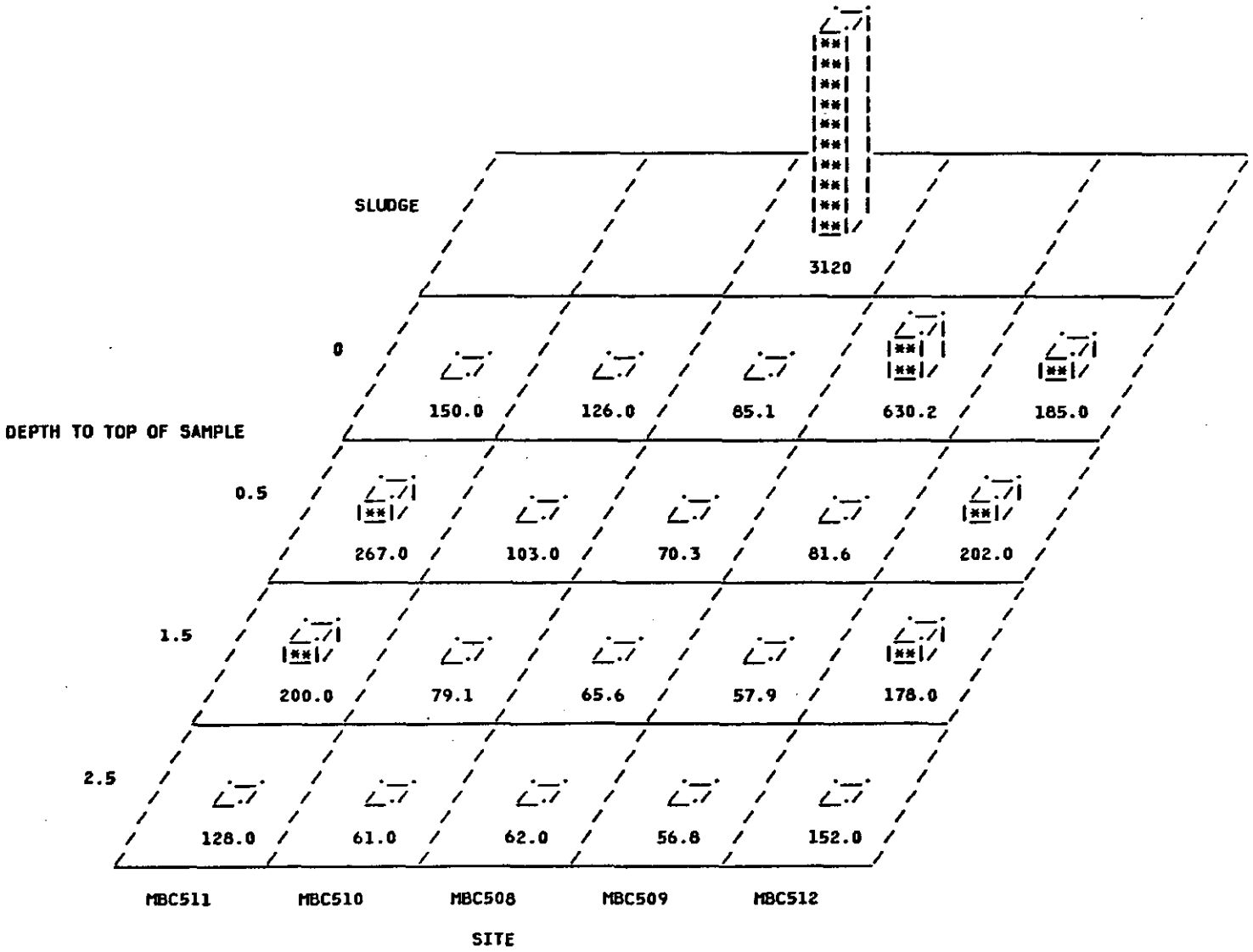


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=MANGANESE UNITS=UGG

BLOCK CHART OF RESULT

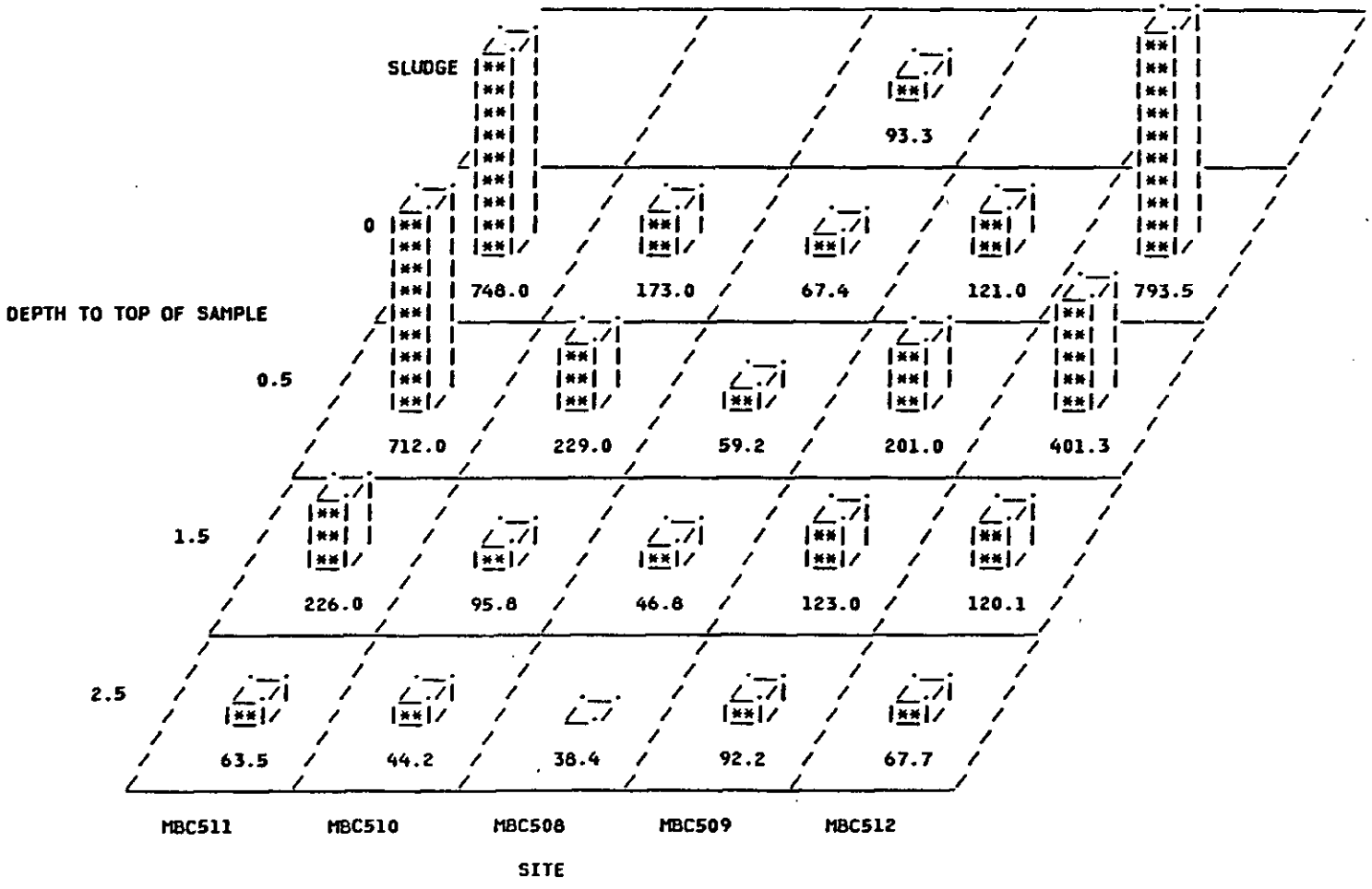


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=SODIUM UNITS=UGG

BLOCK CHART OF RESULT

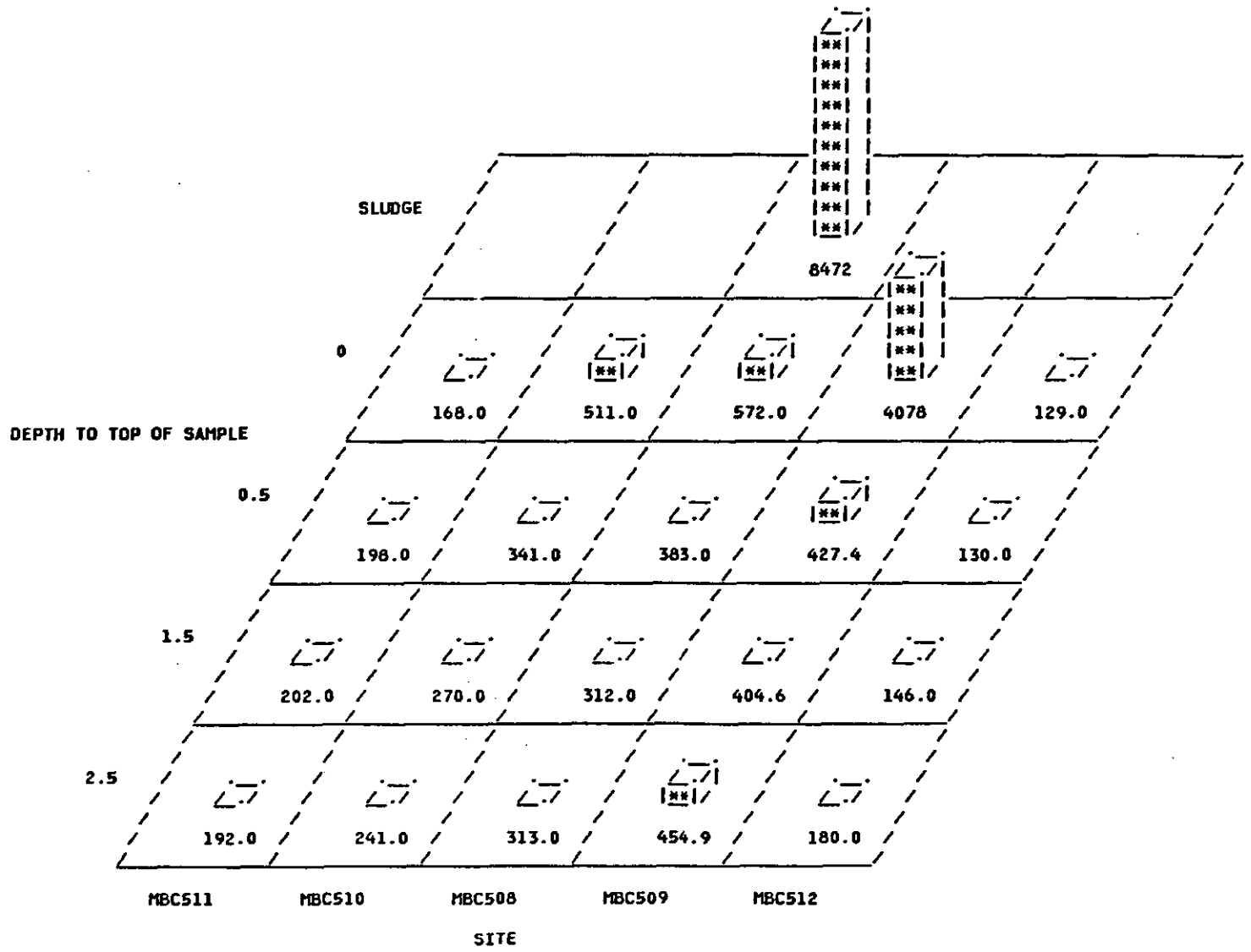


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=AMMONIA NITROGEN  UNITS=UGG

BLOCK CHART OF RESULT

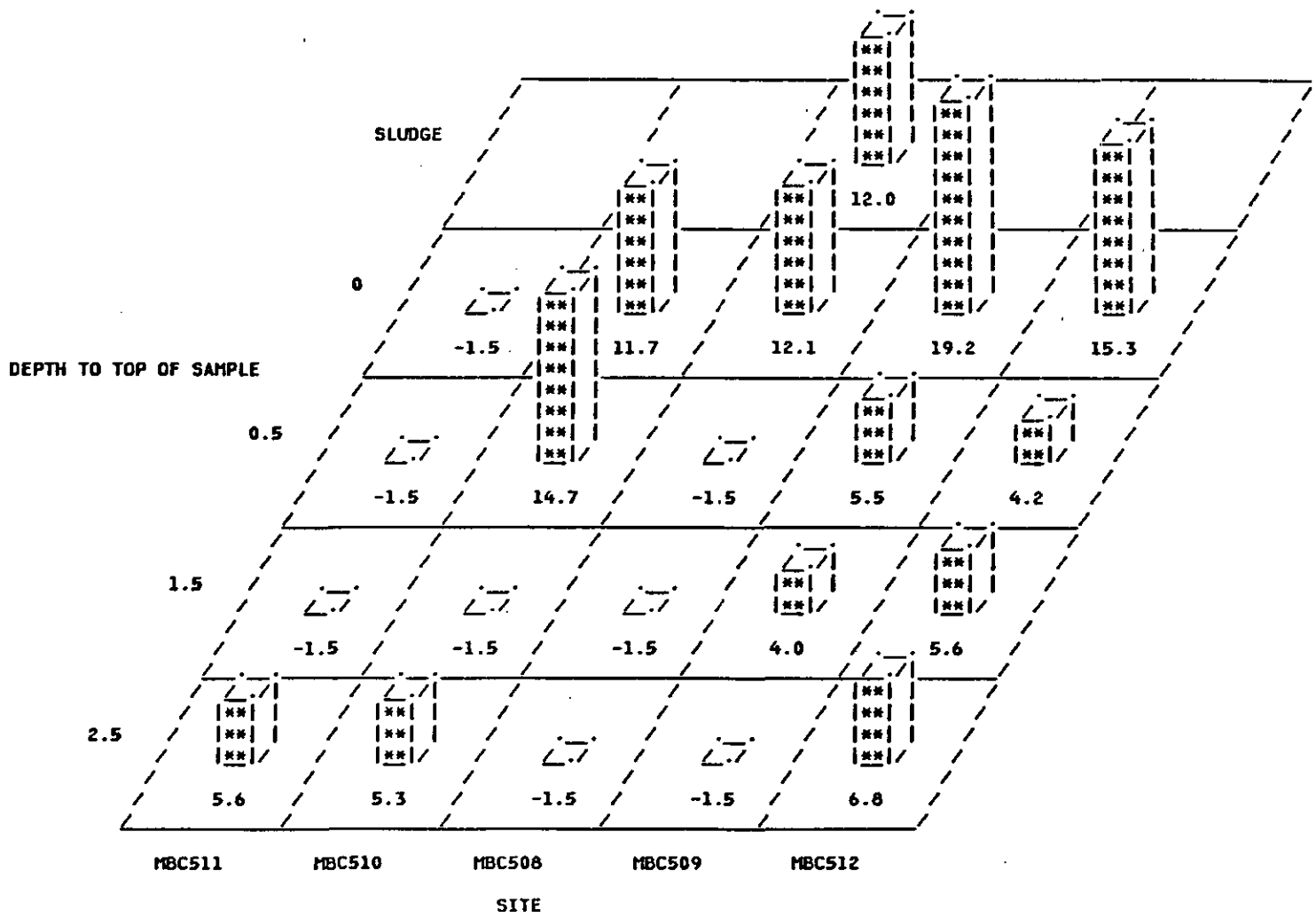


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=NITRATE UNITS=UGG

BLOCK CHART OF RESULT

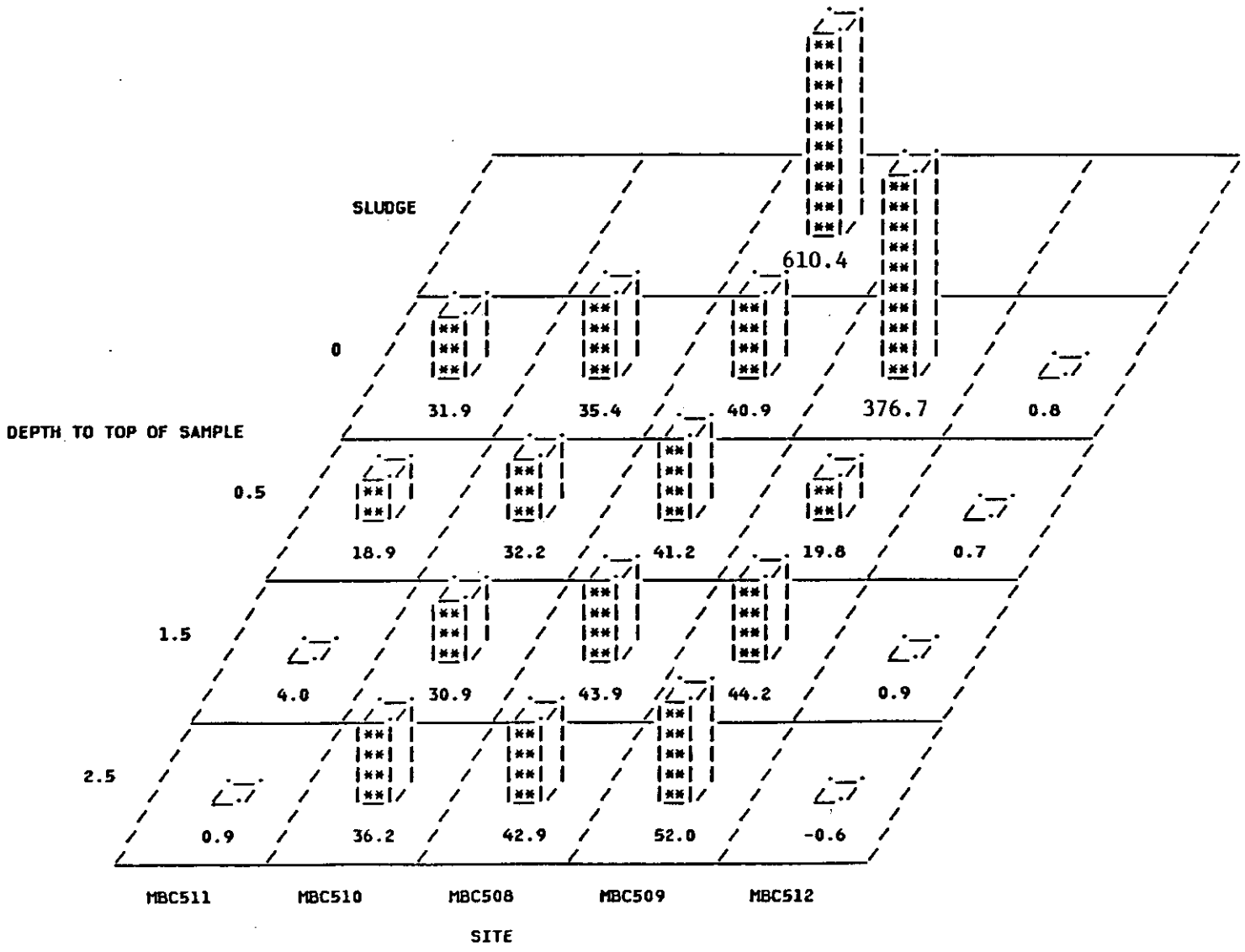


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=NICKEL UNITS=UGG

BLOCK CHART OF RESULT

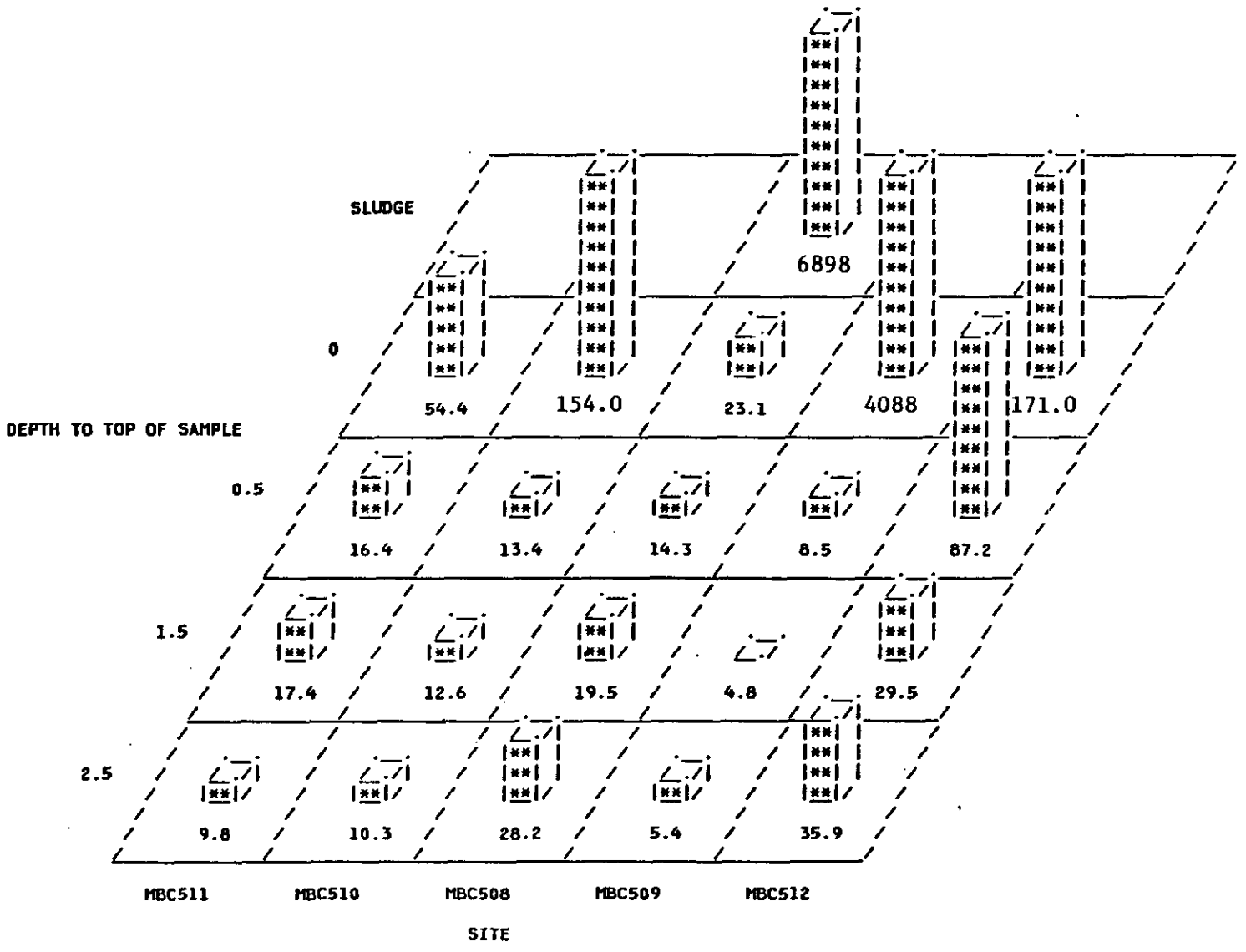


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=LEAD UNITS=UGG

BLOCK CHART OF RESULT

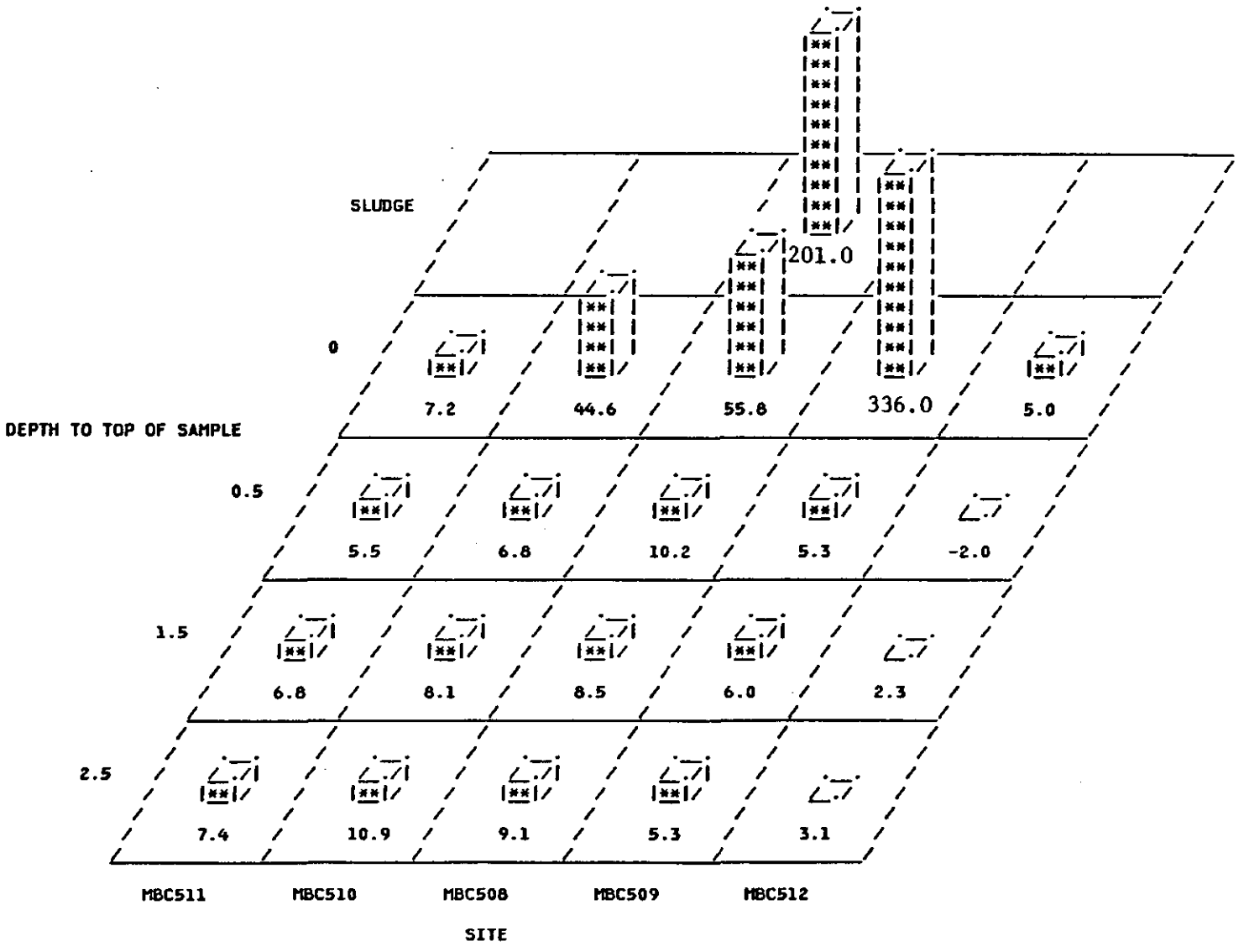


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ORGANIC CARBON UNITS=UGG

BLOCK CHART OF RESULT

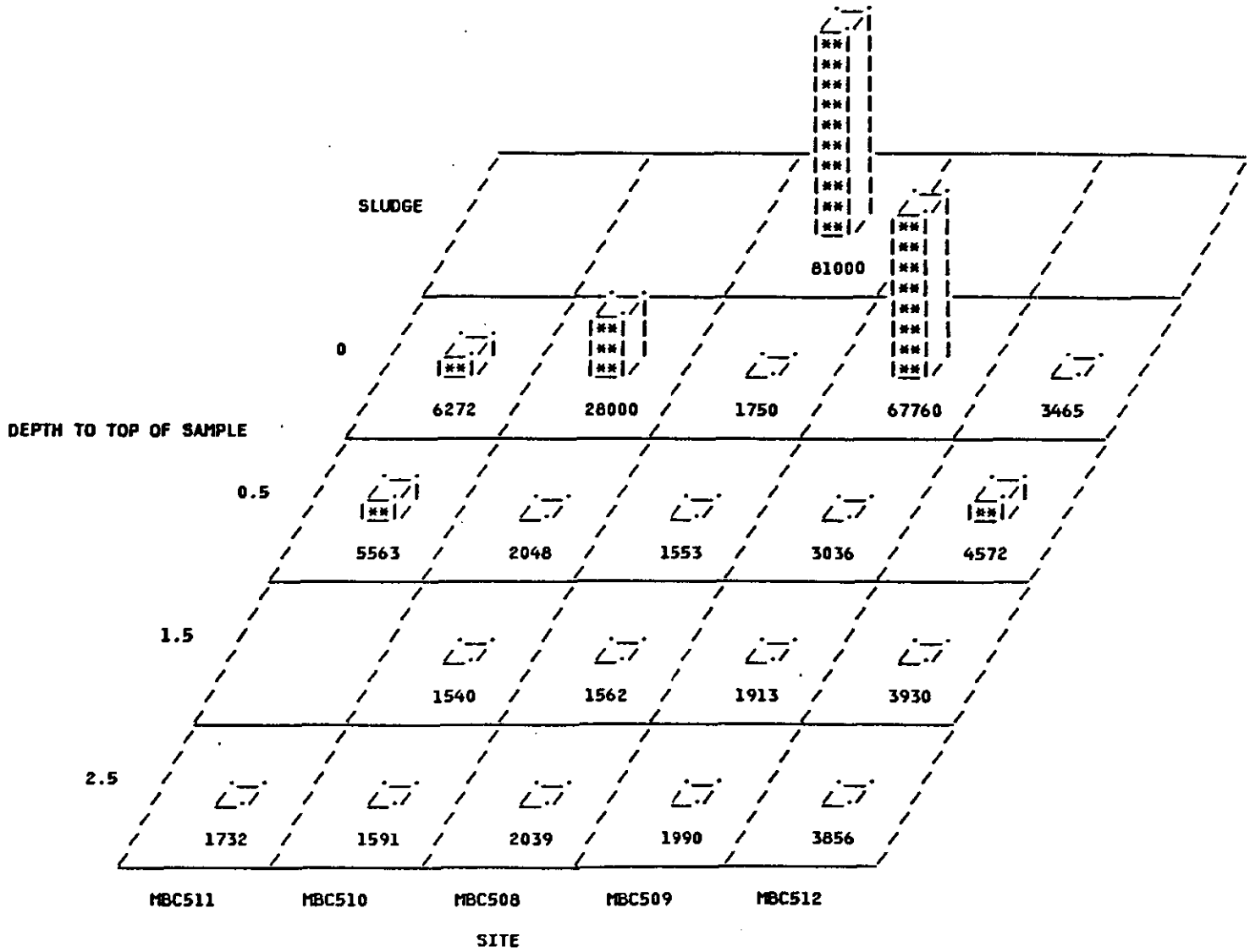


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=TOTAL PHOSPHATES UNITS=UGG

BLOCK CHART OF RESULT

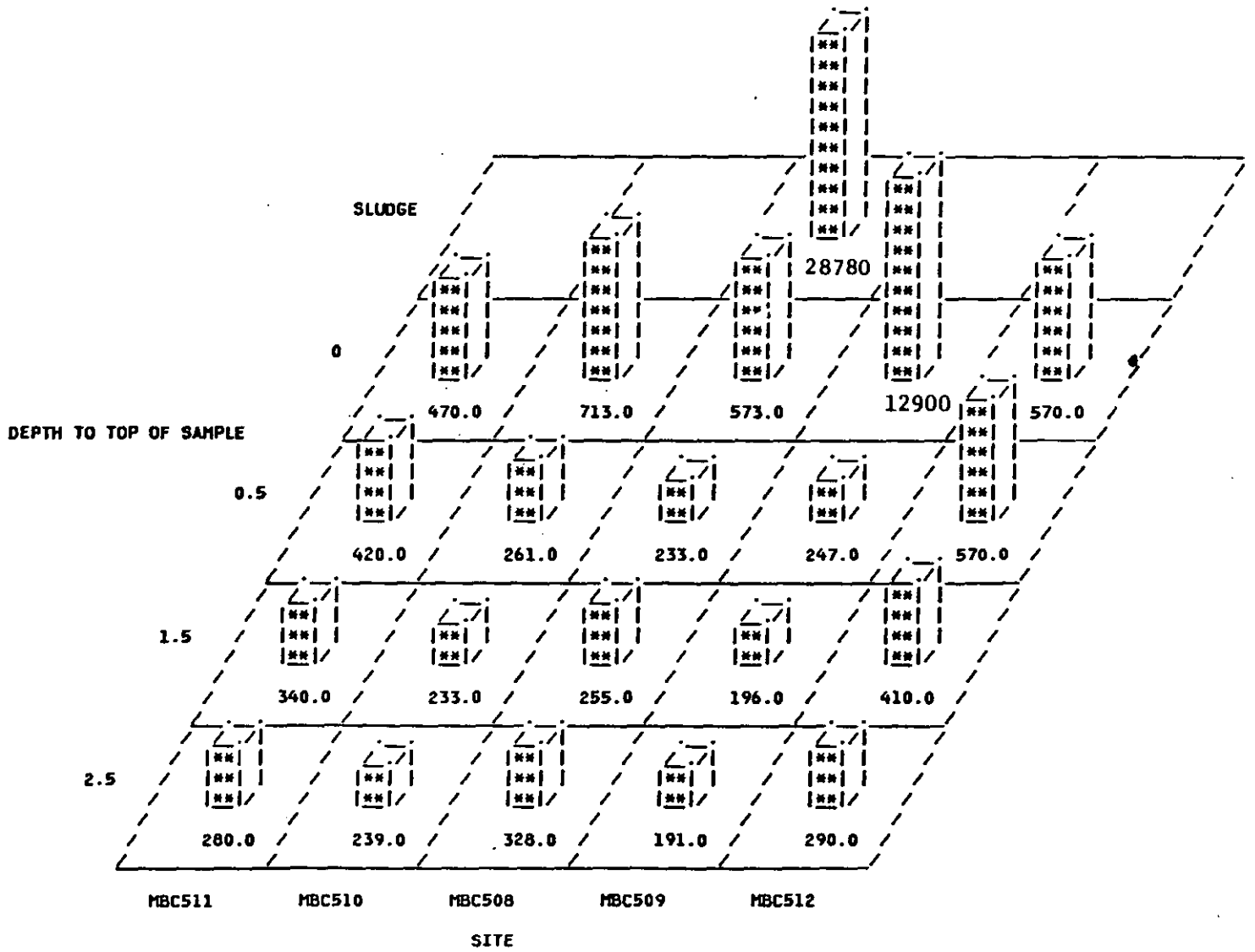


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ORGANIC HALOGENS  UNITS=UGG

BLOCK CHART OF RESULT

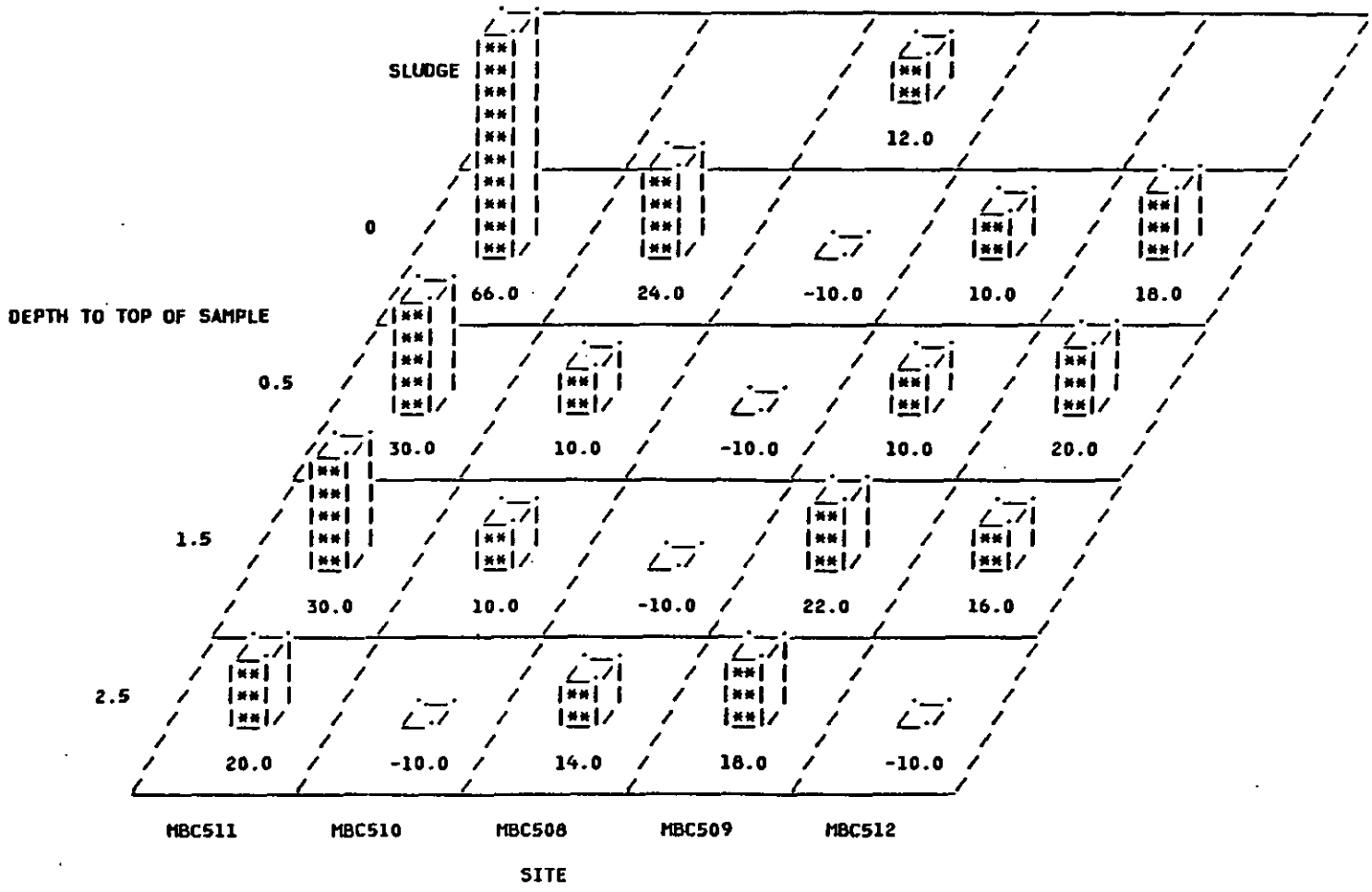


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=URANIUM UNITS=UGG

BLOCK CHART OF RESULT

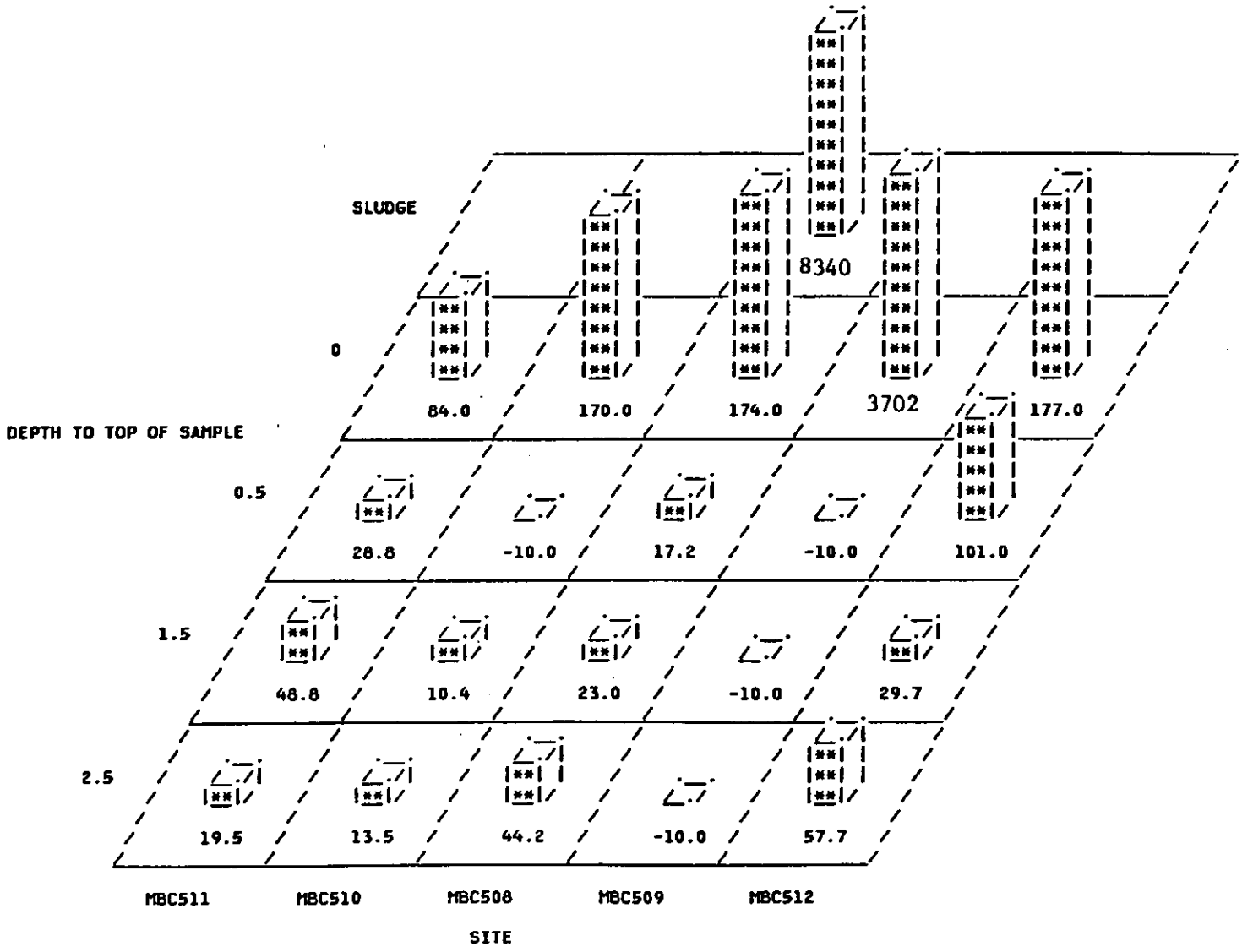


TABLE 6-19.
CROSS SECTIONS OF OVERFLOW DITCH, INORGANIC ANALYTES
TESTNAME=ZINC UNITS=UGG

BLOCK CHART OF RESULT

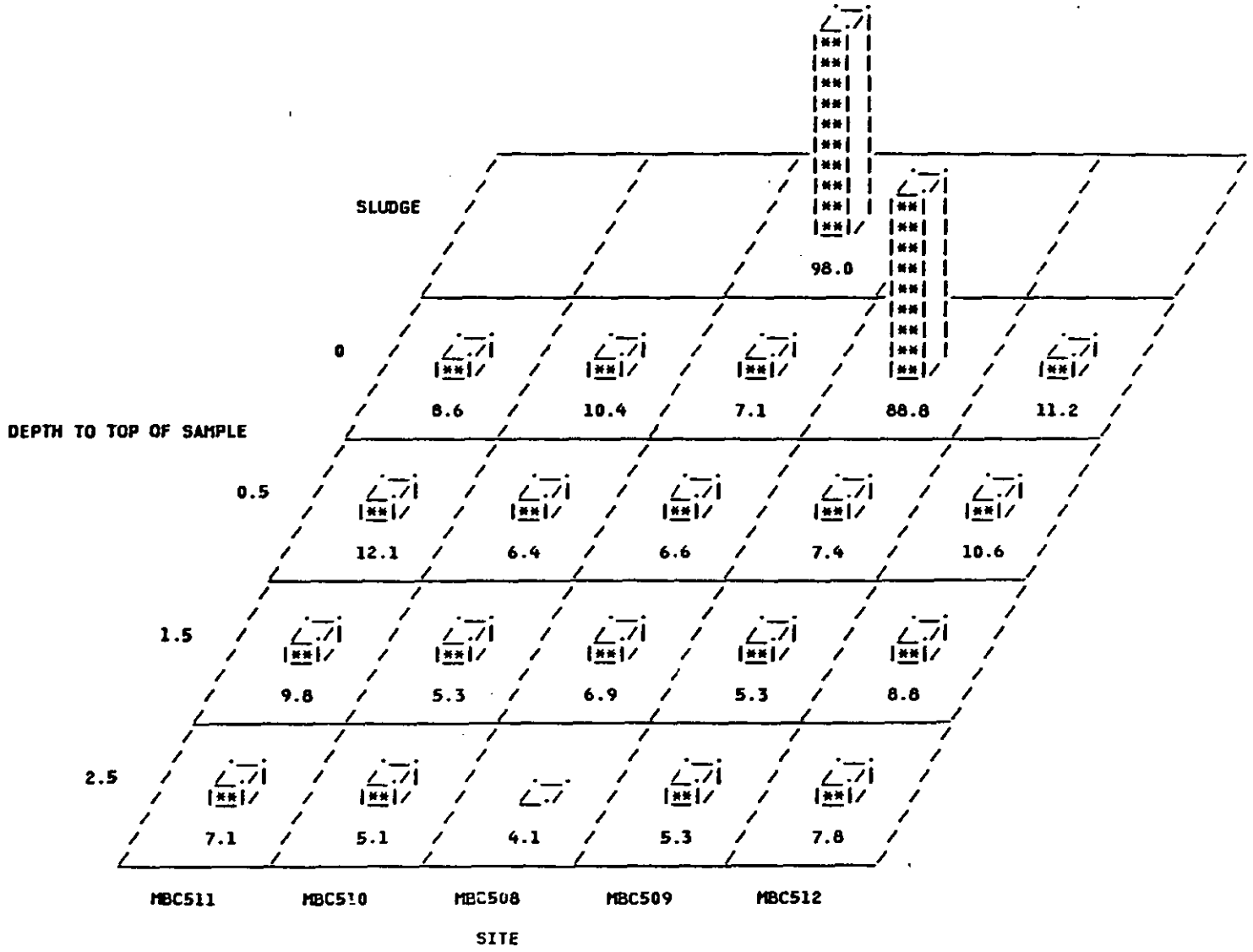


TABLE 6-20.

EP TOXICITY ANALYSES OF SEDIMENTS AND SLUDGES

NEGATIVE NUMBERS ARE LESS THAN THAT DETECTION LIMIT.

| | | TESTNAME | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | SILVER MG/L | ARSENIC MG/L | BARIUM MG/L | CADMIUM MG/L | CHROME MG/L | MERCURY UG/L | LEAD MG/L | SELENIUM MG/L |
| | | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT | RESULT |
| CORE | DEPTH FROM TOP OF SEDIMENT | | | | | | | | |
| MBC205 SETTLING BASIN | 2 FEET ABOVE SEDIMENT | 0.0010 | -0.0010 | 0.2910 | 0.0030 | 0.0380 | -0.2000 | -0.0040 | -0.0010 |
| | TOP 1 FOOT OF SOIL CORE | -0.0005 | -0.0010 | 0.0910 | -0.0020 | -0.0040 | -0.2000 | -0.0040 | -0.0010 |
| MBC207 SETTLING BASIN | 1.8 FEET ABOVE SEDIMENT | 0.0014 | -0.0010 | 0.1990 | -0.0020 | 0.1580 | -0.2000 | -0.0040 | -0.0010 |
| | TOP 1 FOOT OF SOIL CORE | -0.0005 | -0.0010 | 0.1830 | -0.0020 | -0.0040 | -0.2000 | -0.0040 | -0.0010 |
| MBC508 DRAINAGE DITCH | .33 FEET ABOVE SEDIMENT | -0.0005 | -0.0010 | 0.2140 | -0.0020 | -0.0040 | -0.2000 | -0.0040 | -0.0010 |
| MBC619 SEEPAGE AREA | .25 FEET ABOVE SEDIMENT | -0.0005 | -0.0010 | 0.1740 | -0.0020 | -0.0040 | -0.2000 | -0.0040 | -0.0010 |
| | TOP .5 FEET OF SOIL CORE | -0.0005 | -0.0010 | 0.2280 | -0.0020 | -0.0040 | -0.2000 | -0.0040 | -0.0010 |
| MBC620 SEEPAGE AREA | .84 FEET ABOVE SEDIMENT | -0.0005 | -0.0010 | 0.2560 | -0.0020 | 0.0090 | -0.2000 | -0.0040 | -0.0010 |
| | TOP .5 FEET OF SOIL CORE | -0.0005 | -0.0010 | 0.1680 | -0.0020 | -0.0040 | -0.2000 | -0.0040 | -0.0010 |
| MBC704 LOST LAKE | TOP .5 FEET OF SOIL CORE | -0.0005 | -0.0010 | 0.1700 | -0.0020 | 0.0180 | 0.2400 | -0.0040 | -0.0010 |
| MBC716 LOST LAKE | TOP .5 FEET OF SOIL CORE | -0.0005 | -0.0010 | 0.1450 | -0.0020 | 0.0200 | -0.2000 | -0.0040 | -0.0010 |
| EP TOXICITY LIMIT | | 5.0000 | 5.0000 | 100.0000 | 1.0000 | 5.0000 | 200.0000 | 5.0000 | 1.0000 |

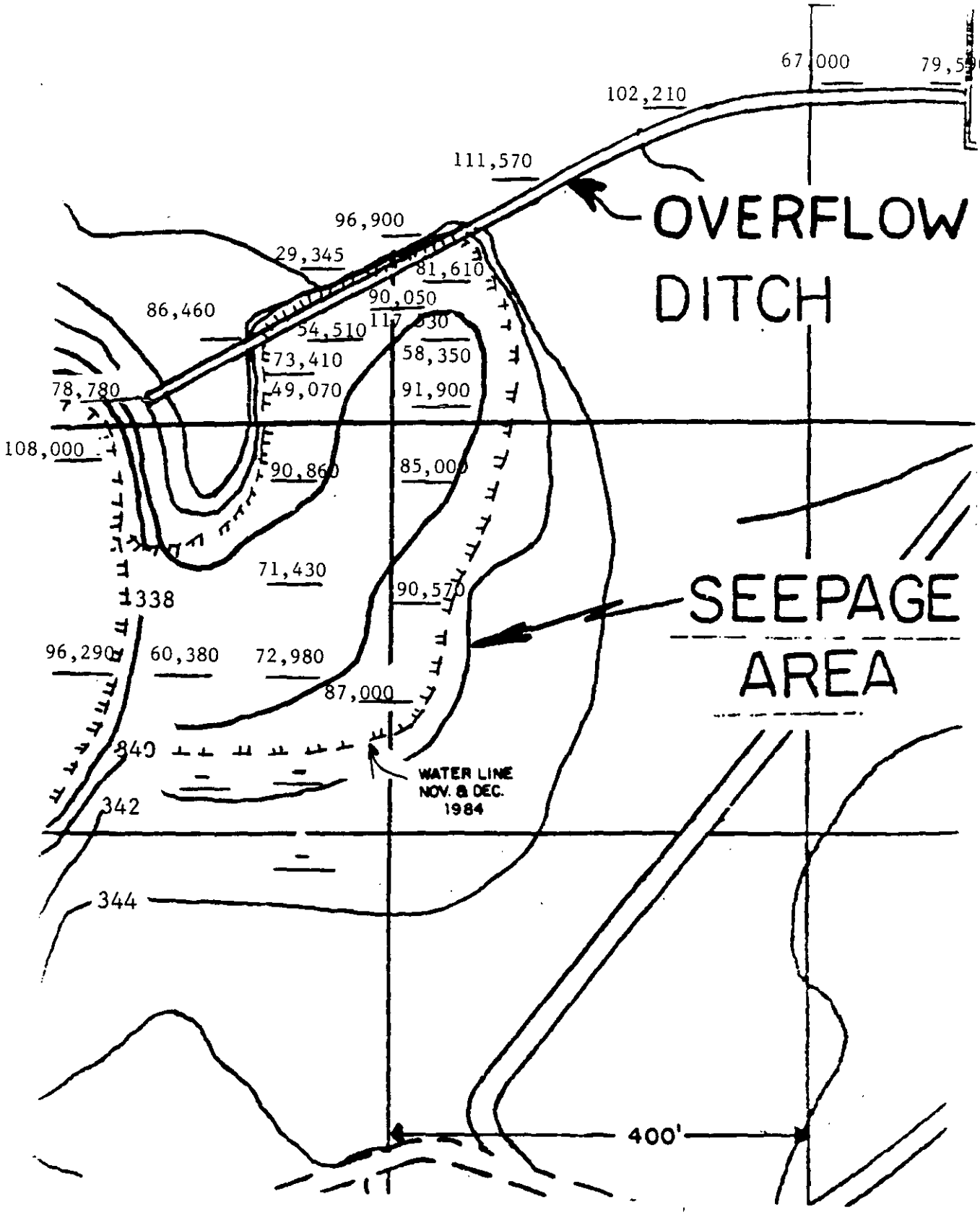



**FIGURE 6-1. Concentration of Aluminum (µg/g) in Sludge (Seepage Area)**

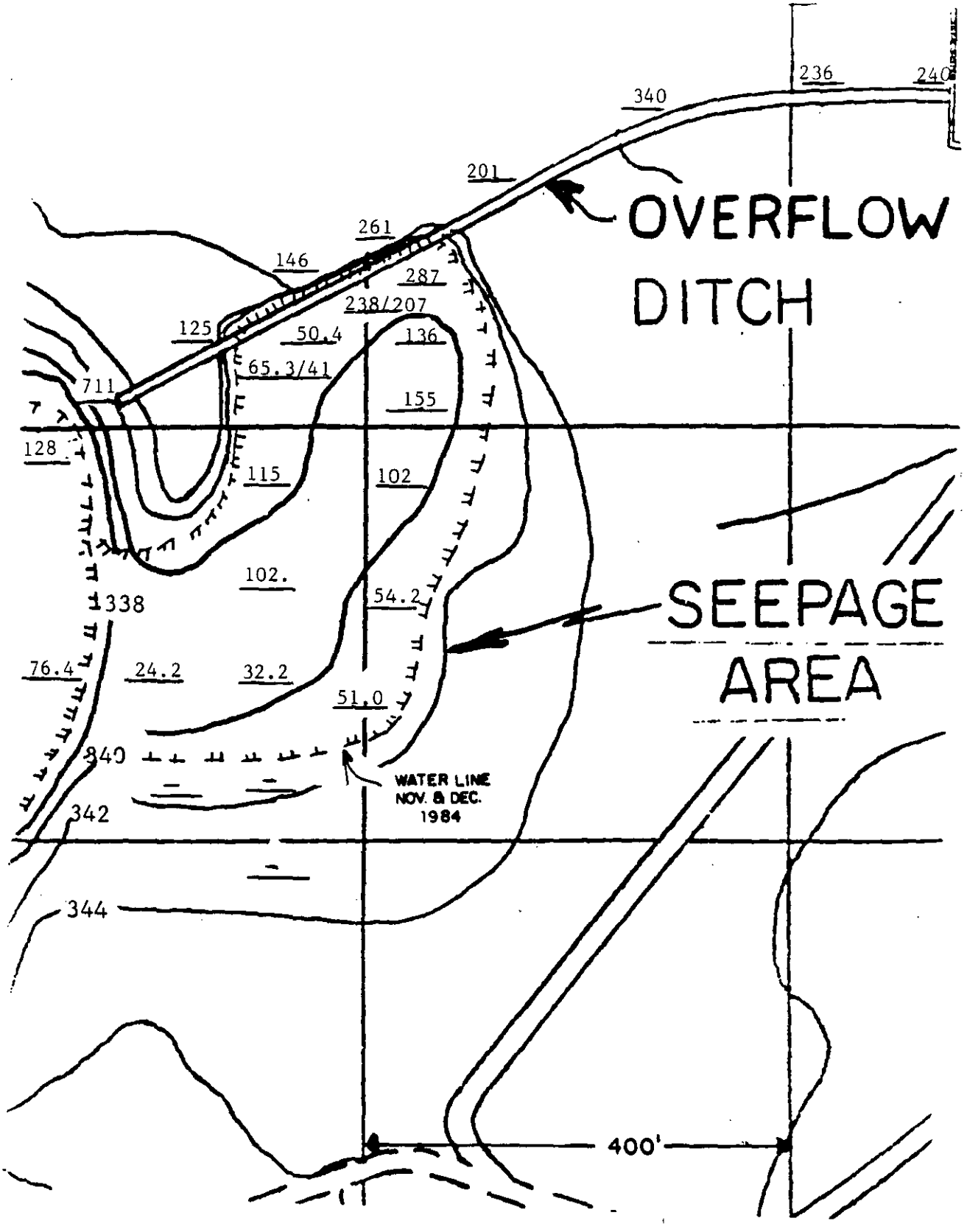



**FIGURE 6-2. Concentration (µg/g) of Lead in Sludge (Seepage Area)**

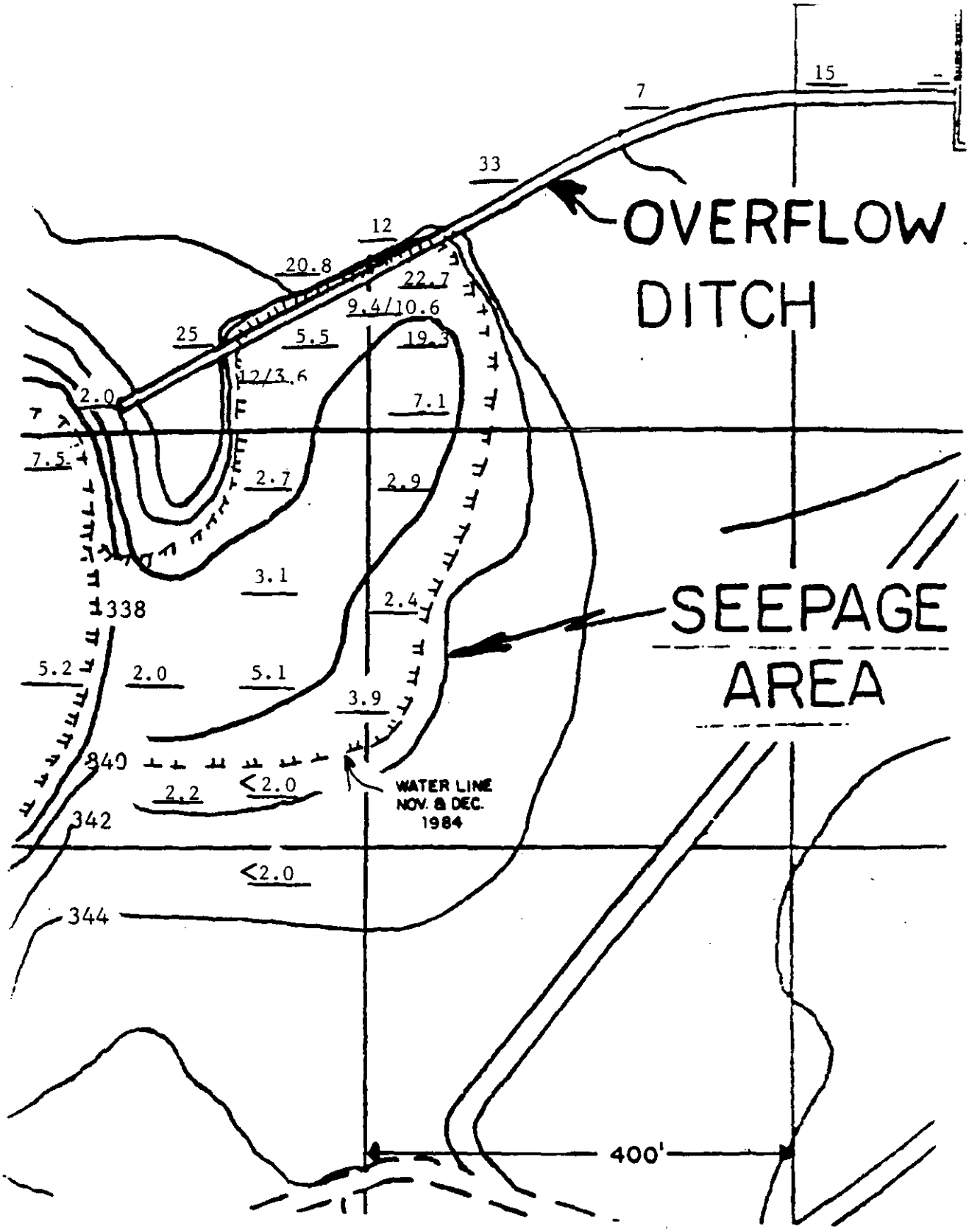



**FIGURE 6-3. Concentration (µg/g) of Lead in Soil, 0 - 1.0 ft (Seepage Area)**

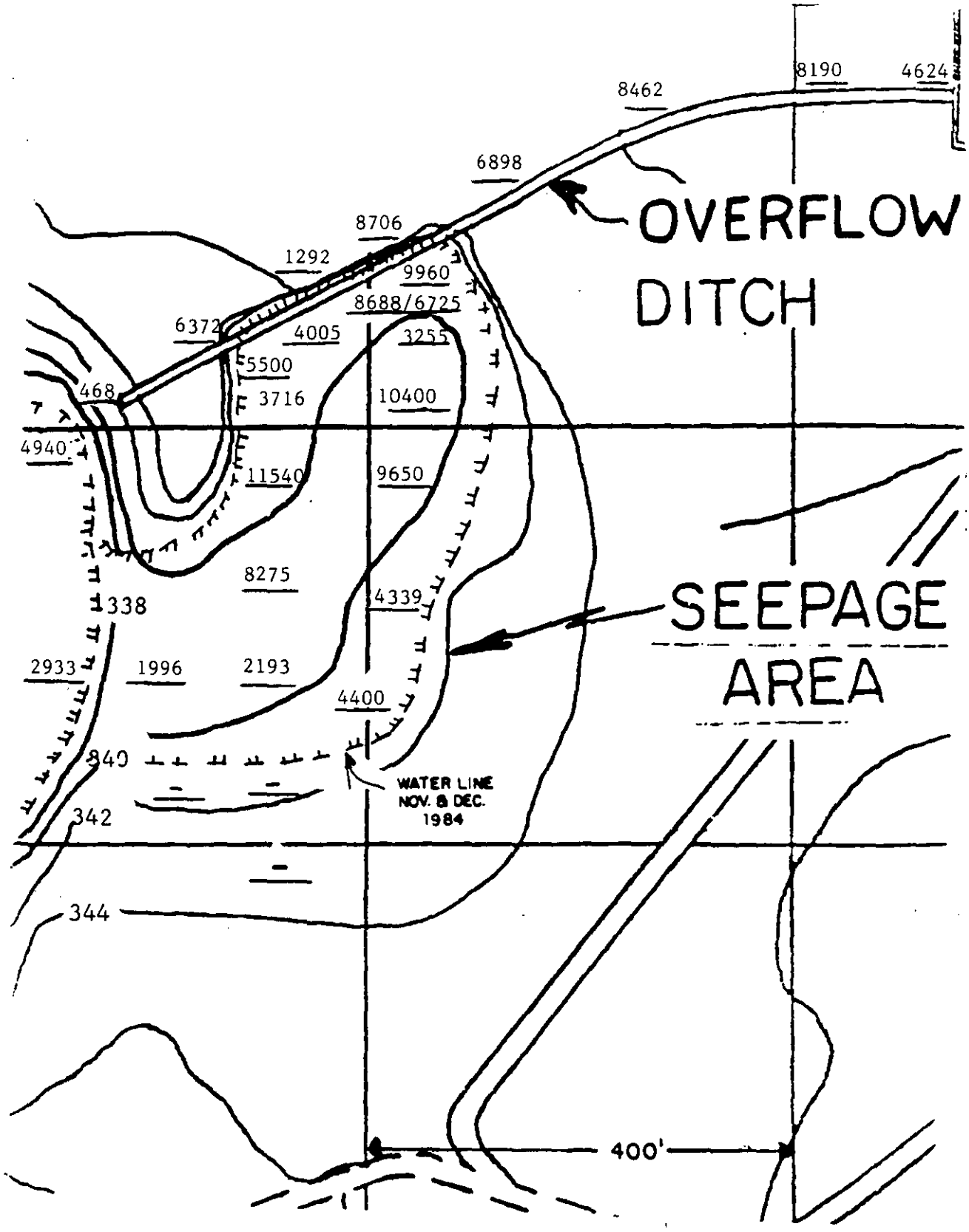



**FIGURE 6-4. Concentration of Nickel (µg/g) in Sludge (Seepage Area)**

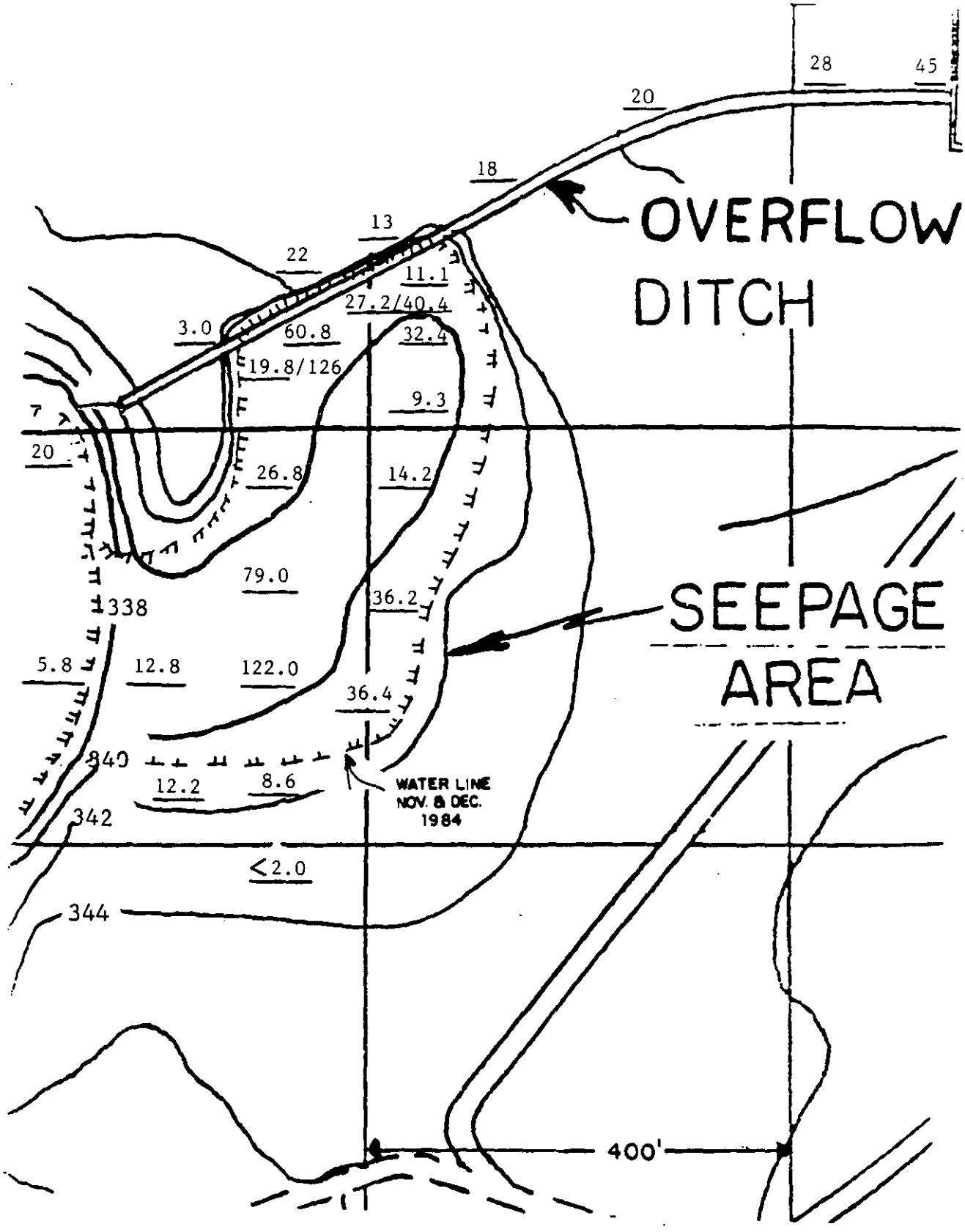



**FIGURE 6-5. Concentration of Nickel (µg/g) in Soil, 0 - 1.0 ft (Seepage Area)**

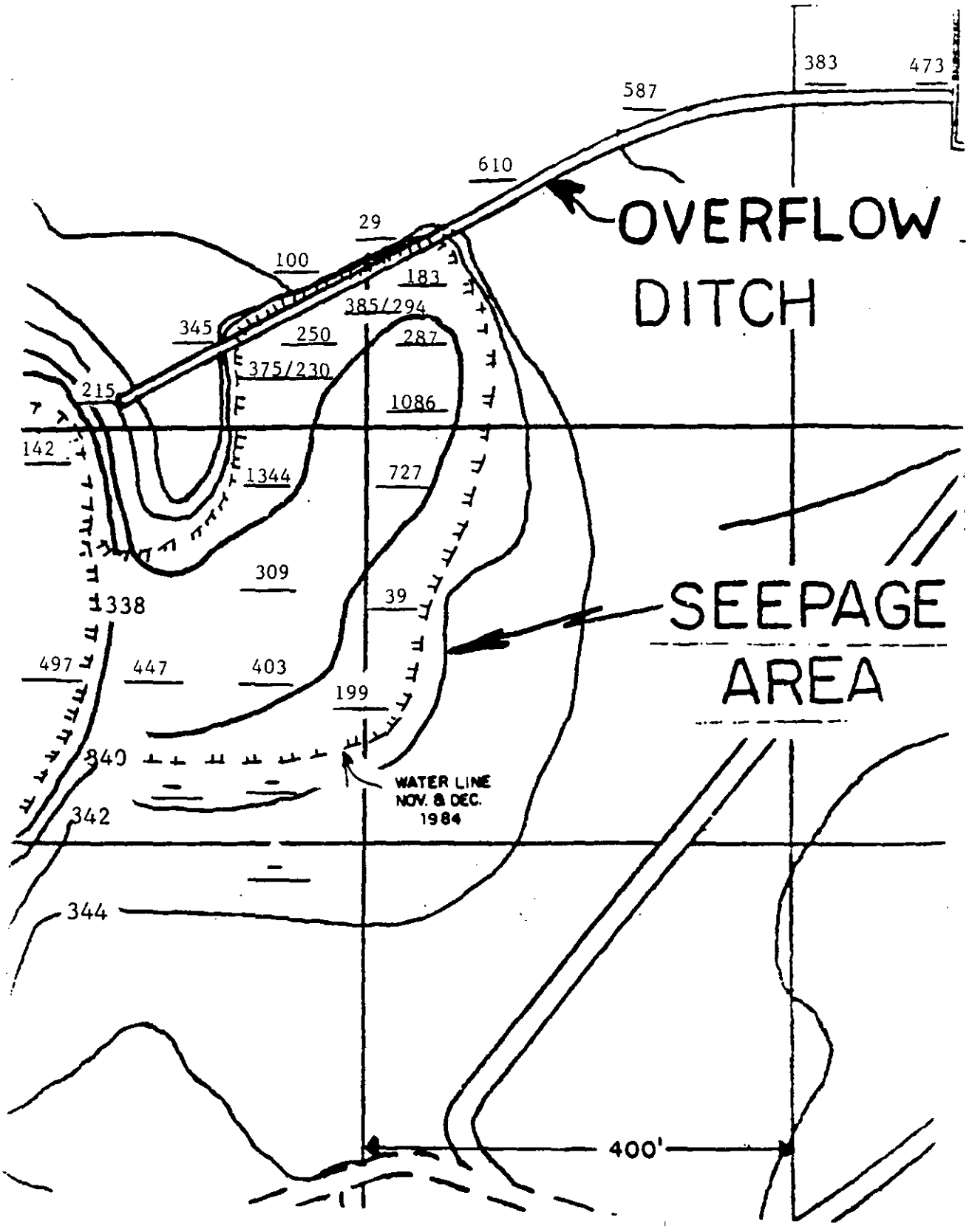



**FIGURE 6-6. Concentration of Nitrate (as Nitrogen, µg/g) in Sludge (Seepage Area)**

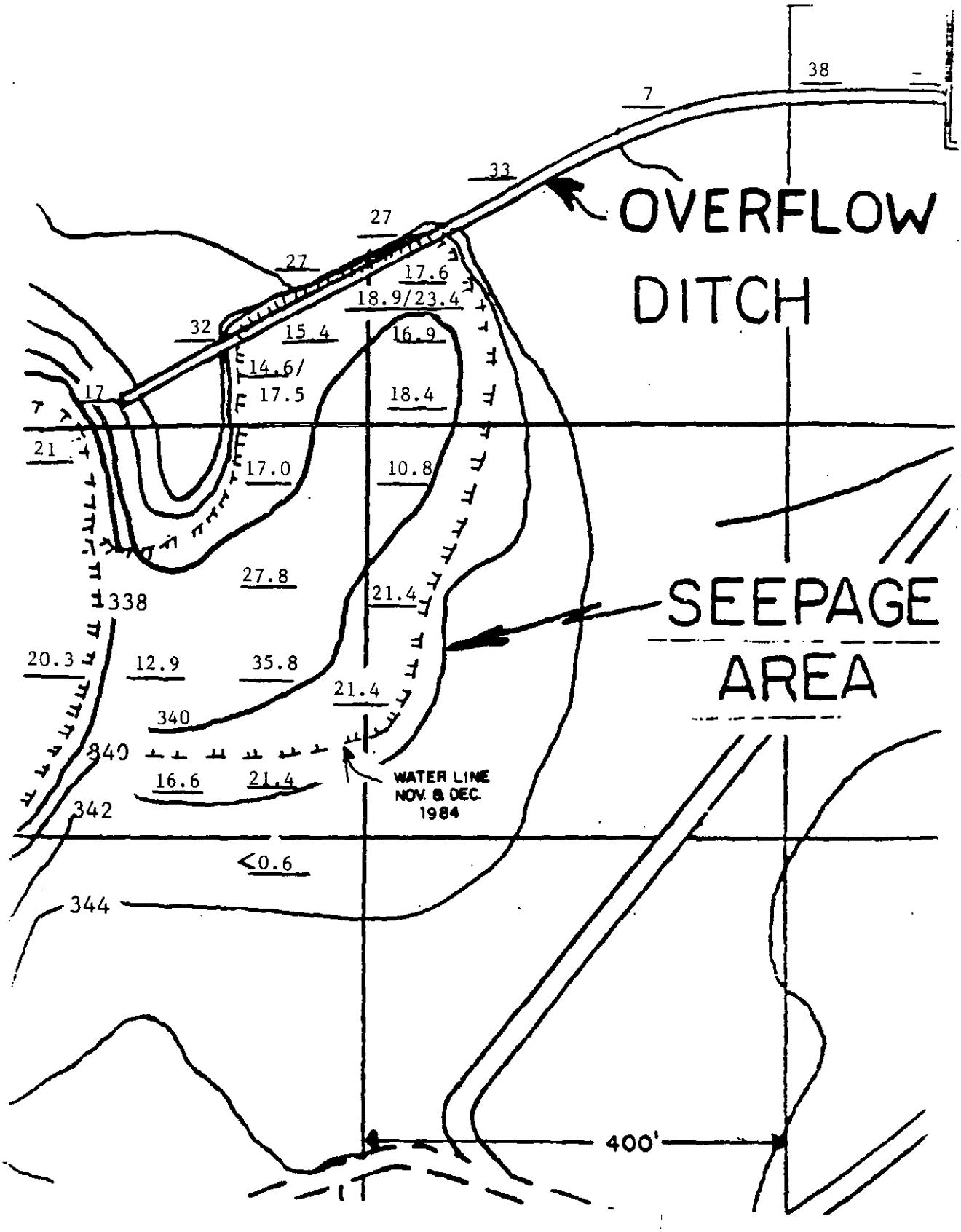



**FIGURE 6-7. Concentration of Nitrate (as Nitrogen, µg/g) in Soil, 0 - 1.0 ft (Seepage Area)**

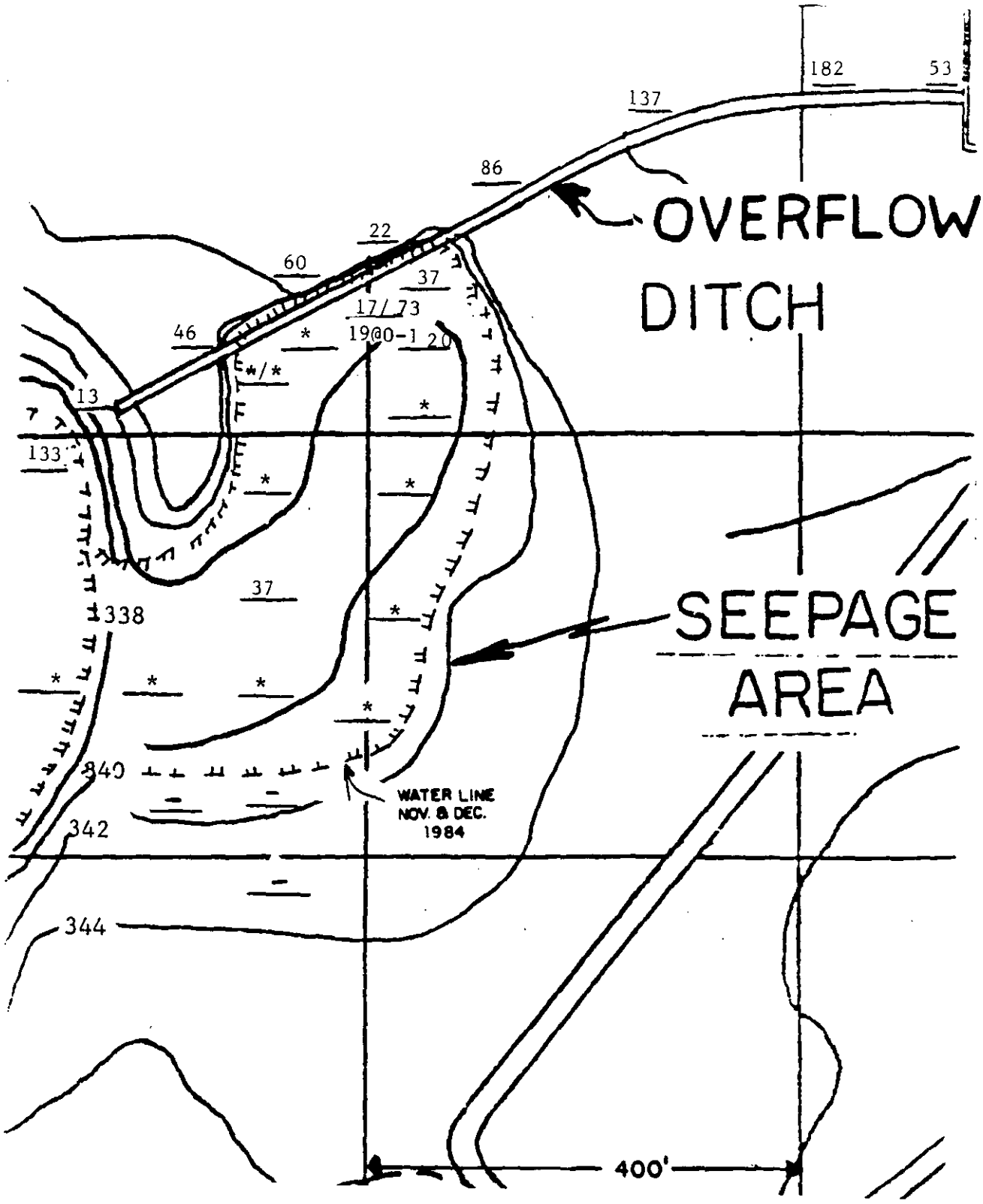



**FIGURE 6-8. Concentration of Tetrachloroethylene (ng/g) in Sludge (Seepage Area)**
*** Not detected above detection limit (10 ng/g)**

Note: Tetrachloroethylene detected only once in soil in seepage area (19 ng/g at location 17). Tetrachloroethylene not detected in soil samples from Lost Lake.

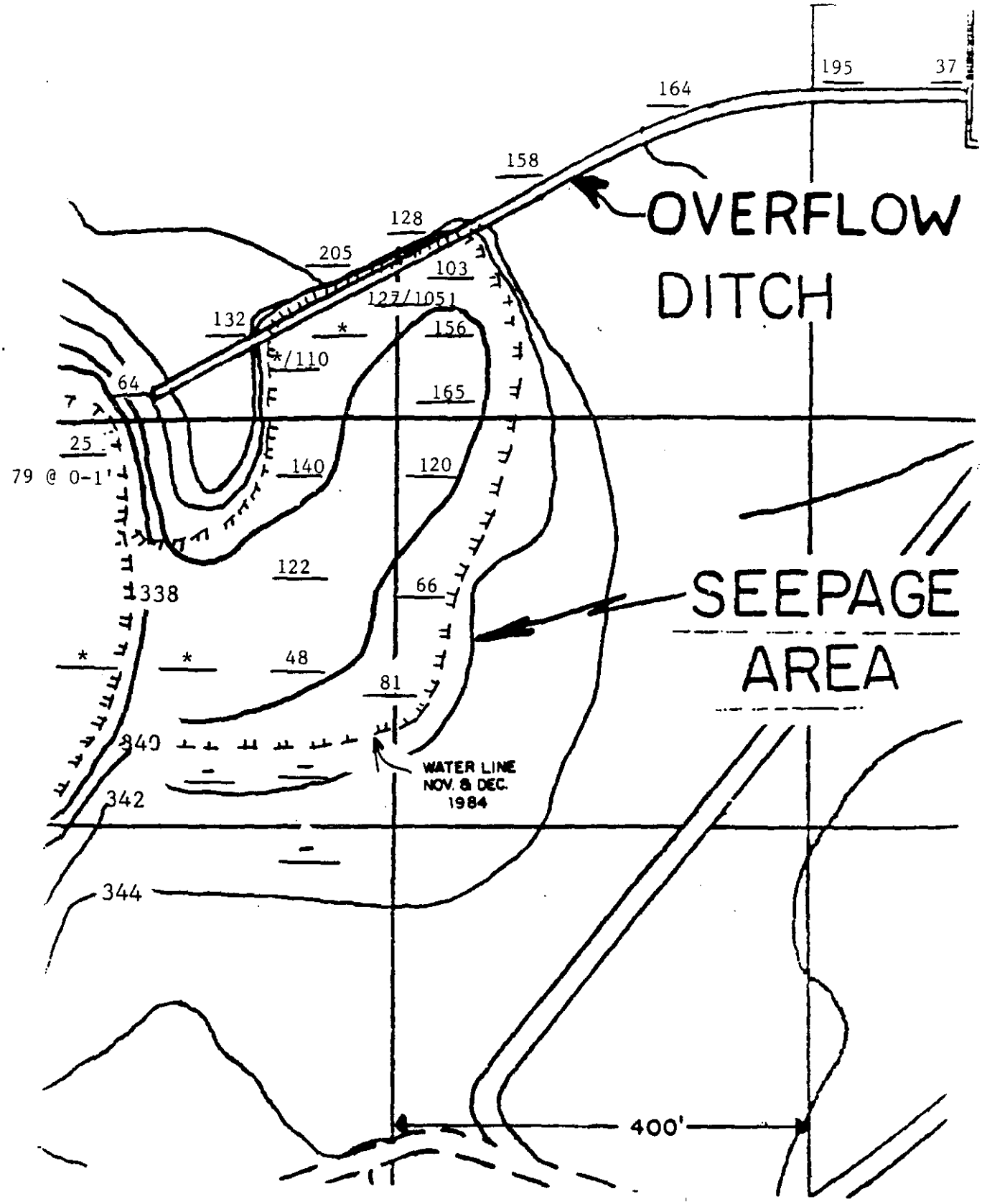



**FIGURE 6-9. Concentration of 1,1,1-Trichloroethane (ng/g) in Sludge (Seepage Area)**
*** Not detected above detection limit (20 ng/g)**

Note: 1,1,1-Trichloroethhylene not detected in any soil samples in seepage area or Lost Lake

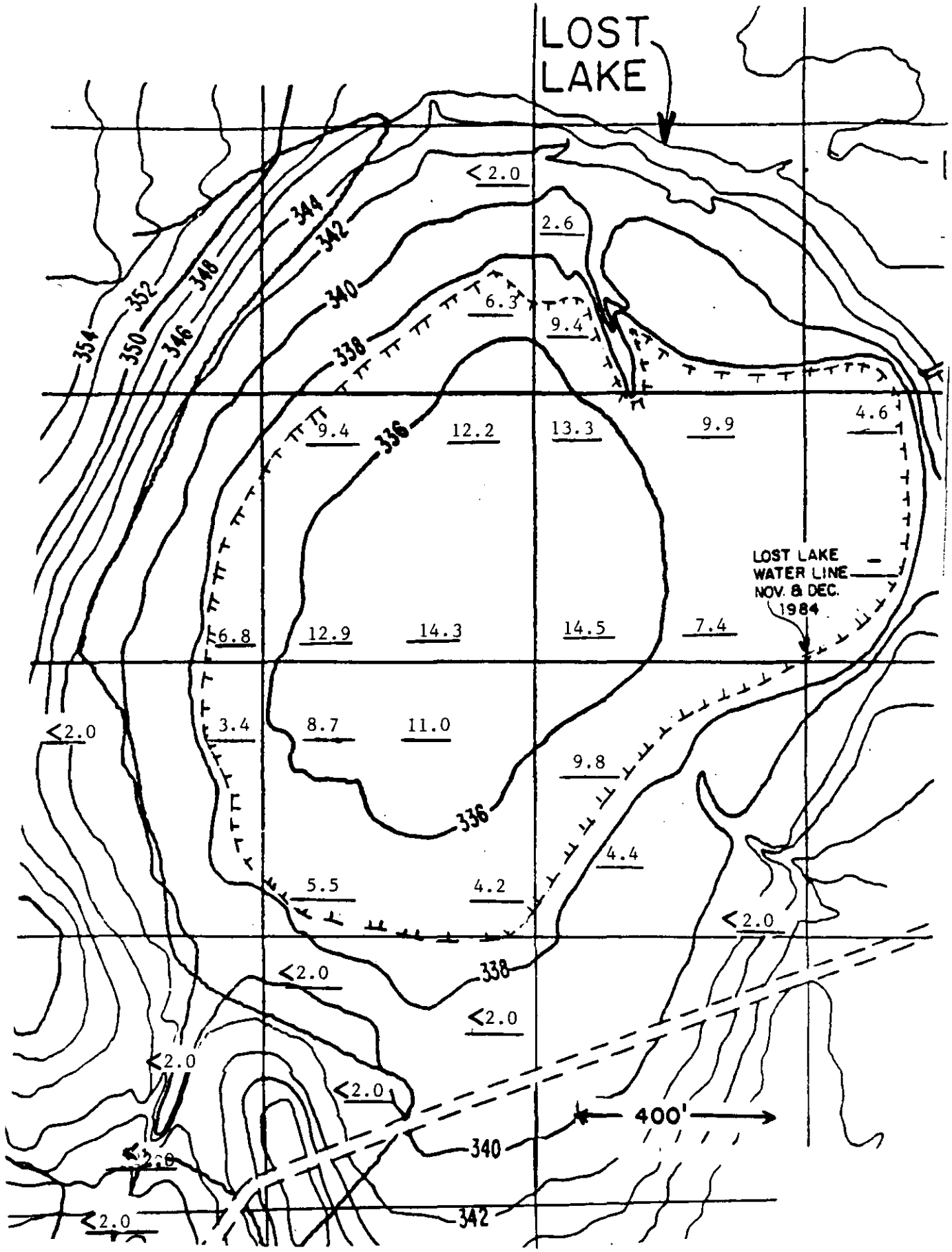



**FIGURE 6-10. Concentration of Copper (µg/g) in Soil, 0 - 0.5 ft (Lost Lake)**

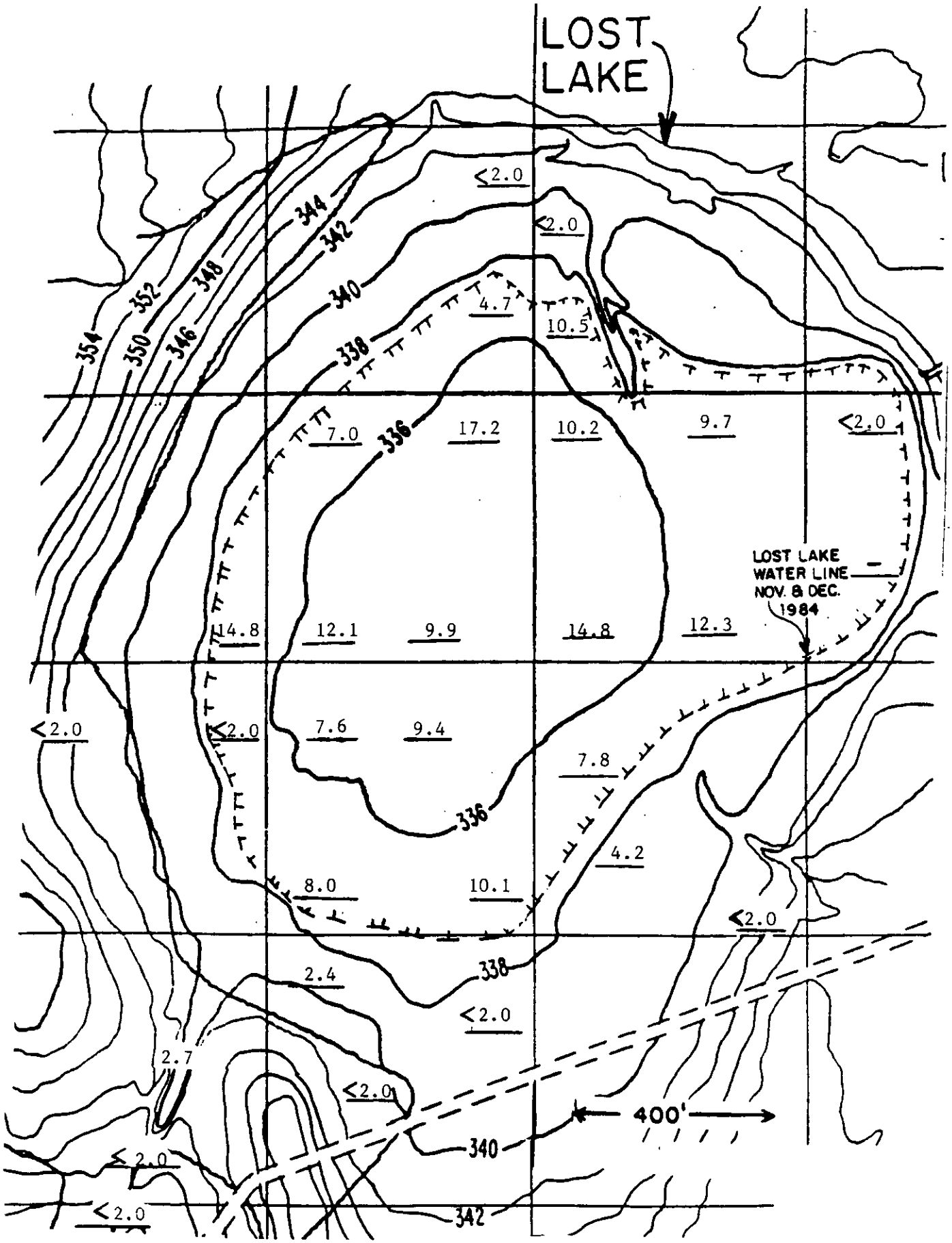



**FIGURE 6-11. Concentration of Copper (µg/g) in Soil, 0.5 - 1.5 ft (Lost Lake)**

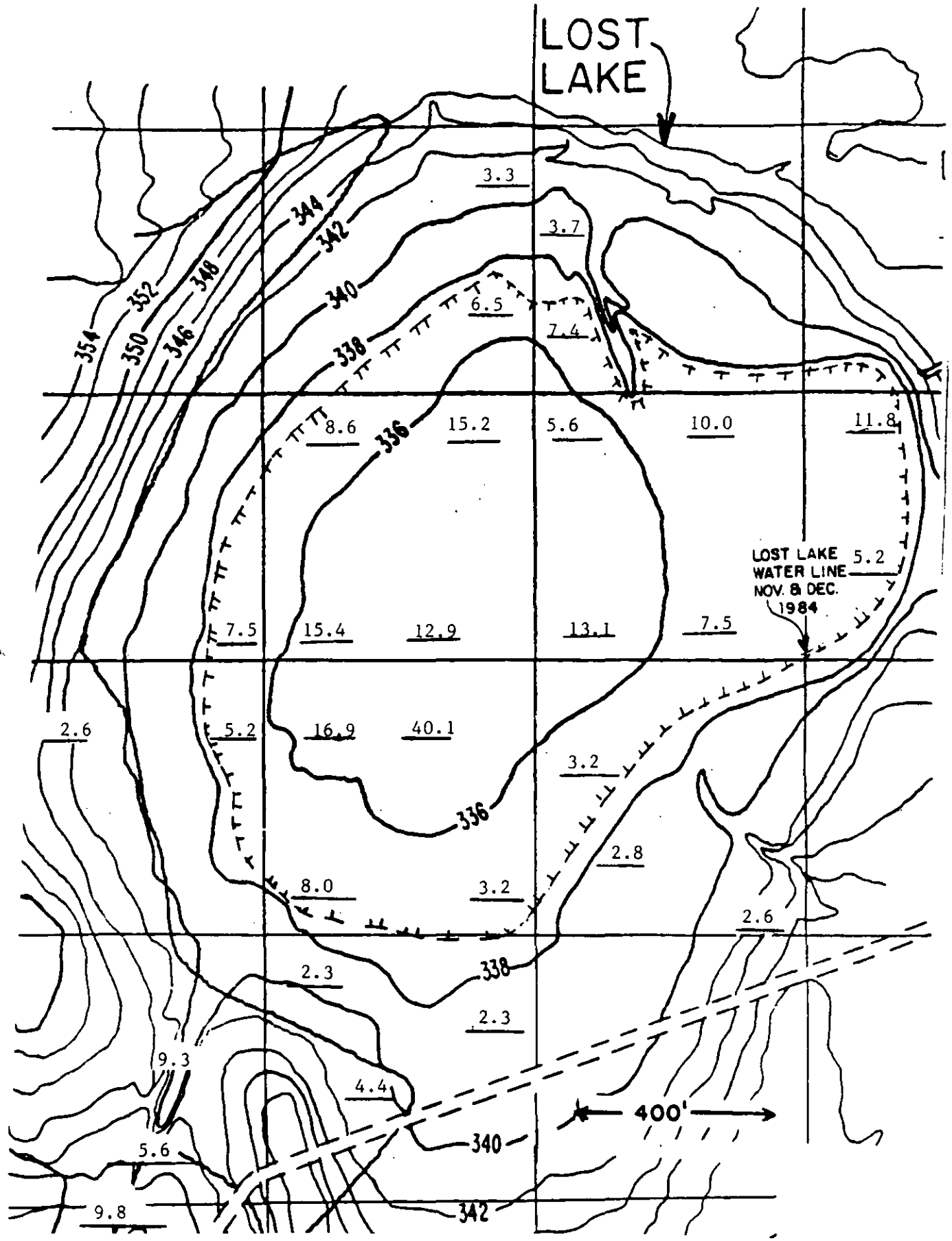



FIGURE 6-12. Concentration of Lead (µg/g) in Soil, 0 - 0.5 ft (Lost Lake)

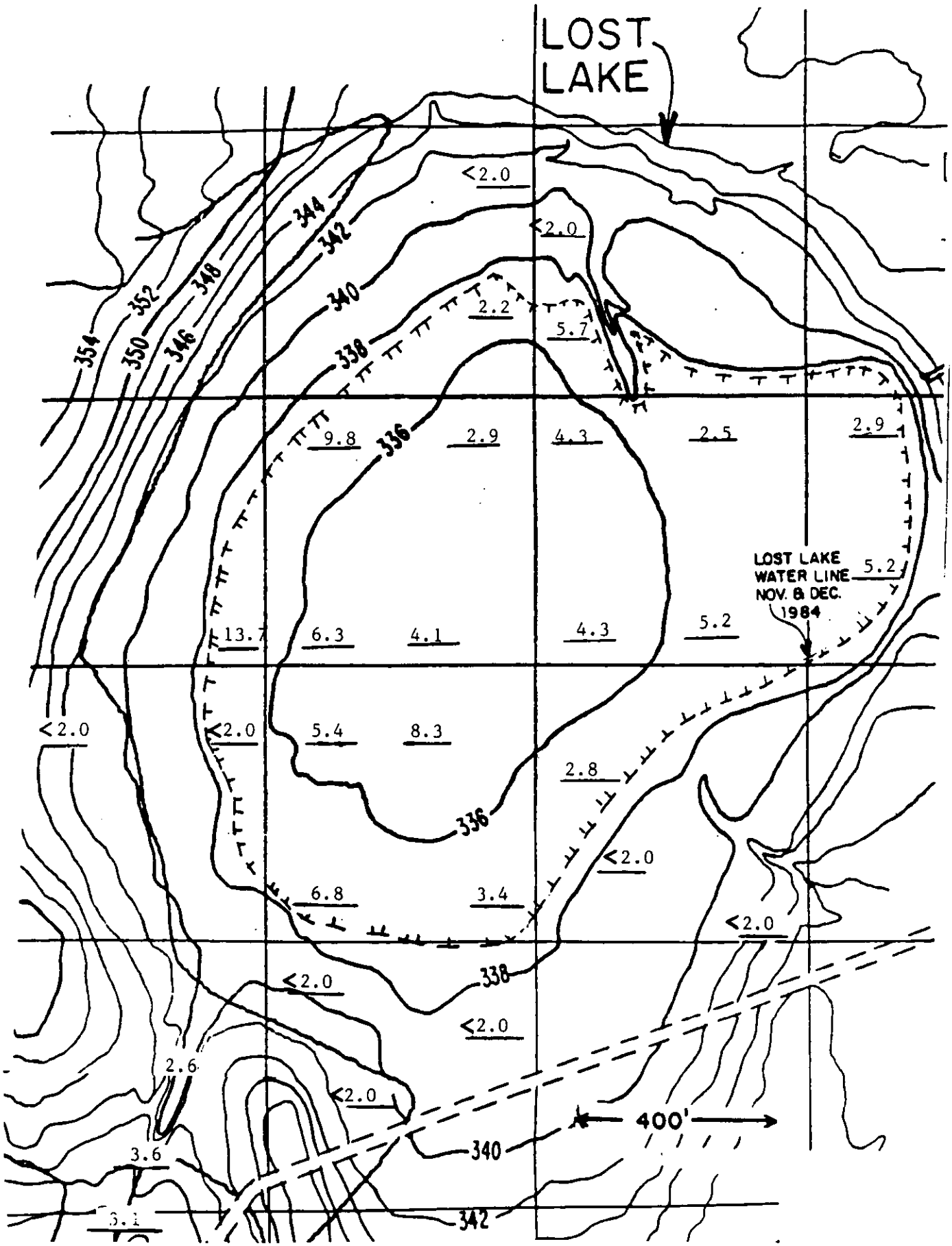



**FIGURE 6-13. Concentration of Lead (µg/g) in Soil, 0.5 - 1.5 ft (Lost Lake)**

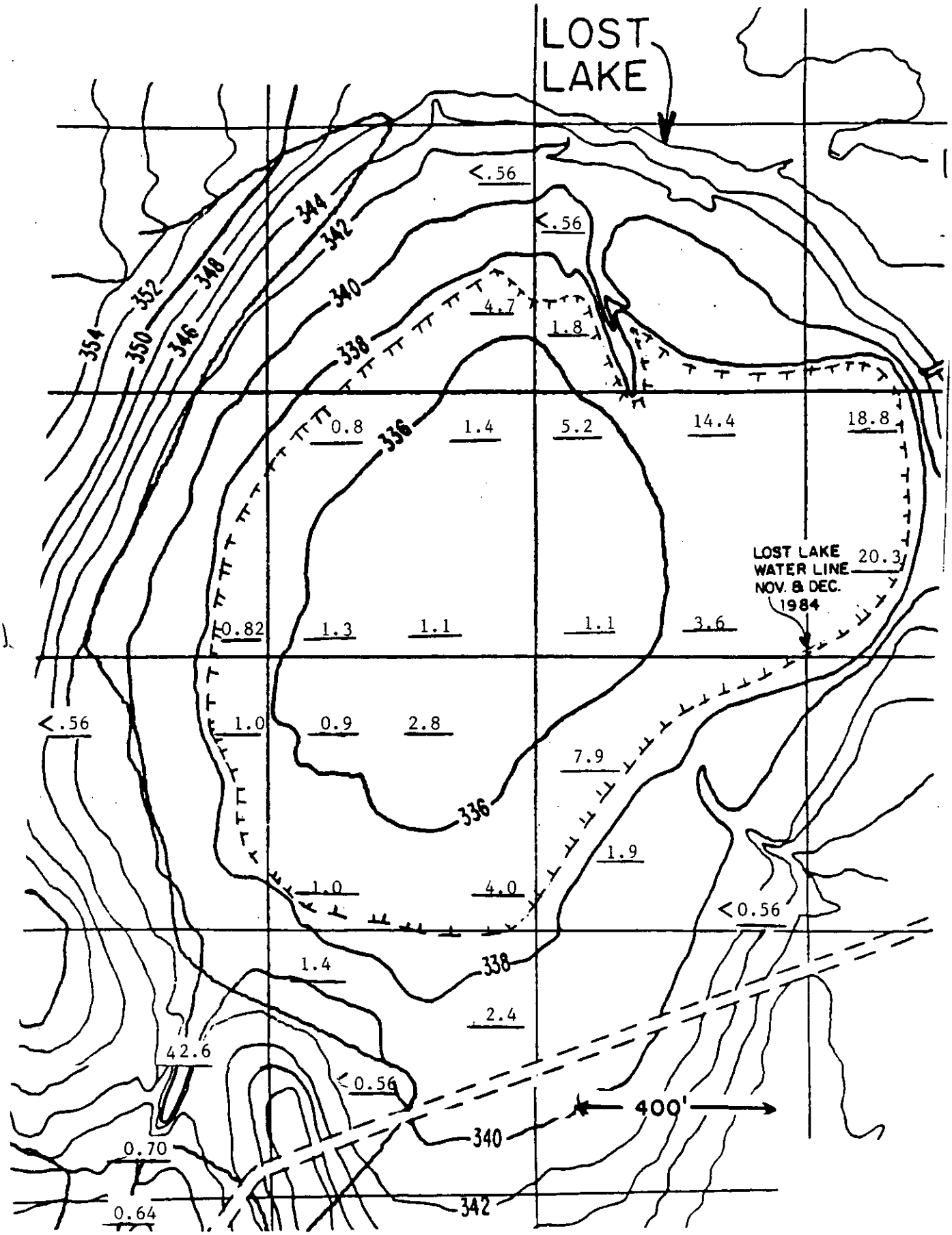



**FIGURE 6-14. Concentration of Nitrate (as Nitrogen, µg/g) in Soil, 0 - 0.5 ft (Lost Lake)**

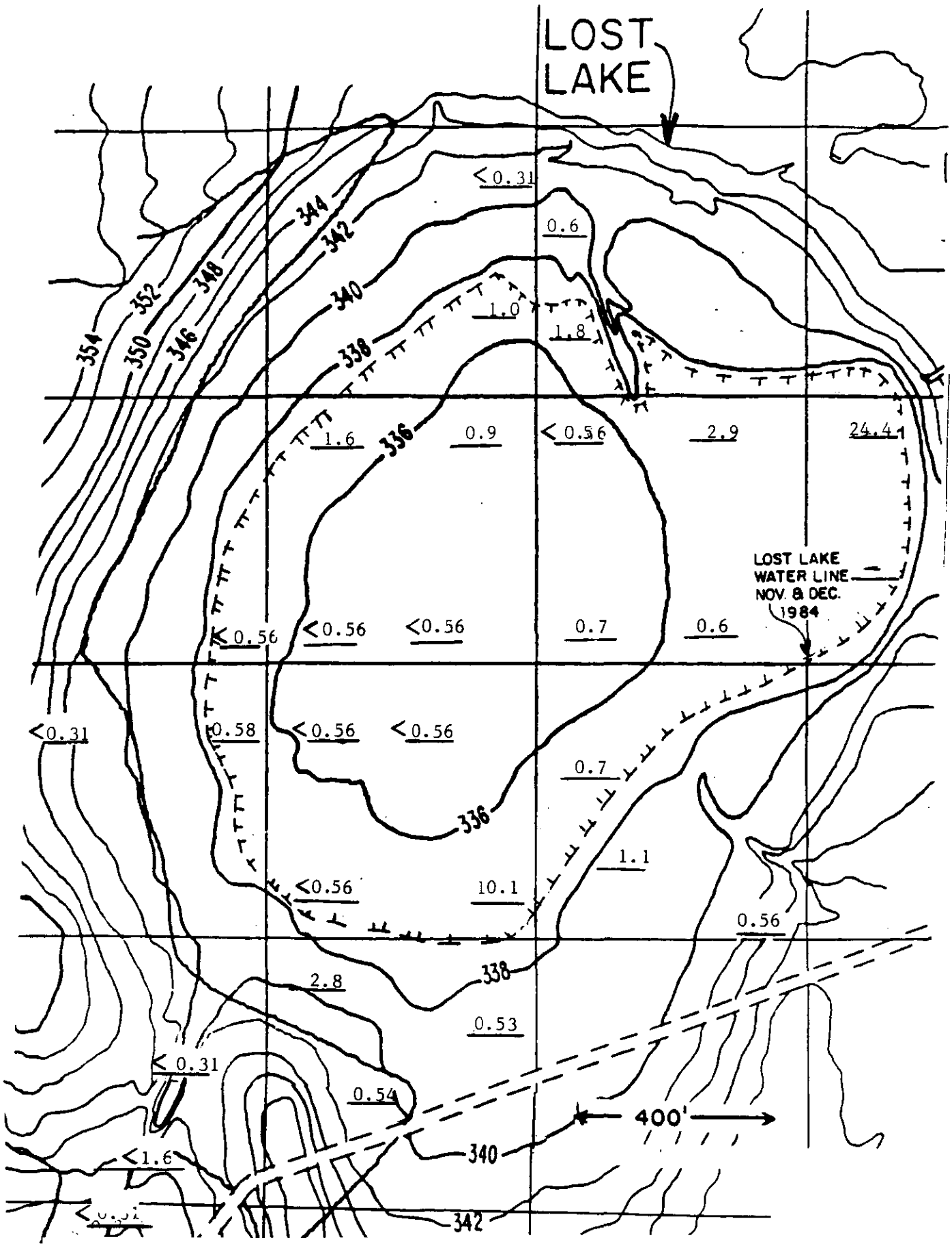



**FIGURE 6-15. Concentration of Nitrate (as Nitrogen, µg/g) in Soil, 0.5 - 1.5 ft - (Lost Lake)**

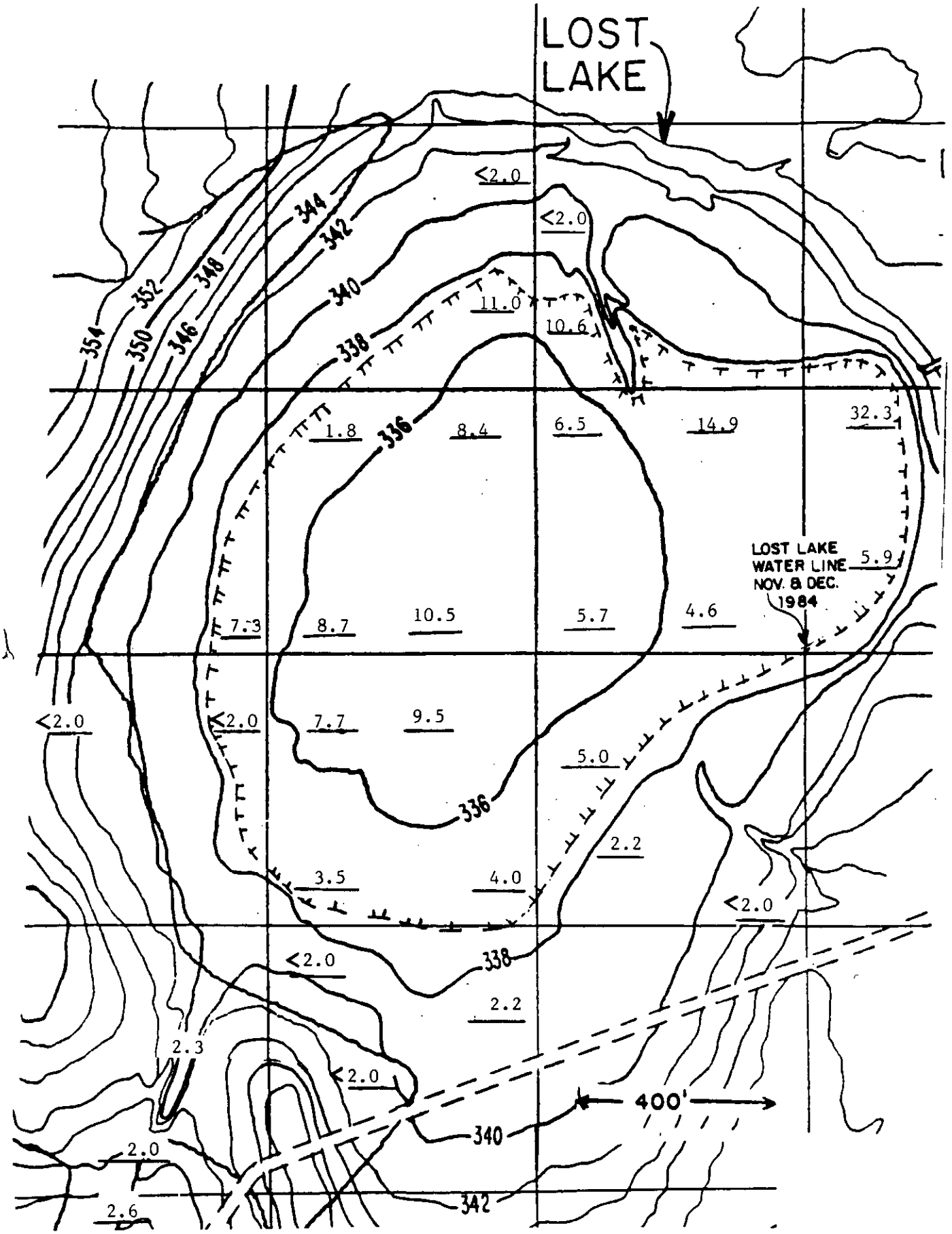



**FIGURE 6-16. Concentration of Nickel (µg/g) in Soil, 0 - 0.5 ft (Lost Lake)**

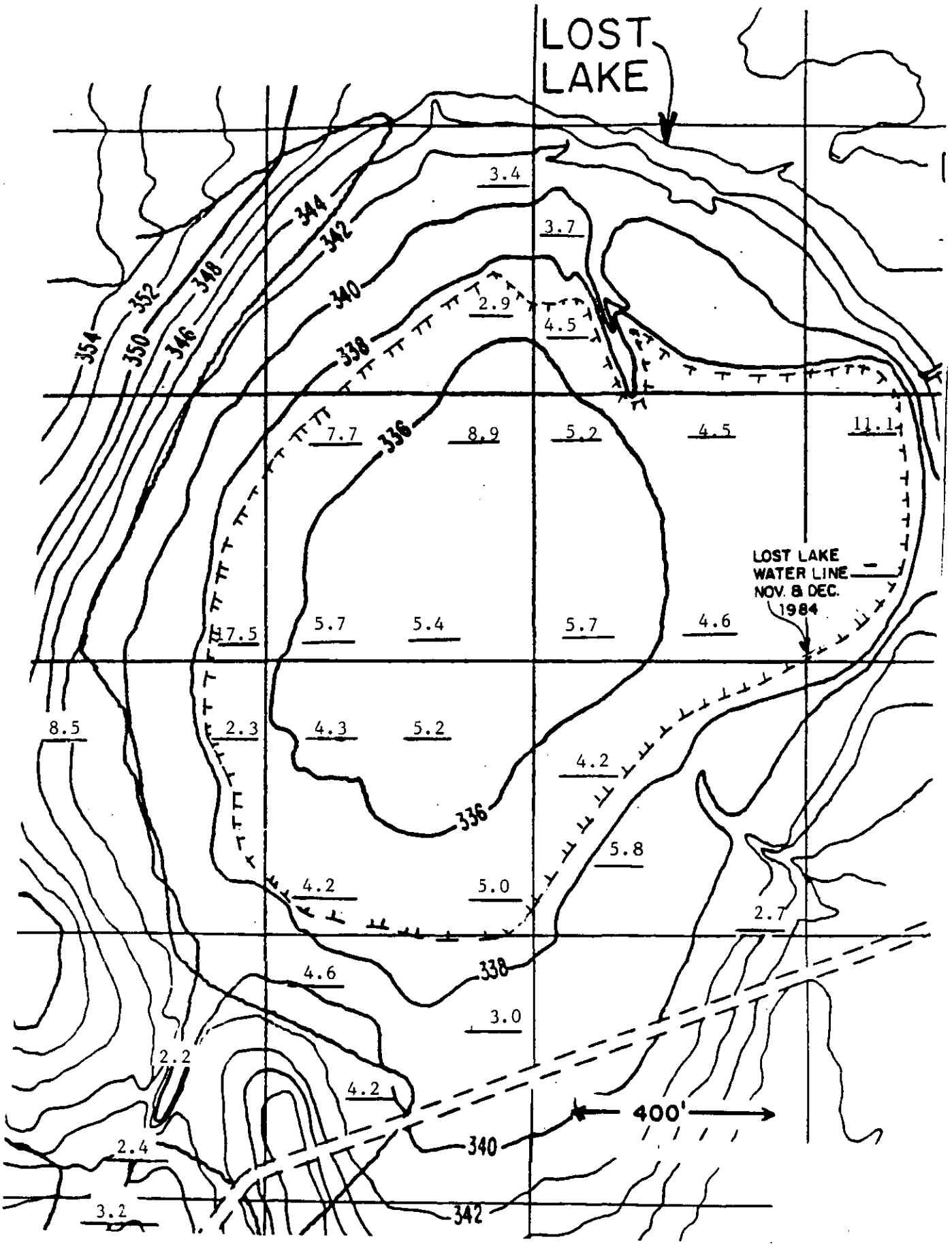



**FIGURE 6-17. Concentration of Nickel (µg/g) in Soil, 0.5 - 1.5 ft (Lost Lake)**

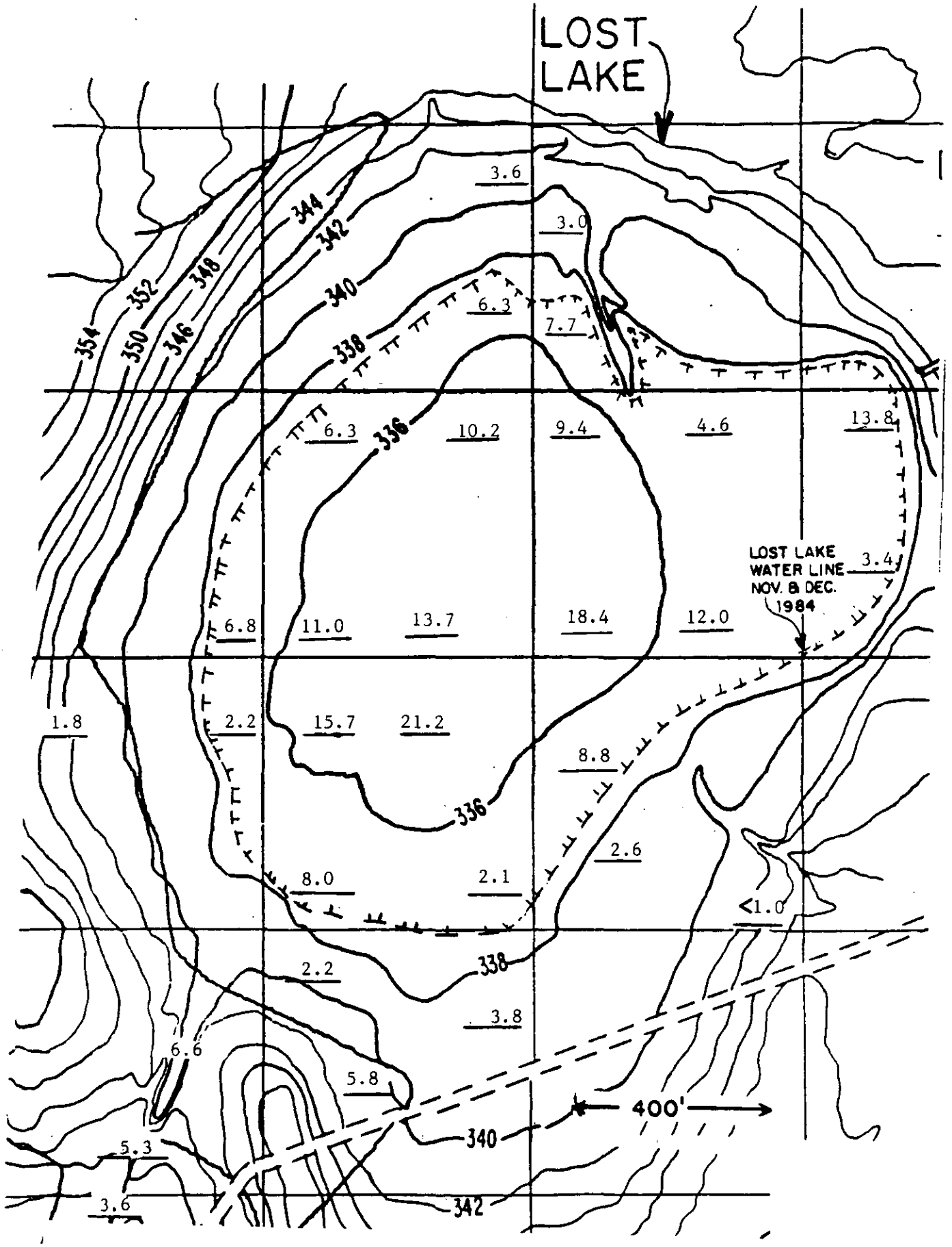



**FIGURE 6-18. Concentration of Zinc (µg/g) in Soil, 0 - 0.5 ft (Lost Lake)**

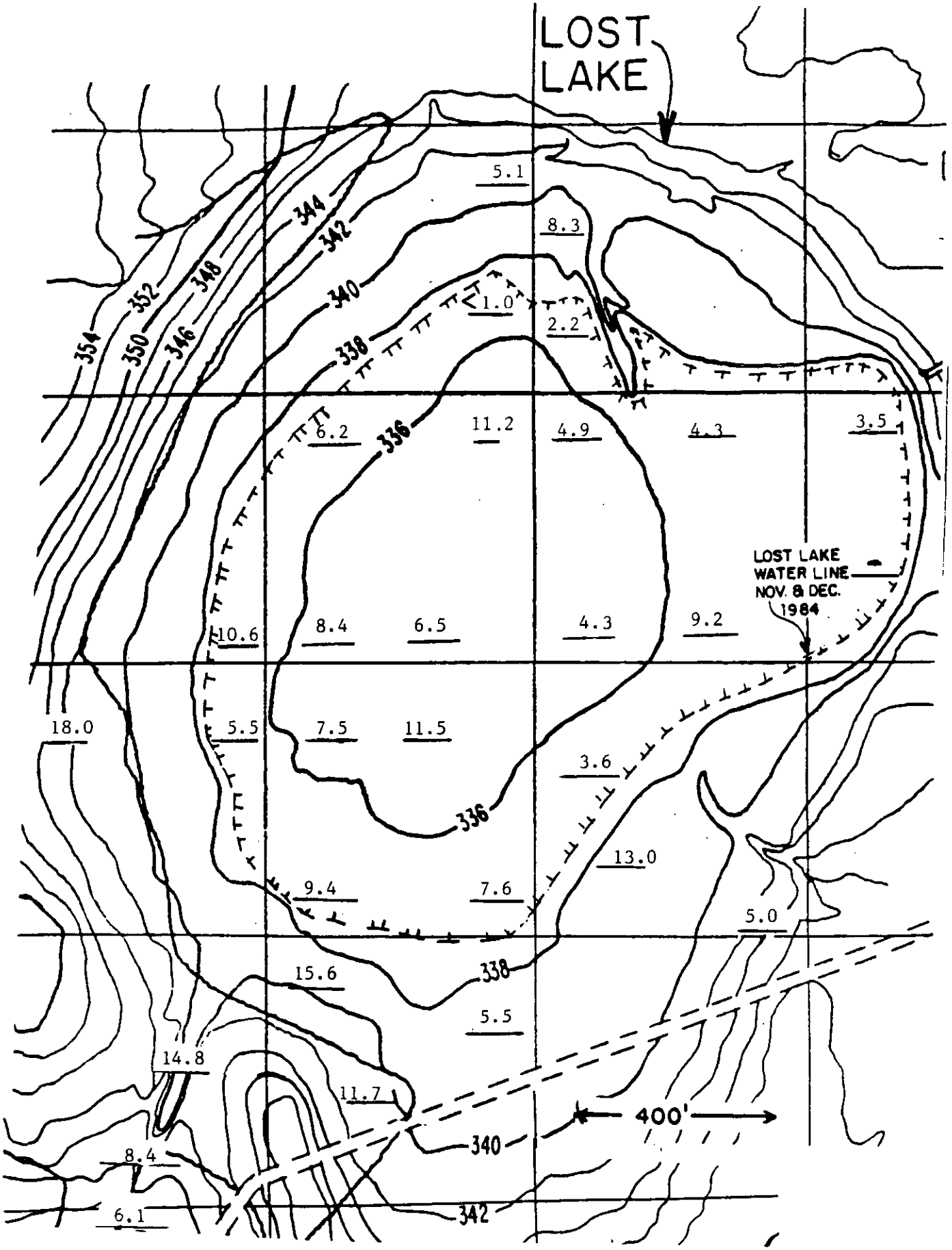



**FIGURE 6-19. Concentration of Zinc (µg/g) in Soil, 0.5 - 1.5 ft (Lost Lake)**

## 7.0 ADDITIONAL STUDIES

In addition to the collection and analysis of the samples for the extended characterization program, a few other programs were conducted in conjunction with this program.

### 7.1 Sludge Stabilization

Field and laboratory tests were conducted to establish minimum performance levels for various stabilizing agents. Several generic absorbant/stabilizing materials including fly ash, lime, kiln dust, Portland cement, and natural soil were tested. These materials were tested using M-basin sludge at 6% to 20% solids. The 20% solids sample was prepared by pan evaporation. The drying properties of the sludge were also evaluated during this study.

The stabilization tests were performed by two solid waste consulting firms, Envirosphere Company and Solid Tek Systems, Inc., both of Atlanta, Georgia. These tests indicated that Type 1 Portland cement produced an acceptable stabilized product. Table 7-1 shows the test data for Type 1 Portland cement and other materials tested. Type 1 Portland cement also exhibited the least volume increase of all materials tested.

It was observed during the test program that the sludge would naturally settle to 6% solids. Evaporation tests showed that the 6% solids could easily be dried to 20% solids in two to three days of good drying conditions with mixing. One test run on a higher sludge percent solids/Portland cement mixture produced a higher compressive strength and lower volume at lower cement/sludge ratios.

The final report from each of the two consultants, Envirosphere and Solid Tek, are attached to this report as Appendices F and G, respectively.

### 7.2 Deep Soil Boring Near M-Area Basin

As a part of a program to study the possibility of biological degradation of the three chlorinated hydrocarbon cleaning agents, soil samples were collected near the M-Area settling basin in December of 1984. The task of obtaining the soil samples, preparing a lithologic log, and obtaining geophysical logs of the borehole was contracted to Envirodyne Engineers, as an addendum to the M-Area Characterization Program. The actual coring was done by PSI, Inc.

The objective of this program was to obtain soil samples with relatively high levels of the halogenated solvents for biological degradation studies. Since analyses of two water table monitoring wells immediately adjacent to the basin (MSB-3A and MSB-22) have shown high levels of the chlorinated hydrocarbons, the soil boring was conducted in that area. The exact location of the coring is midway between a line connecting MSB-3A and MSB-22. The coring is approximately 55 feet from the edge of the water in the M-Area basin.

The coring was drilled to a depth of 242 feet below ground level, which was just to the top of the Ellenton Formation. The soil samples were collected using a three-inch-ID pitcher barrel. The boring was sealed with a 4 to 5% bentonite grout. The soil samples were analyzed for five volatile organics by ETC (Environmental Testing and Certification).

The results of the volatile organic analyses are given in Table 7-2. These data indicate that very little tetrachloroethylene or 1,1,1-trichloroethane were detected until a depth of 96 to 98 feet. The water table in this location is approximately 117 feet below ground surface, so the organics were detected in the soil approximately 20 feet above the water table. The presence of the chlorinated hydrocarbons in the soil above the water table might be due to spreading of the contamination in a horizontal direction below the M-Area basin, or possibly to volatilization of the organics in the "capillary fringe" area of the soil immediately above the water table.

The lithologic and geophysical logs are given in Appendix H of this report.

TABLE 7-1

Field and Laboratory Results from Stabilization Studies Performed on Sludges From the M-Area Settling Basin

| Raw Sludge Properties | | | Stabilization Agent | | Sludge to Stabiliztion Agent Weight Ratio | Final Product Properties | | | |
|---|---|---|---|---|---|---|---|---|---|
| % Solids | Sp. Gr. | Vol (mL) | Agent | Dry Wt (g) | | % Solids | Sp. Gr. | Vol. Increase (%) | Compressive Strength (lb/ft$^2$)†† |
| 5.7 | 1.04 | 1000 | Fly ash | 1000 | 1.04 to 1 | 57.2 | 1.32 | - | 0** |
| 5.7 | 1.04 | 500 | Fly ash | 1500 | 0.35 to 1 | 69.4 | 1.11 | - | 0 |
| 5.7 | 1.04 | 100 | Fly ash | 500 | 0.21 to 1 | 79.1 | 0.833 | - | 0 |
| 5.7 | 1.04 | 100 | Fly ash | 1000 | 0.10 to 1 | 84.3 | 0.788 | - | 0 |
| 6.4 | 1.06 | 150 | Fly ash | 150 | 1.06 to 1 | 51.9 | 1.30 | 41.2 | 0 |
| 6.4 | 1.06 | 100 | Fly ash | 200 | 0.53 to 1 | 62.9 | 1.52 | 82.4 | 0 |
| 6.4 | 1.06 | 50 | Fly ash | 250 | 0.21 to 1 | 80.5 | 0.958 | 206 | 0 |
| 6.4 | 1.06 | 210 | Fly ash + 10% lime* | 100 | 2.2 to 1 | 36.7 | 1.30 | 29.4 | 0 |
| 6.4 | 1.06 | 165 | Fly ash + 10% lime* | 100 | 1.75 to 1 | 39.2 | 1.31 | 35.3 | 0 |
| 6.4 | 1.06 | 210 | Lime* | 100 | 2.2 to 1 | 39.2 | 1.20 | 20.6 | 0 |
| 6.4 | 1.06 | 165 | Lime* | 100 | 1.75 to 1 | 42.1 | 1.27 | 23.5 | 0 |
| 6.4 | 1.06 | 275 | Kiln dust | 100 | 2.9 to 1 | 31.2 | 1.30 | 17.7 | 0 |
| 19.5 | 1.35 | 500 | Natural soil | 500 | 1.35 to 1 | 53.2 | 1.56 | - | 0 |
| 19.5 | 1.35 | 500 | Natural soil | 1000 | 0.68 to 1 | 55.5 | 1.54 | - | 0 |
| 19.5 | 1.35 | 1000 | Portland cement† | 500 | 2.7 to 1 | - | - | - | 22,900 |
| 19.5 | 1.35 | 1000 | Portland cement† | 1000 | 1.35 to 1 | - | - | - | 48,500 |
| 5.7 | 1.04 | 500 | Portland cement† | 1500 | 0.35 to 1 | - | - | - | 410,000 |
| 5.7 | 1.04 | 2000 | Portland cement† | 1000 | 2.1 to 1 | - | - | - | 42,200 |
| 5.7 | 1.04 | 1000 | Portland cement† | 1000 | 1.04 to 1 | - | - | - | 76,500 |
| 6.4 | 1.06 | 165 | Portland cement† | 100 | 1.75 to 1 | 50.7 | 1.29 | 20.6 | - (4,000) |
| 6.4 | 1.06 | 210 | Portland cement† | 100 | 2.2 to 1 | - | - | 17.7 | 7,776 (6,000) |
| 23.3 | - | 200 | Portland cement† | 100 | ~2.7 to 1 | - | - | - | 3,888 (4,000) |
| 6.4 | 1.04 | 210 | Portland cement† +20% fly ash | 100 | 2.2 to 1 | - | - | 29.4 | 0 |

* Hydrated lime

** A compressive strength of 0 lb/ft$^2$ indicates sample never solidified during test period

† Type I Portland cement

†† Unconfined compressive strength (ASTM D-2566)

() Unconfined compressive strength measured by a pocket penetrometer

**TABLE 7-2**

**Concentrations of Volatile Organics in Soil Samples from MBC-805 Coring Near M-Area Settling Basin, December 1984**

| | | Concentration (ng/g) | | | | |
|---|---|---|---|---|---|---|
| I.D. | Depth (ft) | Methylene Chloride | Tetrachloro-ethylene | Toluene | 1,2-Trans-di-chloroethylene | Trichloro-ethylene |
| 1 | 8-10 | 26.1 | -* | - | - | - |
| 2 | 18-20 | - | - | - | - | - |
| 3 | 28-30 | 20.5 | - | - | - | - |
| 4 | 38-40 | - | - | - | - | - |
| 5 | 48-50 | 32.1 | 98.1 | - | - | 66.8 |
| 6 | 58-60 | 371 | - | - | - | 32 |
| 7 | 66-70 | 18.9 | 27 | - | - | 18.7 |
| 8 | 76-82 | 20.1 | 26.8 | - | - | 24.6 |
| 9 | 86-90 | 25.7 | - | - | - | - |
| 10 | 96-98 | - | 16,800 | - | - | 1630 |
| 10B | 98-100 | - | 13,300 | 0 | 0 | 6010 |
| 11 | 106-112 | 87.7 | 1860 | - | - | 1710 |
| 12 | 120-124 | 49.6 | 10,300 | - | 17.6 | 5940 |
| 13 | 128-130 | - | 12,900 | - | - | 6310 |
| 14 | 140-142 | - | 18,000 | - | - | 7600 |
| 15 | 147-149 | - | 2520 | - | 12.7 | 1130 |
| 16 | 157-160 | - | - | - | - | - |
| 17 | 167-168 | 21.7 | 66.1 | - | - | - |
| 17B | 170-172 | 210 | - | - | - | - |
| 18 | 176-178 | 86.8 | 25 | - | - | - |
| 19 | 190-192 | 32.1 | 926 | - | - | - |
| 20 | 200-202 | 46.4 | - | - | - | - |
| 21 | 210-212 | 33.1 | - | - | - | - |
| 22 | 218-220 | 21.2 | - | - | - | - |
| 23 | 226-228 | 29.2 | - | - | - | - |
| 24 | 236-238 | - | 41.3 | 112 | - | - |
| 25 | 240-242 | 28.2 | 26.8 | - | - | - |

* (-) is below detection limit.

Analyses by ETC (Environmental Testing and Certification).

APPENDIX A

# REVIEW OF CHARACTERIZATION PROGRAM FOR M-AREA SETTLING BASIN AND CONTIGUOUS AREAS

BY

BLACK AND VEATCH,

ENGINEERS-ARCHITECTS

BLACK & VEATCH
ENGINEERS-ARCHITECTS

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KANSAS CITY, MISSOURI 64114

E. I. du Pont de Nemours & Co., Inc.
Savannah River Plant
Report on Review of Characterization
Program for M-Area Settling Basin
and Contiguous Areas

B&V Project 11379
B&V File B
July 23, 1984

Mr. John B. Pickett
E.I. du Pont de Nemours & Co., Inc.
Savannah River Laboratory
773-42A, Room 247
Aiken, S.C. 29808

Dear Mr. Pickett:

Enclosed are three copies of our "Review of Characterization Program for M-Area Settling Basin and Contiguous Areas". This report recommends modifications to the Du Pont characterization plan based on a review of existing data. It presents a methodology for determing the number of samples to be taken, the sampling locations, and recommendations for sampling areas impacted by the discharge to M-basin. Data from the characterization program will provide sufficient information to enable development of closure plans.

We appreciate this opportunity to be of service to Du Pont and would be happy to discuss the contents of this report. Please call if additional information or explanations are needed.

Very truly yours,

BLACK & VEATCH

L. T. Schaper

L. T. Schaper

vm
Enclosure

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## I. INTRODUCTION AND SCOPE

The Savannah River Plant M-Area settling basin has received process effluent from the fuel and target fabrication facilities since 1958. Waste effluents have contained metal degreasers, acids, caustics, and metals. Process changes and treatment alternatives are being evaluated with the intention of stopping discharges to the basin by March 1985. The volatile, chlorinated hydrocarbons used in metal-degreasing operations are identified as toxic substances in the regulations (RCRA, PL 94-580, 40 CFR Part 261). Therefore, plans for closure of the M-Area basin are being developed in accordance with state and federal hazardous waste regulations.

Determination of the areal and vertical extent of chemical and radioactive contamination is necessary in order to develop a conceptual closure plan. Du Pont has developed a characterization program for M-Area settling basin, adjacent overflow, and Lost Lake to meet the data requirements for closure. Du Pont has requested services associated with the characterization which include:

- Review the Du Pont characterization plan.
- Review the existing hydrogeological data and monitoring well records.
- Review previous characterization data.
- Recommend sampling protocols.
- Provide a written report recommending changes or improvements to the characterization plan.
- Accompany laboratory/plant representatives in meetings with South Carolina Department of Health and Environmental Control to explain and defend the proposed characterization plan.

This report recommends modifications to the Du Pont characterization plan[1*] based on a review of existing data. It presents a methodology for determining the number of samples to be taken, the sampling locations and recommendations for sampling the areas impacted by the discharge to M-basin. Existing data is presented only as needed to justify the sampling strategy. In several cases the resultant plan is nearly equivalent to the Du Pont plan; however, a justifiable methodology for sampling plan designs can be crucial when defending the plan to regulatory agencies.

## II. IMPACTED AREAS

When the M-Area basin is removed from service, the areas along the discharge pathway will no longer receive wastes. These areas include the process sewer to the basin; the settling basin; an overflow ditch from the basin; an area between the ditch and Lost Lake, where effluent has pooled and formed a seep area; and Lost Lake.

TV inspection of the sewer revealed breaks in the pipeline and a liner was installed in 1983. The shallow soils adjacent to and beneath the sewer may be contaminated with inorganics and organics from exfiltration through cracks in the sewer. Existing data for the settling basin, the seep area, and Lost Lake indicate chemical and radioactive contamination of the sludge and shallow soils from the M-Area basin to Lost Lake. The data indicate, however, that the heavy metals have been arrested in the upper layers of soil.

*Refers to references at the end of the report.

Soil analyses for volatile organics indicate that, unlike the metals, the organics are migrating from the initial sources of contamination. Chemical analyses of water and soil samples from groundwater monitoring wells in M-Area show the highest concentrations of volatile organics in wells along the sewer line (MSB-11, MSB-15, MSB-16), one adjacent to the sewer manhole and the basin (MSB-22), and one near the seep area (MSB-13).[2] The data indicate that organic contaminants have seeped along the process discharge pathway through 100 to 125 feet of unsaturated soils to the groundwater of the McBean Formation. These unsaturated soils which are contaminated with the volatile organics comprise the impacted area referred to in this report as the unsaturated zone.

Closure of the M-Area basin should consider each of the impacted areas described above: the soils beneath and adjacent to the process sewer, the M-Area settling basin, the overflow ditch, the seep area, and Lost Lake; and the soils of the unsaturated zone. Therefore, each of these areas should be characterized for chemical and radioactive contamination.

## III. CHARACTERIZATION OF IMPACTED AREAS

### A. METHODOLOGY

The purpose of characterizing the impacted areas is to obtain sufficient information for development of alternative closure plans, and selection of the best closure plan for the M-Area basin. To achieve this goal, the samples collected must be representative of the material being sampled and a sufficient number of samples must be collected to accurately determine the true mean concentration of each contaminant and the variability of those means within acceptable limits.

RCRA regulations for identification of hazardous wastes require that representative samples of the waste be collected. To demonstrate that the waste is not RCRA hazardous, the regulations also require that a sufficient number of samples be collected to establish the variability of the waste. The regulations refer to the U.S. Environmental Protection Agency (EPA) manual titled "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"[3] for collection methodologies acceptable to the EPA. The sampling plans for the impacted areas are based on the methodologies in this manual.

To sample a soil mass or liquid, a "population", which approaches homogenity, random sampling without replacement (i.e., no unit is sampled more than once) is recommended. The material to be characterized is divided into consecutively numbered sampling units. The units are selected from computer-generated random number tables. Random sampling is an unbiased method of selecting the sample since each unit has an equal chance of being selected from the population. Therefore, the information about the population determined from statistical analysis of the data from the sample is unbiased and, thus the sample is representative of the population. Stratified random sampling is recommended when a waste is stratified such that the contents of each layer may be considered homogeneous for sampling purposes, but there is nonrandom chemical heterogeneity between the strata.

For homogeneous populations the recommended number of samples is based on the least number required to estimate the true mean. The principal contaminants in the medium are identified and an acceptable range of the mean is selected based on existing data. RCRA does not specify a regulatory threshold for the metal degreasers (1,1,1-trichloroethane,

trichloroethylene, and tetrachloroethylene). If a regulatory threshold were available and existing data indicated that the waste did not exceed the limit, the mean and standard deviation of the existing data would be used to determine the number of samples required to show that the upper limit for the 80 percent confidence interval (CI) for the mean is less than the limit. Since there are no regulatory limits for the metal degreasers, this method cannot be used. Instead, existing data are compared to water quality criteria for the volatile organics, and water quality criteria and standards for other principal contaminants. This information and the mean and standard deviation of the existing data are used to calculate the number of samples required to predict the true mean of the population within a given range of the concentration (i.e., achieve a specified precision) with a given probability (80 percent CI).

If the medium of an impacted area is considered to approach homogeneity with respect to its chemical character, but existing data is insufficient for statistical calculation of sample numbers required, uniformly spaced sampling locations are recommended. Justification for the selected spacing is provided in the sampling plan for the specified area.

For areas which have not been uniformly exposed to the contaminant, sampling locations are selected to allow mapping of the contaminant levels. The area is selected on the basis of the discharge pathway to ensure that soils with maximum contamination as well as soils representing baseline conditions are included. The recommended number of samples ensures a minimum of two, and generally three samples in any direction from the discharge pathway.

B. SAMPLING PROGRAM

Sampling plans for each area impacted by discharges to M-Area basin follow. The analyses recommended for the samples are designated by type. Parameters for each type of analysis are listed in Appendix A, sampling protocols are provided in Appendix C, and computer-generated random number tables used to select sampling locations are included in Appendix D.

1. PROCESS SEWER. The process sewer is approximately 2,000 feet long and approximately 8 feet below grade. Groundwater monitoring wells near the sewer show significant concentrations of trichloroethylene and tetrachloroethylene. TV camera inspections indicate that the sewer line was leaking prior to installation of a plastic pipe liner in late 1983. Depending on the material and construction of pipe bedding, the leakage may have migrated laterally along the pipeline as well as vertically into the underlying soils. The soils adjacent to and beneath the sewer line have not been sampled previously. The contamination of the soils along the line is assumed to have occurred at random locations.

Two applicable methods for determining the existance of contamination in soil adjacent to the process sewer are provided as follows. The first is based on either electrical resistivity in the soil, or creating a electromagnetic field and measuring soil response. The second utilizes an organic vapor analyzer or photoionization detection device. The subsurface electrical resistivity profile can be used to identify areas of contaminated subsoils. Detection is based on the difference in the resistivity of contaminated and uncontaminated soils. The contrast is generally caused by a higher ionic concentration (total dissolved solids) in the contaminant.

The sensitivity of the resistivity method also depends on the relative uniformity of the subsurface soils and the quantity of the contaminant. Different soil materials may have different resistivities. Underground power, telephone, and other utility lines, metallic structures, and other conductive materials can cause electrical interference and make mapping of the contamination more difficult. Because of the thickness of the unsaturated zone, considerable current may be required before detection of the underlying saturated material, and even then, the location of the contaminants may remain hidden if the unsaturated soils vary in restivity. Geoelectrical profiling requires a thorough field investigation and careful interpretation to correctly map contaminant plumes. Order of magnitude cost of a resistivity study or electromagnetic mapping of the 2,000-foot line would be $9,000 to $20,000.

Since the primary contaminants are volatile organics, an organic vapor analyzer sensing device can also be used to detect areas of contamination. This would entail numerous auger borings along the sewer, spinning up the soils at various depths, and testing with the analyzer. Based on an estimate $6 per foot for a flight auger, each ten foot 3 to 4-inch diameter boring would cost $60. Fifty vapor detection holes could be drilled along the line for $3,000 (not including mobilization fee for the rig, analyzer rental, technician time, equipment decontamination costs, etc.). Three advantages of this method are (1) the detector measures concentrations of organic vapors directly, (2) contaminated areas are defined in the field, and (3) it is less costly than a resistivity study. A disadvantage of the vapor analyzer technique versus resistivity methods is that the extent of

contamination of large areas must be determined from discrete data points. If an auger boring is not drilled the soils will not be identified as contaminated except by extrapolation of data from other holes. A second disadvantage is that the vapor analyzer techniques are limited to detection of volatile organics, whereas the resistivity methods can discern inorganic contamination as well as organic.

Since high levels of the metal degreasers have been detected in the wells near the process sewer, the volatile organics are considered the key contaminants and acceptable indicators of soils contamination. The organic vapor analyzer should be used in conjunction with inspection data taken prior to lining the sewer. The inspection data may be the best source in locating contaminated soils by identifying earlier breaks in the sewer.

Ten-foot auger borings 3 to 4 inches in diameter, should be drilled at those locations where inspection data indicate breaks in the sewer and at intervals not to exceed 50 feet on alternating sides of the line from M-313, M-320, and M-321 to the manhole next to the basin. An analyzer should be used to detect contamination. Fifteen-foot soil cores should be taken in those areas where contamination is present. Soils from the 9 to 15-foot depth should be sampled at one-foot intervals. At a minimum of two of the areas where a 15-foot core is taken, at least two additional samples should be taken near the first core to determine lateral movement of the contaminants. The total number and location of sample cores will be determined by field personnel. All cores taken should be analyzed for soil physical parameters (Type F). Approximately 20 percent should be analyzed

for the full scan of inorganics and organics (Types B, C, F), with the other samples analyzed for selected inorganics and organics (Types D, E, F).

2. M-AREA SETTLING BASIN

a. Basin Liquids. In early 1982, the settling basin was sampled for a variety of physical/chemical parameters. Stratification was observed at the 4-foot depth, with a floc in the bottom 2 feet. The stratification was attributed to lower density process cooling waters versus waters of higher dissolved solids and, therefore, greater density. Since this sampling, several process changes have resulted in changes of effluent characteristics. On May 22, 1982, process waters were diverted from Tims Branch to the basin, increasing the flow from an average of 430,000 to 800,000 gpd.[4] This change shortened the hydraulic residence time, thereby reducing the basin's effectiveness in removing heavy metals. The increased flow may also have washed out some of the previously settled metal precipitates and changed the mixing characteristics of the basin. In November 1982, cooling waters were diverted back to Tims Branch. The flow was further reduced to 250,000 gpd at the end of 1982 by process changes.[5] The process modifications may also have lowered the basin pH, increasing the solubility of previously precipitated metals.

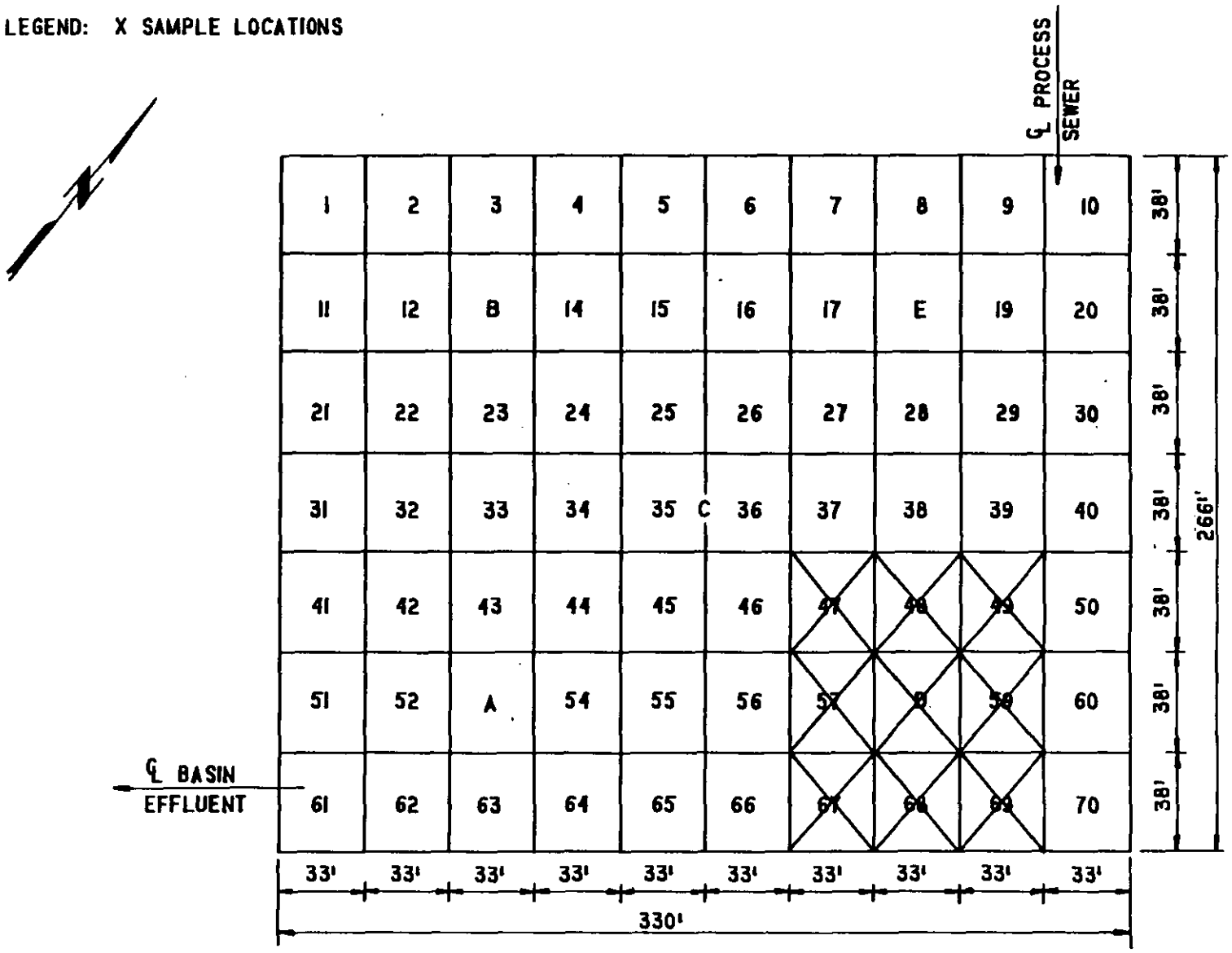
An aspect of basin characterization, aside from the process changes, is the condition of the drums of tetrachloroethylene dumped into the basin in the fall of 1978.[6] It is not known whether the solvent is leaking from the drums. On several occasions, composite samples taken in early 1982 show significantly higher values of the chlorinated hydrocarbon, 1,1,1-trichloroethane (1,1,1-TCE), in the settling basin effluent than in

the influent. In one sample, taken in June 1982 after the flow to the basin was increased, effluent concentrations of both 1,1,1-TCE and tetrachloroethylene were significantly higher than influent concentrations.

The basin contents may be considered a hazardous waste under both the Resource Conservation and Recovery Act (RCRA) and the South Carolina Department of Health and Environmental Control (SCDHEC) Hazardous Waste Management Regulations. The basin liquid is a mixture of solid waste (40 CFR Part, 261 Subpart A, 261.2(b)) and hazardous waste (Subpart D, Section 261.31, F001 spent solvents used in degreasing — tetrachloroethylene, trichloroethylene, 1,1,1-trichloroethane Hazard Code T). Also, because of the dumping of drums of tetrachloroethylene into the basin and the process line leading to the basin, the basin waters could be considered hazardous wastes as contaminated by a spill (Subpart D, Section 261.33d).[7]

The proposed rulemaking to establish Recommended Maximum Contaminants Levels (RMCL) for volatile synthetic organic chemicals in drinking water was published in the Federal Register June 12, 1984.[8] These levels are non-enforceable health goals used to develop Maximum Contaminant Levels (MCL), which are enforceable. The proposed RMCL are zero for trichloroethylene and tetrachloroethylene and 0.2 mg/L for 1,1,1-trichloroethane. Included in the proposed rules was a statement that the MCL are expected to fall in the range of 5 to 50 mg/L for these volatile organic chemicals.

Comparison of basin liquid results for inorganics from December 1981 to available standards and criteria indicates that the two primary contaminants of the liquid are uranium and nickel. The surface and bottom liquid averages were 2.1 and 8.9 mg/L for uranium 1.3 and 1.6 mg/L for nickel.




## SETTLING BASIN SLUDGE/SOIL SAMPLING LOCATIONS NEAR D

SCALE: 1" = 60'

FIGURE 4

Appendix B. When all the data for a constituent is plotted, a large drop in concentration is noted at approximately 17 feet below the water surface. Translating this to soil depth, the large drop occurs 2 to 3 feet below the basin bottom. Truncating the data to permit inspection of the lower concentrations shows values significantly higher than Hollod's background cores for both uranium and nickel.[6] The concentration in eight samples taken at 15 to 30 foot depths was less than 0.2 ug/g for uranium and ranged from 0.3 to 1.2 ug/g for nickel. If the high readings at core E are excluded, a plateau is reached approximately 20 feet below the water surface.

The principal inorganic contaminants are nickel and uranium. Existing data show the uranium to be depleted in $^{235}U$. The sludge/soils underlying the basin are assumed to be homogenous with respect to inorganics. Numbers of samples were calculated on the basis of concentrations in the soils at the first reading below the 4-foot depth at each station. The number of samples required to predict the true mean at 80 percent confidence intervals within 0.7 ug/l for uranium was seven and eight within 1.0 ug/g for nickel. Sampling of eight randomly selected locations is recommended based on uranium and nickel as shown on Fig. 3. A magnetometer or a fathometer should be prior to sampling to locate any drums in basin, to reduce the possibility of puncturing a drum of tetrachloroethylene. Sludge cores should extend through the sludge and 6 feet of soils. The sludge and soils should be separated by visual inspection, with analysis at one-foot intervals. Six samples should be analyzed for physical parameters, selected inorganics, and selected organics (Types D, E, F). Two samples

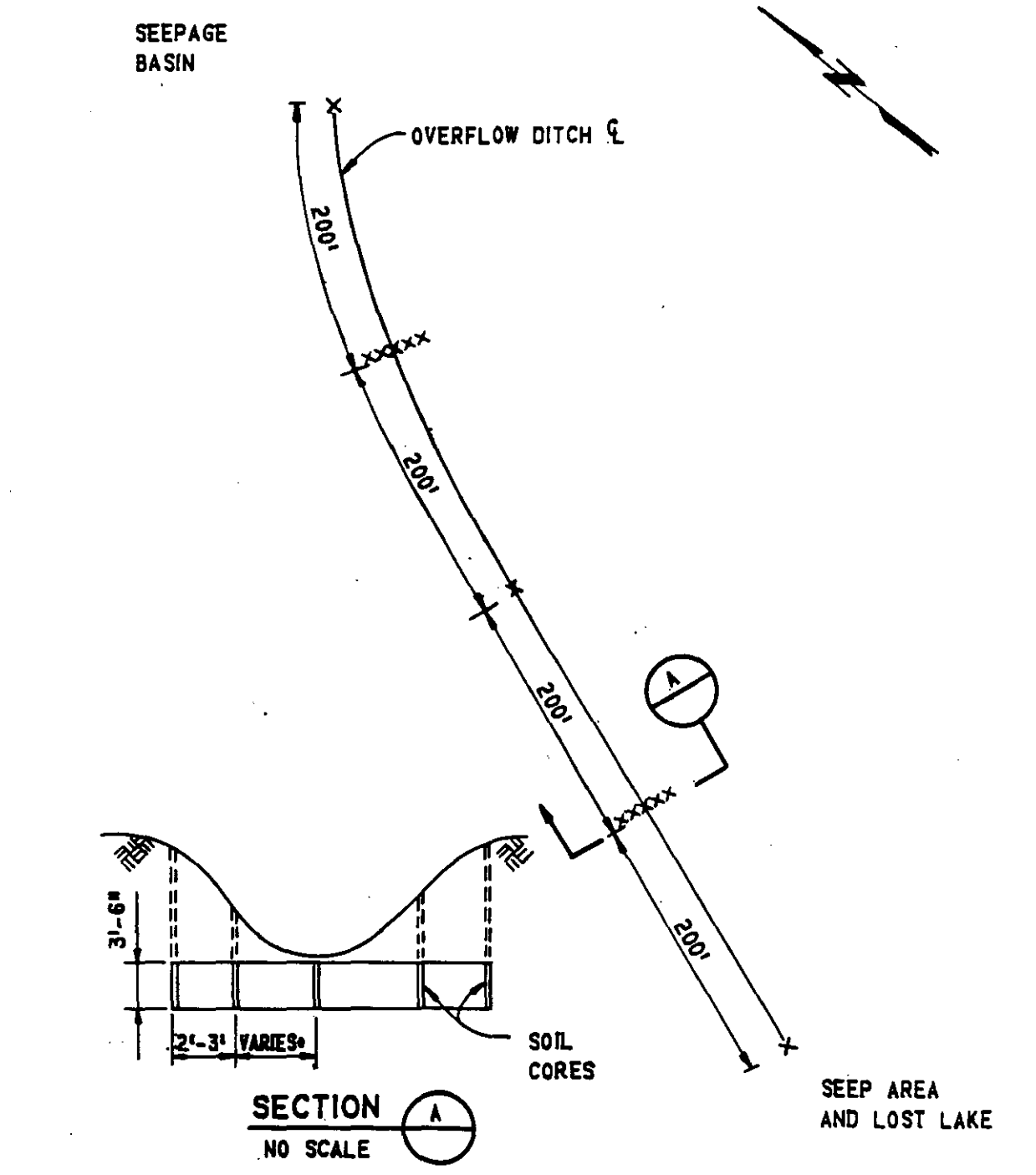
should be analyzed for physical parameters, and all listed inorganic and organic contaminants (Types B, C, F).

In March 1982, the soil cores were analyzed also for volatile organics. Concentrations at sampling locations A (near basin outfall) and B were significantly lower than values at D and E (near basin inflow). Although the values at location E were high, they did show a decrease with depth. Concentrations at location D fluctuated. Although the basin slopes from locations A and B to D and E, the higher concentrations at D may be due to leaking drums of tetrachloroethylene. The higher specific gravity of the degreaser (1.623) would interfere with its mixing in the basin. Sampling of the basin is recommended to detect any changes in the soil chemistry since March 1982 and to better define the magnitude and extent of contamination. Random sampling for this portion of the plan is not desirable since soils have not had identical exposure to the solvents as a result of chemical spills. Therefore, sampling of a grid near location D is recommended as shown on Fig 4. The high concentrations of organics determined in March 1982 suggest that excavation in the area around location D to remove organics may be considered for the closure of the M-Area basin. The cores should extend 15 feet into the basin soils, with analysis at 3-foot intervals for the first 12 feet and at 1-foot intervals for the remaining 3 feet for selected organics only.

c. Soils Adjacent to M-Area Basin. Cores should be drilled near the center of each side of the basin, as close as possible without risking leakage from the basin into the core. The depth of the four cores should be equivalent to 6 feet below the basin. Overall depth will depend on the elevation of the berm above the water. These cores will provide data on

lateral migration of contaminants from the basin. The cores should be analyzed at 5-foot intervals to the 15-foot depth and at 1-foot intervals beginning at the elevation of the bottom of the basin for physical parameters (Type F), selected inorganics, and selected organic contaminants Types (D,E).

3. OVERFLOW DITCH. The overflow ditch between the basin and the seep area is approximately 800 feet long. Deposition of contaminants is expected to be relatively high near the basin, and decrease in the direction of the seep area. Therefore, the soils in the ditch are not expected to be homogeneous. Four or five equally spaced samples along the ditch will provide a sufficient number of data points to define a curve showing any decrease in the concentration with distance from the basin. If, in fact, the chemical concentrations in the soil are random for the length of the ditch, five samples is a conservative number to obtain precise data, given that existing data are not available. Sampling the center of the ditch at 200 foot intervals is recommended as shown on Fig. 5. Two soil cores should be taken, one near the settling basin and one near the seep area, to determine the lateral extent of contaminant migration. Four cores should be taken at both sides of the ditch, approximately 2 to 3 feet from the edge, and extending 3-1/2 feet below the bottom of the ditch. The depth is based on existing data on the seep area which is considered "worst case" data likely to be encountered in the ditch soils. Samples should be split into sludge and soils based on visual inspection. Samples should be analyzed at a maximum of one-foot intervals, with the top six inches analyzed separately. The soil samples taken at the centerline of the ditch from the two locations with cross section sampling

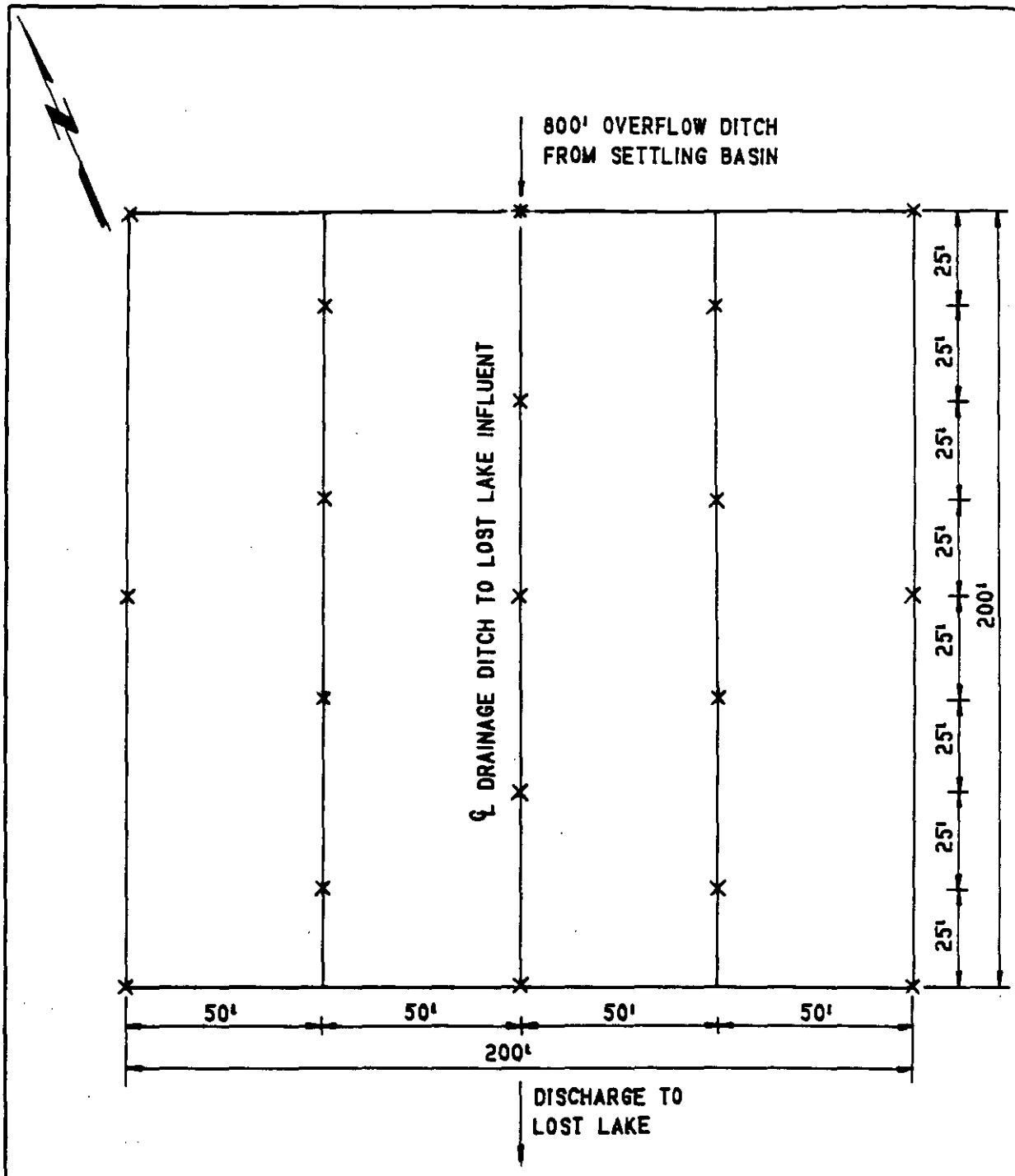



## OVERFLOW DITCH SAMPLING LOCATIONS

NO SCALE

should be analyzed for physical parameters and the full scan of contaminants (Type B, C, F). All other samples should be analyzed for physical parameters and selected inorganics and organics (Type D, E, F).

4. SEEP AREA. The seep area is situated between the drainage ditch and Lost Lake and refers to the area where the discharge has pooled. This area is not well defined. Data from November 1982 show very high concentrations of inorganic contaminants in the top 6 inches of sludge/soil.[9] Plots emphasizing the lower concentrations for lead and nickel show a plateau at the 1-foot depth. Analysis of the uranium data shows fluctuating levels up to 15 inches, with one sample showing high levels at a greater depth (Appendix B). Since the extent of contamination in the pooled area is not known, the objective of the sampling program will be to locate the center of the seep area and determine zones of contamination outward from that center to baseline levels. An area approximately 200 feet by 200 feet, extending from the 342-foot contour of Lost Lake towards the overflow ditch and aligned along the ditch centerline, should be sampled. The results will be used to map the contaminated area and provide data for metals inventory calculations. To achieve this objective, a sufficient number of samples must be taken in all directions to allow extrapolation between the points. Eighteen seep area stations are identified on Fig. 6. In any direction from the center of the grid there are a minimum of two, and generally three sampling locations. To permit mapping of contaminant levels, sampling locations must be recorded accurately. They should be well marked with stakes, and distances of grid corners from trees recorded. Formal surveying is not necessary, however.




LEGEND: * LAST SAMPLE FROM DRAINAGE DITCH CENTERLINE
X SAMPLE LOCATIONS

## SEEP AREA SAMPLING LOCATIONS

NO SCALE

Three and one-half foot samples should be taken at each location. The samples should be divided into a sludge and soil fractions and analyzed separately. The top 6 inches should be analyzed separately and the remainder of the core analyzed at one-foot intervals. Approximately fourteen cores should be analyzed for physical parameters and the shortened lists of inorganics and organics (Types D, E, F). Four cores should be analyzed for all listed parameters (Types B, C, F). These cores should be from areas identified as highly contaminated.

The uranium data indicate that deeper cores are required to identify a base uranium concentration. Uranium is the primary contaminant in the seep area. Prior to sampling, the area should be surveyed with a scintillation counter to locate the highest uranium concentration and to determine the level of radiation protection required for sampling personnel. At areas of highest uranium concentration, 5-foot cores should be taken; the 3-1/2 foot core in that same area is not required. The 5-foot cores should also be split into sludge/soil fractions and analyzed in a manner similar to the 3-1/2 foot cores.

Since deer are known to feed in the seep area, they present a potential of introducing of heavy metals into the human food chain and therefore, the critical organs of a deer killed near the seep area should be tested for accumulation of uranium.

5. LOST LAKE. Analyses of four soil cores taken in November 1982 indicate that M-Area contaminants are filtered out in the top 6 inches of sludge/soil. Because of the limited number of samples taken in that survey and the large area of Lost Lake, more extensive sampling of the sludge and

soils is recommended. Within the 338 foot contour, sampling at the rate of approximately one core per acre is recommended. For the area between the 338-foot and 342-foot contours, one core per 2 acres is adequate. Land application sites are typically monitored at the rate of one soil core per acre. This is also the required rate for monitoring land farming projects in South Carolina.[11] This rate is considered acceptable by regulatory agencies for characterizing large soil areas and is, therefore, recommended as an acceptable rate for sampling the soils of Lost Lake. The rate is reduced to two cores per acre for soils of higher elevation, since records indicated that these soils were infrequently wetted. Using a 200-foot by 200-foot sampling grid and sampling each square within the 338 foot contour yields 17 sampling locations. Sampling alternate squares between elevations 338 and 342 yields eight samples, for a total of approximately 25 samples as shown on Fig. 7.

All samples should be 1-1/2 feet deep, regardless of the depth of the sludge layer. Sample cores should be analyzed in two parts: the top 6 inches, and one 1-foot section. Approximately 80 percent of the cores should be tested for physical parameters and the complete listing of contaminants (Type B, C, F); the other cores should be tested for physical parameters and selected contaminants (Type D, E, F).

Use of a sampling grid or several transects to determine the number and locations of samples in Lost Lake is reasonable. Logistics should be considered in choosing the sampling locations.

6. OUTFLOW FROM LOST LAKE. Two soil cores should be taken from the abandoned farm ditch near the outfall from Lost Lake. The samples should

be taken along the discharge path of Lost Lake. The samples should be 1-1/2 feet deep and split into a 6-inch and a 12-inch section for analysis.

7. UNSATURATED ZONE. Characterization of the unsaturated zones beneath the process sewer line, M-Area settling basin, and the seep area is not recommended at this time. The unsaturated zone below these areas is approximately 100 to 125 feet thick. Water and soil analyses from ground water monitoring wells indicate that these soils contain substantial quantities of volatile organic solvents. The volume of soils in the unsaturated zones is so large that the only feasible closure alternatives will be those that specify in situ treatment or immobilization of the contaminants. Additional characterization of the unsaturated zone to develop preliminary closure alternatives is not necessary. However, better definition of the contamination problem before selection of the most cost-effective alternative will be required to evaluate the time and cost of decontamination. This data will also establish a baseline for use in evaluating the effectiveness of the selected action.

Sampling of the 100 feet of unsaturated zone beneath M-Area basin to obtain characterization data is not recommended until after the basin is taken out of service and drained. Drilling through the unlined full basin would require a floating platform, more sophisticated drilling techniques, and would pose a risk of creating a pathway for the basin contents to groundwater. This risk is not considered justifiable, given that the data is not required until the final stages of closure plan development. Data from the characterization of the surface contamination will be used to recommend sampling of the unsaturated zones beneath the M-Area discharge pathways after draining the basin.

## IV. ADDITIONAL DATA REQUIREMENTS FOR CLOSURE

Characterization of the impacted areas as described in the preceding section will provide data on the extent and magnitude of the contamination problems. Data from two other types of samples are recommended to support and interpret this information: composite sampling of the settling basin influent and effluent, and reference sampling of soils in the vicinity of the impacted areas.

### A. COMPOSITE SAMPLING

Concurrent composite sampling of the basin influent and effluent is recommended to ensure that no process changes have occurred which would significantly alter chemical characteristics of the basin liquids or the soils prior to closure. This information may also be useful in developing process modifications and treatment facilities for the M-Area. Samples should be analyzed for physical parameters, selected inorganics, and volatile organics (Types A, D, E).

### B. REFERENCE SAMPLING

Sampling of ambient soils in the vicinity of the impacted areas is recommended to obtain baseline data for the interpretation of data taken from impacted areas.

Data for soil cores collected at depths of 15 to 30 feet near M-Area were published in the December 1983 groundwater report. Because those samples were taken from the site, they are a better source than a general reference such as Conner and Shacklette.[12] The background of 3 ug/g uranium level uranium for M-Basin soils according to Conner and Shacklette

reported in the Du Pont characterization plan is from soils in Wyoming and Montana.

Existing soil data show a leveling off of contaminants at concentrations higher than the published background data for M-Area. Plant activities may have increased the background concentrations of selected constituents in the soils. Results from these samples will be used as a reference or baseline in interpreting the data.

Areas should be selected that are at a sufficient distance from the process effluent discharge pathway so as not to be directly affected, but within 100 yards of each area. If possible, sampling locations should be at a relatively high elevation to ensure that they are not receiving surface runoff from nearby soils. Soils known to have been disturbed should be avoided. Two 20-foot cores should be taken near the basin or process sewer line. The cores should be analyzed at 4-foot increments to the 8-foot depth and at 2-foot intervals to the 20-foot depth. More data points are required at lower depths, since they will be used to interpret data from the process sewer and the M-Area basin. Vertical migration of contaminants into the soil occurs at approximately 3 feet below grade for the sewer and 15 feet for the basin. Two 10-foot cores should be taken near the seep area or Lost Lake. These cores should be analyzed at 1-foot intervals for the first 4 feet and 2-foot intervals for the bottom 6 feet. These cores will provide baseline data for evaluating the extent of contamination of the surface soils in the seep area.

Samples from one 20-foot core and one 10-foot core should be analyzed for all the listed constituents (Types B, C, F). All other samples should

be analyzed for physical parameters and for selected inorganics and organics (Types D, E, F).

## V. SUMMARY

Existing geohydrological and characterization data for the M-Area settling basin provide a good basis for developing a comprehensive characterization plan for areas impacted by discharges to the basin. Because of the large quantities of volatile organic solvents released to the basin (nearly 2 million pounds), including degreasers listed by RCRA as toxic substances, a special effort must be made to identify all contaminated soils and to determine the amounts of each contaminant present with statistical confidence.

Specific sampling plans have been recommended for each impacted area identified. The sampling plans for the basin are based on uranium, nickel, and the chlorinated hydrocarbons. This is not to imply that these are the only constituents of concern. For example, nitrate levels in the basin pose a potential threat to the groundwater. However, the volatile organics and uranium and nickel are considered, based on existing data, to be the best indicators of contamination in the impacted areas.

A summary of the number of samples required for characterization of the M-Area settling basin and contiguous areas is presented in Table 1. The data from the sampling effort will be used to inventory contaminants and develop alternatives for basin closure consistent with state and federal regulations and guidelines.

TABLE 1

SAMPLE AND ANALYSIS SUMMARY

| Sample Description | No. of Sample Locations | Samples per Location | Total No. of Samples for Analysis | Number of Samples x Types of Analysis |
|---|---|---|---|---|
| PROCESS SEWER | | | | |
| Soil | * | 6 | | 80% x D,E,F<br>20% x B,C,F |
| SETTLING BASIN | | | | |
| Liquid Samples (2 strata) | 18 | - | 18 | 14 x A,D,E<br>4 x A,B,C |
| Sludge/Soil | 8 | 7 | 56 | 14 x D,E,F<br>42 x B,C,F |
| Sludge/Soil at Location D | 9 | 7 | 63 | 63 x B |
| Adjacent Soils | 4 | 9 | 36 | 36 x D,E,F |
| OVERFLOW DITCH | | | | |
| Sludge/Soils | 13 | 4 | 52 | 44 x D,E,F<br>8 x B,C,F |
| SEEP AREA | | | | |
| Sludge/Soil | 18 | 4 | 72 | 56 x D,E,F<br>16 x A,B,F |
| LOST LAKE | | | | |
| Sludge/Soil | 25 | 2 | 50 | 40 x D,E,F<br>10 x B,C,F |
| OUTFLOW | | | | |
| Soil | 2 | 2 | 4 | 4 x D,E,F |
| REFERENCE | | | | |
| Near Process Line/Basin | 2 | 8 | 16 | 8 x D,E,F<br>8 x B,C,F |
| Near Seep Area/Lost Lake | 2 | 7 | 14 | 7 x D,E,F<br>7 x B,C,F |

*To be determined in field.

REFERENCES


1. Pickett, J. B., "Program for Characterization of Chemical and Radioactive Contamination of M-Area Settling Basin, Adjacent Overflow, and Lost Lake", E. I. Du Pont de Nemours & Co., June 1984.

2. Preliminary Technical Data Summary M-Area Groundwater Cleanup Facility, E. I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., 1982.

3. Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods, U.S. Environmental Protection Agency, SW-846, Second Edition, 1982.

4. Hollod, G. J., "Physical and Chemical Characteristics of the M-Area Settling Basin", E. I. Du Pont de Nemours & Co., September 1982.

5. Technical Summary of Groundwater Quality Protection Program at Savannah River Plant, Volume I - Site Geohydrology, and Solid and Hazardous Waters, E. I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, S.C., 29808.

6. Hollod, G. J., et al, "Metals and Organics in the Soil Beneath the M-Area Settling Basin, E. I. Du Pont de Nemours & Co., July 1982.

7. 40 CFR Part 261.

8. "National Primary Drinking Water Regulations; Volatile Synthetic Organic Chemicals; Proposed Rulemaking, 40 CFR Part 141", Federal Register, June 12, 1984.

9. National Research Council, Drinking Water and Health, Volume 3, National Academy Press, Washington, D.C., 1980.

10. Notice of Water Quality Criteria Documents, Federal Register, Volume 45, Number 231, November 28, 1980.

11. "Hazardous Waste Management Regulations Promulgated Pursuant to Sections 44-56-10 through 44-56-140 of the 1976 South Carolina Code of Laws", South Carolina Department of Health and Environmental Control, March 31, 1981 amended January 29, 1981.

12. Conner, J. J., and Shacklette, H. T., Background Geochemistry of Some Rocks, Soils, Plants, and Vegetables in the Conterminous United States, Geological Survey Professional Paper 574-F, Washington, 1975.

# APPENDIX A

# ANALYTICAL GROUPS OF PARAMETERS

Type A Analyses: Water Physical Parameters

pH
Conductivity
Temperature
TDS

Type B Analyses: Inorganic Chemicals

Ammonia (as N)
Chloride
Bromide
Fluoride
Nitrate/Nitrite (as N)
Phosphorus, total
Sulfate (as $SO_4$)
Sulfide (as S)

Aluminum
Barium
Boron
Iron, total
Magnesium
Calcium
Sodium
Potassium
Manganese
Tin
Titanium
Antimony
Arsenic

Cobalt
Vanadium
~~Arsenic~~
~~Antimony~~
Thallium
Cyanide

Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Zinc
Uranium

Radioactivity
- Gross Alpha (pCi/L)
- Gross Beta (pCI/L)
- Radium, total (pCi/L)

*Constituents added to Du Pont characterization plan Type B list.

Type C Analyses: Full organic chemical scan, per Appendix VIII of 40 CFR 261.

Acetonitrile
Acrolein
Acrylamide
Acrylonitrile
Benzene
Benz(a)anthracene
Benzo(a)pyrene
Benzotrichloride
Benzyl chloride
Benzo(b)fluoanthene
Bis(2-chloroethyoxymethane)
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Carbon disulfide
Carbon tetrachloride
Chlordane
Chlorinated dibenzodioxins
Chlorinated biphenyls
Chloroacetaldehyde
Chlorobenzene
Chloroform
Chloromethane
2-Chlorophenol
Chrysene
Creosote
Cresol(s)
Cresylic Acids(s)
Dichlorobenzene(s)
1,1-Dichloroethene
1,2-Dichloroethene
1,1-Dichloroethene*
Dichloromethane
Dichlorophenoxyacetic acid
Dichloropropanol
2,4-Dimethylphenol
Dinitrobenzene
4,6-Dinitro-o-cresol
2,4-Dinitrotoluene
Endrin
Ethyl ether
Formaldehyde
Formic acid
Heptachlor
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Hexachlorocyclopentadiene
Lindane
Maleic anhydride
Methanol
Methomyl
Methyl ethyl ketone
Methyl isobutyl ketone
Napthalene
Napthoquinone
Nitrobenzene
4-Nitrophenol
Paradehyde (trimer of acetaldehyde)
Pentachlorophenol
Phenol
Phorate
Phosphorodithioic acid esters
Phthalic anhydride
2-Picoline
Pyridine
Tetrachlorobenzene(s)
Tetrachloroethane
Tetrachloroethylene
1,2 trans-dichloroethylene*
Tetrachlorophenol
Toluene
Toluenediamine
Toluene diisocyanate(s)
Toxaphene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluormethane
Trichlorophenol(s)
2,4.5-Trichlorophenoxy propionic acid
Trichloropropane
Vinyl chloride
Vinylidene chloride (1,1-dichloroethane)
Xylene
Bis(chloromethyl)ether**

---

*Additional volatile organics not in 40 CFR 261 listing.
**Constituent listed as Type D in original plan.

Type C Analyses: Full organic chemical scan, per Appendix VIII of 40 CFR 261.

Acetonitrile
Acrolein
Acrylamide
Acrylonitrile
Benzene
Benz(a)anthracene
Benzo(a)pyrene
Benzotrichloride
Benzyl chloride
Benzo(b)fluoanthene
Bis(2-chloroethyoxymethane)
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Carbon disulfide
Carbon tetrachloride
Chlordane
Chlorinated dibenzodioxins
Chlorinated biphenyls
Chloroacetaldehyde
Chlorobenzene
Chloroform
Chloromethane
2-Chlorophenol
Chrysene
Creosote
Cresol(s)
Cresylic Acids(s)
Dichlorobenzene(s)
1,1-Dichloroethene
1,2-Dichloroethene
1,1-Dichloroethene*
Dichloromethane
Dichlorophenoxyacetic acid
Dichloropropanol
2,4-Dimethylphenol
Dinitrobenzene
4,6-Dinitro-o-cresol
2,4-Dinitrotoluene
Endrin
Ethyl ether
Formaldehyde
Formic acid
Heptachlor
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Hexachlorocyclopentadiene
Lindane
Maleic anhydride
Methanol
Methomyl
Methyl ethyl ketone
Methyl isobutyl ketone
Napthalene
Napthoquinone
Nitrobenzene
4-Nitrophenol
Paradehyde (trimer of acetaldehyde)
Pentachlorophenol
Phenol
Phorate
Phosphorodithioic acid esters
Phthalic anhydride
2-Picoline
Pyridine
Tetrachlorobenzene(s)
Tetrachloroethane
Tetrachloroethylene
1,2 trans-dichloroethylene*
Tetrachlorophenol
Toluene
Toluenediamine
Toluene diisocyanate(s)
Toxaphene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluormethane
Trichlorophenol(s)
2,4.5-Trichlorophenoxy propionic acid
Trichloropropane
Vinyl chloride
Vinylidene chloride (1,1-dichloroethane)
Xylene
Bis(chloromethyl)ether**

---

*Additional volatile organics not in 40 CFR 261 listing.
**Constituent listed as Type D in Du Pont plan.

Type D Analyses: Selected Organics

Acrolein
Acrylonitrile
Benzene
Bromoform
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Dichlorobromomethane
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl bromide
Methyl chloride
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
Toluene
1,2-trans-Dichloroethylene
1,1,1-Trichloroethane (1,1,1-TCE)
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluoromethane
Vinyl Chloride

Type E Selected Inorganics

| | | |
|---|---|---|
| Na | Pb | Cl |
| K | Ni | $NO_3$ (as N) |
| Ca | Cu | $NH_3$ (as N) |
| Mg | Hg | P, total |
| Fe | Zn | |
| Al | U | |
| Mn | | |

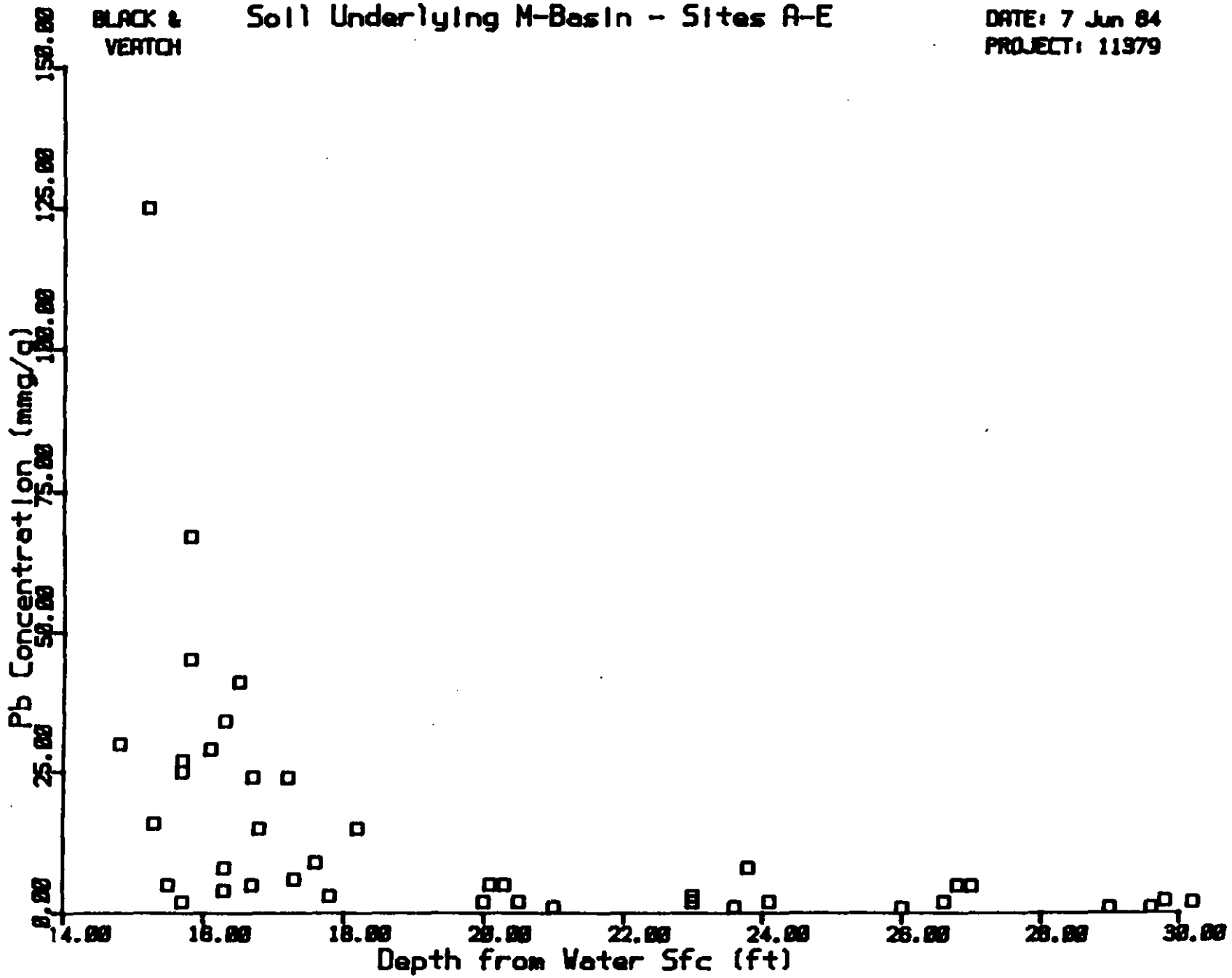
Type F Analyses: Sludge/Soil Physical Parameters

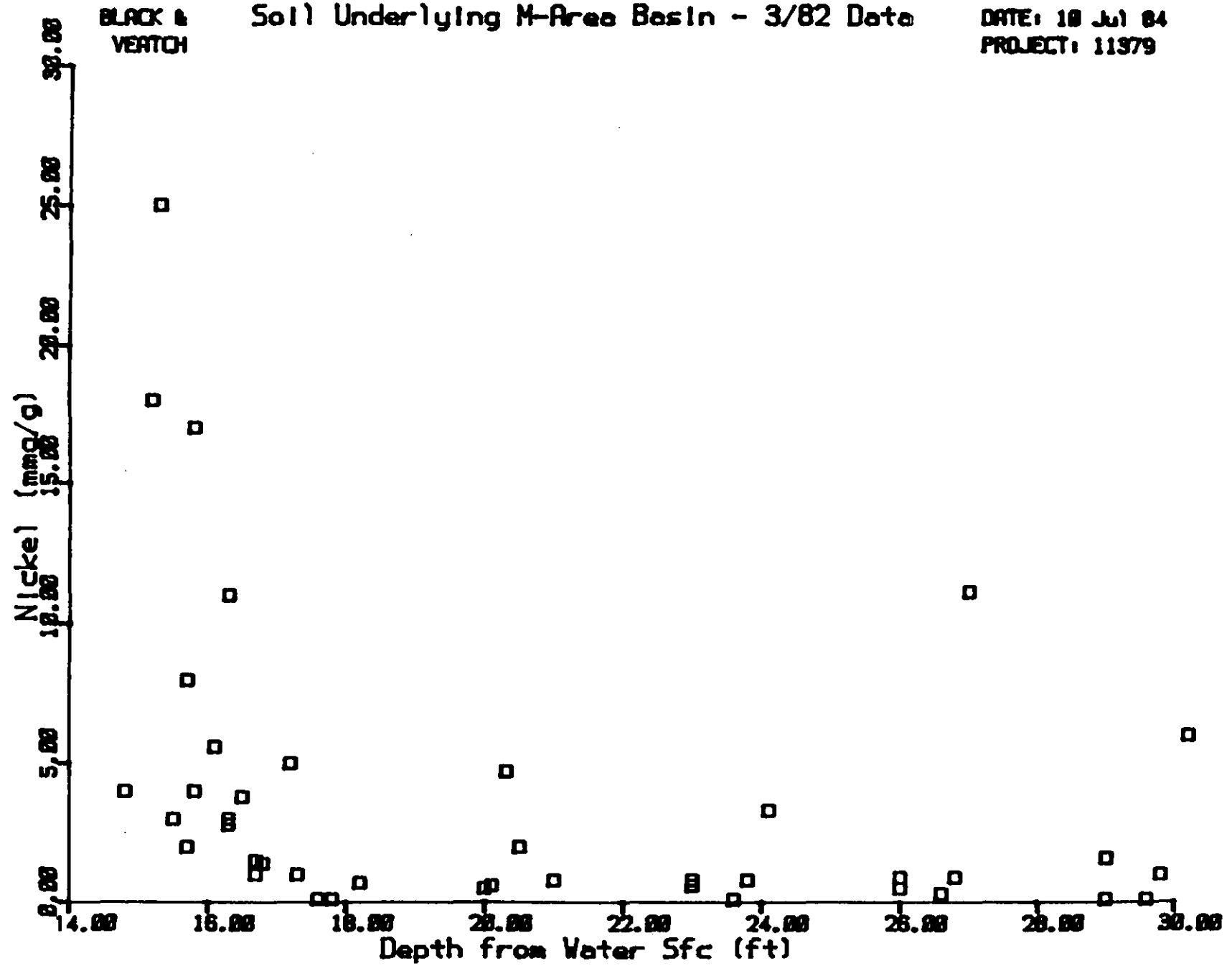
Cation - Exchange Capacity
pH
Specific gravity (Sludge only)
Percent Solids (Sludge only)

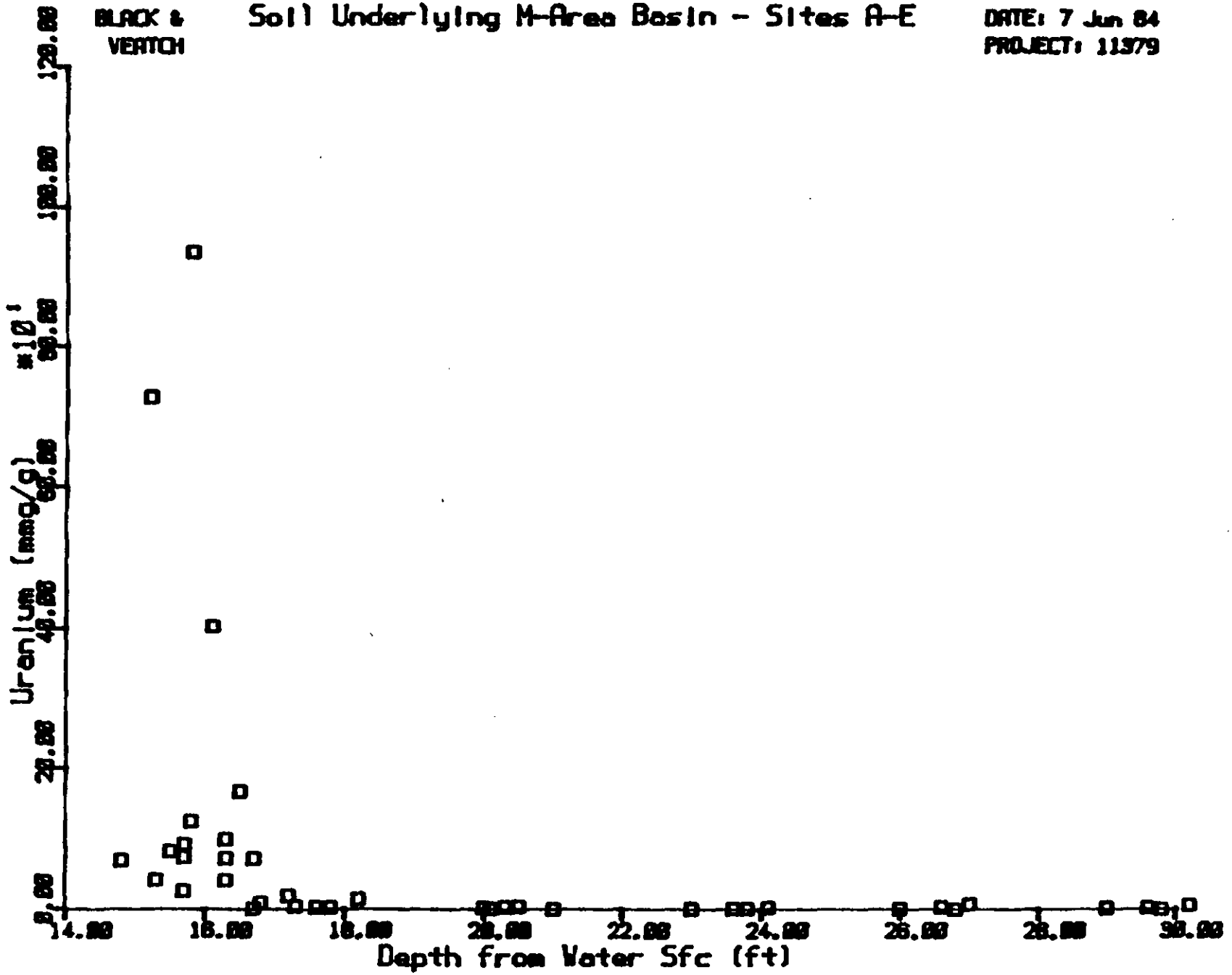
## APPENDIX B

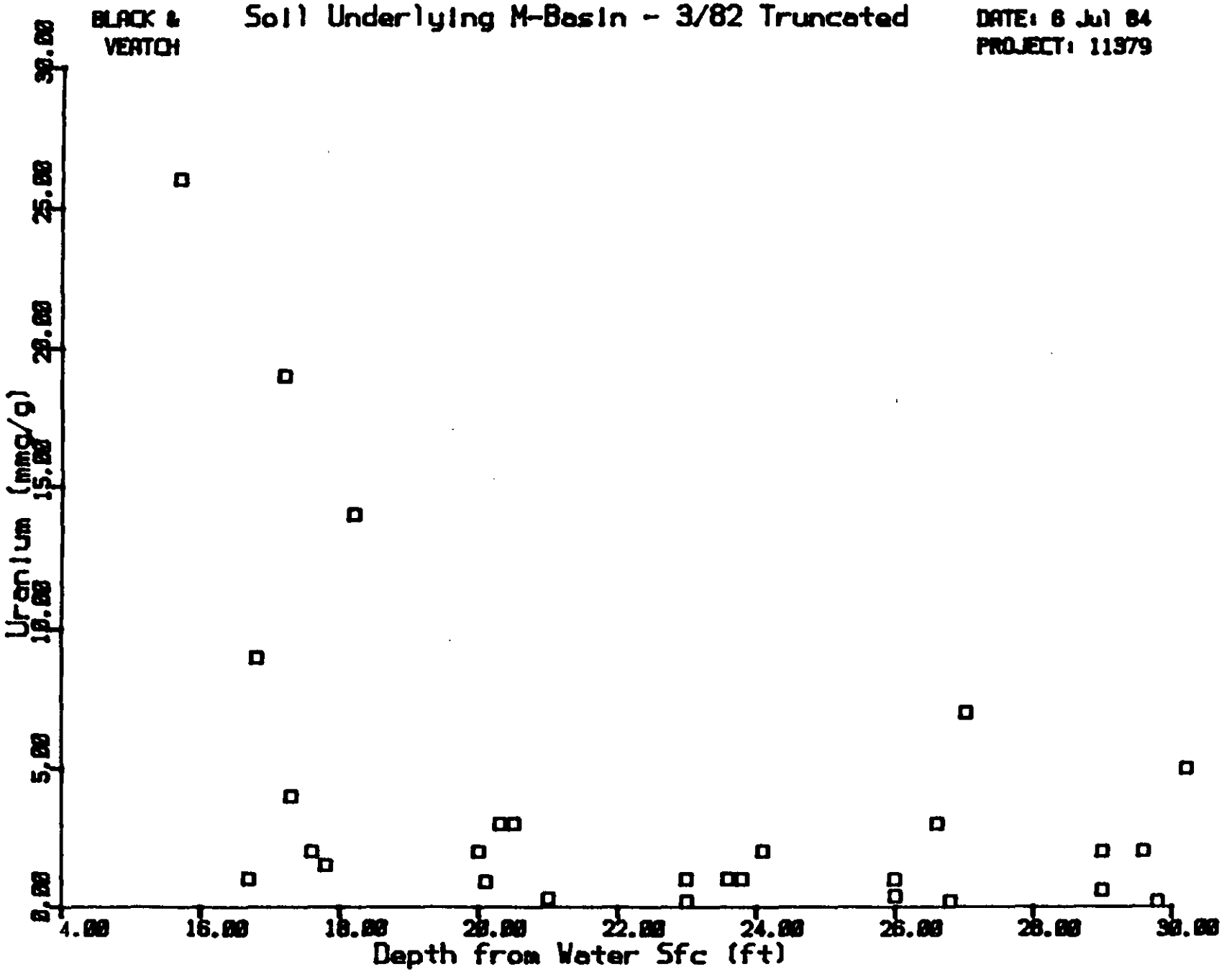
## SUPPLEMENTAL DATA

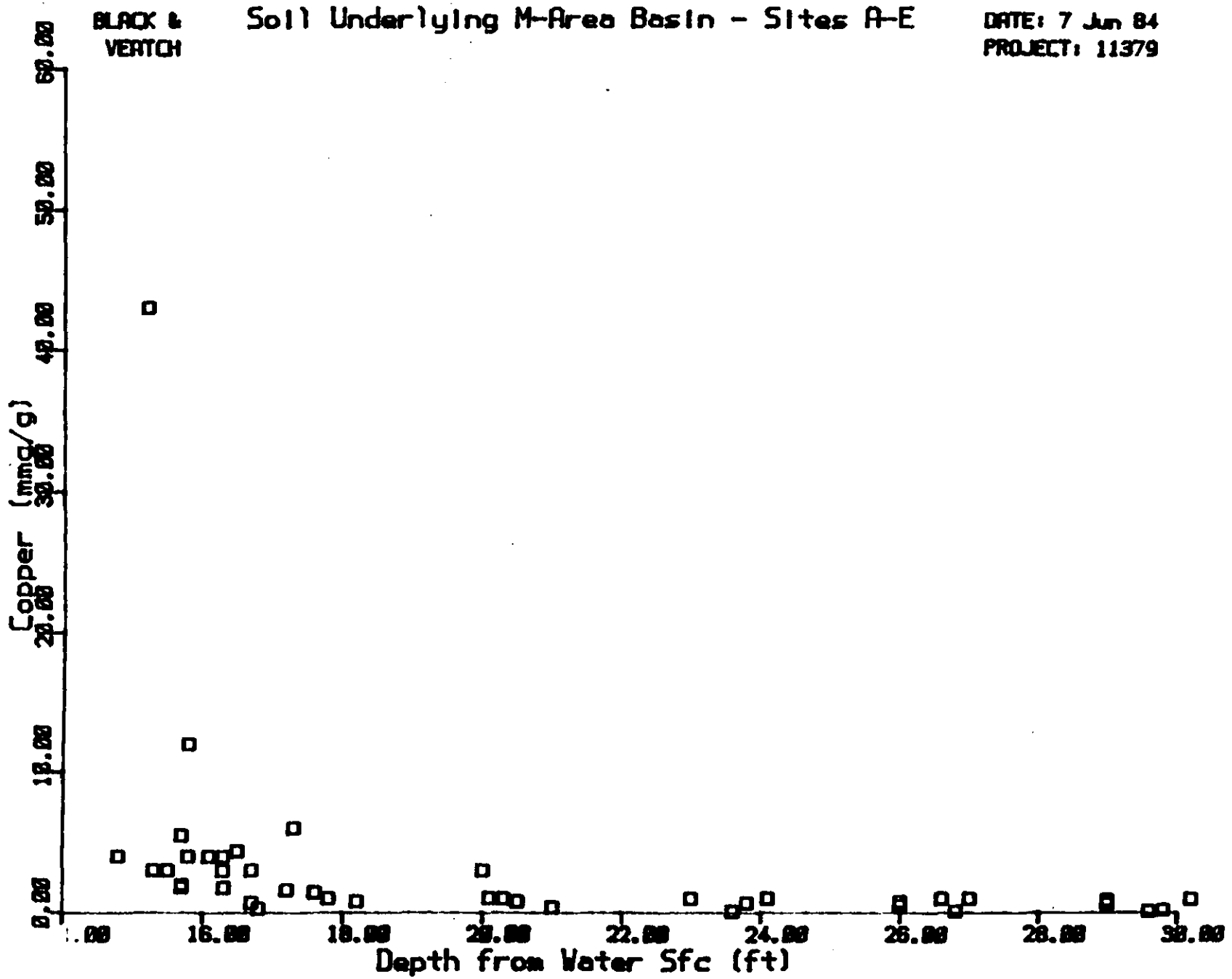
Note: Units of mmg/g as shown on the graphs are equivalent to ug/g

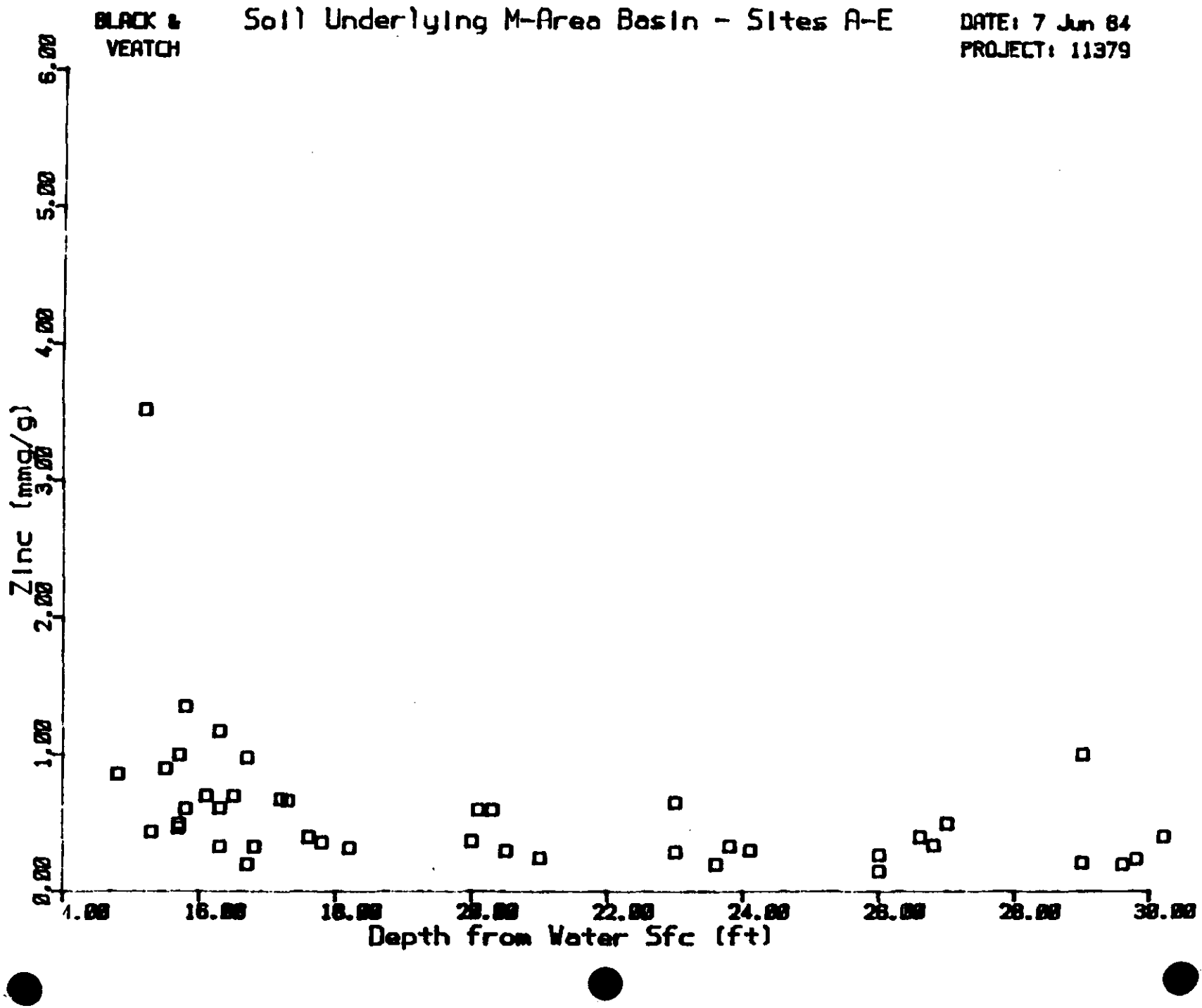

BLACK & VERTCH
Soil Underlying M-Basin - Sites A-E
DATE: 7 Jun 84
PROJECT: 11379
Pb Concentration (mmg/g)
150.00
125.00
100.00
75.00
50.00
25.00
0.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Depth from Water Sfc (ft)

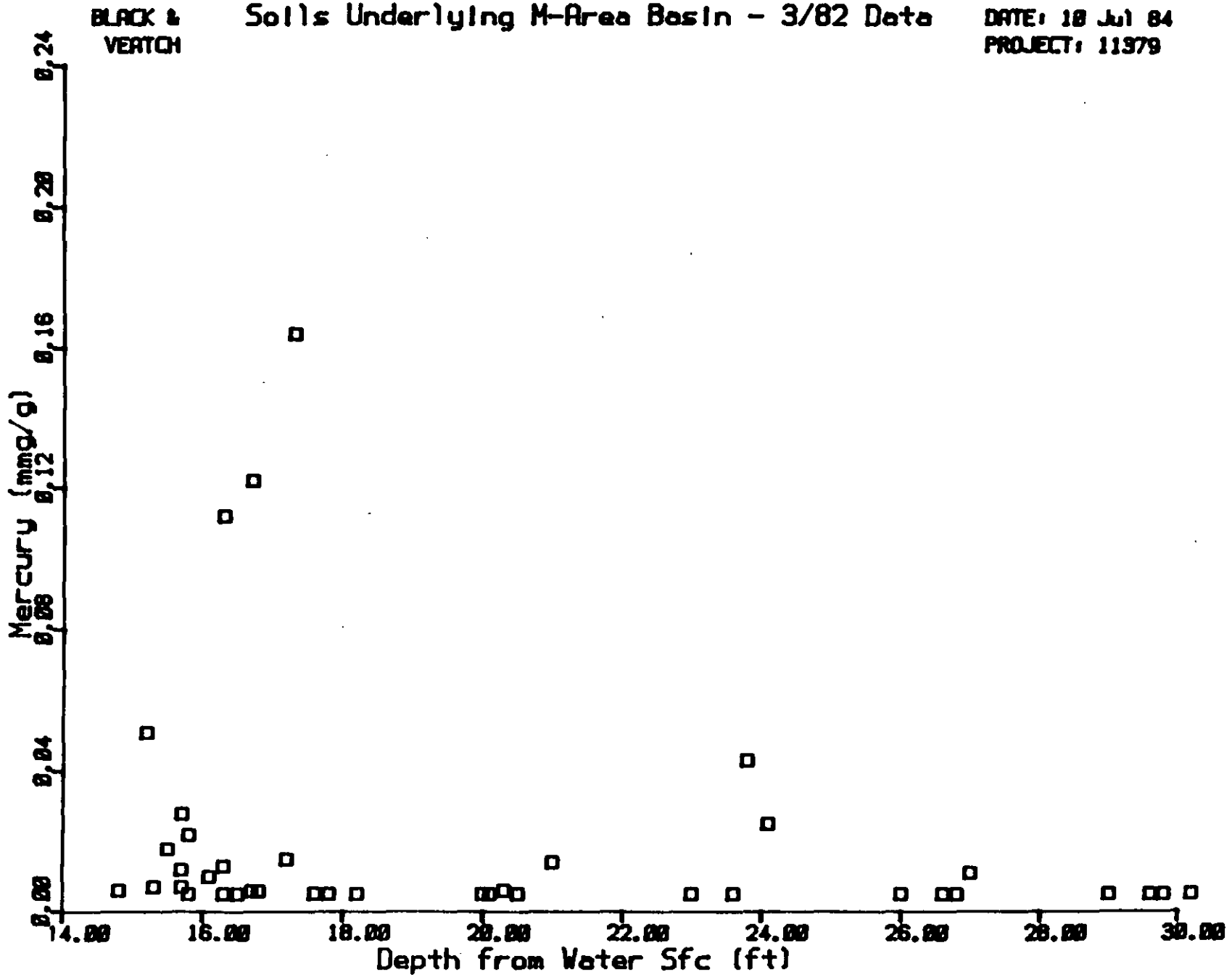

BLACK & VEATCH
Soil Underlying M-Area Basin - 3/82 Data
DATE: 18 Jul 84
PROJECT: 11379
Nickel (mmg/g)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Depth from Water Sfc (ft)

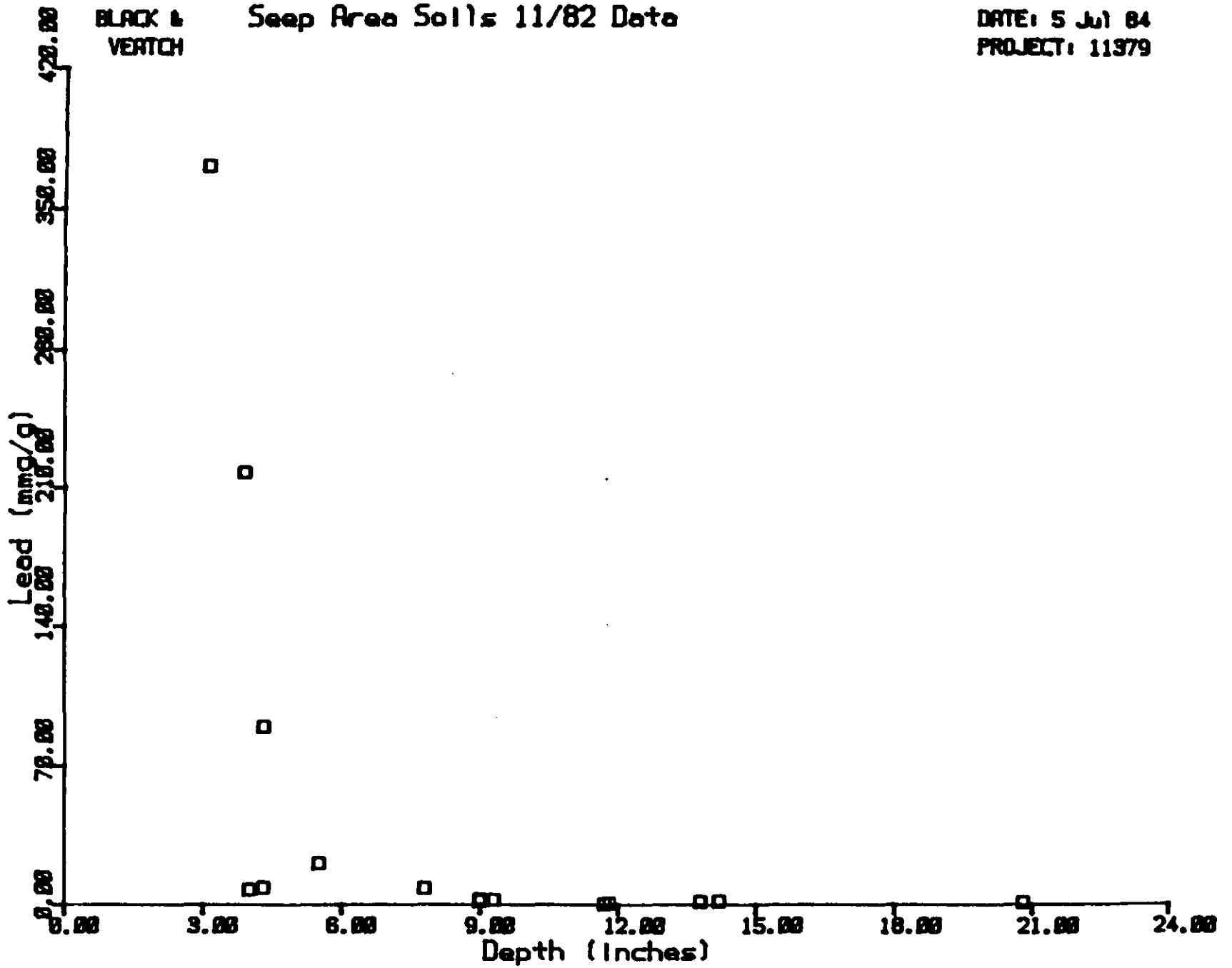

BLACK & VEATCH
Soil Underlying M-Area Basin - Sites A-E
DATE: 7 Jun 84
PROJECT: 11379
Uranium (mmo/g)
*10'
Depth from Water Sfc (ft)

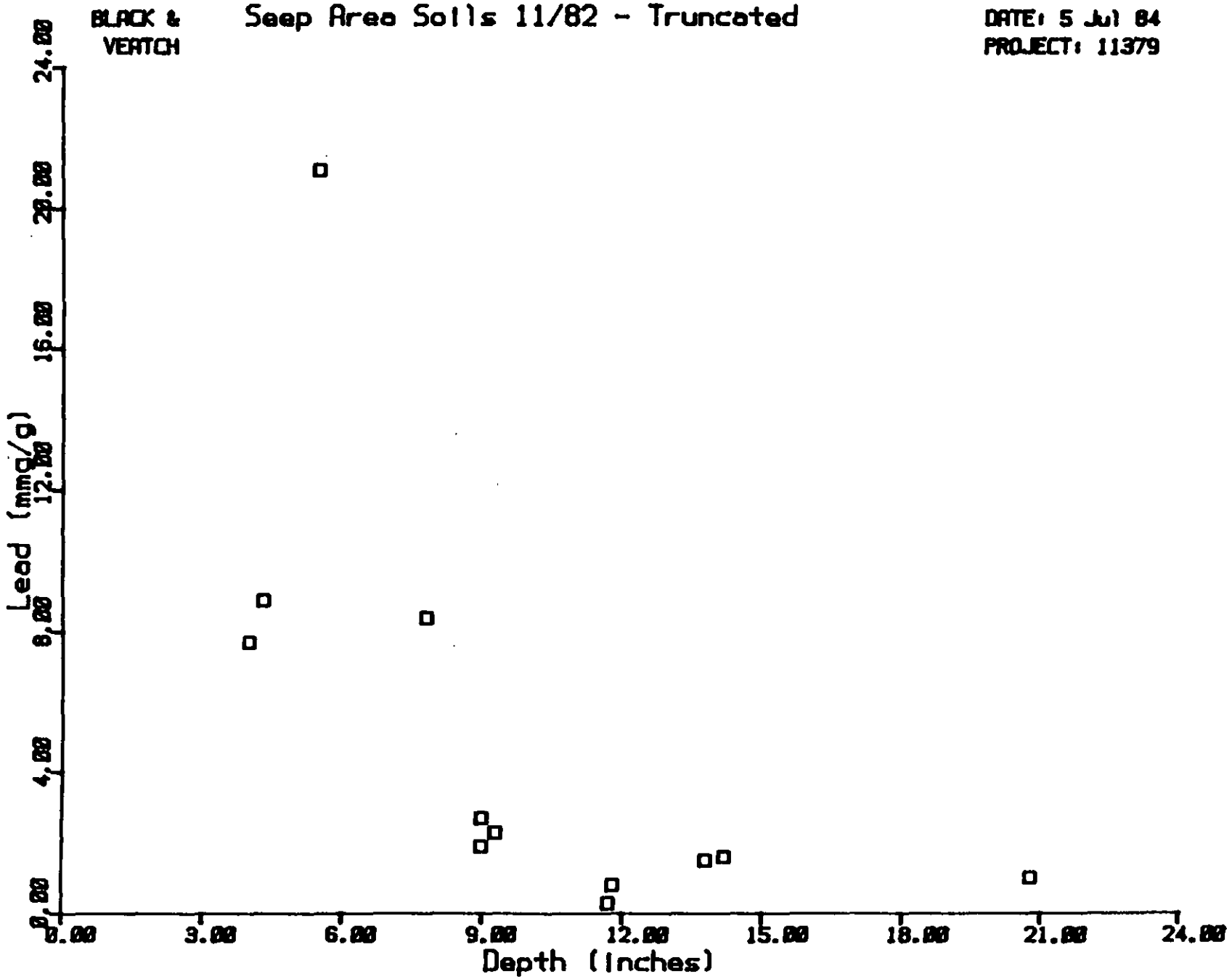

BLACK & VEATCH
Soil Underlying M-Basin - 3/82 Truncated
DATE: 6 Jul 84
PROJECT: 11379
Uranium (mmc/g)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
4.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Depth from Water Sfc (ft)

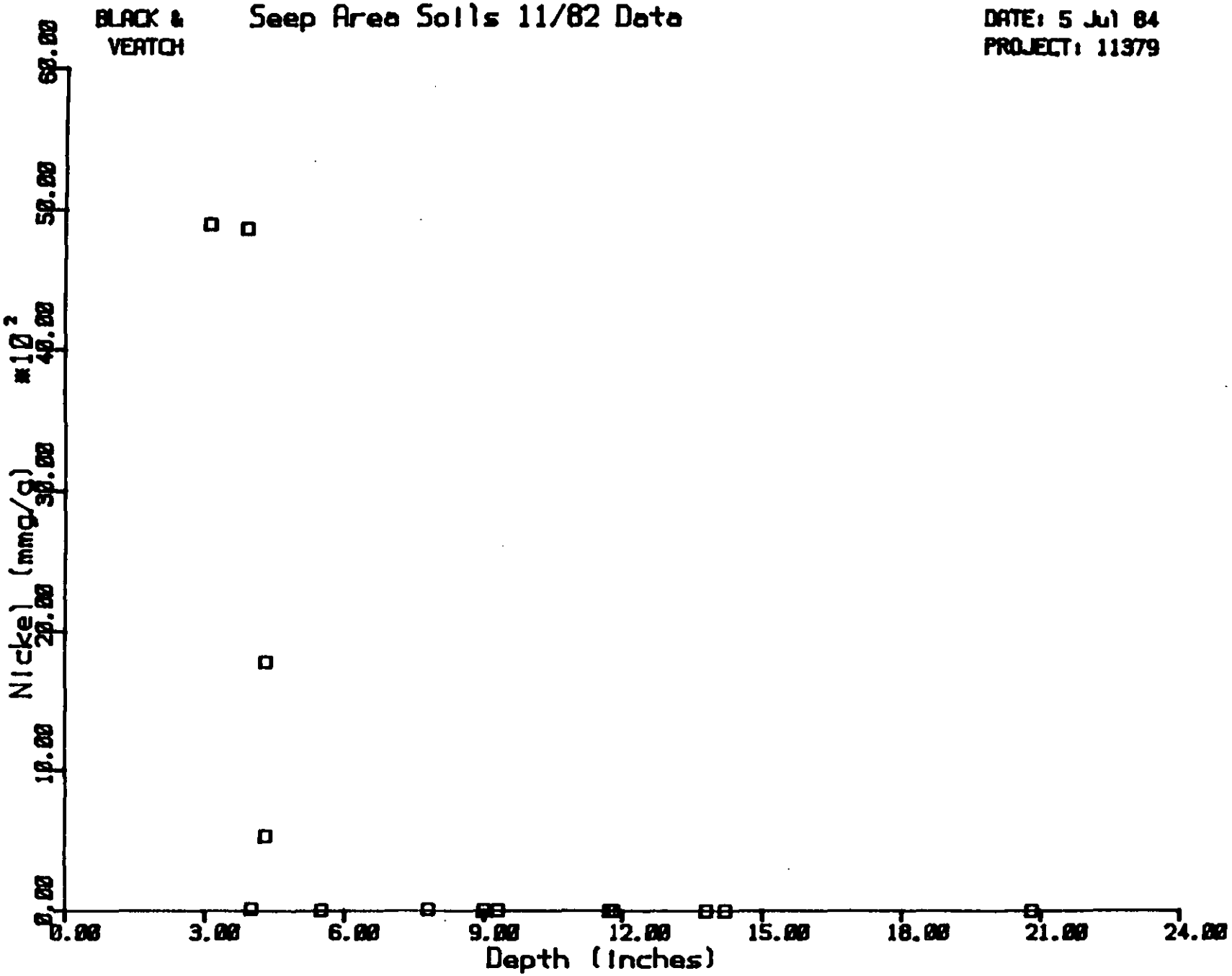

BLACK &
VERTCH
Soil Underlying M-Area Basin - Sites A-E
DATE: 7 Jun 84
PROJECT: 11379
Copper (mmg/g)
0.00
10.00
20.00
30.00
40.00
50.00
60.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Depth from Water Sfc (ft)

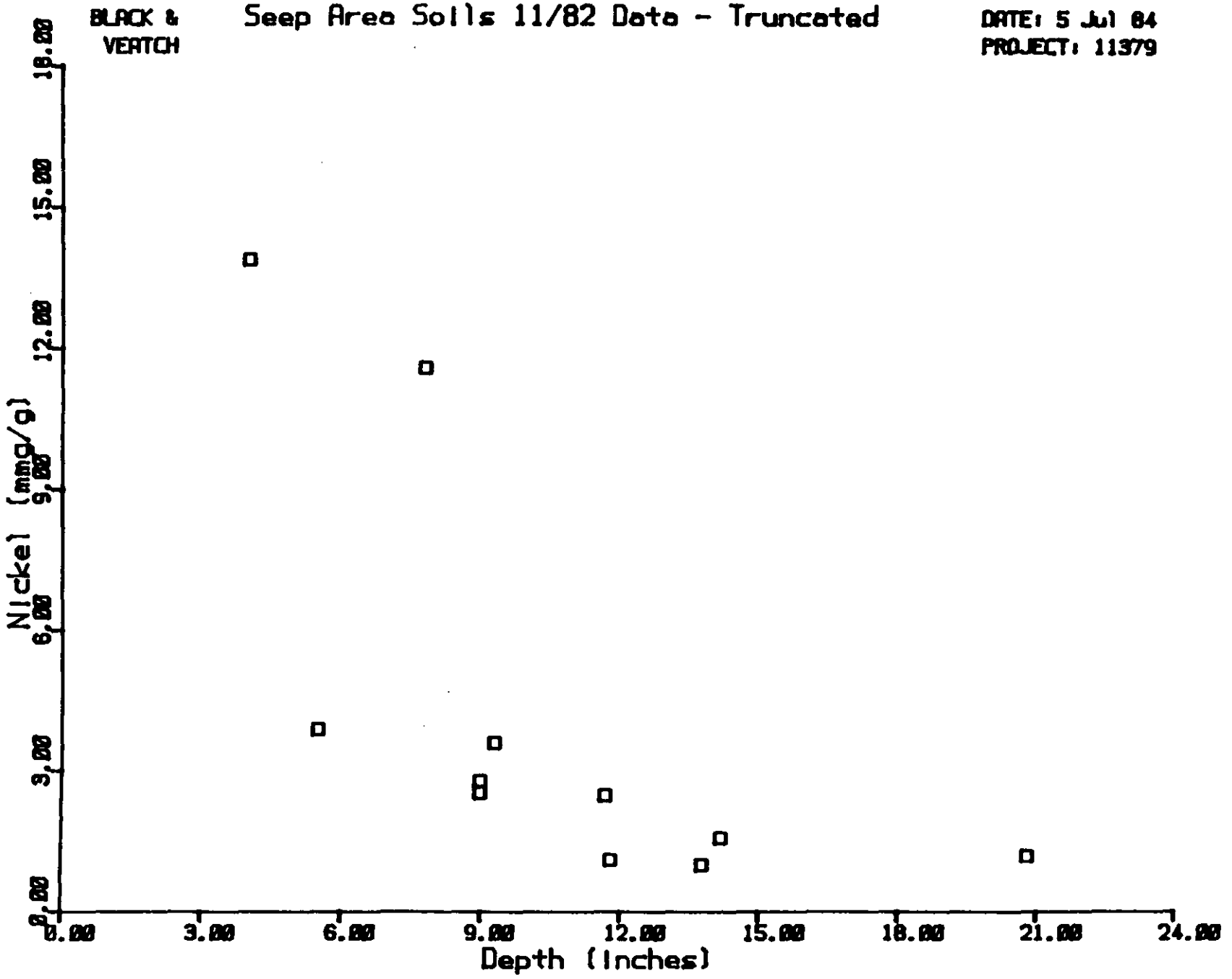

BLACK & VEATCH
Soil Underlying M-Area Basin - Sites A-E
DATE: 7 Jun 84
PROJECT: 11379
Zinc (mmg/g)
6,000
5,000
4,000
3,000
2,000
1,000
0.00
1.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Depth from Water Sfc (ft)

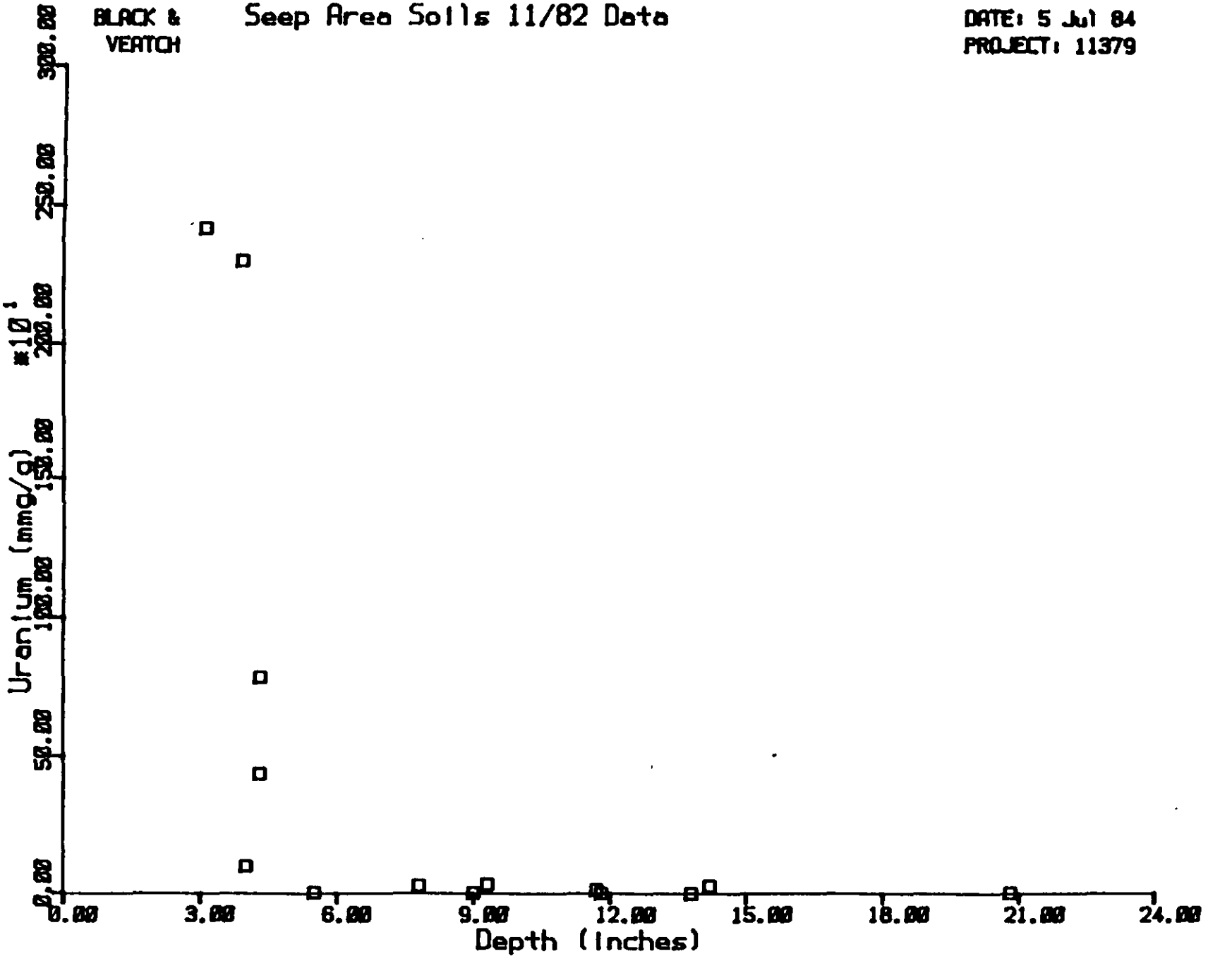

BLACK & VEATCH
Soils Underlying M-Area Basin - 3/82 Data
DATE: 18 Jul 84
PROJECT: 11379
Mercury (mmg/g)
0.24
0.20
0.16
0.12
0.08
0.04
0.00
14.00
16.00
18.00
20.00
22.00
24.00
26.00
28.00
30.00
Depth from Water Sfc (ft)

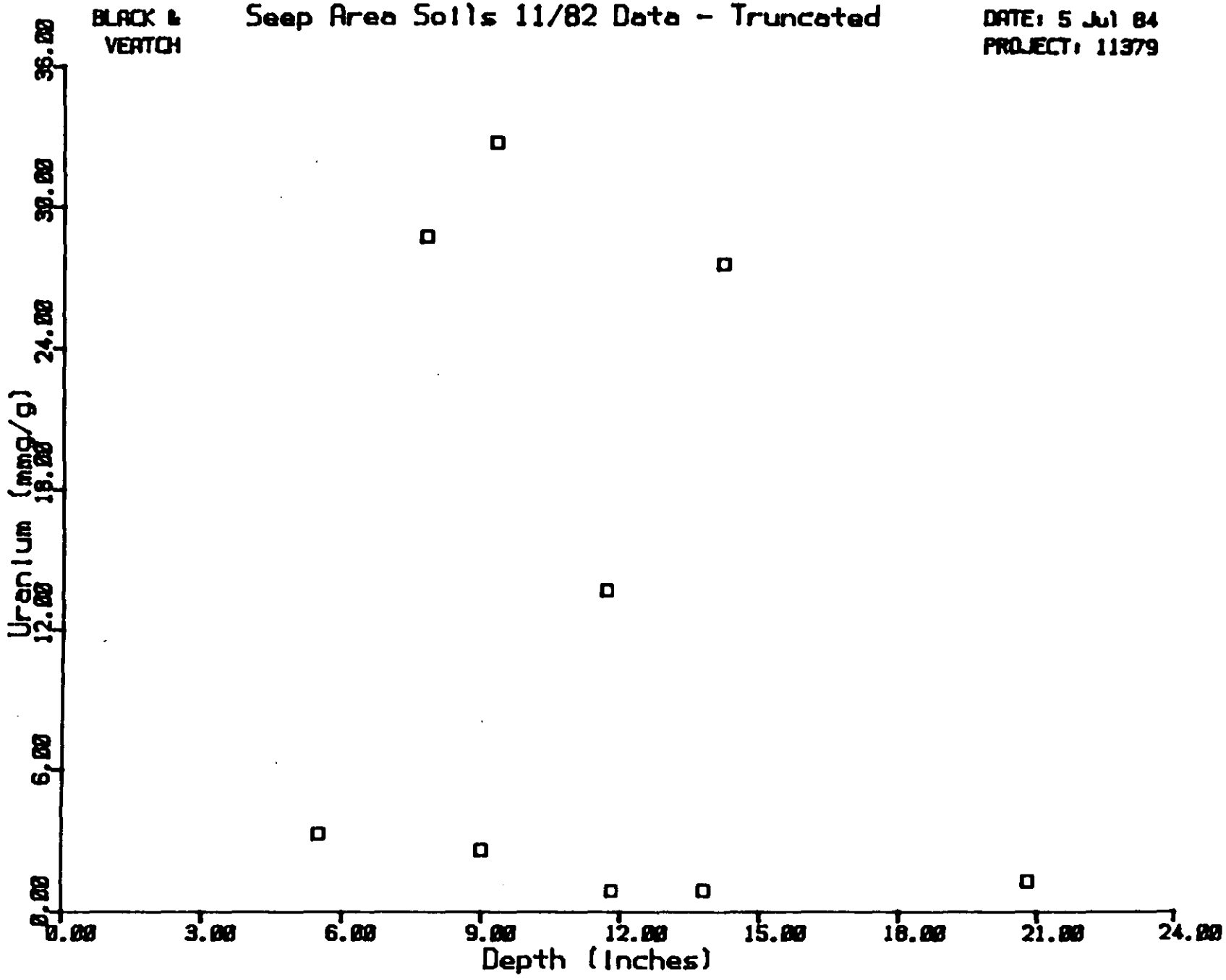

BLACK &
VEATCH
Seep Area Soils 11/82 Data
DATE: 5 Jul 84
PROJECT: 11379
Lead (mg/g)
0.00
70.00
140.00
210.00
280.00
350.00
420.00
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Depth (Inches)

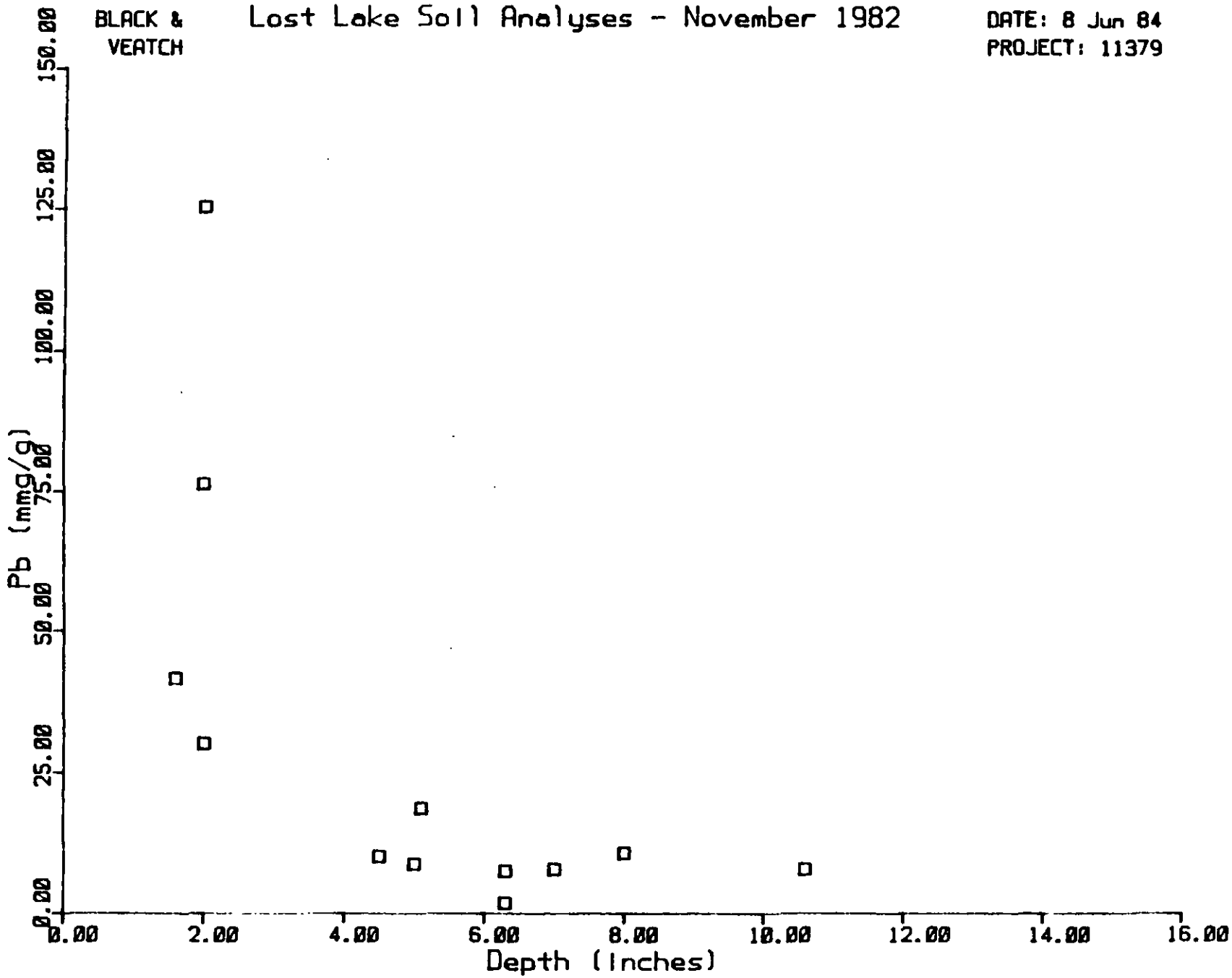

BLACK &
VERTCH
Seep Area Soils 11/82 - Truncated
DATE: 5 Jul 84
PROJECT: 11379
Lead (mmO/g)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Depth (inches)

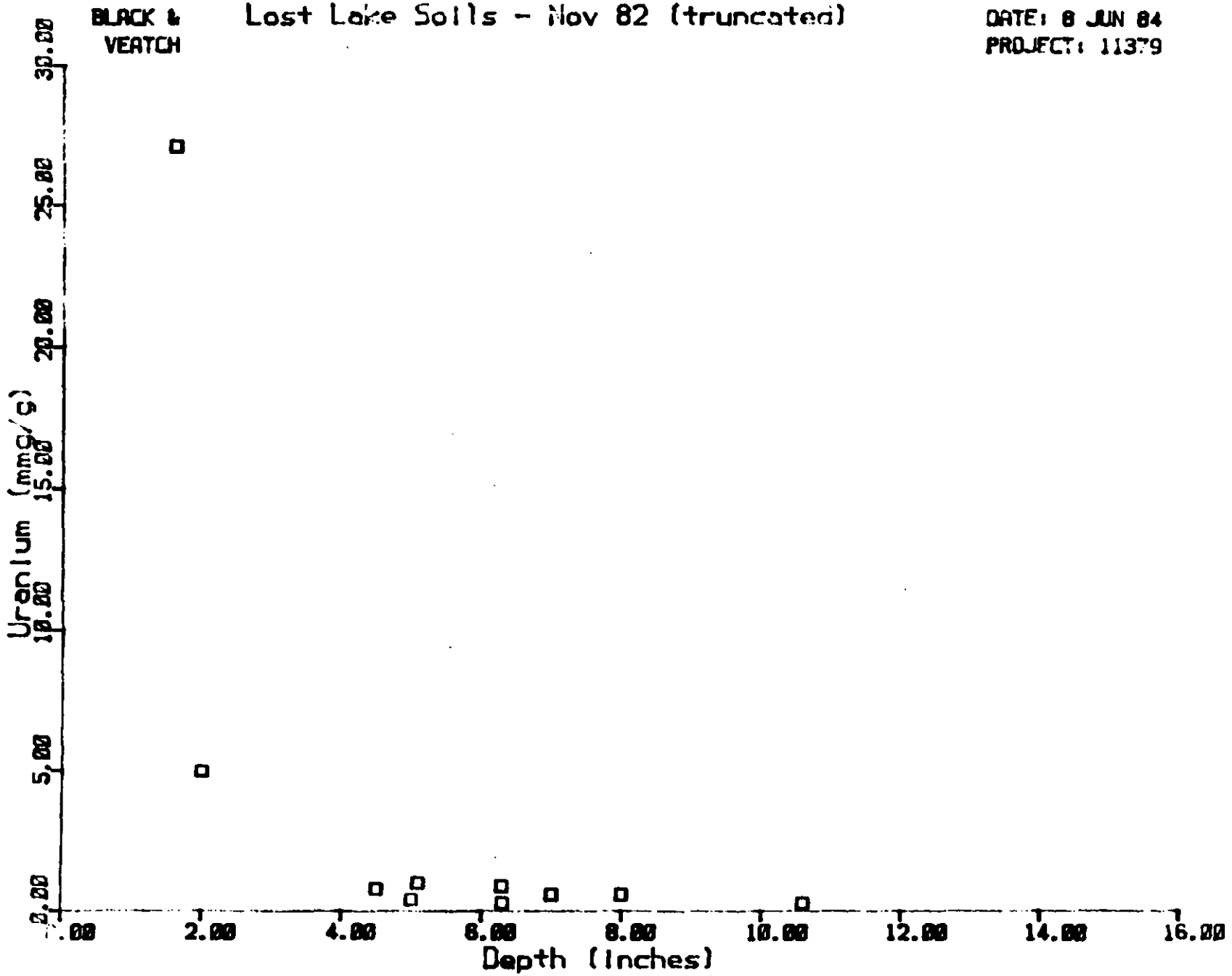

BLACK &
VEATCH
Seep Area Soils 11/82 Data
DATE: 5 Jul 84
PROJECT: 11379
Nickel (mmg/g) *10²
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Depth (Inches)


BLACK &
VEATCH
Seep Area Soils 11/82 Data - Truncated
DATE: 5 Jul 84
PROJECT: 11379
Nickel (mmg/g)
18.00
15.00
12.00
9.00
6.00
3.00
0.00
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Depth (Inches)


BLACK & VEATCH
Seep Area Soils 11/82 Data
DATE: 5 Jul 84
PROJECT: 11379
Uranium (mmo/g) *10⁻¹
300.00
250.00
200.00
150.00
100.00
50.00
0.00
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Depth (inches)


BLACK &
VERTCH
Seep Area Soils 11/82 Data - Truncated
DATE: 5 Jul 84
PROJECT: 11379
Uranium (mmg/g)
0.00
6.00
12.00
18.00
24.00
30.00
36.00
0.00
3.00
6.00
9.00
12.00
15.00
18.00
21.00
24.00
Depth (Inches)


BLACK &
VEATCH
Lost Lake Soil Analyses - November 1982
DATE: 8 Jun 84
PROJECT: 11379
Pb (mmg/g)
150.00
125.00
100.00
75.00
50.00
25.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Depth (Inches)


BLACK &
VEATCH
Lost Lake Soils - Nov 82 (truncated)
DATE: 8 JUN 84
PROJECT: 11379
Uranium (mmC/C)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
Depth (Inches)

# APPENDIX C

# SAMPLING PROTOCOL

## 1.0 INTRODUCTION

This Appendix presents specific information concerning the collection of samples at the Savannah River Plant (SRP). Included are sections on sample containers and preservation, sample classification, field procedures, decontamination, sample documentation and custody, sample packaging and shipment, safety, blanks, and duplicates.

It is suggested that an engineer or scientist supervise the collection, handling, packing, and shipment of samples on Du Pont's behalf to allow meaningful interpretation of data on contaminant characterization at SRP.

The sampling protocols contained in this Appendix are recommendations based on review of currently available SRP data, and experience in developing and implementing environmental sampling and analysis programs. They are not intended to restrict sampling methods used by the selected subcontractor. While some of the analytical methods to be used are specified in EPA Regulations (40 CFR 136), the sampling methods are guidelines based on EPA Procedures during enforcement investigations of hazardous waste sites. Since many sampling and analytical practices have been standardized, there is no reason to undertake the characterization activities using other methods.

## 2.0 SAMPLE CONTAINERS AND PRESERVATION

It is important that samples contain enough physical material for the laboratory to complete the required analyses. Due to differences in instrumentation and analytical methods, different sample amounts are required. Table 1 shows the containers needed for each type of sample to be analyzed.

TABLE 1

SAMPLE CONTAINERS

| Sample Type | Container Type* | Number of Containers per Sample |
|---|---|---|
| Water, VOA | 40 ml glass vial | 2 |
| Water, extractable organics | 1/2 gal amber glass | 2 |
| Water, inorganics | 1 liter polyethylene | 1 |
| Water, cyanide | 1 liter polyethylene | 1 |
| Soil, organics | 8 oz. wide mouth jar | 1 |
| Soil, inorganics | 8 oz. wide mouth jar | 1 |
| Contaminants or high hazard samples | 8 oz. wide mouth jar | 1 |

*All containers should have teflon-lined screw caps.

Source: User's Guide to the Contract Laboratory Sample Analysis Programs, EPA, 1981.

Table 2 shows the containers necessary for each of the analytical groups of parameters contained in Appendix A. It is recommended that cyanide ($CN^-$) be added to the inorganic analyses to demonstrate that it does not exist in quantities sufficient to affect the issuance of a facility permit by EPA or the SCDHEC. In addition, the removal of bis(chloromethyl)ether from the Type D analysis will allow the sample to be collected in only two 40 ml vials, rather than in two additional 1/2 gallon amber glass jars. It is also recommended that the Total Organic Carbon and Total Organic Halogen analyses be deleted from Type B and Type E analyses since specific constituent information will be provided for each sample.

TABLE 2

CONTAINERS FOR SPECIFIC ANALYTICAL GROUPS OF PARAMETERS

| Analytical Parameters/Matrix | Sample Container | Number of Containers per Sample |
|---|---|---|
| Type A (Physical)/Water | 8 oz. wide mouth jar | 1 |
| Type B (Inorganic)/Water | 1 liter polyethylene | 2 |
| Type B (Inorganic)/Soil | 8 oz. wide mouth jar | 1 |
| Type C (Organic)/Water | 40 ml glass vial<br>1/2 gal amber glass | 2<br>2 |
| Type C (Organic)/Soil | 8 oz. wide mouth jar | 1 |
| Type D (Selected Organics)/ Water | 40 ml glass vial | 2 |
| Type D (Selected Organics)/ Soil | 8 oz. wide mouth jar | 2 |
| Type E (Selected Inorganics)/ Water | 1 liter polyethylene | 1 |
| Type E (Selected Inorganics)/ Soil | 8 oz. wide mouth jar | 1 |
| Type F (Physical)/Soil | 8 oz. wide mouth jar | 1 |

Archiving of samples is recommended only when it will not be possible to obtain a sample at a future date, such as after building construction. An archived sample will yield questionable analytical results, especially for organic chemicals. In addition, results from archived samples will probably not be recognized by regulatory agencies.

In order to minimize chemical and physical changes in the sample between collection and analysis, it is necessary to preserve each sample according to the methods shown in Table 3. For valid analytical results, the holding times shown in Table 3 should not be exceeded before analysis.

TABLE 3

SAMPLE PRESERVATION METHODS

| Sample Type | Preservation Method | Holding Time |
|---|---|---|
| Water, VOA | Cool to 4 C | 7 days |
| Water, extractible organics | Cool to 4 C | 5 days |
| Water, inorganics | Add conc. $HNO_3$ to pH 2 | 30 days |
| Water, cyanide | Add 6N NaOH to pH 12; cool to 4 C | 30 days |
| Soil, organics | Cool to 4 C | 7 days |
| Soil, inorganics | None required | 30 days |
| Contaminants or high hazard samples, organics | None required | 7 days |
| Contaminants, inorganics | None required | 30 days |

Source: Enforcement Considerations for Evaluations of Uncontrolled Hazardous Waste Sites by Contractors, EPA, 1980.

## 3.0 SAMPLE CLASSIFICATION

Samples are classified as low, medium, or high concentration depending on the amount of contaminants present. This classification is important because different regulations apply for shipping, packaging, and labeling high concentration samples. In addition, the analytical laboratory needs some indication of contaminant concentrations to safely analyze the samples and stay within the operating ranges of the analytical instruments. The basis for sample classification is shown in Table 4.

TABLE 4

SAMPLE CLASSIFICATION

| Classification | Contaminant Concentration |
|---|---|
| Low | Up to 10 ppm (0.001%) |
| Medium | 10 ppm (0.001%) - 150,000 ppm (15%) |
| High | Greater than 150,000 ppm (>15%) |

## 4.0 FIELD PROCEDURES

### 4.1 Decontamination and Cross-contamination

In order for representative samples to be taken and analyzed, all sampling equipment must be decontaminated prior to its first use and before every succeeding use. This will prevent the occurrence of cross-contamination between sampling points and will prevent the introduction of contaminants into the sample. The decontamination solutions to be used will vary with each piece of sampling equipment, but decontamination generally follows a wash-rinse-wash-rinse pattern. Any equipment, such as drill rigs, brought on-site during the investigation will be thoroughly decontaminated before leaving the site. This will eliminate the potential spread of contaminants to off-site locations. For these reasons, sampling equipment should be made of materials that will clean easily, such as stainless steel or teflon. In addition, sample containers should be wrapped with plastic in the event of the sample spills onto the outside of the container.

### 4.2 Sample Documentation and Custody

Prior to taking the samples, each should be assigned a unique sample number. This will assist in accurately tracking the samples through

analysis and correlating the results with sample location. If litigation is anticipated, chain-of-custody procedures should be followed to ensure that samples were not intentionally altered. Most laboratories can provide chain-of-custody forms and seals. The sampling team should record pertinent information about each sample in a field log. This information includes sample number, time, location, sampling method, decontamination procedures, and other field observations. Photographs taken during sampling will assist in documenting methods and site conditions.

4.3 Sample Packaging and Shipment

Sample bottles should be placed in plastic bags and packed in coolers with enough inert packing material to minimize breakage. Ice should not be used as packing material. Accompanying paperwork will be sealed in a plastic bag and taped to the inside cover of the cooler. The cooler and drain plug should be sealed with duct tape or strapping tape before shipment.

Some commercial laboratories provide shipping containers for sample shipment and directions for these containers should be followed if they are used.

High and medium concentration samples need to be sealed inside a metal paint can before placing them in the cooler. Appropriate labels must be affixed to the cans and cooler before shipment. Department of Transportation regulations covering shipment of samples and hazardous materials are found at 49 CFR 171 and 172.

4.4 Safety

A complete site safety plan should be developed prior to issuance of the bid specifications, since the level of personal protection used can

affect work efficiency and cost. The safety plan should address levels of personal protection requied, action levels for changes in personal protection, chemical and physical site hazards, laboratory safety, emergency response procedures, and locally available emergency and medical services. In addition, a radiation monitor and personal film badges should accompany a sampling team.

4.5 Blanks

For every sampling method used, a "method blank" should be prepared using either ultra-pure water or reagent grade diatomaceous or infusorial earth. These method blanks will provide information about contamination caused by the actual sampling method and are important in the overall QA/QC process.

4.6 Duplicates

To provide an additional quality control check, duplicate samples should be taken for 10 percent of the samples. These duplicates should be taken at the same time as the primary sample, and if possible, no indication should be given to the analytical personnel that the sample is a duplicate.

# APPENDIX D

# RANDOM NUMBER TABLES

```
LIST

SKB          28-Jun-84    11:51

10 RANDOMIZE
20 OPEN "LP:" FOR OUTPUT AS FILE #1
30 PRINT #1,CHR$(27)+"[4w"
40 FOR I%=1% TO 500%
50 PRINT #1,INT(100%*RND)+1%;
60 NEXT I%
70 CLOSE #1
80 END
Ready
```

31 8 97 38 88 48 51 76 46 70 71 51 79 5 19 3 45 99 74 93 73 68 98 46 60 33 63 64 24 41 1 35 46
58 4 78 52 84 14 20 48 99 39 29 55 88 8 5 68 65 98 16 83 74 10 81 85 74 31 43 89 50 64 60 47 85
33 26 88 49 14 62 84 16 33 48 18 93 64 75 18 55 37 41 29 63 1 97 12 29 2 91 96 61 74 72 88 32 17
51 49 54 32 21 11 16 42 44 60 9 62 62 12 30 96 90 60 70 91 78 97 29 41 65 79 59 55 32 100 23 22 84
28 72 31 83 53 41 89 47 48 25 93 90 81 69 100 19 26 90 93 44 22 47 94 43 96 78 41 27 13 36 45 17
67 63 56 27 1 8 73 81 37 46 24 94 13 76 61 97 89 85 95 45 74 18 44 47 20 5 25 28 36 96 2 83 61 58
37 46 94 11 71 63 95 86 51 54 19 79 98 20 10 23 69 3 9 36 12 63 99 1 22 3 58 35 99 82 100 37 5 30
8 82 31 23 52 9 57 5 45 22 23 70 46 17 70 78 9 2 60 82 26 40 21 44 60 57 33 1 12 17 42 71 2 81
34 21 74 38 20 21 43 81 47 38 61 6 51 22 98 50 64 97 98 57 17 96 86 95 60 97 78 82 23 39 6 88 68
55 22 45 78 15 57 22 62 1 51 4 6 17 76 66 17 31 47 26 1 75 95 9 6 3 6 12 18 74 15 9 29 25 52 36
33 2 36 90 6 26 89 48 38 44 35 6 1 90 23 70 23 35 50 53 66 20 28 10 95 90 22 62 88 3 9 8 54 38
57 26 52 15 23 60 76 82 8 16 76 29 14 80 68 75 87 86 33 15 47 65 85 77 97 68 83 90 63 55 29 8 60
93 42 69 55 37 41 95 61 86 75 60 97 29 52 70 72 36 86 20 76 77 2 67 74 14 15 65 73 56 100 34 8 88
29 100 78 95 46 34 96 43 99 19 79 75 9 17 20 31 68 52 57 72 4 85 67 77 46 41 16 7 11 68 37 87 19
59 9 54 20 72 13 73 31 56 62 71 17 16 93 31 31 40 68 13 24 43 29 21 3 74 35 47 48 4 25 79 20 90

```
LIST

BKB          28-Jun-84    11:02

10 RANDOMIZE
20 OPEN "LP:" FOR OUTPUT AS FILE #1
30 PRINT #1,CHR$(27)+'[4w'
40 FOR I%=1% TO 500%
50 PRINT #1,INT(100%*RND)+1%;
60 NEXT I%
70 CLOSE #1
80 END
Ready
```

14 54 22 88 98 55 19 17 84 32 92 21 61 97 15 23 45 41 87 74 90 84 56 24 58 11 32 8 14 21 69 19 15
2 73 51 1 33 93 93 37 38 48 95 71 17 29 34 6 93 98 64 100 34 55 31 37 5 1 30 37 56 33 55 56 83 [illegible]
61 14 54 12 97 73 42 75 44 78 1 77 57 59 26 83 18 96 1 53 67 56 22 93 17 88 31 59 55 95 35 65 [illegible]
49 52 68 40 13 3 56 51 49 36 71 76 95 3 95 53 34 95 96 15 41 36 83 39 63 33 12 100 29 3 95 37 20
73 49 74 83 18 24 82 6 14 73 72 15 11 60 10 57 72 21 60 86 62 56 26 40 1 55 95 71 72 50 85 49 51
47 46 96 39 21 19 33 22 59 33 57 38 81 99 19 42 63 62 67 14 17 64 9 34 5 72 50 60 74 60 80 100 82
42 33 97 1 13 10 96 12 58 98 10 42 92 100 39 97 6 70 57 94 50 65 73 51 76 19 59 28 29 68 29 49 1
69 98 31 4 61 90 30 67 91 71 40 77 97 99 54 84 2 76 26 78 7 56 51 20 82 42 92 3 18 15 23 86 33 12
36 20 35 95 82 39 9 12 43 69 22 87 19 61 36 31 32 75 55 7 60 32 2 34 57 93 87 18 6 72 27 70 47 31
54 91 35 2 2 39 23 26 94 29 48 83 38 93 80 27 8 12 41 72 90 46 94 3 35 74 100 74 62 5 100 34 90
67 99 85 30 24 100 32 64 53 92 30 97 58 42 88 3 46 51 66 90 60 35 53 69 8 32 54 48 81 67 11 90 52
65 61 79 63 11 87 46 33 92 14 14 66 2 99 7 46 13 67 89 24 66 31 93 46 86 69 78 9 74 2 45 76 98 27
27 19 61 51 65 8 60 24 6 28 51 100 33 31 12 54 28 78 2 31 99 40 96 23 3 56 20 72 77 74 36 64 32
67 56 12 28 17 88 94 60 11 44 16 68 69 92 85 83 18 88 22 36 57 4 51 72 89 86 100 74 45 45 71 42 93
41 57 42 92 21 28 78 45 32 21 63 9 10 23 12 54 42 66 28 78 20 96 89 83 15 100 20 42 28 34 79 26 81
12

```
LIST

SKB          28-Jun-84    11:02

10 RANDOMIZE
20 OPEN "LP:" FOR OUTPUT AS FILE #1
30 PRINT #1,CHR$(27)+'[4w'
40 FOR I%=1% TO 500%
50 PRINT #1,INT(100%*RND)+1%;
60 NEXT I%
70 CLOSE #1
80 END
Ready
```

63 26 85 58 42 6 12 37 1 60 78 40 100 15 13 8 54 22 3 29 63 16 35 56 43 85 14 8 61 26 86 30 85 14
69 98 66 31 93 47 64 67 65 97 1 71 24 50 74 69 9 88 44 46 79 75 54 7 14 20 10 39 48 76 34 35 92
70 97 48 1 58 62 60 64 95 79 34 87 93 9 67 14 61 93 97 99 59 45 11 63 97 18 91 97 20 63 43 15 70
61 15 79 43 41 16 1 6 27 51 60 56 84 44 70 66 48 8 22 50 17 52 47 87 47 14 60 72 20 56 37 26 19
21 18 28 41 93 89 54 30 18 38 49 24 89 32 56 70 61 26 60 73 3 29 44 37 15 29 87 18 59 91 16 73 85
69 80 41 23 5 84 41 55 47 19 35 25 60 48 43 73 88 82 58 60 47 68 19 100 33 47 32 31 28 16 40 29 49
4 19 20 42 46 76 5 32 78 39 51 92 33 25 11 49 91 36 48 70 1 83 9 26 3 38 49 35 53 100 12 68 69 43
85 90 50 71 45 56 84 47 82 8 51 22 17 74 56 15 6 44 47 18 3 63 15 30 9 89 24 42 37 68 79 62 50 77
72 20 6 38 47 74 16 3 15 14 39 1 8 68 25 4 10 76 98 86 73 63 48 18 22 89 71 97 76 47 88 60 63 77
69 18 100 31 70 94 26 10 77 97 1 73 13 6 53 40 71 85 19 45 35 84 76 7 44 68 79 91 37 78 86 100 58
11 62 82 71 66 96 76 10 36 57 65 100 63 77 59 36 94 83 23 4 95 12 25 92 72 73 29 31 60 30 10 78 48
96 39 53 32 3 46 70 94 100 34 41 4 59 87 92 68 32 16 35 71 54 38 22 12 52 76 98 31 69 65 50 8 46
63 39 71 16 75 6 36 55 97 26 41 66 95 59 33 48 77 66 25 72 20 81 91 4 91 59 65 97 7 4 60 35 11 73
93 11 7 72 21 31 15 74 91 88 58 38 2 19 2 66 83 10 82 31 51 42 61 13 33 19 8 96 93 97 79 87 87 75
91 21 47 73 88 16 50 41 91 57 6 30 27 3 8 75 33 41 60 37 63 17 11 28 61 34 14 61 46 55 74 91

BLACK & VEATCH
ENGINEERS-ARCHITECTS

TEL. (913) 967-2000
TELEX 42-6263

1500 MEADOW LAKE PARKWAY
MAILING ADDRESS: P.O. BOX NO. 8405
KANSAS CITY, MISSOURI 64114

September 24, 1984

E. I. duPont de Nemours & Co., Inc.
Savannah River Laboratory
Aiken, South Carolina 29808

Attn: J. B. Pickett, 773-42A; Room 247

Dear Mr. Pickett:

Black & Veatch concurs with the Sampling and Analysis Plan for M-Area Basin dated September 4, 1984. The data from this sampling effort will be sufficient to develop closure alternatives for the basin.

Phase 2 of the sampling program will be developed at a later date to provide characterization of the organics in the unsaturated zone and near Location D in the basin. Selection of a final closure plan will follow Phase 2 characterization.

Very truly yours,

BLACK & VEATCH

Larry T. Schaper

Larry T. Schaper

lj

OSR 24-A116
(REV 10-81)

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

ATOMIC ENERGY DIVISION
SAVANNAH RIVER LABORATORY
AIKEN, SOUTH CAROLINA 29808-0001
(TWX. 810-771-2670 TEL. 803-725-6211, WU: AUGUSTA, GA.)

BCC: L. P. Fernandez, SRP
C. F. Muska
W. P. Colven
C. R. Sherman
J. C. Corey
D. E. Gordon
B. B. Looney
HWM Chron File

September 4, 1984

Black and Veatch
Engineers-Architects
1500 Meadow Lake Parkway
P. O. Box No. 8405
Kansas City, Missouri 64114

Attention: L. T. Schaper

**SAMPLE AND ANALYSIS PLAN FOR M-AREA BASIN**

In a meeting held August 23, 1984 representatives of Black and Veatch (L. T. Shaper and S. K. Booth) and DuPont (J. B. Pickett, W. P. Colven, and C. R. Sherman) agreed upon a detailed sampling and analysis plan for the M-Area Settling Basin and vicinity. The final plan was based on a characterization plan proposed by DuPont (Ref 1) and one proposed by Black and Veatch Engineers (Ref 2). These two plans differed mainly in small details (such as depth of sample, specific sample location, etc.) and resolving the differences to the satisfaction of both parties was not difficult.

DuPont has contracted Black and Veatch to prepare a closure plan for the M-Area Settling Basin based on the results of this characterization plan (Ref 3). The Black and Veatch representatives stated that they believed this final characterization plan would provide sufficient information to develop their closure plan.

The final characterization plan (as reconstructed from my meeting notes) is given in Table I. Please confirm that this plan agrees with your notes of the meeting and reply in writing that this plan is one which is acceptable to Black and Veatch.

The original DuPont and Black and Veatch tables are given in Tables 2 and 3. The final plan reduced the number of samples and analysis proposed by DuPont (Ref 1) as shown below:

| | Initial DuPont Plan | | Final DuPont/B & V Plan | |
|---|---|---|---|---|
| Analysis Type | Full | Limited | Full | Limited |
| Liquid | 2 | 18 | 2 | 16 |
| Sludge | 10 | 65 | 9 | 52 |
| Soil | 23 | 314 | 12 | 303 |

This will provide an estimated cost reduction of $20 - 25,000 versus the initial DuPont plan.

Sincerely,

John B. Pickett

JBP:ckf

## REFERENCES


1. J. B. Pickett, **Program for Characterization of Chemical and Radioactive Contamination of M-Area Settling Basin, Adjacent Outflow, and Lost Lake,** DPST-84-603, E. I. du Pont de Nemours and Co., Savannah River Laboratory, Aiken, SC (July 24, 1984).

2. L. T. Schaper, **Report on Review of Characterization Program for M-Area Settling Basin and Contiguous Areas,** Black and Veatch Engineers-Architects, Kansas City, Missouri. (July 23, 1984).

3. Purchase Requisition AX-654789.

**TABLE 1. Final Analysis Scheme (DuPont and Black and Veatch Combined)**

| Sample Description | No. of Locations | | | Split per Sample | No. of Samples for Analysis | Sample Analysis - Number of Samples x Type* |
|---|---|---|---|---|---|---|
| | Total | Archived | Analysed | | | |
| **Process Sewer Line** | | | | | | |
| Deep Soil Samples (3-4 diameter, 6' of soil core, below process sewer line) | 14 | 0 | 14 | 6<br>6, 1' fractions | 84 | 82 x E<br>40 x D<br>2 x B, C |
| **Settling Basin** | | | | | | |
| Water samples (1 L per sample) | 18 | 0 | 18 | - | 18 | Liquid-16 x A,D,E<br>- 2 x A,B,C |
| Sludge - (3-4" diameter) | 16 | 8 | 8 | -<br>(1-2' of sludge) | 8 | Sludge- 6 x A,D,E<br>- 2 x A,B,C |
| Shallow soil cores (3-4" diameter, 6' deep from bottom of basin) | 8 | 4 | 4 | 6<br>(~6, 1' fractions) | 24 | Soil-22 x D,E<br>- 2 x B,C |
| Adjacent soil cores (2-4" diameter, 21' deep) | 4 | 0 | 4 | 9 (3, 5' segments plus 6, 1' segments from Bottom 6 feet) | 36 | Soil-36 x D,E |
| Reference soil cores (2-4" diameter, 20' deep, ~150' away from basin) | 2 | 0 | 2 | 8<br>(2, 4' segments plus 6, 2' segments) | 16 | Soil-14 x D,E<br>2 x B,C |
| **Overflow Ditch** | | | | | | |
| Sludge - soil/sediment (1-2" diameter; ~4.5' deep, from center of ditch) | 8 | - | 8 | 5<br>(~1' of sludge; 4 soil fractions, 6", 1', 1', 1') | 40 | Sludge-7 x A,D,E<br>-1 x A,B,C<br>Soil-30 x D,E<br>- 2 x B,C |
| Shallow soil cores on either side of ditch (1-2" diameter, 3.5' deep) | 8 | - | 8 | 4<br>(6", 1', 1', 1' fractions) | 32 | Soil-32 x D,E |
| **Seep Area** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~3' deep) | 36 | 18 | 18 | 3<br>(1-2' of sludge; upper 4-6" soil; lower 1' of soil) | 54 | Sludge-16 x A,D,E<br>- 2 x A,B,C<br>Soil-34 x D,E<br>- 2 x B,C |
| Shallow soil core (1-2" diameter, ~6' deep) | 2 | - | 2 | 8<br>(1-2' of sludge plus upper 6" soil + 6 - 1 foot fractions) | 16 | Sludge- 2 x A,D,E<br>Soil -14 x D,E |
| **Lost Lake** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~2-3' deep) | 25 | 0 | 25 | 2<br>(upper ~6" of sludge; bottom 12" soil) | 50 | Sludge-23 x A,D,E<br>- 2 x A,B,C<br>Soil-23 x D,E<br>- 2 x B,C |
| Reference Soil Cores 2-4" diameter, 10' deep, ~150' away from Lake) | 2 | - | 2 | 5<br>(2' fractions) | 10 | Soil-10 x D,E |
| **Outflow Ditch** | | | | | | |
| Shallow soil cores (2-3" diameter, 4' deep) | 3 | - | 3 | 2<br>(upper 6" and lower 12" fractions) | 6 | Soil-6 x D,E |

*Sample Groups defined in Appendix A

## TABLE 2. Initial DuPont Sample and Analysis Scheme

| Sample Description | No. of Locations Total | Archived | Analyzed | Split per Sample | Total No. of Samples for Analysis | Sample Analysis - Number of Samples x Type* |
|---|---|---|---|---|---|---|
| **Process Sewer Line** | | | | | | |
| Deep Soil Samples (3-4 diameter, 5' of soil core, below process sewer line) | 8 | 0 | 8 | 5 | 40 | 40 x D,E |
| **Settling Basin** | | | | | | |
| Water samples (1 L per sample) | 20 (4 at 5 locations) | - | 20 | - | 20 | Liquid-18 x A,D,E<br>- 2 x A,B,C |
| Sludge - soil/sediment (1-2" diameter, 2-3' deep) | 32 | 16 | 16 | 2 (1-2' of sludge; ~6" of soil/sediment) | 32 | Sludge-14 x A,D,E<br>- 2 x A,B,C<br>Soil/Sediment-14 x D, E<br>- 2 x B,C |
| Shallow soil cores (3-4" diameter, 6' deep from bottom of basin) | 6 | 3 | 3 | 6 (~6, 1' fractions) | 18 | Soil-15 x D,E<br>- 3 x B,C |
| Adjacent soil cores (2-4" diameter, 20' deep, Lower 5') | 4 | 0 | 4 | 5 (5, 1' segments of Bottom 5 feet) | 20 | Soil-20 x D,E |
| Reference soil cores (2-4" diameter, 20' deep, ~150' away from basin) | 3 | 0 | 3 | 10 (5, 3' segments plus 5, 1' segments) | 30 | Soil-30 x D,E - |
| **Overflow Ditch** | | | | | | |
| Sludge - soil/sediment (1-2" diameter; ~4' deep, from center of ditch) | 8 | - | 8 | 4 (~1' of sludge; 3, 1' soil fractions) | 32 | Sludge-6 x A,D,E<br>-2 x A,B,C<br>Soil-20 x D,E<br>- 4 x B,C |
| Shallow soil cores on either side of ditch (1-2" diameter, 4' deep) | 8 | - | 8 | 4 (1 foot fractions) | 32 | Soil-32 x D,E |
| **Seep Area** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~3' deep) | 40 | 20 | 20 | 3 (1-2' of sludge; upper 4-6" soil; lower 1' of soil) | 60 | Sludge-18 x A,D,E<br>- 2 x A,B,C<br>Soil-36 x D,E<br>- 4 x B,C |
| Shallow soil core (2-3" diameter, 6' deep, from bottom of seep area) | 2 | - | 2 | 6 (6 - 1' fractions) | 12 | Soil-12 x D,E<br>-2 x B,C |
| **Lost Lake** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~2-3' deep) | ~50 | 25 | 25 | 3 (upper ~6' of sludge; 6-10" intermediate soil layer; bottom 12" soil) | 75 | Sludge-21 x A,D,E<br>- 4 x A,B,C<br>Soil-42 x D,E<br>- 8 x B,C |
| Soil samples at edge of Lost Lake (1-2" diameter, 3' deep) | ~14 | 7 | 7 | 3 (1' fractions) | 21 | Soil-21 x D,E |
| Reference Soil Cores 2-4" diameter, 20' deep, ~150' away from Lake) | 2 | - | 2 | 10 (2' fractions) | 20 | Soil-20 x D,E |
| **Outflow Ditch** | | | | | | |
| Shallow soil cores (2-3" diameter, 4' deep) | 3 | - | 3 | 4 (1' fractions) | 12 | Soil-12 x D,E |

*Sample Groups defined in Appendix A

TABLE 3. Initial Black and Veatch Analysis Scheme

| Sample Description | No. of Sample Locations | Samples per Location | Total No. of Samples for Analysis | Number of Samples x Types of Analysis |
|---|---|---|---|---|
| PROCESS SEWER | | | | |
| Soil | * | 6 | | 80% x D,E,F<br>20% x B,C,F |
| SETTLING BASIN | | | | |
| Liquid Samples (2 strata) | 18 | - | 18 | 14 x A,D,E<br>4 x A,B,C |
| Sludge/Soil | 8 | 7 | 56 | 14 x D,E,F<br>42 x B,C,F |
| Sludge/Soil at Location D | 9 | 7 | 63 | 63 x B |
| Adjacent Soils | 4 | 9 | 36 | 36 x D,E,F |
| OVERFLOW DITCH | | | | |
| Sludge/Soils | 13 | 4 | 52 | 44 x D,E,F<br>8 x B,C,F |
| SEEP AREA | | | | |
| Sludge/Soil | 18 | 4 | 72 | 56 x D,E,F<br>16 x A,B,F |
| LOST LAKE | | | | |
| Sludge/Soil | 25 | 2 | 50 | 40 x D,E,F<br>10 x B,C,F |
| OUTFLOW | | | | |
| Soil | 2 | 2 | 4 | 4 x D,E,F |
| REFERENCE | | | | |
| Near Process Line/Basin | 2 | 8 | 16 | 8 x D,E,F<br>8 x B,C,F |
| Near Seep Area/Lost Lake | 2 | 7 | 14 | 7 x D,E,F<br>7 x B,C,F |

*To be determined in field.

## APPENDIX A

### Type "A" Analyses: Physical Parameters

pH (water)
Conductivity (water)
Temperature (water)
TDS (water)
Specific gravity (water and sludge)
% Solid

### Type "B" Analyses: Inorganic Chemicals

Ammonia (as N)
Chloride
Bromide
Fluoride
Nitrate/Nitrite (as N)
Phosphorus, total
Sulfate (as $SO_4$)
Sulfide (as S)
Cyanide

Aluminum
Barium
Boron
Iron, total
Magnesium
Calcium
Sodium
Potassium
Manganese
Tin
Titanium
Antimony
Arsenic

Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Zinc
Uranium

Radioactivity
- Gross Alpha (pCi/L)
- Gross Beta (pCi/L)
- Radium, total (pCi/L)

Total Organic Carbon
Total Organic Halogen

Type C Analyses: Full organic chemical scan, per Appendix VIII of 40 CFR 261.

Acetonitrile
Acrolein
Acrylamide
Acrylonitrile
Benzene
Benz(a)anthracene
Benzo(a)pyrene
Benzotrichloride
Benzyl chloride
Benzo(b)fluoanthene
Bis(2-chloroethyoxymethane)
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Carbon disulfide
Carbon tetrachloride
Chlordane
Chlorinated dibenzodioxins
Chlorinated biphenyls
Chloroacetaldehyde
Chlorobenzene
Chloroform
Chloromethane
2-Chlorophenol
Chrysene
Creosote
Cresol(s)
Cresylic Acids(s)
Dichlorobenzene(s)
1,1-Dichloroethene
1,2-Dichloroethene
1,1-Dichloroethene*
Dichloromethane
Dichlorophenoxyacetic acid
Dichloropropanol
2,4-Dimethylphenol
Dinitrobenzene
4,6-Dinitro-o-cresol
2,4-Dinitrotoluene
Endrin
Ethyl ether
Formaldehyde
Formic acid
Heptachlor
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Hexachlorocyclopentadiene
Lindane
Maleic anhydride
Methanol
Methomyl
Methyl ethyl ketone
Methyl isobutyl ketone
Napthalene
Napthoquinone
Nitrobenzene
4-Nitrophenol
Paradehyde (trimer of acetaldehyde)
Pentachlorophenol
Phenol
Phorate
Phosphorodithioic acid esters
Phthalic anhydride
2-Picoline
Pyridine
Tetrachlorobenzene(s)
Tetrachloroethane
Tetrachloroethylene
1,2 trans-dichloroethylene*
Tetrachlorophenol
Toluene
Toluenediamine
Toluene diisocyanate(s)
Toxaphene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluormethane
Trichlorophenol(s)
2,4.5-Trichlorophenoxy propionic acid
Trichloropropane
Vinyl chloride
Vinylidene chloride (1,1-dichloroethane)
Xylene
Bis(chloromethyl)ether**

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*Additional volatile organics not in 40 CFR 261 listing.
**Constituent listed as Type D in original plan.

**Type "D" Analyses: Volatile Organics**

Acrolein
Acrylonitrile
Benzene
Bromoform
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Dichlorobromomethane
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl bromide
Methyl chloride
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Perclene®)
Toluene
1,2-trans-Dichloroethylene
1,1,1-Trichloroethane (1,1,1-TCE)
1,1,2-Trichloroethane
Trichloroethylene (Triclene®)
Trichlorofluoromethane
Vinyl Chloride

**Type "E" (Reduced Level of Inorganic Analyses)**

| | | |
|---|---|---|
| Na | Cr | Cl |
| K | Pb | $NO_3$ (as N) |
| Ca | Ni | $NH_3$ (as N) |
| Mg | Cu | P, total |
| Fe | Hg | Total organic carbon |
| Al | Zn | Total organic halogen |
| Mn | U | |
| Cd | | |

APPENDIX B

# REVISED SPECIFICATIONS FOR CHARACTERIZATION OF M-AREA SETTLING BASIN

July 1, 1984
Revised: November 12, 1984

# REVISED SPECIFICATIONS: FOR COLLECTION AND ANALYSIS OF SEDIMENT AND SOIL SAMPLES FROM M-AREA SETTLING BASIN, OVERFLOW AREA, AND LOST LAKE

## BACKGROUND

The Savannah River Plant (SRP) is operated by E. I. du Pont de Nemours and Company for the Department of Energy. Process effluents from the M-Area metal finishing operations have been released to the M-Area settling basin (904-51G) since 1958. The effluents (Figure 1) from the basin overflow through an engineered ditch to a natural seepage area, and subsequently to a surface depression called "Lost Lake" (904-112G). The settling basin is filled with water to a depth of 15 feet, the seep area is approximately 2- to 4-feet deep, and Lost Lake ranges from 4 to 10 feet at the center (depending on natural rainfall and surface runoff). Additional characterization of the settling basin is needed in order to close the settling basin pursuant to State and Federal regulations for closure of hazardous waste facilities. The drainage ditch, natural seep area and Lost Lake are not considered to be hazardous waste sites. However, these areas will also be characterized in order to determine if any custodial actions are needed. A number of samples of sludge and soil/sediments will be collected underneath the surface of the water in the basin, seep area, and

Lost Lake. In addition, soil samples will be collected from a few locations underneath the process sewer line leading to the settling basin. Background (or reference) soil samples will be collected near the basin and Lost Lake to provide a valid comparison basis.

Previous characterization studies and operating records of the M-Area process facilities indicate that nitrates, sodium and aluminum hydroxide, phosphates, chlorides, depleted uranium, and nickel have been discharged to the basin. Additional metals such as lead, zinc, copper, chromium, arsenic, cadmium, and silver were found to slightly exceed normal background soil concentrations in a previous study. The majority of the heavy metals are believed to be precipitated as a hydroxide/oxide/phosphate sludge on the bottom of the basin. A previous study indicated none of the heavy metals had traveled more than two to three feet vertically in the soil underlying the basin. In addition to the inorganic materials, three halogenated hydrocarbon degreasing agents were released to the basin. These materials have been found to have migrated to the groundwater underlying the basin. The definition and cleanup of the organic contamination in the groundwater or in the unsaturated (vadose) zone is being treated by a separate program, and will not be a portion of this basin characterization program.

The program for characterizing the basin, overflow area, and Lost Lake will involve the collection and analysis of various types of samples: (1) ~15-foot deep soil samples from a few selected locations beneath the inlet process sewer, (2) "sludge" and shallow

soil cores (~6 feet deep) from the bottom of the basin, (3) soil cores from 20-foot-deep borings near the edge of the basin and (4) 20-foot-deep "reference" soil cores ~150 feet away from the basin, (5) shallow soil cores in the overflow ditch and seep area, and (6) sludge/sediment and shallow soil cores (~2 feet deep) at the bottom of Lost Lake. Eighteen (18) liquid samples will be collected in the basin. Monitoring of the groundwater in the vicinity of these areas is addressed separately and is not included in these specifications.

**OBJECTIVE**

The objective of these specifications is for Du Pont to procure the services of a competent and experienced subcontractor to provide for the collection and analysis of liquid, sludge, and soil samples from the M-Area settling basin, the inlet process sewer line, overflow ditch, seep area, and Lost Lake, and to establish the concentrations of metallic, inorganic, and organic constituents in the samples. The subcontractor is required to provide overall project management for the sample collection and analysis activities.

**SCOPE**

The required services to be provided by the subcontractor include:

1. Professional management of the sampling and analyses
2. Collection of liquid, sludge, and soil samples
3. Preparation of samples for shipment to analytical laboratories

4. Analysis of samples
5. Computerized management of analytical data
6. Documentation of work

1. **Professional Management of Sampling and Analyses**

- The subcontractor shall provide a project manager to be located at the SRP site full time. The project manager shall be responsible for ensuring that the characterization activities are conducted in a safe, efficient, and cost-effective manner. The project manager will be responsible for maintaining a quality assurance program in order to certify the integrity of the sampling and analysis data.
- The sample collection and analysis techniques are to follow current applicable EPA and RCRA guidelines.
- During inclement weather, Du Pont and the subcontractor will consult to determine if it is safe to conduct sampling operations. The subcontractor will not charge Du Pont for periods of downtime which are due to inclement weather.
- Du Pont will provide land use, site clearance, and work clearance permits, as required.
- The subcontractor will make no changes in the approved program proposal without written approval from Du Pont.
- The subcontractor shall be liable for damages at the sampling locations resulting from the subcontractor's negligence, failure to follow proper procedures or specifications, or failure to take proper precautions prior to said damages.

- The subcontractor shall certify that he is licensed to analyze radioactive samples (depleted uranium only), or specify how he intends to handle these samples if he is not so licensed.

**2. Collection of Liquid, Sludge, and Soil Samples**

**(a) Inlet Process Sewer Line**

Previous investigations have shown that the process sewer line from M Area to the settling basin was broken and probably leaking in a few locations. The sewer line is buried approximately 8-feet deep. Samples of the soil underneath the sewer line will be collected by drilling close to the sewer line, at a slight angle. The samples will be analyzed for inorganic and organic contamination. The soil cores are to be about 15-feet deep, with the top 8 to 10 feet discarded, and the bottom 5 feet separated into 1-foot segments for analysis. Eight locations along the pipeline will be specified by Du Pont. The type of procedure (and equipment) for taking these 15-foot-deep soil samples is to be described in the contract proposal.

**Revision**

Based on recent experience in sampling a process sewer line near the metallurgical laboratory, is recommended that the soil on top of the sewer line be excavated. The soil samples can then be collected by hand augering. Three locations along the pipeline will be sampled. Two of these locations will be chosen to correspond to known pipeline cracks and/or evidence of organic solvent contamination. The third location will be near the manhole closest to M-Area basin. The samples will be six (6) feet deep, split into one foot fractions from the bottom of the process sewer. At one location, a sample directly underneath the pipeline will be taken, then three other samples will be taken at one-foot intervals away

from the pipeline, on both sides of the pipeline (seven total cores). At the second location, a six-foot-deep sample will be collected underneath the pipeline, and then one core (one foot away from this pipe) on each side (three total cores). Four cores (6-feet deep) will be collected near the manhole. Therefore, a total of 14 cores will be taken, each split into six, one-foot fractions for analysis. Two of the samples will be fully analyzed,* 82 of the samples will be sampled for inorganics (Type "E" - Appendix A), and 40 of the samples for volatile organics (Type "D" - Appendix A). (See Table 1 - Final Analysis Scheme (Du Pont and Black and Veatch combined).

**(b) M-Area Settling Basin**

- Liquid Samples

Samples of the water in the basin will be taken at five locations. Two samples at each location will be taken of the liquid above the "chemocline", and two samples below the chemocline. The chemocline in M-Area basin was previously found to be characterized by differences in conductivity, specific gravity, nitrate concentration, etc. (Figure 2).

The depth of the chemocline below the surface will be defined by Du Pont personnel at the time the samples are taken. The one liter samples are to be either collected in or transferred to polyethylene or glass containers, and maintained at 4°C until analyzed. Two* of the samples will be "completely" analyzed (i.e., full organic and inorganic scans), while 18** of the samples will be analyzed for volatile organics and a limited inorganic scan. The analysis schemes (i.e., "complete" vs. "limited") are shown in Appendix A.

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* Analysis Types A, B, and C - Appendix A
** Analysis Types A, D, and E - Appendix A

**Revision**

Conductivity, pH, and dissolved oxygen profiles will be taken prior to sampling to determine if stratification exists and its depth. Based on previous data, stratification can be expected at approximately 4-foot depth with a total liquid depth of 12.5 feet. Eighteen samples of the basin liquid are to be obtained. If the basin is stratified, random sampling will be used, with the samples proportioned between the two layers. The proportion of each layer should be based on the ratio of depth of the layer to the overall depth. For stratification at 4 feet, six samples will be taken from the top and twelve from the bottom layer. Samples should be taken from various depths in each layer. Sampling locations were selected randomly and are shown in Figures 3 and 4. One of the samples from above the chemocline and one of the samples from below the stratification is to be analyzed for all the listed inorganic and organic chemicals (Type B & C). All samples will be analyzed for physical properties (Type A). The sixteen remaining samples will be analyzed for limited inorganics and organics (Type D & E).

- Sludge and Soil/Sediment Samples

  Sixteen locations in the basin will be sampled for the layer of sludge at the bottom of the basin, and a few (4 to 10) inches of soil immediately beneath the sludge. These samples are to be collected so that the depth of the water from the surface of the basin to the top of the sludge may be measured and so that the thickness of the sludge layer is measured. One- to two-inch-diameter samples are required. The sampling apparatus is to acquire 4 to 10 inches of the soil/sediment immediately below the sludge layer. The two layers of solids are to be separated and analyzed separately. Two representative corings are to be taken at each of the 16 locations. One of the corings from each location is to be retained as an archive sample, the other is to be analyzed. The sludge layer may be separated from the soil/sediment layer in the field if desired. The subcontractor's

program proposal will specify the technique which he plans to use to acquire these samples. Two of the 16 sludge samples will have a "complete"* analysis, 14 will be analyzed only for "key"** inorganic and organic constituents. The 16 soil/sediment samples will be analyzed in a similar manner.

All of the rest of the samples described in the following sections will be analyzed in the above manner; i.e., a limited number will be analyzed "completely," while the majority of the samples will be analyzed only for key constituents. The sampling scheme and analysis schedule are detailed in Table 1.

- Shallow Soil Samples

Six shallow soil cores (3 to 4 inch diameter) are to be collected from the bottom of M-Area basin. These cores will be approximately 6 feet deep in the soil/sediment at the bottom of the basin. None of the flocculent sludge layer is required in these samples. The depth of the water above the soil/sediment layer is to be determined. Three of the soil cores are to be archived, the other three 6-foot soil cores are to be separated into 1-foot segments. A total of 18 soil/sediment samples are anticipated.

**Revision**

Eight locations in the basin are to be sampled for the layer of sludge, and at four of those locations approximately 6 feet of soil at the bottom of the basin will also be collected. The sludge and soil are to be separated by visual inspection, and the soil separated into six, one-foot fractions for analysis. The sample pattern is shown in Figure 5. An additional sample is to be obtained at each location and retained until the analyses are

completed. Two of the eight sludge samples are to be analyzed fully (e.g., Type A, B, C), while the other six sludge samples will receive limited analysis (Type A, B, E). Of the 24 soil samples, two will receive "full" analysis, 22 a limited analysis.

- Soil Samples Adjacent to Basin

  Four deep soil core samples are to be collected immediately adjacent to the basin. The cores are to be drilled in the basin berm, approximately 10 to 15 feet from the edge of the water. The cores are to be sampled from 15 to 20 feet below the ground surface, and separated into 1 foot segments for analysis. The upper 15 feet of soil will not be retained or analyzed. This 5-foot sample is intended to correspond to the 5 feet of soil immediately below the bottom of the basin. The cores will be collected at each side of the basin, close to the existing groundwater monitoring wells MSB 1A, 2A, 3A, and 4A.

**Revision**

Cores should be drilled near the center of each side of the basin, as close as possible without risking leakage from the basin into the core. The final depth of the four cores should be equivalent to 6 feet below the basin. Overall depth will depend on the elevation of the berm above the water. These cores will provide data on lateral migration of contaminants from the basin. The cores are to be analyzed at 5-foot intervals to the 15-foot depth and at 1-foot intervals beginning at the elevation of the bottom of the basin for selected inorganics and selected organic contaminants (Types D, E).

- Reference Soil Cores

  Three reference soil cores are to be collected near the M-Area basin. The cores are to be taken from 3 sides of the basin, approximately 150 feet away from the basin. The cores are to be 2 to 4 inches in diameter and approximately 20 feet deep. The

cores will be split in 3 foot segments for the upper 15 feet, and then into 1 foot segments from the bottom 5 feet. The lower samples are intended to correspond to the same 5 foot soil horizon that underlies the basin, so the actual depth of the samples may vary slightly, depending on ground surface elevation. Du Pont will specify the exact locations and survey the surface elevations, so that the exact depth may be specified. The 3 feet soil samples from the upper 15 feet will be composited and analyzed similarly as the 1 foot segments from the bottom 5 feet.

**Revision**

Two 20-foot-deep reference cores are to be obtained. The upper 8 feet are to be split into two, 4-foot segments, and the lower 12 feet into six, 2-foot fractions. Two of the 16 total samples are to be analyzed "fully" (Types B and C), 14 of the samples are to receive "limited" analysis (Types D and E).

**(c) Overflow Ditch**

A series of shallow cores is to be collected along the ditch from the overflow of the basin to the natural seep area. The sample cores from the center of the ditch are to be 1 to 2 inches in diameter, and 4 feet deep. At two locations along the ditch, five cores will be taken (one at the center of the ditch, one at each edge, and one approximately 2 to 3 feet away from each edge). The edge samples will be 4 feet deep. Six other locations, approximately 100 feet apart, are to be sampled at the center of the ditch. The sludge/soil samples from the center of the ditch are to be separated into an upper 6 to 12-foot fraction containing any "sludge" material and the

remainder into one-foot segments, and each portion analyzed separately. The samples at the edge of the ditch are to be separated into 12 foot fractions.

**Revision**

Eight locations are to be sampled at the center of the ditch (no revision). However, five sample fractions are to be collected (vs 4 sample fractions previously). The top approximate 1 foot of sludge is to be sampled, and then the next 6 inches of soil, and then three 1-foot segments. The eight cores at the side of the overflow ditch are to be sampled similarly, e.g., top 6 inches of soil and three 1-foot segments. The sample analysis scheme is shown in Table 7.

**(d) Natural Seepage Area**

The overflow ditch drains into a natural depression about two acres in extent. A portion of the flow, which depends on natural rainfall and soil water content, drains out of the seep area into Lost Lake. In the summer of 1981, none of the flow drained out of the seep area resulting in the fact that Lost Lake was dry. About 20 locations in the seep area are to be sampled. The sampling will consist of 1- to 2-inch-diameter cores of the surface "sludge" and underlying soil/sediment. The sludge may vary in depth, but approximately 12 to 18 inches of the underlying soil is to be sampled. Two cores at each location are to be obtained, with one used for analysis, and one core archived. Each core is to be fractionated visually into the upper sludge layer, any intermediate layer (if present), and the underlying soil/sediment.

The locations of the sample cores will be defined in conjunction with Du Pont personnel. Du Pont will be responsible for emplacing surveyed reference points, so that accurate sample locations may be defined.

Two deeper soil cores are to be taken at the location of the maximum heavy metal concentration. The maximum concentration point will be determined by Du Pont personnel, using portable scintillation detectors to detect the maximum concentration of depleted uranium. These soil cores are to be 2 to 3 inches in diameter, and about 6-feet deep. The soil cores are fractionated into 1-foot segments for analysis. The contract proposal is to specify the technique that the subcontractor plans to use to take these 6-foot deep soil samples.

**Revision**

Only 18 locations will be sampled in the seepage area for sludge and shallow soil (vs. 20 initially). Eighteen cores are to be immediately analyzed, eighteen cores are to be retained until the analyses are complete. These samples are to be visually split into the upper 1 to 2 feet of sludge, the upper 4-to 6-inch top layer of soil, and the next 12 inches of soil. An additional two locations will be sampled to a deeper depth. The upper 1 to 2 feet of sludge, the next 6 inches of soil, and approximately 6 feet of soil, split into 1-foot fractions at those two locations. The analysis scheme is shown in Table 1.

**(e) Lost Lake**

A number of soil and sludge/soil samples are to be taken in and around the shore of Lost Lake. Approximately 32 locations are to be sampled, with two cores at each location (one for analysis, one to be archived). The samples from the lake and wet lake-shore area are to include the upper sludge material,

and approximately 12 inches of underlying soil/sediment. The cores are to be fractionated based on visual appearance. The cores taken on the dry shore are to be 3-feet deep, and split into 12-inch samples. The method of sample collection under the surface of the water in Lost Lake is assumed to be similar to that used in the settling basin; if different, it is to be specified in the contract proposal.

Two reference soil core samples are also to be collected near of Lost Lake. The cores are to be taken ~150 feet away from the edge of the lake, and will be ~20-feet deep. The cores will be separated into 2-foot segments, mixed well, and analyzed.

Du Pont will be responsible for surveying and installing sighting/location markers on the shore of Lost Lake, and specifying the location of the two "reference" soil core samples.

**Revision**

The total number of sample locations in and around the shore of Lost Lake has been reduced from 32 to 25. All the samples are to be fractionated the same; e.g., into an upper 6-inch layer and a lower 12-inch segment. Sample analysis is shown in Table 1. Sample location is indicated in Figure 6.

The two reference cores near Lost Lake are to be only 10-feet deep (vs. 20 feet). Each core is to be split into five, 2-foot segments for analysis.

**(f) Outflow Ditch from Lost Lake**

An outflow ditch is present at the southern edge of Lost Lake. The ditch has been dammed to prevent outflow of water. Three

soil core samples (2 to 3 inches in diameter) are to be taken in the ditch, one "upstream" of the dam, and two "downstream". The cores are to be 4-feet deep, split into 12-inch segments.

**Revision**

Three locations are to be sampled; however, the cores are to be only 18-inches deep, split into an upper 6-inch fraction and the lower 12 inches. Sample analysis is shown in Table 1.

**Sample Collection**

All samples are to be placed in suitable containers such that volatile organic contamination (or loss of volatile organic compounds) will not occur. Due to the complexity of the analysis scheme (Table 1), it is suggested that all sludge or soil/sediment samples be placed in glass or Teflon®-lined containers, and maintained at 4°C (or less) until tested for volatile organics and nitrate.

**3. Preparation of Samples for Shipment to Analytical Laboratories**

The subcontractor will provide drums and Type "A" packaging materials required for shipping the samples. Du Pont will be responsible for defining whether or not the samples are to be labeled "radioactive" due to the depleted uranium.

The subcontractor will prepare, label, and package the samples. Du Pont will arrange and pay for the actual shipment of the samples. The contractor will track all samples during preparation, packaging, shipment, receipt at the laboratory, and analysis.

Detailed work status of any or all samples will be provided to Du Pont upon request.

The subcontractor will prepare, package, and label the archive samples. These will be stored in a freezer provided by Du Pont. Facilities to maintain the samples for analysis at <4°C (refrigerators or freezers) will also be provided by Du Pont.

Du Pont will provide a staging location for sample preparation, labeling, storage, and packaging. This staging location will provide benches, sinks, office space, a vented hood (if required) and storage facilities. Utilities, such as water and electricity, will be furnished. Telephone service will be provided if feasible. The subcontractor will be prepared to furnish portable sanitary facilities. This staging location will probably be located near Building 704-U, approximately two to three miles from the M-Area facilities. The staging building will be used for this and other site characterizations.

Note: The samples may be separated into the various fractions in the field, or at the staging area. The samples may be transported to the staging facility at ambient temperatures. The sampling scheme is summarized in Table 1.

**4. Analysis of Samples**

The analyses required on each sample are shown in Table 1. Five types of analyses will be required:

"A" - Physical properties of the liquid and sludge samples

"B" - A full inorganic and metallic constituent scan

"C" - A organic scan, per 40 CFR 261

"D" - A volatile organic scan

"E" - A limited inorganic/metallic scan

Each of the above types (A-E) is specified in Appendix A.

**5. Computerized Management of Analysis Data**

- The subcontractor will set up and provide Du Pont with a computerized data base.
- The data base will be maintained on 9-track tapes with fixed block formats. Each tape will contain one record per sample.
- One tape will consist of data obtained from measurements performed during sampling and shipment preparation. Each record must include a sample identifier, date collected, and preparation methods, in addition to all measurements made during sampling and shipment preparation. This tape will be provided to Du Pont within two weeks of sample preparation.
- Another tape will contain all analytical data. Each record must include sample identifier, analysis performed, analytical method used, instrument used, date and time of analysis, visible contaminants, spiked amount added, dilution factor, number of dilutions, analytical result, precision, and accuracy of the result. Codes for the analytical methods and test names will be provided by Du Pont to be used by the subcontractor. This tape will be submitted to Du Pont within two weeks of completion of sample analyses.

6. **Documentation of Work**

- The subcontractor will document all work that is performed.
- A report indicating sample locations, depths of collected samples, number of samples collected, and other information about sampling activities will be submitted to Du Pont within two weeks of completion of sampling operations.
- A report describing shipment preparation methods and measurements made on samples prior to shipping will be submitted to Du Pont within two weeks of shipping the samples to the analytical laboratory.
- A report containing analytical results for the sediment and basin water samples will be submitted to Du Pont within two weeks of completion of analyses.
- Documentation for the computerized data base will be submitted to Du Pont with the tapes.

**QUALITY ASSURANCE**

- The subcontractor will establish a quality assurance program to ensure the integrity of all results obtained. This program must be approved by Du Pont and will specify the aspects of quality assurance to be in effect for the work described herein.
- All samples will be collected by EPA (or "RCRA") approved sampling procedures.
- All analyses will be performed by a laboratory qualified to accept EPA samples for such analyses.

- Control samples, control charts, reference materials, instrument calibration, spiked samples, laboratory blank samples, and field blank samples will be included as a part of the quality assurance program.
- The controls will be maintained throughout all of the stages of the analysis of the samples.
- All data entries to computer files will be checked for errors.

**SAFETY AND HOUSEKEEPING**

- The subcontractor will meet all applicable OSHA requirements. The subcontractor will obey all Du Pont safety rules. Particular attention should be paid to SRP Safety Manual Items 51, 67, and 104 (Appendix C).
- All personnel associated with this project must attend a workshop on Du Pont required safety procedures.
- Sanitation facilities are to be provided by the subcontractor at the work site.
- The subcontractor will maintain good housekeeping. All facilities, equipment, and tools must be kept clean and orderly. All disposable items must be contained and properly disposed of at least twice a week.
- The overflow ditch, seep area, and Lost Lake are prime habitats for poisonous reptiles. The undergrowth should be cleared where feasible to minimize contact, and snake boots or leggings are to be worn while working in these areas.

- The sediments and sludge at the bottom of the settling basin, in the overflow ditch, and in the seep area are known to contain small amounts of depleted uranium. This should be treated as a toxic heavy metal, and contact should be minimized. Light plastic gloves are to be worn while gathering these samples. Du Pont "Health Protection" personnel will be present when necessary to field test the individual samples, to insure that proper handling procedures are followed.
- Splash-proof goggles are to be worn when samples underneath the water are being taken in the settling basin, the overflow ditch, and the seep area. The liquid in the basin has been found to be at pH ranges of 9 to 11.5. While not considered hazardous, contact with the liquid should be minimized. Skin contact must be minimized; with all splashes or spills promptly rinsed off, and any solution soaked clothing replaced.

**MATERIALS AND SERVICES PROVIDED BY DU PONT**

- Du Pont will provide the necessary land use, site clearance, and work clearance permits.
- Du Pont will provide the safety clothing necessary to safely conduct this program.
- Du Pont will provide an onsite laboratory for preparation of samples for shipping offsite.
- Du Pont will provide a freezer for storage of samples.
- Du Pont will provide the subcontractor with a safety shower and eye wash station.

**SCHEDULE**

- It is estimated that sampling will begin around September 1, 1984 and that the entire program will be completed by December 31, 1984.

**Revision**

The sampling program will start no later than November 26, 1984 and the entire program will be completed by March 22, 1985.

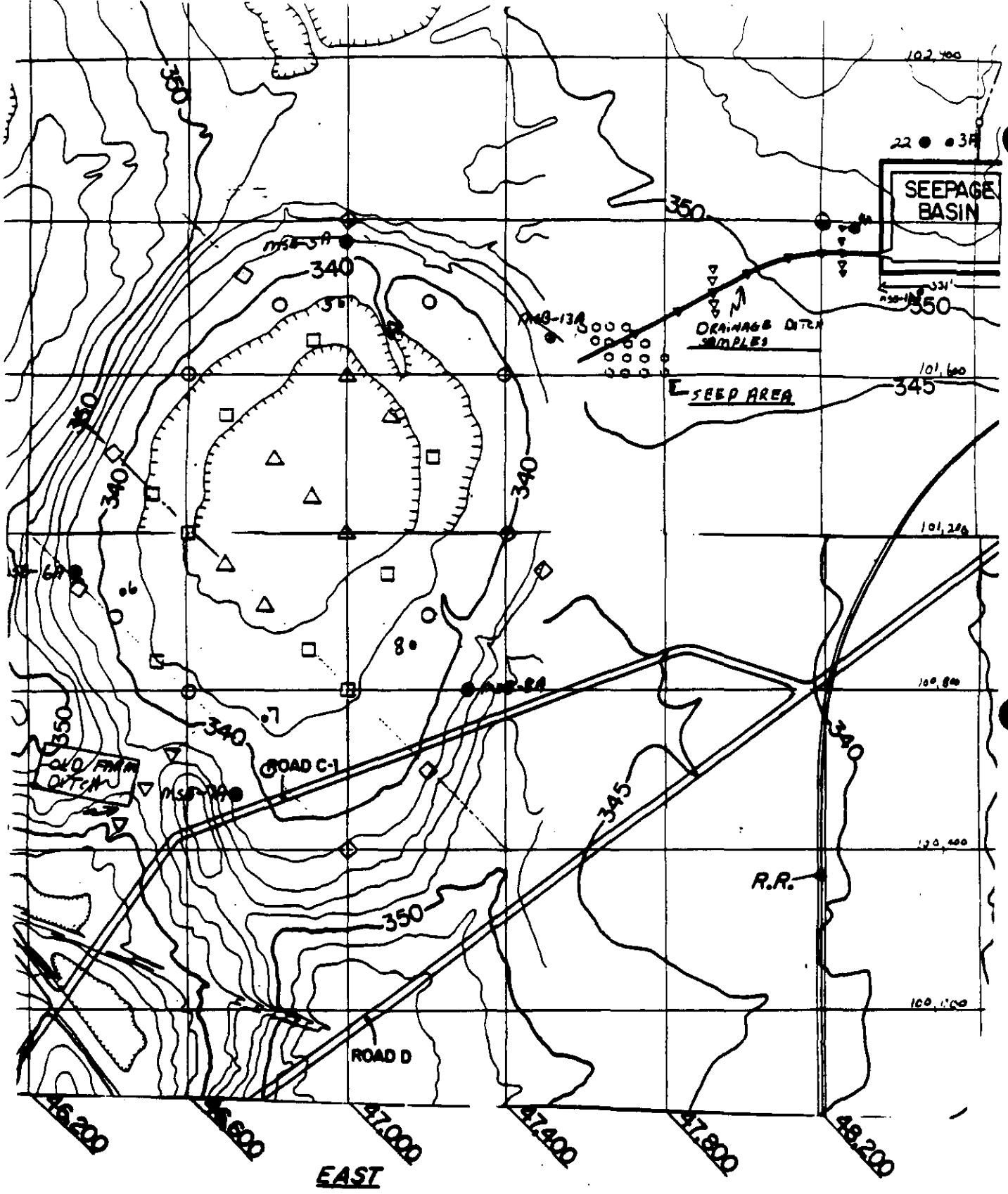



FIGURE 1. Proposed Sample Locations; Overflow Ditch, Seep Area, and Lost Lake.

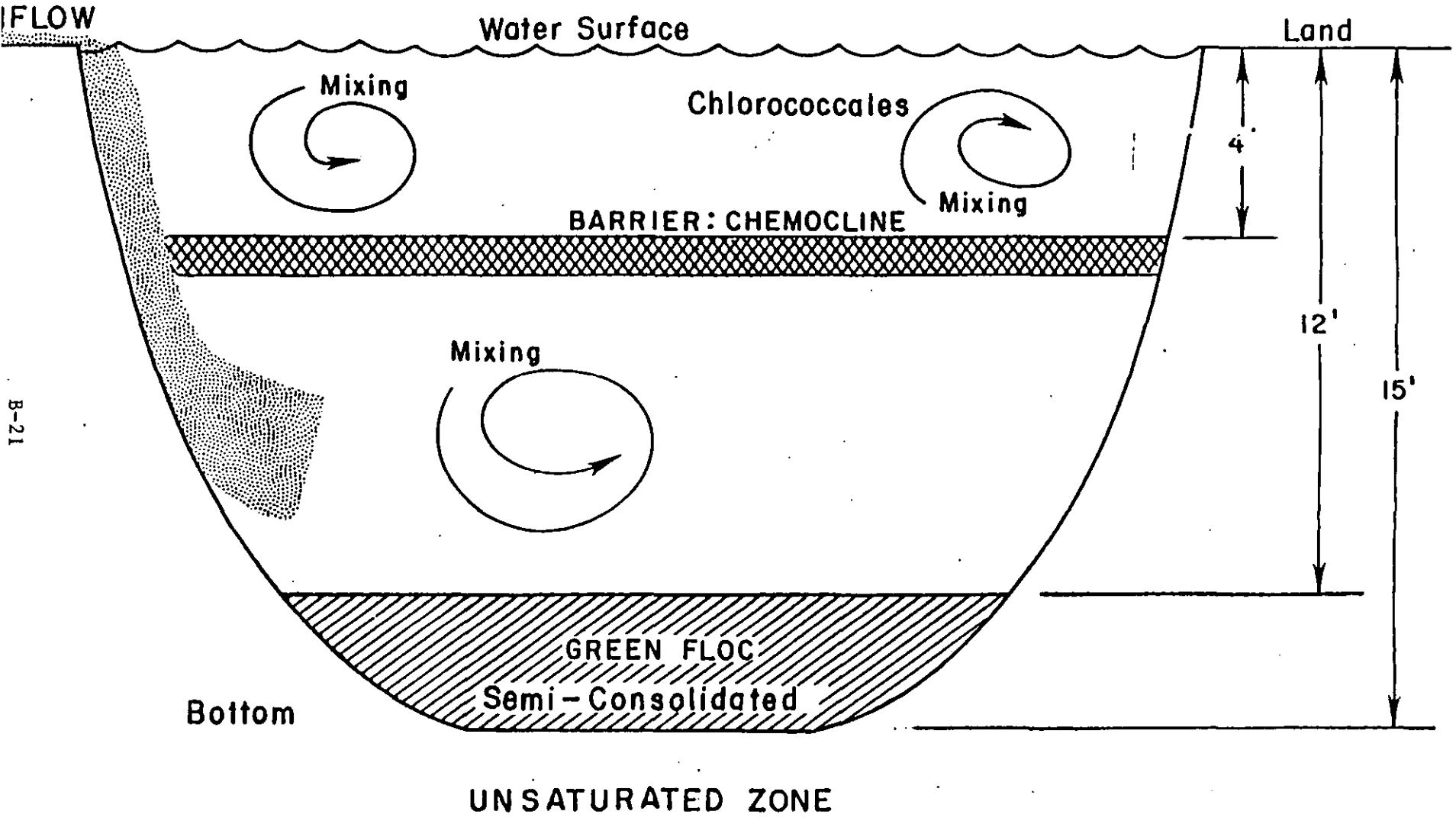
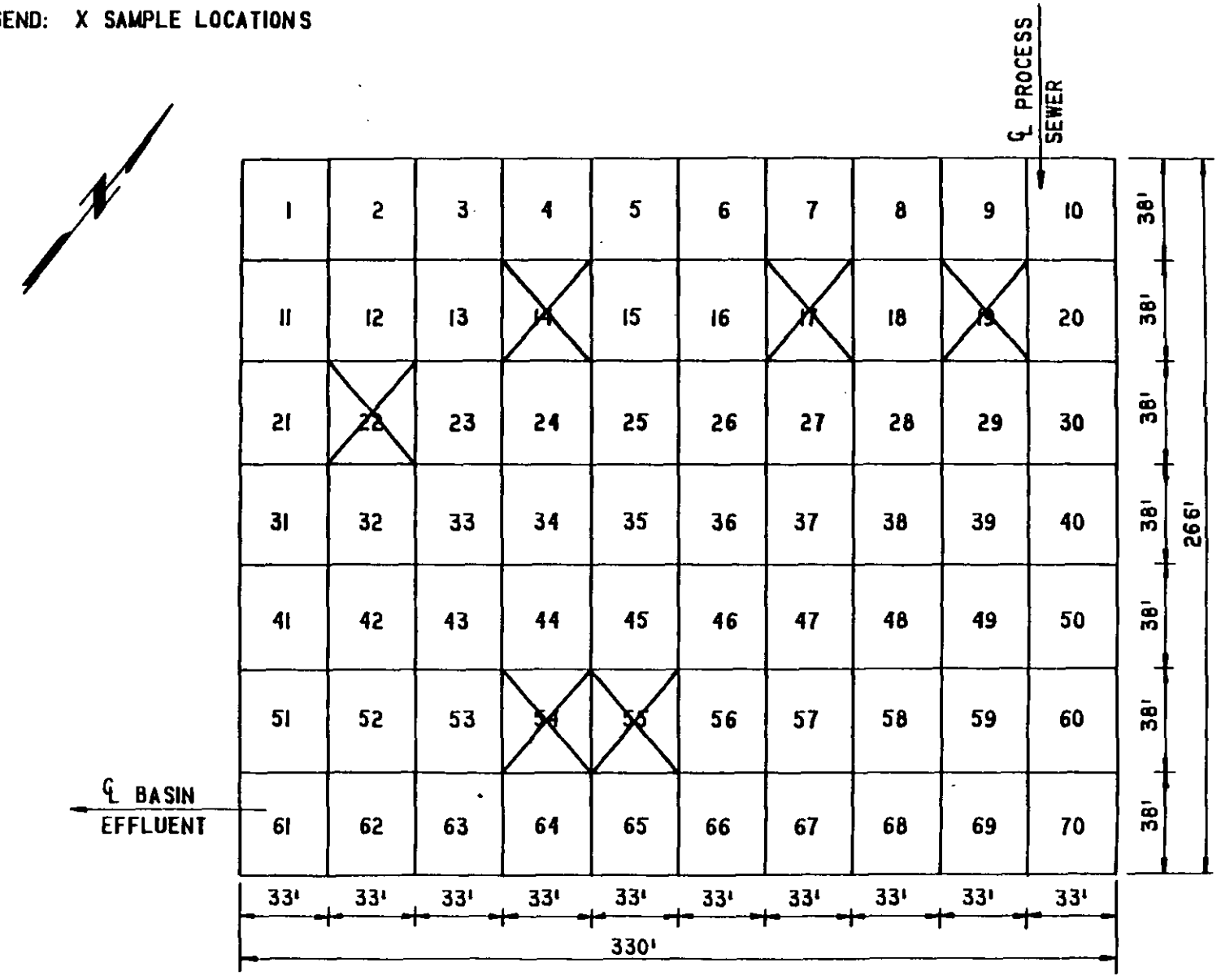


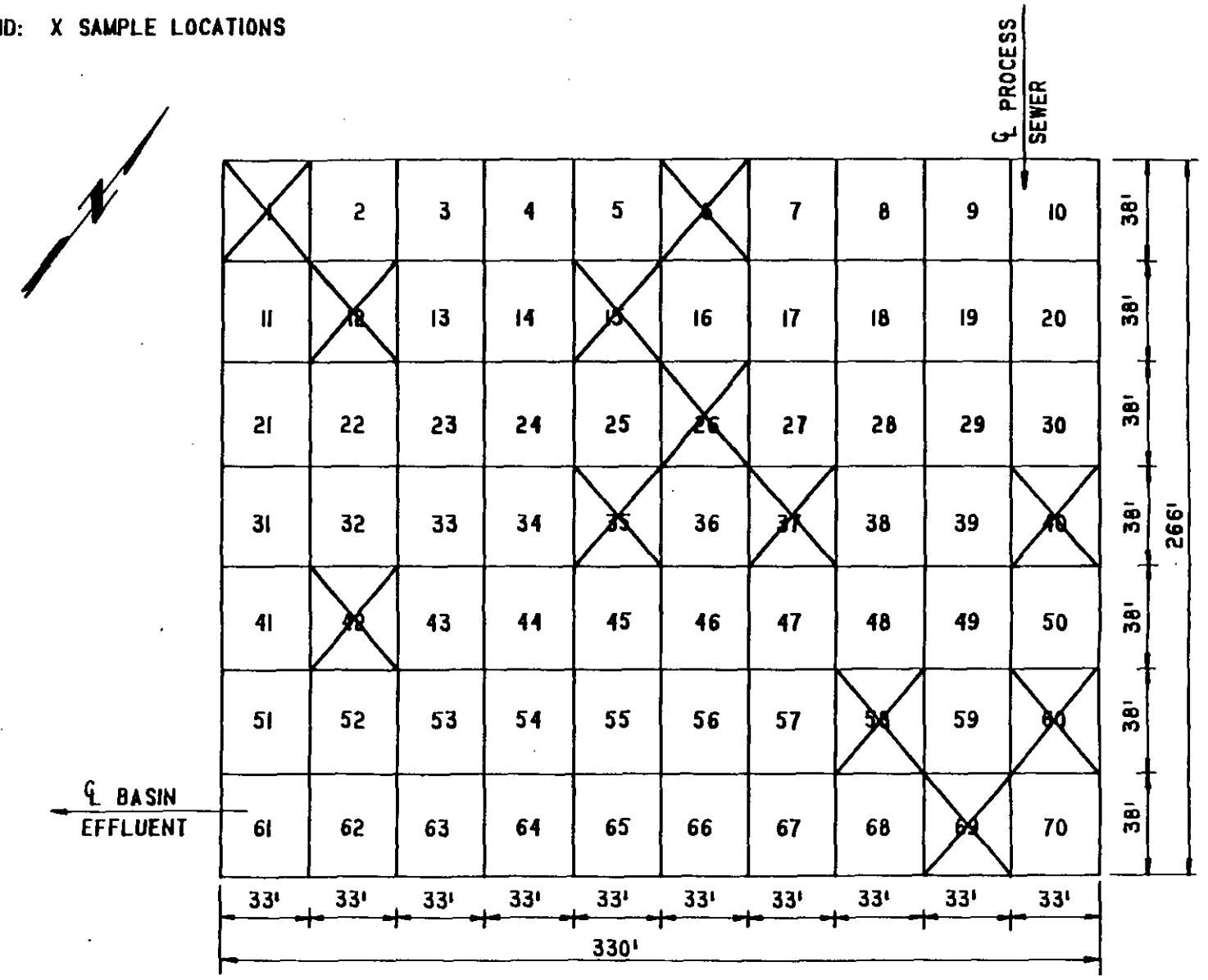

FIGURE 2 Side View of the M-Area Settling Basin (February 1982)




## SETTLING BASIN LIQUID SAMPLING LOCATIONS 0-4'

SCALE: 1" = 60'

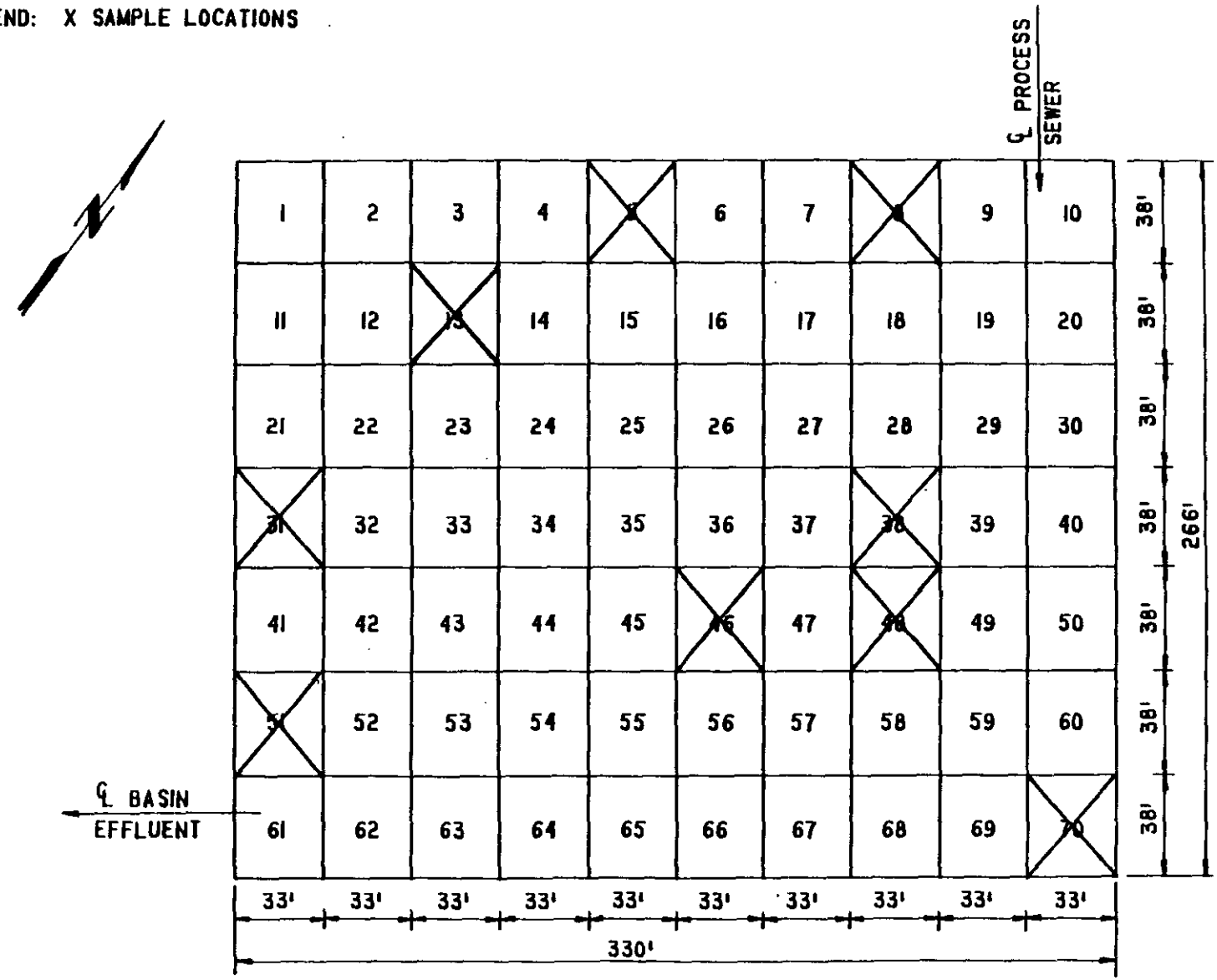
FIGURE 3




## SETTLING BASIN LIQUID SAMPLING LOCATIONS 4'-12.5'

SCALE: 1" = 60'

FIGURE 4




**SETTLING BASIN SLUDGE/SOIL SAMPLING LOCATIONS**

SCALE: 1" = 60'

FIGURE 5

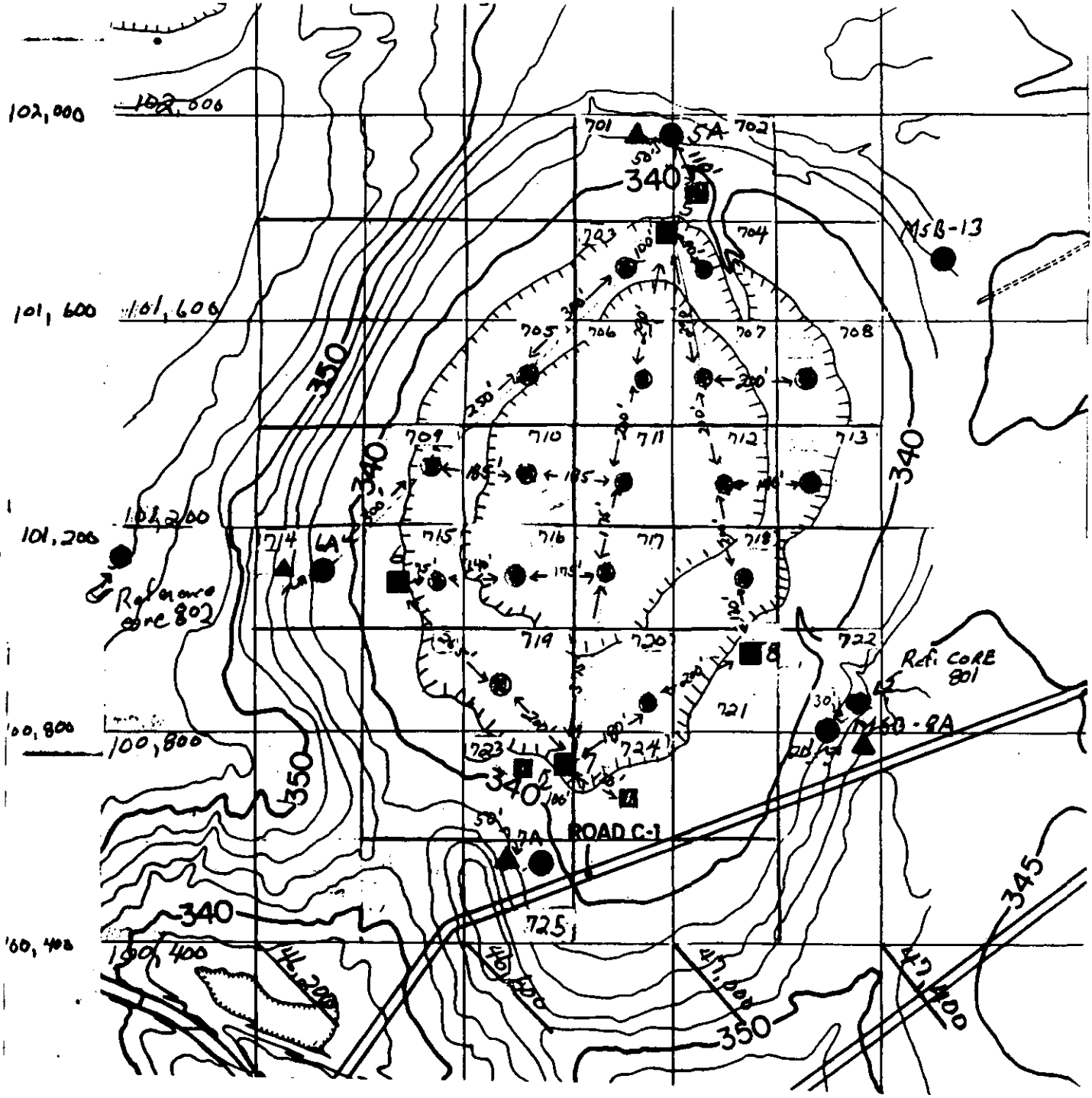



FIGURE 6. Lost Lake Sampling Locations

## TABLE 1. Final Analysis Scheme (DuPont and Black and Veatch Combined)

| Sample Description | No. of Locations | | | Split per Sample | No. of Samples for Analysis | Sample Analysis - Number of Samples x Type* |
|---|---|---|---|---|---|---|
| | Total | Archived | Analysed | | | |
| **Process Sewer Line** | | | | | | |
| Deep Soil Samples (3-4 diameter, 6' of soil core, below process sewer line) | 14 | 0 | 14 | 6<br>6, 1' fractions | 84 | 82 x E<br>40 x D<br>2 x B, C |
| **Settling Basin** | | | | | | |
| Water samples (1 L per sample) | 18 | 0 | 18 | - | 18 | Liquid-16 x A,D,E<br>- 2 x A,B,C |
| Sludge - (3-4" diameter) | 16 | 8 | 8 | -<br>(1-2' of sludge) | 8 | Sludge- 6 x A,D,E<br>- 2 x A,B,C |
| Shallow soil cores (3-4" diameter, 6' deep from bottom of basin) | 8 | 4 | 4 | 6<br>(~6, 1' fractions) | 24 | Soil-22 x D,E<br>- 2 x B,C |
| Adjacent soil cores (2-4" diameter, 21' deep) | 4 | 0 | 4 | 9 (3, 5' segments plus 6, 1' segments from Bottom 6 feet) | 36 | Soil-36 x D,E |
| Reference soil cores (2-4" diameter, 20' deep, ~150' away from basin) | 2 | 0 | 2 | 8<br>(2, 4' segments plus 6, 2' segments) | 16 | Soil-14 x D,E<br>2 x B,C |
| **Overflow Ditch** | | | | | | |
| Sludge - soil/sediment (1-2" diameter; ~4.5' deep, from center of ditch) | 8 | - | 8 | 5<br>(~1' of sludge; 4 soil fractions, 6", 1', 1', 1') | 40 | Sludge-7 x A,D,E<br>-1 x A,B,C<br>Soil-30 x D,E<br>- 2 x B,C |
| Shallow soil cores on either side of ditch (1-2" diameter, 3.5' deep) | 8 | - | 8 | 4<br>(6", 1', 1', 1' fractions) | 32 | Soil-32 x D,E |
| **Seep Area** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~3' deep) | 36 | 18 | 18 | 3<br>(1-2' of sludge; upper 4-6" soil; lower 1' of soil) | 54 | Sludge-16 x A,D,E<br>- 2 x A,B,C<br>Soil-34 x D,E<br>- 2 x B,C |
| Shallow soil core (1-2" diameter, ~6' deep) | 2 | - | 2 | 8<br>(1-2' of sludge plus upper 6" soil + 6 - 1 foot fractions) | 16 | Sludge- 2 x A,B,C<br>Soil -14 x D,E |
| **Lost Lake** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~2-3' deep) | 25 | 0 | 25 | 2<br>(upper ~6" of sludge; bottom 12" soil) | 50 | Sludge-23 x A,D,E<br>- 2 x A,B,C<br>Soil-23 x D,E<br>- 2 x B,C |
| Reference Soil Cores 2-4" diameter, 10' deep, ~150' away from Lake) | 2 | - | 2 | 5<br>(2' fractions) | 10 | Soil-10 x D,E |
| **Outflow Ditch** | | | | | | |
| Shallow soil cores (2-3" diameter, 4' deep) | 3 | - | 3 | 2<br>(upper 6" and lower 12" fractions) | 6 | Soil-6 x D,E |

*Sample Groups defined in Appendix A

# TABLE 2. Initial DuPont Sample and Analysis Scheme

| Sample Description | No. of Locations Total | Archived | Analyzed | Split per Sample | Total No. of Samples for Analysis | Sample Analysis - Number of Samples x Type* |
|---|---|---|---|---|---|---|
| **Process Sewer Line** | | | | | | |
| Deep Soil Samples (3-4 diameter, 5' of soil core, below process sewer line) | 8 | 0 | 8 | 5 | 40 | 40 x D,E |
| **Settling Basin** | | | | | | |
| Water samples (1 L per sample) | 20 (4 at 5 locations) | - | 20 | - | 20 | Liquid-18 x A,D,E<br>- 2 x A,B,C |
| Sludge - soil/sediment (1-2" diameter, 2-3' deep) | 32 | 16 | 16 | 2 (1-2' of sludge; ~6" of soil/sediment) | 32 | Sludge-14 x A,D,E<br>- 2 x A,B,C<br>Soil/Sediment-14 x D, E<br>- 2 x B,C |
| Shallow soil cores (3-4" diameter, 6' deep from bottom of basin) | 6 | 3 | 3 | 6 (~6, 1' fractions) | 18 | Soil-15 x D,E<br>- 3 x B,C |
| Adjacent soil cores (2-4" diameter, 20' deep, Lower 5') | 4 | 0 | 4 | 5 (5, 1' segments of Bottom 5 feet) | 20 | Soil-20 x D,E |
| Reference soil cores (2-4" diameter, 20' deep, ~150' away from basin) | 3 | 0 | 3 | 10 (5, 3' segments plus 5, 1' segments) | 30 | Soil-30 x D,E |
| **Overflow Ditch** | | | | | | |
| Sludge - soil/sediment (1-2" diameter; ~4' deep, from center of ditch) | 8 | - | 8 | 4 (~1' of sludge; 3, 1' soil fractions) | 32 | Sludge-6 x A,D,E<br>-2 x A,B,C<br>Soil-20 x D,E<br>- 4 x B,C |
| Shallow soil cores on either side of ditch (1-2" diameter, 4' deep) | 8 | - | 8 | 4 (1 foot fractions) | 32 | Soil-32 x D,E |
| **Seep Area** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~3' deep) | 40 | 20 | 20 | 3 (1-2' of sludge; upper 4-6" soil; lower 1' of soil) | 60 | Sludge-18 x A,D,E<br>- 2 x A,B,C<br>Soil-36 x D,E<br>- 4 x B,C |
| Shallow soil core (2-3" diameter, 6' deep, from bottom of seep area) | 2 | - | 2 | 6 (6 - 1' fractions) | 12 | Soil-12 x D,E<br>-2 x B,C |
| **Lost Lake** | | | | | | |
| Sludge - soil/sediment (1-2" diameter, ~2-3' deep) | ~50 | 25 | 25 | 3 (upper ~6' of sludge; 6-10" intermediate soil layer; bottom 12" soil) | 75 | Sludge-21 x A,D,E<br>- 4 x A,B,C<br>Soil-42 x D,E<br>- 8 x B,C |
| Soil samples at edge of Lost Lake (1-2" diameter, 3' deep) | ~14 | 7 | 7 | 3 (1' fractions) | 21 | Soil-21 x D,E |
| Reference Soil Cores 2-4" diameter, 20' deep, ~150' away from Lake) | 2 | - | 2 | 10 (2' fractions) | 20 | Soil-20 x D,E |
| **Outflow Ditch** | | | | | | |
| Shallow soil cores (2-3" diameter, 4' deep) | 3 | - | 3 | 4 (1' fractions) | 12 | Soil-12 x D,E |

*Sample Groups defined in Appendix A

## APPENDIX A

### Type "A" Analyses: Physical Parameters

pH (water)
Conductivity (water)
Temperature (water)
TDS (water)
Specific gravity (water and sludge)
% Solid

### Type "B" Analyses: Inorganic Chemicals

Ammonia (as N)
Chloride
Bromide
Fluoride
Nitrate/Nitrite (as N)
Phosphorus, total
Sulfate (as $SO_4$)
Sulfide (as S)
Cyanide

Aluminum
Barium
Boron
Iron, total
Magnesium
Calcium
Sodium
Potassium
Manganese
Tin
Titanium
Antimony
Arsenic

Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Zinc
Uranium

Radioactivity
- Gross Alpha (pCi/L)
- Gross Beta (pCi/L)
- Radium, total (pCi/L)

Total Organic Carbon
Total Organic Halogen

**APPENDIX A (Contd)**

**Type "C" Analyses: Full organic chemical scan, per Appendix VIII of 40 CFR 261.**

Acetonitrite
Acrolein
Acrylamide
Acrylonitrile
Benzene
Benz(a)anthracene
Benzo(a)pyrene
Benzotrichloride
Benzyl chloride
Benzo(b)fluoanthene
Bis(2-chloroethoxymethane)
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Carbon disulfide
Carbon tetrachloride
Chlordane
Chlorinated dibenzodioxins
Chlorinated biphenyls
Chloroacetaldehyde
Chlorobenzene
Chloroform
Chloromethane (Methyl chloride)
2-Chlorophenol
Chrysene
Creosote
Cresol(s)
Cresylic Acid(s)
Dichlorobenzene(s)
1,1-Dichloroethane
1,2-Dichloroethane
Dichloromethane (Methylene dichloride)
Dichlorophenoxyacetic acid
Dichloropropanol
2,4-Dimethylphenol
Dinitrobenzene
4,6-Dinitro-o-cresol
2,4-Dinitrotoluene
Endrin
Ethyl ether
Formaldehyde
Formic acid
Heptachlor
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Hexachlorocyclopentadiene
Lindane
Maleic anhydride
Methanol
Methomyl
Methyl ethyl ketone
Methyl isobutyl ketone
Napthalene
Napthoquinone
Nitrobenzene
4-Nitrophenol
Paraldehyde (trimer of acetaldehyde)
Pentachlorophenol
Phenol
Phorate
Phosphorodithioic acid esters
Phthalic anhydride
2-Picoline
Pyridine
Tetrachlorobenzene(s)
Tetrachloroethane(s)
Tetrachloroethene (perchloroethylene)
1,2 trans-Dichloroethylene*
Tetrachlorophenol
Toluene
Toluenediamine
Toluene diisocyanate(s)
Toxaphene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene (1,1,2-Trichloroethene)
Trichlorofluoromethane
Trichlorophenol(s)
2,4,5-Trichlorophenoxy propionic acid
Trichloropropane
Vinyl chloride (Chloroethene)
Vinylidene chloride (1,1-Dichloroethene)
Xylene
Bis(chloromethyl)ether**

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* Additional volatile organic not in 40 CFR 261 listing.
** Compound originally shown in Type D analyses.

**Appendix A (Contd)**

**Type "D" Analyses: Volatile Organics**

Acrolein
Acrylonitrile
Benzene
Bromoform
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Dichlorobromomethane
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl bromide
Methyl chloride
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Perclene®)
Toluene
1,2-trans-Dichloroethylene
1,1,1-Trichloroethane (1,1,1-TCE)
1,1,2-Trichloroethane
Trichloroethylene (Triclene®)
Trichlorofluoromethane
Vinyl Chloride

APPENDIX A (Contd)

**Type "E" (Reduced Level of Inorganic Analyses)**

| | | |
|---|---|---|
| Na | Cr | Cl |
| K | Pb | $NO_3$ (as N) |
| Ca | Ni | $NH_3$ (as N) |
| Mg | Cu | P, total |
| Fe | Hg | Total organic carbon |
| Al | Zn | Total organic halogen |
| Mn | U | |
| Cd | | |

## Appendix III—Chemical Analysis Test Methods

[Appendix III revised by 48 FR 14153, April 1, 1983]

Tables 1, 2, and 3 specify the appropriate analytical procedures, described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (incorporated by reference, see § 260.11) which shall be used to determine whether a sample contains a given Appendix VII or VIII toxic constituent.

Table 1 identifies each Appendix VII or VIII organic constituent along with the approved measurement method. Table 2 identifies the corresponding methods for inorganic species. Table 3 summarizes the contents of SW-846 and supplies specific section and method numbers for sampling and analysis methods.

Prior to final sampling and analysis method selection the analyst should consult the specific section or method described in SW-846 for additional guidance on which of the approved methods should be employed for a specific sample analysis situation.

TABLE 1.—ANALYSIS METHODS FOR ORGANIC CHEMICALS CONTAINED IN SW-846

| Compound | First edition method(s) | Second edition method(s) |
|---|---|---|
| Acetonitrile | 8.03, 8.24 | 8030, 8240 |
| Acrolein | 8.03, 8.24 | 8030, 8240 |
| Acrylamide | 8.01 8.24 | 8015, 8240 |
| Acrylonitrile | 8.03, 8.24 | 8030, 8240 |
| Benzene | 8.02, 8.24 | 8020, 8024 |
| Benzo(a)anthracene | 8.10, 8.25 | 8100, 8250, 8310 |
| Benzo(a)pyrene | 8.10, 8.25 | 8100, 8250, 8310 |
| Benzodichloride | 8.12, 8.25 | 8120, 8250 |
| Benzyl chloride | 8.01, 8.12, 8.24, 8.25 | 8120, 8250 |
| Benzo(b)fluoranthene | 8.10, 8.25 | 8100, 8250, 8310 |
| Bis(2-chloroethyl)ether | 8.01, 8.24 | 8010, 8240 |
| Bis(2-chloroethyl)ether | 8.01, 8.24 | 8010, 8240 |
| Bis(2-chloroisopropyl)ether | 8.01, 8.24 | 8010, 8240 |
| Carbon disulfide | 8.01, 8.24 | 8015, 8240 |
| Carbon tetrachloride | 8.01, 8.24 | 8010, 8240 |
| Chlordane | 8.08, 8.25 | 8080, 8250 |
| Chlorinated dibenzodioxins | 8.08, 8.25 | 8080, 8250 |
| Chlorinated biphenyls | 8.08, 8.25 | 8080, 8250 |
| Chloroacetaldehyde | 8.01, 8.24 | 8010, 8240 |
| Chlorobenzene | 8.01, 8.02, 8.24 | 8020, 8240 |
| Chloroform | 8.01 8.24 | 8010, 8240 |
| Chloromethane | 8.01, 8.24 | 8010, 8240 |
| 2-Chlorophenol | 8.04, 8.25 | 8040, 8250 |
| Chrysene | 8.10, 8.25 | 8100, 8250, 8310 |
| Cresote | 8.10, 8.25 | 8100, 8250 |
| Cresol(s) | 8.04, 8.25 | 8040, 8250 |
| Cresylic Acid(s) | 8.04, 8.25 | 8040, 8250 |
| Dichlorobenzene(s) | 8.01, 8.02, 8.12, 8.25 | 8010, 8120, 8250 |
| Dichloroethane(s) | 8.01 8.24 | 8010, 8240 |
| Dichloromethane | 8.01, 8.24 | 8010, 8240 |
| Dichlorophenoxyacetic acid | 8.40 8.25 | 8150, 8250 |
| Dichloropropanol | 8.12, 8.25 | 8120, 8250 |
| 2,4-Dimethylphenol | 8.04, 8.25 | 8040, 8250 |
| Dinitrobenzene | 8.09, 8.25 | 8090, 8250 |
| 4,6-Dinitro-o-cresol | 8.04, 8.25 | 8040 8250 |
| 2,4-Dinitrotoluene | 8.09, 8.25 | 8090, 8250 |
| Endrin | 8.08 8.25 | 8080, 8250 |
| Ethyl ether | 8.01 8.02, 8.24 | 8015, 8240 |
| Formaldehyde | 8.01 8.24 | 8015, 8240 |
| Formic acid | 8.06 8.25 | 8250 |
| Heptachlor | 8.06 8.25 | 8080, 8250 |
| Hexachlorobenzene | 8.12, 8.25 | 8120, 8250 |
| Hexachlorobutadiene | 8.12, 8.25 | 8120, 8250 |
| Hexachloroethane | 8.12, 8.25 | 8010, 8240 |
| Hexachlorocyclopentadiene | 8.12, 8.25 | 8120, 8250 |
| Lindane | 8.08 8.25 | 8080, 8250 |
| Maleic anhydride | 8.06, 8.25 | 8250 |

TABLE 1.—ANALYSIS METHODS FOR ORGANIC CHEMICALS CONTAINED IN SW-846—Continued

| Compound | First edition method(s) | Second edition method(s) |
|---|---|---|
| Methanol | 8.01, 8.24 | 8010, 8240 |
| Methomyl | 8.32 | 8250 |
| Methyl ethyl ketone | 8.01, 8.02, 8.24 | 8015, 8240 |
| Methyl isobutyl ketone | 8.01, 8.02, 8.24 | 8015, 8240 |
| Naphthalene | 8.10, 8.25 | 8100, 8250 |
| Naphthoquinone | 8.08, 8.09, 8.25 | 8040, 8250 |
| Nitrobenzene | 8.09, 8.25 | 8[illegible], 8250 |
| 4-Nitrophenol | 8.04, 8.25 | 8[illegible], 8240 |
| Peroxides (Primary oil contaminants) | 8.01, 8.24 | 8015, 8240 |
| Pentachlorophenol | 8.04, 8.25 | 8040, 8250 |
| Phenol | 8.04, 8.25 | 8040, 8250 |
| Pronamide | 8.22 | 8140 |
| Phosphorodithioic acid esters | 8.08, 8.09, 8.22 | 8140 |
| Phthalic anhydride | 8.08, 8.09, 8.25 | 8090, 8250 |
| 2-Picoline | 8.08, 8.09, 8.25 | 8090, 8250 |
| Pyridine | 8.08, 8.09, 8.25 | 8090, 8250 |
| Tetrachlorobenzene(s) | 8.12, 8.25 | 8120, 8250 |
| Tetrachloroethane(s) | 8.01, 8.24 | 8010, 8240 |
| Tetrachloroethene | 8.01, 8.24 | 8010, 8240 |
| Tetrachlorophenol | 8.04, 8.24 | 8040, 8250 |
| Toluene | 8.02, 8.24 | 8020, 8024 |
| Toluenediamine | 8.25 | 8250 |
| Toluene diisocyanate(s) | 8.08, 8.25 | 8250 |
| Toxaphene | 8.08, 8.25 | 8080, 8250 |
| Trichloroethane | 8.01, 8.24 | 8010, 8240 |
| Trichloroethene(s) | 8.01, 8.24 | 8010, 8240 |
| Trichlorofluoromethane | 8.01, 8.24 | 8010, 8240 |
| Trichlorophenol(s) | 8.04, 8.25 | 8040, 8250 |

TABLE 1.—ANALYSIS METHODS FOR ORGANIC CHEMICALS CONTAINED IN SW-846—Continued

| Compound | First edition method(s) | Second edition method(s) |
|---|---|---|
| 2,4,5-Trichlorophenoxy propionic acid | 8.40, 8.25 | 8150, 8250 |
| Trichloropropane | 8.01, 8.24 | 8010, 8240 |
| Vinyl chloride | 8.01, 8.24 | 8010, 8240 |
| Vinylidene chloride | 8.01, 8.24 | 8010, 8240 |
| Xylene | 8.02, 8.24 | 8020, 8240 |

[1] Analysis for phenanthrene and carbazole. If these are present in a ratio between 1.4:1 and 5:1 creosote should be [illegible] present.

TABLE 2.—ANALYSIS METHODS FOR INORGANIC CHEMICALS CONTAINED IN SW-846

| Compound | First edition method(s) | Second edition method(s) |
|---|---|---|
| Antimony | 8.50 | 7040, 7041 |
| Arsenic | 8.51 | 7060, 7061 |
| Barium | 8.52 | 7080, 7081 |
| Cadmium | 8.53 | 7090, 7091 |
| Chromium | 8.54 | 7190, 7191 |
| Chromium Hexavalent | 8.545, 8.546, 8.547 | 7195, 7196, 7197 |
| Lead | 8.58 | 7420, 7421 |
| Mercury | 8.57 | 7470, 7471 |
| Nickel | 8.58 | 7520, 7521 |
| Selenium | 8.59 | 7740, 7741 |
| Silver | 8.60 | 7760, 7761 |
| Cyanides | 8.55 | 9010 |
| Total Organic Halogen | 8.66 | 9020 |
| Sulfides | 8.67 | 9030 |

TABLE 3.—SAMPLING AND ANALYSIS METHODS CONTAINED IN SW-846

| Title | First edition | | Second edition | |
|---|---|---|---|---|
| | Section No. | Method No. | Section No. | Method No. |
| Sampling of Solid Wastes | 1.0 | | 1.0 | |
| Development of Appropriate Sampling Plans | 1.0 | | 1.1 | |
| Regulatory and Scientific Objectives | 1.0-2 | | 1.1.1 | |
| Fundamental Statistical Concepts | 1.0-3 | | 1.1.2 | |
| Basic Statistical Strategies | 1.0-7 | | 1.1.3 | |
| Simple Random Sampling | | | 1.1.3.1 | |
| Stratified Random Sampling | | | 1.1.3.2 | |
| Systematic Random Sampling | | | 1.1.3.3 | |
| Special Considerations | 1.0-7 | | | |
| Composite Sampling | | | 1.1.4.1 | |
| Subsampling | | | 1.1.4.2 | |
| Cost and Loss Functions | | | 1.1.4.3 | |
| Implementation of Sampling Plan | 1.0-7 | | 1.2 | |
| Selection of Sampling Equipment | | | 1.2.1 | |
| Composite Liquid Waste Sampler | 3.2.1 | | 1.2.1.1 | |
| Weighted Bottle | 3.2.2 | | 1.2.1.2 | |
| Dipper | 3.2.3 | | 1.2.1.3 | |
| Thief | 3.2.4 | | 1.2.1.4 | |
| Trier | 3.2.5 | | 1.2.1.5 | |
| Auger | 3.2.6 | | 1.2.1.6 | |
| Scoop and Shovel | 3.2.7 | | 1.2.1.7 | |
| Selection of Sample Containers | 3.3 | | 1.2.2 | |
| Processing and Storage of Samples | 3.3 | | 1.2.3 | |
| Documentation of Chain of Custody | 2.0 | | 1.3 | |
| Sample Labels | 2.0-1 | | 1.3.1 | |
| Sample Seals | 2.0-3 | | 1.3.2 | |
| Field Log Book | 2.0-5 | | 1.3.3 | |
| Chain-of-Custody Record | 2.0-6 | | 1.3.4 | |
| Sample Analysis Request Sheet | 2.0-9 | | 1.3.5 | |
| Sample Delivery to Laboratory | 2.0-10 | | 1.3.6 | |
| Shipping of Samples | 2.0-10 | | 1.3.7 | |
| Receipt and Logging of Samples | 2.0-12 | | 1.3.8 | |
| Assignment of Samples for Analysis | 2.0-13 | | 1.3.9 | |
| Sampling Methodology | 3.0 | | 1.4 | |
| Containers | 3.2-2 | | 1.4.1 | |
| Tanks | 3.2-2 | | 1.4.2 | |
| Waste Piles | 3.2-2 | | 1.4.3 | |
| Landfills and Lagoons | 3.2-2 | | 1.4.4 | |
| Waste Evaluation Procedures | | | 2.0 | |

TABLE 3.—SAMPLING AND ANALYSIS METHODS CONTAINED IN SW-846—Continued

| Title | First edition | | Second edition | |
|---|---|---|---|---|
| | Section No. | Method No. | Section No. | Method No. |
| Characteristics of Hazardous Waste | | | 7.1 | |
| Ignitability | 4.0 | | 7.1.1 | |
| Pensky-Martens Closed-Cup Method | 4.1 | | 7.1.1 | 1010 |
| Setaflash Closed-Cup Method | 4.1 | | 7.1.1 | 1020 |
| Corrosivity | 5.0 | | 7.1.2 | |
| Corrosivity Toward Steel | 5.3 | | 7.1.2 | 1110 |
| Reactivity | 6.0 | | 7.1.3 | |
| Extraction Procedure Toxicity | 7.0 | | 7.1.4 | |
| Extraction Procedure Toxicity Test | 7.1, 7.2, 7.3 | | | |
| Method and Structural Integrity Test | 7.4 | | 7.1.4 | 1310 |
| Sample Workup Techniques | | | 4.0 | |
| Inorganic Techniques | 8.4.9 | | 4.1 | |
| Acid Digestion for Flame AAS | | | 4.1 | 3010 |
| Acid Digestion for Furnace AAS | | | 4.1 | 3020 |
| Acid Digestion of Oil, Grease, or Wax | 8.4.9-6 | | 4.1 | 3030 |
| Dissolution Procedure for Oil, Grease or Wax | 8.4.9-6 | | | |
| Alkaline Digestion | 8.0 | 8.4.5.8 | 4.1 | 3060 |
| Organic Techniques | 8.0 | | 4.2 | |
| Separatory Funnel Liquid-Liquid Extraction | 8.0 | 8.1 | 4.2 | 3510 |
| Continuous Liquid-Liquid Extraction | 8.0 | 8.0.1 | 4.2 | 3520 |
| Acid-Base Cleanup Extraction | 8.0 | 8.0.4 | 4.2 | 3530 |
| Soxhlet Extraction | 8.0 | 8.0.2 | 4.2 | 3540 |
| Sonication Extraction | 8.0 | 8.0.5 | 4.2 | 3560 |
| Sample Introduction Techniques | | | 5.0 | |
| Headspace | 8.0 | 8.0.2 | 5.0 | 5020 |
| Purge-and-Trap | 8.0 | 8.0.3 | 5.0 | 5030 |
| Inorganic Analytical Methods | 8.0 | | 7.0 | |
| Antimony, Flame AAS | 8.0 | 8.5.0 | 7.0 | 7470 |
| Antimony, Furnace AAS | 8.0 | 8.5.0 | 7.0 | 7471 |
| Arsenic, Flame AAS | 8.0 | 8.5.1 | 7.0 | 7060 |
| Arsenic, Furnace AAS | 8.0 | 8.5.1 | 7.0 | 7061 |
| Barium, Flame AAS | 8.0 | 8.5.2 | 7.0 | 7080 |
| Barium, Furnace AAS | 8.0 | 8.5.2 | 7.0 | 7081 |
| Cadmium, Flame AAS | 8.0 | 8.5.3 | 7.0 | 7130 |
| Cadmium, Furnace AAS | 8.0 | 8.5.3 | 7.0 | 7131 |
| Chromium, Flame AAS | 8.0 | 8.5.4 | 7.0 | 7080 |
| Chromium, Furnace AAS | 8.0 | 8.5.4 | 7.0 | 7191 |
| Chromium, Hexavalent, Coprecipitation | 8.0 | 8.5.4.6 | 7.0 | 7195 |
| Chromium, Hexavalent, Colorimetric | 8.0 | 8.5.4.9 | 7.0 | 7196 |
| Chromium, Hexavalent, Chelation | 8.0 | 8.5.4.7 | 7.0 | 7197 |
| Lead, Flame AAS | 8.0 | 8.5.5 | 7.0 | 7420 |
| Lead, Furnace AAS | 8.0 | 8.5.5 | 7.0 | 7421 |
| Mercury, Cold Vapor, Liquid | 8.0 | 8.5.7 | 7.0 | 7470 |
| Mercury, Cold Vapor, Solid | 8.0 | 8.5.7 | 7.0 | 7471 |
| Nickel, Flame AAS | 8.0 | 8.5.8 | 7.0 | 7520 |
| Nickel, Furnace AAS | 8.0 | 8.5.8 | 7.0 | 7521 |
| Selenium, Flame AAS | 8.0 | 8.5.9 | 7.0 | 7740 |
| Selenium, Gaseous Hydride AAS | 8.0 | 8.5.9 | 7.0 | 7741 |
| Silver, Flame AAS | 8.0 | 8.5.10 | 7.0 | 7760 |
| Silver, Furnace AAS | 8.0 | 8.5.10 | 7.0 | 7761 |
| Organic Analytical Methods | 8.0 | | 8.0 | |
| Gas Chromatographic Methods | 8.0 | | 8.1 | |
| Halogenated Volatile Organics | 8.0 | 8.0.1 | 8.1 | 8010 |
| Nonhalogenated Volatile Organics | 8.0 | 8.0.1 | 8.1 | 8015 |
| Aromatic Volatile Organics | 8.0 | 8.0.2 | 8.1 | 8020 |
| Acrolein, Acrylonitrile, Acetonitrile | 8.0 | 8.0.3 | 8.1 | 8030 |
| Phenols | 8.0 | 8.0.4 | 8.1 | 8040 |
| Phthalate Esters | 8.0 | 8.0.5 | 8.1 | 8060 |
| Organochlorine Pesticides and PCBs | 8.0 | 8.0.8 | 8.1 | 8080 |
| Nitroaromatics and Cyclic Ketones | 8.0 | 8.0.9 | 8.1 | 8090 |
| Polynuclear Aromatic Hydrocarbons | 8.0 | 8.1.0 | 8.1 | 8100 |
| Chlorinated Hydrocarbons | 8.0 | 8.1.2 | 8.1 | 8120 |
| Organophosphorus Pesticides | 8.0 | 8.2.2 | 8.1 | 8140 |
| Chlorinated Herbicides | 8.0 | 8.4.0 | 8.1 | 8150 |
| Gas Chromatographic/Mass Spectroscopy Methods (GC/MS) | 8.0 | | 8.2 | |
| GC/MS Volatiles | 8.0 | 8.2.4 | 8.2 | 8240 |
| GC/MS Semi-Volatiles, Packed Column | 8.0 | 8.2.5 | 8.2 | 8250 |
| GC/MS Semi-Volatiles, Capillary | 8.0 | 8.2.7 | 8.2 | 8270 |
| High Performance Liquid Chromatographic Methods (HPLC) | 8.0 | | 8.3 | |
| Polynuclear Aromatic Hydrocarbons | 8.0 | 8.1.0 | 8.3 | 8310 |
| Miscellaneous Analytical Methods | 8.0 | | 9.0 | |
| Cyanide, Total and Amenable to Chlorination | 8.0 | 8.5.5 | 9.0 | 9010 |
| Total Organic Halogen (TOX) | 8.0 | 8.6.6 | 9.0 | 9020 |
| Sulfide | 8.0 | 8.6.7 | 9.0 | 9030 |
| pH Measurement | 5.0 | 5.2 | 9.0 | 9040 |
| Quality Control/Quality Assurance | 10.0 | | 10.1 | |
| Introduction | 10.0 | | 10.1 | |
| Program Design | 10.0 | | 10.2 | |
| Sampling | 10.0 | | 10.3 | |
| Analysis | 10.0 | | 10.4 | |
| Data Handling | 10.0 | | 10.5 | |

[1] See specific detail.

[Appendix III]

**APPENDIX C**

Safety Procedures 51, 67 and 104

# SAFETY INSPECTION AND TESTING OF NEW, ALTERED, OR DISCONTINUED FACILITIES OR EQUIPMENT

## A. PURPOSE

The purpose of this procedure is to ensure that a final safety check is made before new or altered equipment and facilities are placed in service or after they are permanently removed from service.

Before plant facilities or equipment are taken over by the custodian, they are inspected and, when necessary, tested by Works Engineering Control Procedures DPSOP 203, chapter III. Items found during inspection and/or testing which do not meet requirements are reported to the installing group for correction. Inspection is also necessary following repair or alteration (DPSOP 201, Work Order Procedure) if the repair or change may have created a potential hazard to personnel, equipment, or process. If complete or partial abandonment of facilities creates hazards (excavations, projecting connections, deterioration, etc.), a safety inspection is necessary.

## B. GENERAL

Before new or altered facilities or equipment are accepted and used, the department having the primary responsibility for the facilities arranges a safety inspection. This applies to work done on Projects, Plant Minor Projects, Cost Orders, and Direct Purchase Orders. An inspection should be made for even minor repairs. Do not formalize by using OSR 20-22, but rather indicate approval -- SRP Work Request form. The department may call on any specialized sources of information on the plant that are needed for the test or inspections.

1) Inspect equipment altered or installed on Projects or Plant Minor Projects and test such equipment per item 51, divisions C and D.

2) Inspect equipment abandoned in place or the site from which equipment has been removed to ensure that no hazards remain.

## C. INSPECTION

1) Survey the job to determine if it is ready for a safety inspection.

2) Enter the names of the Inspection Committee on OSR 20-22, SRP Safety Inspection of New or Altered Facilities or Equipment (exhibit 1).

3) Inspect the equipment or facility. Any of the following items which are applicable should be reviewed for potential hazards during the inspection. Additional items which might offer a hazard should be considered.
   - Falling hazards
   - Tripping hazards
   - Clearances
   - Sharp edges

- Guards
- Cleanliness
- Accessibility of controls
- Overload protection
- Exposed wiring
- Grounding
- Warning devices
- Lighting and emergency lighting
- Safety shower and eyewash station
- Emergency exit
- Fire-fighting equipment
- Painting (color coding, etc.)
- Warning signs
- Pinch points
- Identification, including equipment piece number
- Relief valve (testing and tagging)
- Stored energy
- Radiation hazards
- Ventilation
- Temperature
- Noise level
- Operating procedures
- Domestic water cross connection

4) Issue instructions to implement the inspection committee's recommendations.

5) Arrange to put the equipment into operation after any necessary testing.

6) After the report is signed by the ranking department supervisor of the facility, it is forwarded to the Area Safety Office and a copy is sent to the Project Engineer for major and minor project work or to the Project Area Controller for all other work.

## D. TESTING

1) The custodial department outlines the method for testing the new or altered equipment. Personnel should begin the test with the attitude that the equipment or installation is defective, taking all necessary precautions to prevent injury to themselves or others.

2) Attach a copy of the test results to the completed OSR 20-22.

DISTRIBUTION
ORIGINAL — FACILITY SUPERVISOR
CC — AREA SAFETY ENGINEER
PROJECT ENGINEER - HEADS OF MINOR PROJECTS OR PROJECT AREA CONTROLLER - ALL OTHER CASES

# SRP SAFETY INSPECTION OF NEW OR ALTERED FACILITIES OR EQUIPMENT

| REPAIR ORDER OR PROJECT ORDER NO. | PROGRAM NO. OR JOB FILE NO. | BUILDING | DATE OF INSPECTION |
|---|---|---|---|
| | | | |

TITLE

ITEMS TO BE INSPECTED

THE ABOVE ITEMS WERE INSPECTED AND FOUND TO BE:

☐ SATISFACTORY FOR SAFE OPERATION.

☐ UNSATISFACTORY FOR SAFE OPERATION UNTIL THE FOLLOWING CONDITIONS ARE CORRECTED.

INSPECTION COMMITTEE

| NAME | DEPARTMENT | NAME | DEPARTMENT |
|---|---|---|---|
| | CUSTODIAN | | |
| | SAFETY | | |
| | | | |

THE UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED AND THE ITEMS ARE NOW SATISFACTORY FOR SAFE OPERATION.

FACILITY SUPERVISOR OR RELEASER — DATE

INSTRUCTIONS:

In accordance with Safety Manual Item 51, the facility supervisor (or delegate) examines this form to record the inspection of new, altered, repaired, or discontinued facilities or equipment if the repair or change may have created a potential hazard to personnel, equipment, or process.

When all unsatisfactory conditions are corrected, the facility supervisor (or delegate) will sign and distribute copies of this form as appropriate.

Any of the following items which are applicable should be reviewed for potential hazards during the inspection. Additional items which might affect a hazard should be considered.

1. Falling Hazards
2. Tripping Hazards
3. Cleanliness
4. Sharp Edges
5. Controls
6. Cleanliness
7. Accessibility to Controls
8. Overhead Protection
9. Exposed Wiring
10. Grounding
11. Warning Devices
12. Lighting & Emergency Lighting
13. Safety Shower & Eyewash Stations
14. Emergency Exit
15. Fire Fighting Equipment
16. Planning (Color Coding, etc.)
17. Identification
18. Radiation Hazards
19. Warning Signs
20. Ventilation
21. Temperature
22. Noise Level
23. Operating Procedures
24. Domestic Water Cross Connection
25. Piped Power
26. Relief Valve (Tagging & Tag
27. Stored Energy

# BOATING REQUIREMENTS

## A. PURPOSE

This procedure states the boating requirements applicable to all water craft used by SRP personnel. Operating personnel are responsible for developing detailed operating procedures.

## B. IDENTIFICATION

The letters "USDOE," the last four digits of the SRO number, and the letters "SR" must be displayed on the forward half of each side of the boat, distinctly visible, clearly legible, and 3 inches in height.

## C. EQUIPMENT REQUIREMENTS

1) All equipment shall be in conformance with or exceed U.S. Coast Guard specifications where applicable.

2) Minimum equipment required for all boats is as follows:
   - Oar
   - Life jacket for each person (Type I)
   - Fire extinguisher (not required for boats without motors)
   - Horn or whistle
   - Bailing device
   - Anchor and line (12-lb anchor and a minimum of 50 ft of 3/8-in. nylon line.
   - Ring buoy with 100 feet of 1/4-inch nylon rope attached (type IV)
   - First-aid kit

3) A radio communication system is required for all boats operated on large bodies of water, such as Par Pond, Clark Hill Lake, and the Savannah River.

4) Running lights are required for boats operated during the hours of darkness.

5) Boat trailers must be stenciled with their rated capacity; boats must be stenciled with their gross weight.

## D. TRAILER REQUIREMENTS

1) Trailer shall be equipped with stop and running lights in operating condition.

2) Safety chains must be secured while trailer is hooked to vehicle.

## E. RAMP OPERATIONS

1) Exercise extreme caution while performing loading and unloading operations.

2) Vehicle must be chocked during loading and unloading of boats. Not required if driver stays in driver's seat.

## F. OPERATING REQUIREMENT

1) Only trained and authorized operators are permitted to operate boats. The minimum training requirement is completion of the SRP Training Division's Boat Safety course under the direction of the Health Protection Department.

2) Life jackets must be worn and fully tied at all times while in the boat.

3) Boats shall be operated at speeds suitable for water and weather conditions.

4) The operator shall be responsible for the safe transport of all passengers and shall determine that the load capacity of the boat is not exceeded.

5) Two persons are required in a boat when work is conducted out of sight of a designated observer, or radio communications are not being maintained.

6) A high degree of housekeeping must be maintained at all times.

7) Report unsafe items or defective equipment.

## G. PERSONAL FLOTATION DEVICE INSPECTION

1) The custodian is responsible for inspecting personal flotation devices every 6 months (Safety Manual item 53).

2) The 100 feet of 1/4-inch nylon rope is replaced annually. At the time of replacement a tape is affixed to indicate when it must be replaced again.

3) Before using the boat, check all flotation devices and rope for rotting, mildew, tears, cracking, cleanliness, and current inspection tapes. Replace defective equipment.

4) Coast Guard approved flotation devices are labeled Type I, Type II, Type III, and Type IV. The following types are approved for use at SRP.
   - Type I personal flotation device is designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position and has more than 20 lb of buoyancy.
   - Type II personal flotation device is designed to turn an unconscious person in the water from a face downward position to a vertical or slightly backward position and has at least 15.5 lb of buoyancy.
   - Type IV personal flotation device is designed to be thrown to a person in the water and not worn. It has at least 16.5 lb of buoyancy.

## H. ANNUAL INSPECTIONS

Boat and boat equipment must be inspected annually by a committee appointed by the Health Protection Department.

# SAFETY OF NONCOMPANY PERSONNEL

## A. PURPOSE

This item establishes Du Pont responsibility for the safety practices of noncompany personnel serving Du Pont at the Savannah River Plant and lists general safety guidelines for these personnel on the site. Only safety practices acceptable to Du Pont will be permitted by noncompany personnel who make deliveries or perform a service for Du Pont or one of our subcontractors.

## B. GENERAL PLANT RULES

1) The department responsible for arranging for the service by noncompany personnel is responsible for designating a Du Pont representative to maintain liaison and to arrange for a safety orientation by the Area Safety Engineer and Health Protection and Security representatives.

2) All injuries shall be reported to a Du Pont representative who will direct or assist the person or persons to Plant Medical (refer to item 104, division E).

## C. RULES FOR NONCOMPANY PERSONNEL

1) Park in designated areas.

2) Do not block operating areas, passageways, road, or railways without specific Du Pont permission.

3) Fire alarms, fire extinguishers, fire hose boxes, gas masks, safety showers, and other safety equipment are plainly marked. Keep them free of obstruction for emergency use.

4) Comply with posted area safety rules.

5) Personal protective equipment must be worn as specified by posted safety rules, or as specified by Du Pont personnel.

6) The vendor is responsible for providing the equipment necessary for safe work performance; this includes personal protective equipment.

7) Transport and store flammable liquids in UL-approved safety cans, tanks, or trucks, or original unopened shipping containers.

8) Wheels of vehicles must be chocked when loading or unloading materials using material handling equipment.

9) Drivers are responsible for the proper loading of their vehicles and for the proper securing of loads.

10) Noncompany employees will not use Du Pont tools or equipment unless authorized by Du Pont supervision.

11) All tools and equipment brought onto the site for use are subject to inspection and approval by the Du Pont representative.

12) Employers of noncompany employees providing services for Du Pont are responsible for complying with the Occupational Safety and Health Act of 1970.

13) Intoxicants and persons under the influence of intoxicants or narcotics are not permitted on the plantsite.

14) Firearms are prohibited unless authorized by the Security Department.

15) Materials and equipment that may emit hazardous or objectionable gases are not permitted in the vicinity of building air intake ducts.

16) Place or arrange equipment and materials properly in accordance with good housekeeping and safety practices.

## D. RESPONSIBILITIES OF DU PONT REPRESENTATIVE

1) Thoroughly explain to the noncompany employee any chemical or other hazards associated with the work.

2) Ensure that equipment and material brought on the Plant by the noncompany employee does not present a hazard to Du Pont employees.

3) Point out posted safety rules, protective equipment, safety showers, and emergency equipment to the noncompany employee.

4) Direct the noncompany employee in the event of plant emergency alarms.

5) Do not use or permit other Du Pont personnel to use noncompany equipment or tools.

6) Coordinate locking, tagging, and trying of equipment before allowing the noncompany employee to begin work.

7) Should an injury occur, investigate the incident and write a factual report. Omit conclusions and recommendations. Forward the report to the Central Safety Office, 703-2A (refer to Safety Manual item 104, division E).

8) Maintain continuing liaison with personnel working onplant.

## E. HANDLING VISITOR AND VENDOR INJURIES

### 1. First Aid

Plant Medical will render first aid to the extent required by the circumstances.

### 2. Highway Accident (Serious)

1) Patrol investigates and sends a copy of the report to the Central Safety Office, Building 703-2A.

2) Plant Medical renders first aid, contacts the vendor's company for the name of their company doctor, and proceeds as requested by the company's doctor.

3) Plant Medical records the incident and disposition.

### 3. Plant Accidents

#### 3.1 Serious

- Same as Safety Manual item 104, steps E,2,2) and 3).
- Custodian of the building investigates and sends report to the Central Safety Office, Building 703-2A.

#### 3.2 Minor Cases

Minor cases are given first aid at Plant Medical. Medical records the incident and disposition.

### 4. Personal Cases (Fainting, etc.)

Plant Medical handles these cases as circumstances dictate.

**WORK PROPOSAL**

The subcontractor is to submit a proposal containing firm prices for the work described herein. The work proposal shall establish the capability and qualifications of the subcontractor as well as those selected by the subcontractor to perform this work. Other items to be in the proposal include (but are not limited to): resumés of personnel to be assigned to this project; description and specifications of sampling equipment and procedures; proposed time table for completion of work, and a list of equipment and supplies to be furnished by the contractor.

Each of the various types of sampling and sample preparation shall be performed on a unit price basis as listed in the following compensation schedule. Hourly charges should be given for such costs as Project Manager, specialist, and/or technician. Mobilization from one sample location to another should be prorated in the unit rates.

Project management fees should be priced on a lump sum basis. The lump sum fee will be adjusted (plus or minus) for departures from the total number of samples estimated herein. The lump sum estimate shall include all professional services, transportation, subsistence, reports, etc. necessary to complete the job as described.

Proposals shall be evaluated on both cost and technicalr considerations. The approximate weighting factors will be: cost 35% and technical merit 65%. Du Pont reserves the right to

negotiate details with the apparent successful bidder before awarding the contract.

| **Criteria for Evaluation** | **PTS** |
|---|---|
| Qualifications of technical personnel assigned to program | 10 |
| Techniques, equipment, and procedures to be used in taking samples and analysis | 30 |
| Data management | 10 |
| Thoroughness of proposal and quality assurance program | 10 |
| Cost | 40 |

**ATTACHMENT**

**COMPENSATION SCHEDULE**
**(Revised November 1984)**

As full compensation for services rendered in accordance with the Scope of Work, Du Pont shall reimburse the subcontractor at the following unit prices:

| | |
|---|---|
| Project Supervision | $ _____ per lump sum |
| • Additional Service | $ _____ per hour |
| • Project Manager | $ _____ per hour |
| • Technician | $ _____ per hour |

Sample Collection

| | |
|---|---|
| • Soil samples adjacent to sewer line (6 one foot samples from ~9 to 15' level). | $ _____ per sample location |
| • Liquid samples in settling basin | $ _____ per sample |
| • Undisturbed sludge at bottom of settling basin | $ _____ per sample location |
| • Soil/sediment samples - 6 feet deep, at bottom of settling basin (include separation into 12-inch portions) | $ _____ per sample location |
| • Soil samples adjacent to basin; (~21' deep, upper 15' into 5' portions, lower 6' into 1' portions) | $ _____ per sample location |
| • Reference soil cores, ~20' deep, ~150' from edge of basin (split into two x 4' portions and six two foot portions). | $ _____ per sample location |
| • Sludge and soil samples from overflow ditch (4 feet deep) (include separation of sludge layer, and separation of soil into one 6" portion plus three one-foot segments) | $ _____ per sample location |
| • Soil samples at the edge of the overflow ditch (3.5 feet deep, separated into one 6 inch portion plus three one-foot portions) | $ _____ per sample location |

**ATTACHMENT (contd)**

- Sludge and soil samples in seep area. Most samples will be taken below 1 to 2 feet of water. (Each sample to be ~3' deep and split into a sludge fraction plus 2 soil portions) $ _____ per sample location
- Shallow (~6' deep) soil samples from bottom of seep. (Samples split into sludge plus upper 6" soil plus six one foot soil portions) $ _____ per sample location
- Undisturbed sludge and soil samples at bottom and edge of Lost Lake. (Samples to be split into 2 fractions, based on appearance) $ _____ per sample location
- Reference soil cores, ~10' deep, ~150' from Lost Lake (split into 2 foot segments) $ _____ per sample location
- Soil samples from outflow ditch (1.5' deep, separate into 6" & 12" fractions) $ _____ per sample location

**ATTACHMENT (contd)**

| Summary of Sample Collection and Preparation | No. of Samples | Total Cost of Collection and Separation |
|---|---|---|
| Liquid | 18 | _____ |
| Sludge | | |
| - For analysis | 61 | _____ |
| - Archived* | 26 | _____ |
| Soil/Sediment | | |
| • Adjacent to sewer line | 84 | _____ |
| • Below settling basin | | |
| - Analysis | 24 | _____ |
| - Archived* | 24 | _____ |
| • Adjacent to basin | 36 | _____ |
| • Reference cores | 16 | _____ |
| • Overflow ditch | 64 | _____ |
| • Seep Area | | |
| - Analysis | 50 | _____ |
| • Lost Lake | | |
| - Analysis | 25 | _____ |
| • Reference cores | 10 | _____ |
| • Outflow ditch | 6 | _____ |

*Archived samples do not need to be separated into various fractions - just labeled and preserved.

**ATTACHMENT (Contd)**

Sample Analyses (see Appendix A)

| | |
|---|---|
| Type "A" - Physical parameters | $ _____ per sample |
| Type "B" - Inorganic constituents | $ _____ per sample |
| Type "C" - Full organic scan | $ _____ per sample |
| Type "D" - Volatile organics | $ _____ per sample |
| Type "E" - Reduced inorganic analyses | $ _____ per sample |

Analysis of Samples

| Type of Sample | No. of Samples | Type of Analysis | Cost, $ |
|---|---|---|---|
| Liquid from Basin | 2 | A, B, C | _____ |
| | 16 | A, D, E | _____ |
| Sludge | 9 | A, B, C | _____ |
| | 52 | A, D, E | _____ |
| Soil/Sediment | 12 | B, C | _____ |
| | 221 | D, E | _____ |
| | 82 | E only | _____ |
| | 40 | D only | _____ |

## APPENDIX C

ENVIRODYNE ENGINEERS, INC.

FIELD REPORT

April 26, 1985

Dr. John B. Pickett
E.I. DuPont de Nemours and Co.
Environmental Sciences
Savannah River Laboratory
Aiken, SC 29808

Dear Dr. Pickett,

Environdyne Engineers, Inc. (EEI) is pleased to submit this field report of the work performed on the characterization of the M-Area basin and vicinity. The report includes a descripition of the sampling methdologies, sample processing techniques, and shipping procedures.

If you have any questions or comments please feel free to contact me at X6647.

Sincerely

Bruce G. Campbell
Geologist

cc: G.R. Parks

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## Introduction

The M-Area Settling Basin was constructed in 1958 for the disposal of effluents from the metal finishing operations conducted in M-Area. The effluents flow to the settling basin through a terra cotta sewer line. From the basin the effluent flows through an engineered ditch to a natural seepage or recharge area and on to a "Carolina Bay" (a natural surface depression called "Lost Lake"). The settling basin is filled with water to a maximum depth of 15-feet , the seep area is 1-2 feet in depth and Lost Lake ranges from 2-4 feet deep depending on rainfall and surface runoff. It is projected that this settling basin will be taken off line in June 1985 when a new wastewater treatment facility will begin operation. At that time, DuPont will initiate steps to close the basin pursuant to State and Federal regulations.

The objective of this investigation is to identify the chemical pollutants associated with the M-Area basin, sewer line, overflow ditch, seep and Lost Lake and to define the spatial distribution of these pollutants within the basin and peripheral areas. The data base generated by this study will be used by DuPont in the development of a remedial action plan for basin closure.

Sample aquisition and analytical services provided by Envirodyne Engineers, Inc. during the project are:

- overall project management of sample collection and analysis
- technical oversight for the coring activites around the sewer line, basin and Lost Lake
- collection and shipment of water, sludge and soil/sediment samples from the process sewer line, basin, overflow ditch, seep and Lost Lake
- field processing and packaging of sediment and sludge samples for shipment offsite for chemical and radiological analysis
- data management services
- documentation of all field and analytical work performed

Other subcontractors involved in the project include Professional Service Industries, Inc. who performed coring operations at the process sewer line, the basin and Lost Lake. Carolina Cranes, Inc. provided equipment to transfer the sampling boat in and out of the basin.

## METHODOLOGY

### A. FIELD SAMPLING

Field sampling activitites involved the collection of sediment, sludge and water samples. Sediment samples were taken from beneath the sewer line, in and around the basin, the overflow ditch, seepage area, Lost Lake and in the overflow ditch out of Lost Lake. Sludge samples were taken from the basin, ditch and seep area. All sampling equipment was thoroughly cleaned before beginning sampling and between intervals using a high pressure hot water wash system. Prior to beginning field work, steps were taken to ensure that all contract personnel were familiar with DuPont safety and security requirements and procedures. Safety precautions for field personnel included protective clothing (brown coveralls, work boots, hard hats, safety glasses, plastic and leather gloves, rubber waders), a high pressure wash system in case of immersion in the basin, and life preservers while on board the boat.

#### 1. Process Sewer Line

The initial step of this segment was to determine the specific locations along the sewer line to take the samples. The locations were selected using a portable organic sniffer provided by DuPont. The sniffer was used to detect high concentrations of organic vapors, which in this situation could indicate a previous leak from the cracked sewer line. The results of the organic "sniffer" survey were compared with the findings of an earlier study of the process sewer pipe using a remote television camera. Two locations along the process sewer pipe having a high probability of previous leaks were then chosen for sampling. A third location, adjacent to the manhole (manhole #6) closest to the M-Area settling basin was also chosen for soil sampling.

A backhoe was used to expose the pipe at the two locations along the sewer line. Extreme care was taken to avoid breaking the pipe and the last foot of soil was removed using a shovel. The soil core samples close to manhole #6 were taken by PSI using a CME auger rig with hollow-stem augers and 1.5-inch I.D. split spoons. These cores were taken starting at the level of the bottom of the sewer pipe. The depth from ground surface was 7-feet for locations MBC-401 through 404. The distances of the coreholes from manhole #6 are given in Table 1. The soil above these core samples was not excavated with a backhoe due to the risk of damaging the manhole itself.

The core samples at the two exposed sewer pipe locations were taken using a hand auger. The soil cores were taken starting level with the bottom of the sewer pipe. At the middle location two six foot samples were taken from directly beneath the pipe; withtwo on one side and two on the other (MBC-405 to 410). The depth from the ground surface was 6-feet. At the location nearest M-Area two samples were taken from directly beneath the sewer pipe with one on one side and one on the other (MBC-411 to 414). The depth from ground surface was 12-feet. All of these samples were split into one foot intervals, all of which were analyzed for limited inorganics; and one-half of the samples were analyzed for volatile organics. Two of the intervals (MBC-407 5-6' and MBC-408 1-2') were selected for full organic and inorganic analyses. The sample locations are detailed in Figure 1.

Table 1: Distance of Coreholes from Manhole #6

| Sample # | Distance from concrete apron around manhole #6 to center of core (ft) |
|---|---|
| MBC-401 | 7.5 |
| MBC-402 | 10.0 |
| MBC-403 | 12.5 |
| MBC-404 | 8.3 |

2. Seepage Basin

Samples were taken in the basin using Envirodynes' custom modified jon boat. The boat is 20-feet long and 6-feet wide with a 18-inch by 18-inch sampling well in the center. The boat is also equipped with a four-legged derrick used to raise and lower heavy sampling equipment through the well. The boat was placed in the basin with an 18-ton crane rented from Carolina Cranes, Inc. The fence surrounding the basin was marked off in a 33-foot by 38-foot grid pattern to use as a guide for positioning the boat at the selected sampling locations. The boat was held stationary with polyproplyene rope stretched between the boat and the fence posts. Access to the large boat was gained by utilizing a small two-man boat. After the boat was positioned, the sampling equipment was lowered through the well to the bottom of the basin.

Sludge samples were collected using a clear plexiglass tube attached to a Shelby tube head. This was lowered to the bottom on a string of drill rods until firm ground could be felt then driven into the bottom until the end was firmly plugged with soil. The depth to the bottom of the basin was measured by counting the number of 5-foot rods and the length of the plexiglass tube needed to reach the firm soil and subtracting the part of any that remained above the water surface. The plexiglass tube was then retreived and the bottom capped as soon as it was clear of the water (this apparatus is diagrammed in Figure 2). The connector head was then unbolted from the tube and the water standing above the sludge siphoned back into the basin. After the thickness of the sludge was measured, it was poured into labeled glass jars and placed into a cooler containing blue ice. Eight sludge samples were collected from the basin, two of these being full organic and inorganic analyses (MBC-205 and MBC-207)

Four locations in the basin were selected for sediment sampling. Two continuous 6-foot cores were taken from each site, one for analysis and one to be archived. The sediment samples were initially taken using a ball-check sampler of 1 and1/4-inch I.D. steel pipe with a 6-foot long 1-inch I.D. PVC liner. Figure #2 gives a detailed view of this equipment. The sampler was driven and retrieved using a 140 lb hammer and a gasoline powered cathead. This method met with limited success on the samples for analysis and very little success on the deeper archived intervals. The 6-foot cores were split into 1-foot intervals with two intervals (MBC-203 0-1' and MBC-203 4-5') selected for full organic and inorganic analyses.

A method was subsequently developed utilizing a 4-inch I.D. PVC casing and 2-inch diameter Shelby tubes which produced much better results in the extremely hard sediments. The PVC pipe served as a casing which was lowered to the bottom of the basin and hammered several inches into the sediment. The Shelby tubes were then lowered to the bottom through the casing and driven 3-feet or to refusal, whichever came first. The 140-pound hammer and the cathead were utilized to supply the force to drive and retreive the Shelby tubes. Six foot cores were recovered sucessfully using this method. Figure #2 gives a detailed view of this equipment. All of the archived samples and MBC-205 5-6' were collected using this method. Figure #3 gives the location of these samples within the basin.

The water samples were collected from the two man boat using a small peristaltic pump (Masterflex portable sampling pump). The boat was positioned using the grid pattern fixed on the fence surrounding the basin. A small anchor was used to hold the boat in place while the samples were collected. A stainless steel weight was attached to the end of a length of marked plastic tubing and lowered to the desired depth. Six samples were collected two feet deep and twelve were taken at the eight foot depth. One from each depth was designated a full organic and inorganic sample (MBL-101 and MBL-114) At each station, the pH, conductivity and temperature of the water at the sampling depth was measured using a Horiba Waterchecker and recorded in a field notebook. The results are presented in Table 2. Figures #4 and 5 show the locations of the water samples within the basin.

Four 20-foot cores were taken from around the perimeter of the basin by PSI, Inc. , using a CME auger rig. The hole was advanced using 10-inch diameter hollow-stem augers, while the samples were taken with a 1.5-inch I.D. 2-foot long split spoon. The resulting cores were divided into 5-foot intervals to 15-feet and 1-foot intervals from 15 to 20-feet. Three intervals were not recovered due to problems retaining the sample in the split spoon, these samples were: MBC-301 17-18', 19-20' and MBC-303 15-16'.

Two reference cores were collected at sites approximately 150-feet from the edge of the basin which were obtained in the same manner as above. These cores are 20-feet deep with the first 8-feet split into two 4-foot intervals and the lower 12-feet split into six 2-foot intervals. Two of the samples (MBC-803 8-10' and MBC-804 8-10') were selected for full organic and inorganic analyses.

3. Overflow Ditch:

Sixteen locations were selected for sampling of the overflow ditch, eight in the center and eight on the sides. The sediment samples were taken by hand augering to the appropriate depth and then transferring the samples from the auger to the sample containers. The hand auger was pressure washed after each interval to remove all soil and prevent cross contaimination of subsequent samples. Sludge samples were obtained using a plexiglass tube hammered into the bottom of the ditch until plugged, then removed, the sludge thickness measured, any water above the sludge decanted off, and the sludge poured into labeled glass containers.

The sludge layer thicknesses are presented in Table 3. The eight center holes consisted of the sludge interval, the top 6-inches of soil, and three 1-foot segments. The eight holes on the side were split into the top 6-inches, and three 1-foot intervals. The only exception being MBC-501 which consists of only a sludge interval due to the presence of rip-rap in the streambed. Three samples were selected for full organic and inorganic analyses: MBC-502 0-1', 1-1.5' and MBC-516 1.5-2.5'. The locations of the overflow ditch samples are detailed in Figure 6.

4. Seep Area

Eighteen locations were sampled in the seep area; for sludge and a 1-foot soil/sediment sample. Three locations MBC-601, 602 and 603 did not have sludge present. Table 3 gives the thickness of the sludge layer when present.

NOTE: The original sampling plan called for 6-inch and 12-inch soil samples below the sludge in the seepage area. This was reduced to only one foot of soil beneath the sludge owing to the field observation that the 6-inch and 12-inch segments were equivalent. That is, there was no visual evidence of any layering in the soil below the sludge.

The method selected for taking the sediment samples utilized 2-inch diameter Shelby tubes, a Shelby tube head, a 2-foot section of drill rod and a sledge hammer. At the sample sites, the tubes were driven with the sledge hammer to the1-foot depth and retreived by hand. The tubes were then capped and taken to the soils lab where the soil was removed using a Soiltest hand operated extruder and the sediment placed in the appropriate sample container. The three locations without sludge present were collected with a hand auger. The sludge samples were collected in the field and transported to the laboratory in either plastic or glass 1-gallon containers depending on which type of analysis was to be performed.

Two locations were resampled to obtain a 6-foot deep core. Sample MBC-619 was obtained at sample location MBC-609; sample MBC-620 was obtained at location MBC-617. The 6-foot sediment cores were taken by the same method as the shallow cores except three or four Shelby tubes were inserted consecutively into the same hole to take progressively

deeper samples. These cores were separated into the following intervals: 0-1' (sludge), 1-1.5', and 1-foot intervals to 7.5'. At MBC-620 the last 1-foot interval 6.5-7.5' was not recovered.

Samples selected for full organic and inorganic analysEs were MBC-612 0-1' and1-2'.

5. Lost Lake:

Twenty-five locations were sampled in and around Lost Lake. The samples on Lost lake were collected at stations marked on the lake with plastic 1-gallon jugs set out by DuPont in a pattern to cover the entire area. Nine samples were taken on dry ground utilizing a hand auger while sixteen were collected from a 12-foot alumnium boat using the same Shelby tube method as was utilized in the seep area.

Initially, the nine samples from the dry shore area included a top 0-0.5 foot sample and a sample from 1.5-2.5 feet. The interval from 0.5-1.5 feet was collected later. The sixteen samples collected under the water of Lost Lake were split into 0-0.5 feet and 0.5-1.5 foot segments. No sludge (similar to the sludge in the seep area or settling basin) was observed in any of the Lost Lake samples. Some of the water recovered in the tube was included in the volatile organic samples. This caused a problem with breakage of the 40-ml glass vials when they were placed in storage in the freezer. A number of the sites in Lost Lake had to be resampled due to this problem.

Also included in this numbering series are three samples taken with the hand auger in the dry overflow ditch out of Lost Lake. These locations were initially sampled for the upper 0-0.5 foot depth and a lower 3.0-4.0 foot interval. These locations were resampled (3/19/85) to obtain the 0.5-1.5 foot interval.

The samples selected for full organic and injorganic analysis include MBC-707 0-0.5' and 0.5-1.5'; MBC-719 0-0.5' and 0.5-1.5'; MBC-721 0-0.5' and 0.5-1.5'.

Two reference cores were collected at sites approximately 150-feet from the edge of Lost Lake. These cores were taken by PSI, Inc utilizing hollow-stem augers and 1.5-inch I.D. split spoons. Each core was split into 5, two foot intervals. No organic samples were taken.

B. FIELD PROCESSING

Field processing of the sediment samples was performed by an Envirodyne field technician at a location near the sampling activites. Various types of processing were employed as described below:

1. Split spoon:
   -determination of rate of core recovery
   -taking penetrometer readings for each interval. A minimum of six readings were taken and the average value determined
   -taking of volatile organic fractions where applicable. These samples are sealed in duplicate 40-ml glass vials and placed on blue ice in a Coleman cooler for preservation and transportation back to the field laboratory.
   -taking of total organic halogen fractions where applicable. These samples were sealed in 40-ml glass vials.
   -placing the remaining sample in labeled zip-lock plastic bags or glass jars depending on the type of analysis and transporting back to the field laboratory.
   -cleaning of all sampling equipment with the steam cleaner after each sample is taken.

2. Hand auger
   -taking of volatile organic and total organic halogen fractions in 40-ml glass vials and placement on blue ice in coolers.
   -placing of remaining sample in labled zip-lock bags or glass jars depending on the type of analysis and transporting back to the field laboratory.
   -cleaning of all sampling equipment with the steam cleaner after each sample is taken.

3. 6-foot continuous sampler
   -the PVC tubes were removed from the steel pipe, labeled, then taken ashore and cut into 1-foot segments and extruded by hand.
   -the volatile organic and total organic halogen fractions were then taken, placed into 40-ml glass vials on blue ice, and transported to the field laboratory.
   -the remaining sample was then placed in zip-lock plastic bags, or glass jars, depending on the type of analysis required.

4. Shelby tube sampler
   -Shelby tubes steam cleaned prior to using.
   -the tubes were removed from the head, labeled, sealed, then transported to the field laboratory , removed with the Soiltest hand operated extruder, and the volatile organic and total organic halogen fractions taken.

C. FIELD LABROTORY PROCEDURES

1. Sample Processing

Sediment samples received in the field laboratory were first thoroughly mixed by hand to ensure the taking of representative samples for both wet and dry fractions. A wet fraction of 20-50 grams was taken for percent moisture analysis. These fractions were first preweighed on a digital analytical scale and then placed in an oven at 103 degrees Centigrade until dry. Then the samples were placed in a dessicator until cool, then reweighed. Moisture content results can be found in Table 4. As previously discussed, the volatile organic and TOH fractions were taken in the field except for the Shelby tube samples which were taken in the field laboratory. To maintain sample integrity, these samples were kept at 4 degrees Centigrade after bottling until analyzed. Preservation in the field laboratory and at the laboratory in St. Louis was accomplished using a refrigerator. Preservation in the field was done with blue ice packed in Coleman coolers. There is no formally recognized holding time of sediment samples for volatile organic analysis (References 1,2 in Appendix 3), but these samples were analyzed as soon as possible after their receipt in St. Louis.

After the taking of wet fractions the remaining sediments were placed in labeled polyethylene trays or porcelain basins depending on the type of analysis. Air drying the samples was done to facilitate analytical procedures in the St. Louis laboratory. Drying time for the sediment samples averaged around 7 days. The sludge samples were initially set out to air dry, however, it soon became apparent that they were not drying rapidly enough so they were placed in an oven at 50 degrees Centigrade. Using this method, the drying time was cut to 4-5 days. When fully dried to the touch, the samples were processed under a hood to prevent the contamination of lab facilities or personnel. This processing involved the following steps: first the sample was pulverized with a mortar and pestel. The pulverized sediment was then sieved through a number twenty

stainless steel sieve. Residual soil clumps retained in the sieve were reground and sieved again to ensure maximum sample retention.

Ideally, two 250ml amber glass jars were filled with processed sample and shipped to the St. Louis laboratory. Due to occasional partial sample loss or inadequate volume some intervals were shipped with only one jar. Excess sample was placed in labeled zip-lock bags, double bagged, taped, labeled and frozen. When all processing was completed, extra samples and archival samples were placed in a freezer located in Building 704-U. Custody of these samples was then transferred to DuPont. Appendix #1 is a summary of the sample tracking log used to follow the samples from date taken to the date shipped.

The samples were shipped to the St. Louis laboratory in Coleman coolers containing blue ice. The jars were wrapped in bubble-pack, then placed in zip-lock plastic bags and packed in the coolers.

The analytical requirements for the samples are presented in Table #5. Radioactivity measurements were taken on samples MBC-208 sludge, MBC-203 0-1', MBC-617 1-2', MBC-803 4-8', MBC-804 4-8'. The results of these counts are presented in Table #6. Appendix #2 gives the laboratory procedures used in determining the levels of radioactivity.

## D. ANALYTICAL PROCEDURES/QUALITY ASSURANCE PROGRAMS

Following is a brief discussion of quality control procedures used to maintain sample integrity during the field work phases of the study.

1. Sample aquisition and field processing
   1) steam cleaning of all sampling equipment prior to the start of work and before the collection of each new sample to prevent possible cross contaimination
   2) use of fresh plastic gloves between each sample to prevent cross-contaimination
   3) appropriate labeling of sample containers to reflect site location, sample interval, date of aquisition, samplers initials, type of analysis and preservative
   4) field preservation of samples at four degrees Centigrade via Coleman coolers and blue ice

5) daily field notes to identify events which may potentially impact sample integrity

2. Field laboratory processing
   1) use of sample tracking log to track samples from date of aquisition through processing to date of custody transfer
   2) thorough cleaning of processing equipment with alconox, acetone and distilled water to prevent possible cross-contaimination of samples
   3) use of fresh gloves between samples to prevent cross-contaimintation
   4) segregation of organic samples from plastic processing equipment to preserve sample integrity
   5) use of proper labeling on sample containers (project number, sampling site, sample identifer, etc.) to ensure proper sample identification
   6) preservation of volatile samples and processed samples at or below four degrees Centigrade prior to shipment

3. Sample shipment and transfer of custody
   1) sample containers securely wrapped in bubble pack and zip-lock bags to prevent breakage during shipment
   2) preservation during shipment with Coleman® coolers and blue ice
   3) use of chain of custody sheets to document all transfers of custody

A discussion of analytical procedures and the laboratory quality assurance program utilized by Envirodyne can be found under separate cover.

# ADDITIONAL SAMPLES

M-2 Outfall
Lost Lake
EP Toxicity
Influent/Effluent Basin Water samples

## Introduction

A number of additional sediment and water samples were collected from the Seepage Basin, the Overflow Ditch, the Seep Area, Lost Lake and the M-2 Outfall area which were outside the scope of the original contract. These samples were collected from locations specified by John Pickett of DuPont. The M-2 Outfall is a storm sewer drain from M-area. The periodically inundated fringe area around Lost Lake was sampled to a depth of 6 inches for metals and ions (samples MBC-729 through 733). Also, three water samples were collected from Lost Lake, one of which was analyzed fully for organic and inorganic chemicals. Samples for the EP Toxicity test were collected from areas specified by DuPont. A 10-week sampling program of the Seepage basin influent/effluent streams was conducted.

## Methodology

### A. M-2 Outfall

The nine 6-foot sediment cores from the M-2 Outfall area were collected using Shelby tubes. Four of the samples (MBC-901 to 904) were taken from the 20-foot boat using the 4-inch PVC pipe as casing and driving the tubes with a post driver. The larger 140-lb hammer was not needed due to less dense sediments than were found in the M-area basin. The remaining cores (MBC-905 to 909) were collected with Shelby tubes driven with a sledge hammer and retrieved by hand. The tubes were the taken back to the soils laboratory, extruded, the volatile organic samples bottled and the processed sample set out to dry. The intervals collected were 0-1 feet, 1-3 feet and 3-6 feet.

B. Lost Lake Soil Samples

The shallow Lost Lake samples were 0.5 feet deep(6 inches) and split into three intervals: 0-0.1 feet, 0.1-0.3 feet and 0.3-0.5 feet. These samples were collected using a small trowel and a tape measure graduated in tenths of an inch. The sediment samples were scooped into zip-lock plastic bags. Two 40-ml vials for total organic halogen analysis were also filled with sediment. The samples were then transported to the soils laboratory in Coleman coolers on blue ice.

C. Lost Lake Water Samples

The Lost Lake water samples were collected from the small aluminum boat used to take the sediment samples. The same sampling locations as the soil cores MBC-708, 717 and 719 were used to mark the water sample locations. A peristaltic pump (Masterflex portable sampling pump) was used to collected the samples. Sample MBC-717 was analyzed for full inorganic and organic constituents.

D. EP Toxicity Test

Samples of soil and sludge were collected for EP Toxicity tests at various locations in the basin, overflow ditch, seep area and Lost Lake. A total of 11 locations were selected for sampling. Table 7 gives details on locations and types of the samples collected.

Table 7; EP Toxicity Sample Locations

| Sampling location | Sludge | Soil |
|---|---|---|
| Settling Basin | | |
| MBC-205 | 1 | 1 (top 12" of soil) |
| MBC-207 | 1 | 1 (top 12" of soil) |
| Overflow Ditch | | |
| MBC-508 | 1(from center of ditch) | |
| Seepage Area | | |
| MBC-619 | 1 | 1(top 6" of soil) |
| MBC-620 | 1 | 1 (top 6" of soil) |
| Lost Lake | | |
| MBC-704 | - | 1 (top 6" of soil) |
| MBC-716 | - | 1 (top 6" of soil) |

These samples were analyzed per 40 CFR 261.24, Appendix II.

E. Influent/Effluent Sampling Program

A10 week Influent/Effluent sampling program was initiated at the basin on 03/04/85. An Isco® wastewater sampler was placed at Manhole #6 and at the beginning of the overflow ditch. The samplers were programmed to collect 40-50ml samples at 1-hour intervals to provide a composite sample for a 72-hour period. The samples were collected in 2-gallon glass jars placed in a Coleman® cooler filled with blue ice. The sampling interval was from Monday through Thursday morning when the sample in the 2-gallon jar was thouroughly mixed and placed in the appropriate containers for shipment. The voliatile organic samples were collected directly from the stream (not from the glass jar) due to the extended sampling period. The first week included samples for full organic and inorganic analysis while the rest of the samples were for limited analysis. Table 8 presents the parameters analyzed. Please refer to Table 5 for a detailed list of the specific metals and compounds for the different analyses types.

Table 8; Analytical Parameters of Influent/Effluent Samples

1st week.....A,B,C
2nd week.....A,D,E
3rd week.....A,D,E
4th week.....A,D,E
5th week.....A,D,E
6th week.....A,D,E
7th week.....A,D,E
8th week.....A,D,E
9th week.....A,D,E
10th week.....A,D,E

The field processing, field laboratory and analytical procedures/quality assurance programs for these additional samples were the same as for the M-area basin samples.

## REFERENCES

1. J. B. Pickett to C. B. Shedrow, Storage and Handling of Samples From M-Area Characterization Program,December 11, 1984.

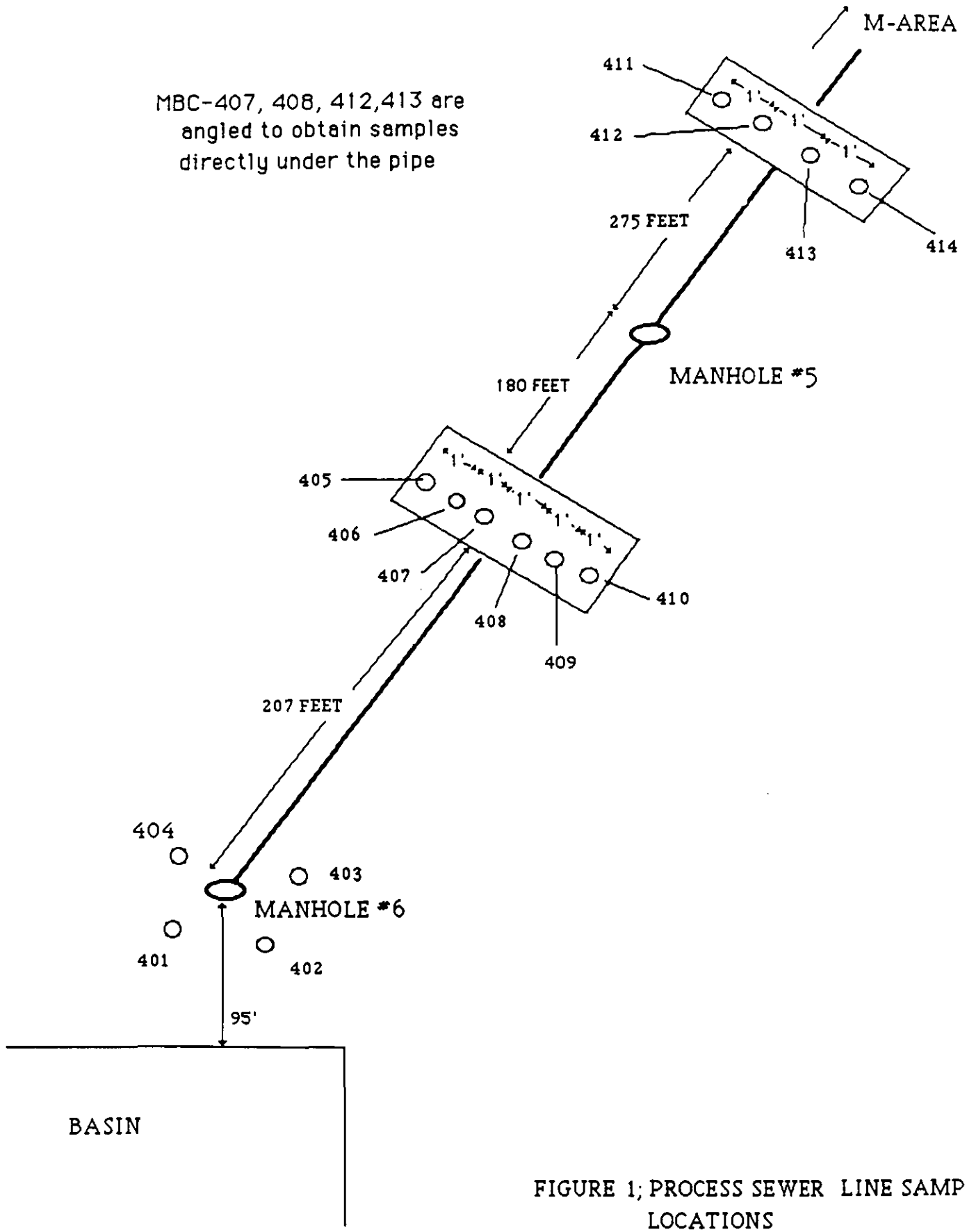
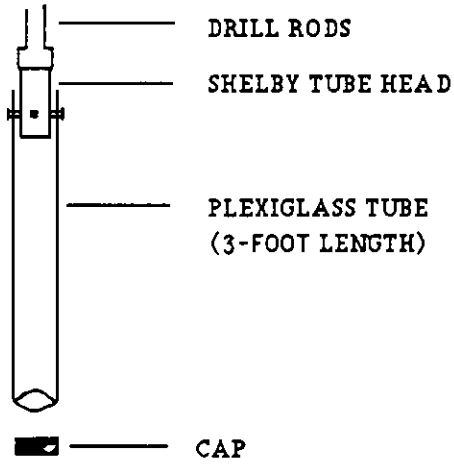
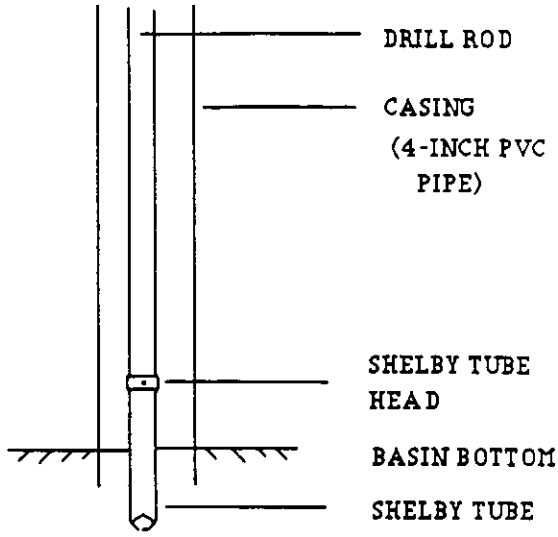


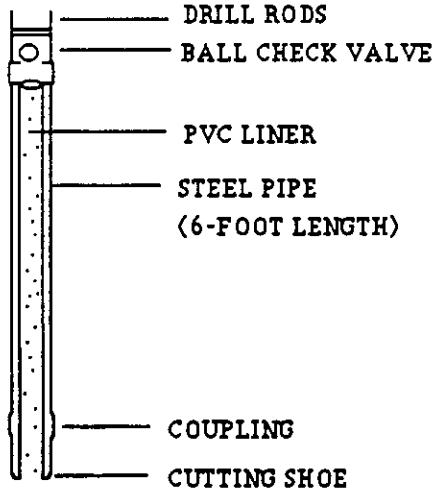

FIGURE 1; PROCESS SEWER LINE SAMPLE LOCATIONS




PLEXIGLASS TUBE SAMPLER

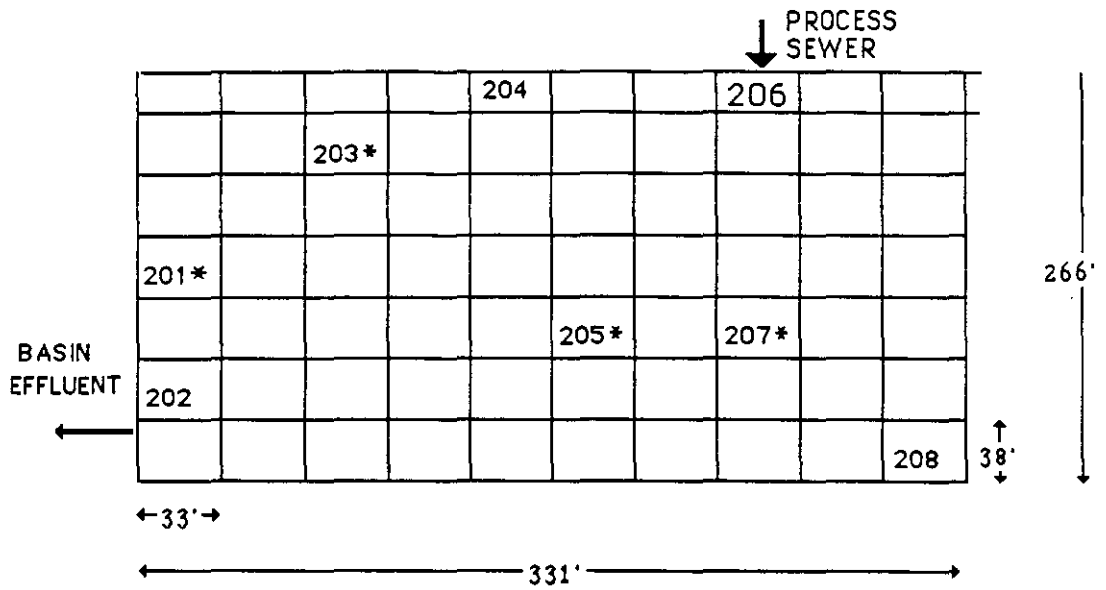



SHELBY TUBE/PVC CASING METHOD




PVC LINED STEEL PIPE SAMPLER

FIGURE 2; BASIN SAMPLING EQUIPMENT




All locations sampled for sludge

* Locations sampled for 6-foot deep soil cores

FIGURE 3 SETTLING BASIN SLUDGE/SOIL SAMPLING LOCATIONS

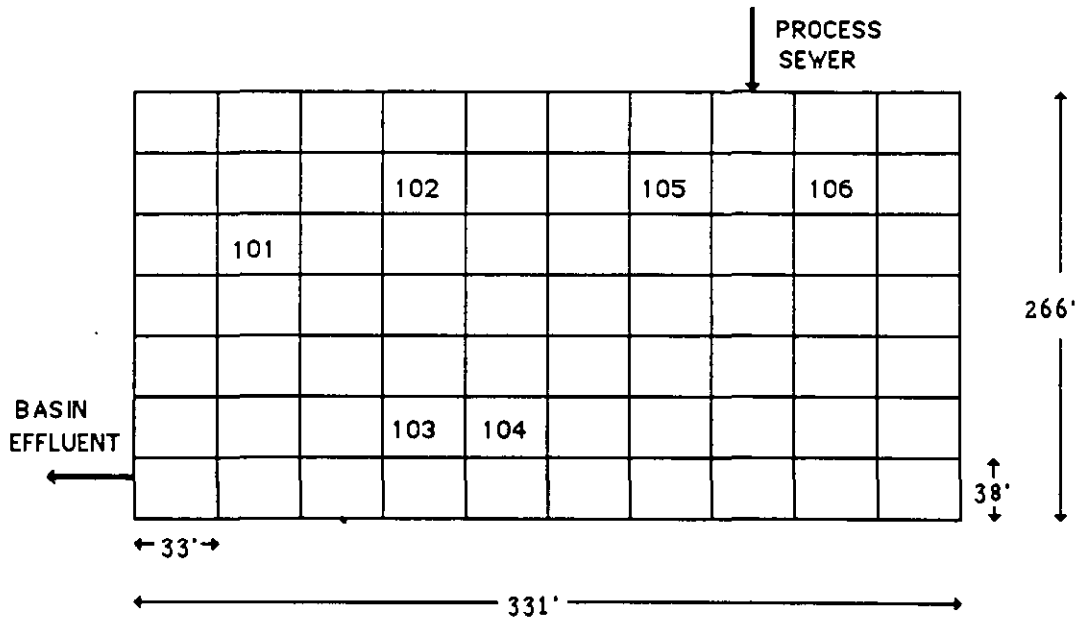



FIGURE 4;SETTLING BASIN LIQUID SAMPLING LOCATIONS 2-FOOT DEPTH

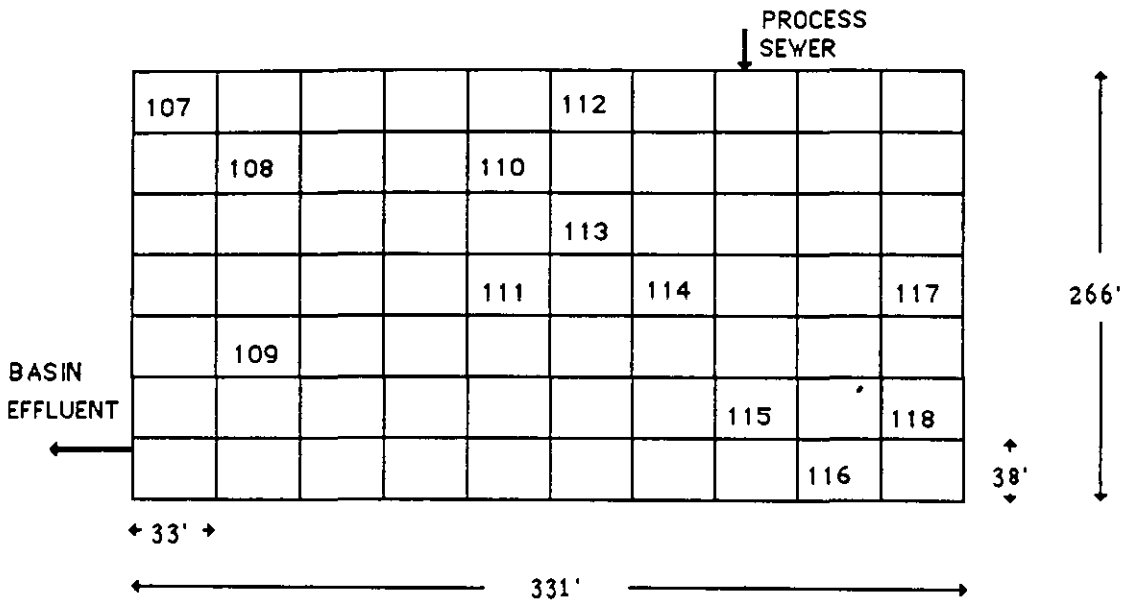



FIGURE 5, SETTLING BASIN LIQUID SAMPLING LOCATIONS 8-FOOT DEPTH

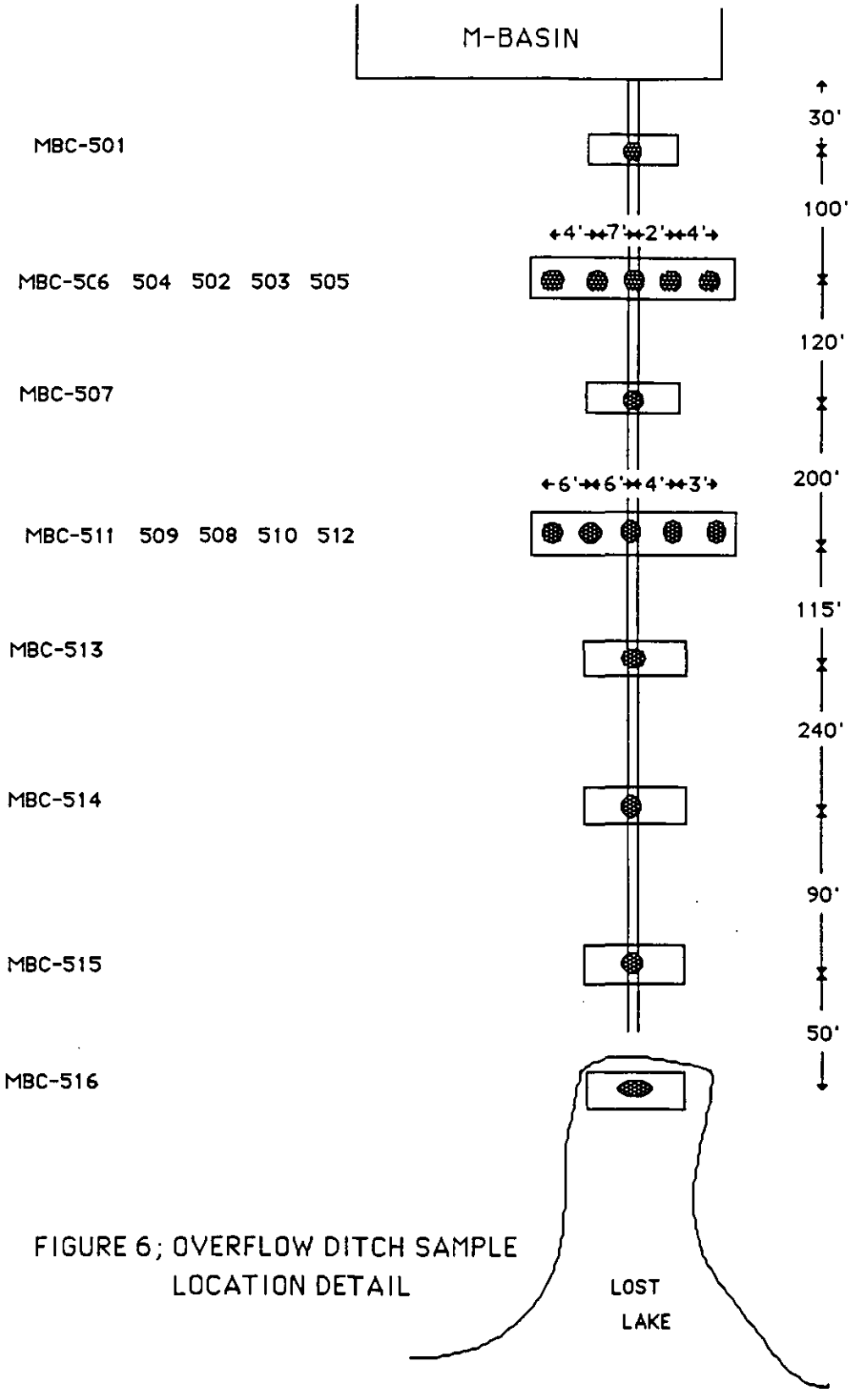



FIGURE 6; OVERFLOW DITCH SAMPLE LOCATION DETAIL

Table 2
Water Measurement Data

M-Area Basin

| Station # | pH | Temperature (degrees C) | Conductivity (ms/cm) | Depth (ft) |
|---|---|---|---|---|
| | | M-Area Basin Samples | | |
| MBL-101 | 11.9 | 7.8 | 1.76 | 2 |
| MBL-102 | 11.7 | 6.5 | 0.82 | 2 |
| MBL-103 | 12.0 | 8.0 | 1.94 | 2 |
| MBL-104 | 12.0 | 8.3 | 1.94 | 2 |
| MBL-105 | 11.3 | 6.8 | 1.02 | 2 |
| MBL-106 | 11.5 | 6.9 | 0.82 | 2 |
| MBL-107 | 12.1 | 9.2 | 3.42 | 8 |
| MBL-108 | 12.4 | 13.0 | 4.90 | 8 |
| MBL-109 | 12.4 | 13.0 | 4.82 | 8 |
| MBL-110 | 12.7 | 8.4 | 3.86 | 8 |
| MBL-111 | 11.6 | 13.5 | 7.40 | 8 |
| MBL-112 | 12.3 | 11.4 | 4.12 | 8 |
| MBL-113 | 12.4 | 18.0 | 7.04 | 8 |
| MBL-114 | 11.8 | 13.1 | 6.60 | 8 |
| MBL-115 | 11.6 | 10.3 | 4.90 | 8 |
| MBL-116 | 11.6 | 9.7 | 5.79 | 8 |
| MBL-117 | 12.3 | 16.3 | 5.93 | 8 |
| MBL-118 | 11.5 | 11.3 | 5.00 | 8 |
| Lost Lake Samples | | | | |
| MBL-119 | 10.1 | 5.7 | 0.15 | 0.5 |
| MBL-120 | 10.5 | 5.7 | 0.04 | 0.5 |
| MBL-121 | 10.4 | 4.8 | 0.02 | 0.5 |

Table: 3 Sludge Thicknesses-Overflow Ditch and Seep Areas
(Sample interval listed as 0-1' on all samples for simplicity;
actual thicknesses listed below)

Overflow Ditch (inches)

| | |
|---|---|
| MBC-501 | 14" |
| MBC-502 | 8" |
| MBC-507 | 16" |
| MBC-508 | 4" |
| MBC-513 | 14" |
| MBC-514 | 3" |
| MBC-515 | 6" |
| MBC-516 | 4" |

Seep Area (inches)

| | | | |
|---|---|---|---|
| MBC-601 | 0" | MBC-611 | 3" |
| MBC-602 | 0" | MBC-612 | 8" |
| MBC-603 | 0" | MBC-613 | 8" |
| MBC-604 | 5" | MBC-614 | 4" |
| MBC-605 | 4" | MBC-615 | 13" |
| MBC-606 | 3" | MBC-616 | 5" |
| MBC-607 | 6" | MBC-617 | 10" |
| MBC-608 | 7" | MBC-618 | 7" |
| MBC-609 | 3" | MBC-619 | 3" |
| MBC-610 | 3" | MBC-620 | 10" |

Table 4
Percent Moisture
M-area Basin sediment and sludge samples

| Station # | 0-1' | 1-2' | 2-3' | 3-4' | 4-5' | 5-6' | Sludge |
|---|---|---|---|---|---|---|---|
| MBC-201 | 13% | 14% | 12% | 10% | 0% | 12% | 97% |
| MBC-202 | | | | | | | 96% |
| MBC-203 | 12% | 11% | 10% | 10% | 15% | 15% | 95% |
| MBC-204 | | | | | | | 90% |
| MBC-205 | 17% | 16% | 10% | 0% | 7% | 13% | 93% |
| MBC-206 | | | | | | | 97% |
| MBC-207 | 13% | 17% | 17% | 1% | 0% | 13% | 96% |
| MBC-208 | | | | | | | 89% |

| Station# | 0-5' | 5-10' | 10-15' | 15-16' | 16-17' | 17-18' | 18-19' | 19-20' | 20-21' |
|---|---|---|---|---|---|---|---|---|---|
| MBC-301 | 14% | 14% | 14% | 12% | 11% | n/a | 11% | n/a | 11% |
| MBC-302 | 14% | 20% | 10% | 13% | 12% | 13% | n/a | n/a | n/a |
| MBC-303 | 13% | 13% | 11% | n/a | 10% | 9% | 10% | 10% | 10% |
| MBC-304 | 10% | 13% | 13% | 13% | 12% | 9% | 13% | 10% | 11% |

| Station# | 7-8' | 8-9' | 9-10' | 10-11' | 11-12' | 12-13' |
|---|---|---|---|---|---|---|
| MBC-401 | 12% | 11% | 13% | 11% | 11% | 11% |
| MBC-402 | 15% | 14% | 13% | 15% | 11% | 11% |
| MBC-403 | 13% | 12% | 12% | 11% | 11% | 12% |
| MBC-404 | 13% | 12% | 11% | 12% | 12% | 10% |

| Station# | 0-1' | 1-2' | 2-3' | 3-4' | 4-5' | 5-6' |
|---|---|---|---|---|---|---|
| MBC-405 | 16% | 17% | 17% | 15% | 14% | 15% |
| MBC-406 | 15% | 17% | 18% | 17% | 18% | 16% |
| MBC-407 | 16% | 17% | 17% | 18% | 15% | 15% |
| MBC-408 | 14% | 14% | 16% | 16% | 15% | 14% |
| MBC-409 | 15% | 12% | 16% | 14% | 13% | 17% |
| MBC-410 | 17% | 18% | 17% | 13% | 18% | 19% |
| MBC-411 | 13% | 14% | 15% | 14% | 14% | 13% |
| MBC-412 | 12% | 14% | 15% | 14% | 14% | 13% |
| MBC-413 | 10% | 12% | 13% | 14% | 13% | 13% |
| MBC-414 | 13% | 13% | 15% | 15% | 15% | 14% |

Table 4 con't

| Station# | 0-1' | 0-0.5' | 0.5-1.5' | 1-1.5' | 1.5-2.5' | 2.5-3.5' | 3.5-4.5' |
|---|---|---|---|---|---|---|---|
| MBC-501 | 86% | | | | | | |
| MBC-502 | 93% | | | 30% | 22% | 22% | 22% |
| MBC-503 | | 29% | 13% | | 16% | 14% | |
| MBC-504 | | 33% | 14% | | 13% | 18% | |
| MBC-505 | | 39% | 19% | | 16% | 15% | |
| MBC-506 | | 30% | 16% | | 15% | 16% | |
| MBC-507 | 92% | | | 25% | 52% | 23% | 19% |
| MBC-508 | 94% | | | 30% | 18% | 22% | 19% |
| MBC-509 | | 87% | 17% | | 18% | 20% | |
| MBC-510 | | 19% | 16% | | 17% | 19% | |
| MBC-511 | | 17% | 13% | | 13% | 14% | |
| MBC-512 | | 6% | 9% | | 10% | 10% | |
| MBC-513 | 84% | | | 17% | 17% | 19% | 19% |
| MBC-514 | 88% | | | 20% | 19% | 17% | 17% |
| MBC-515 | 85% | | | 15% | 18% | 19% | 20% |
| MBC-516 | 85% | | | 14% | 14% | 17% | 16% |

| Station# | 0-1' | 1-2' | Station# | 0-1' | 1-2' |
|---|---|---|---|---|---|
| MBC-601 | 13% | n/a | MBC-610 | 83% | 23% |
| MBC-602 | 1% | n/a | MBC-611 | 88% | 18% |
| MBC-603 | 5% | n/a | MBC-612 | 74% | 27% |
| MBC-604 | 85% | 22% | MBC-613 | 90% | 17% |
| MBC-605 | 83% | 16% | MBC-614 | 84% | 17% |
| MBC-606 | 76% | 33% | MBC-615 | 92% | 17% |
| MBC-607 | 92% | 18% | MBC-616 | 74% | 16% |
| MBC-608 | 93% | 18% | MBC-617 | 92% | 18% |
| MBC-609 | 78% | 14% | MBC-618 | 83% | 16% |

| Station # | 0-1 | 1-1.5 | 1.5-2.5 | 2.5-3.5 | 3.5-4.5 | 4.5-5.5 | 5.5-6.5 | 6.5-7.5* |
|---|---|---|---|---|---|---|---|---|
| MBC-619 | 81% | 15% | 16% | 17% | 17% | 18% | 17% | 17% |
| MBC-620 | 95% | 21% | 16% | 18% | 17% | 15% | 15% | n/a |

*units in feet

Table 4 con't

| Station# | 0-0.5' | 0.5-1.5' | 1.5-2.5' |
|---|---|---|---|
| MBC-701* | 5% | 8% | 8% |
| MBC-702 * | 6% | 10% | 7% |
| MBC-703 | 23% | 18% | |
| MBC-704 | 17% | 19% | |
| MBC-705 | 29% | 25% | |
| MBC-706 | 34% | 29% | |
| MBC-707 | 29% | 23% | |
| MBC-708 | 40% | 4% | |
| MBC-709 | 27% | 21% | |
| MBC-710 | 30% | 25% | |
| MBC-711 | 23% | 25% | |
| MBC-712 | 32% | 23% | |
| MBC-713 | 31% | 10% | |
| MBC-714* | 5% | 9% | 5% |
| MBC-715* | 18% | 12% | 19% |
| MBC-716 | 31% | 26% | |
| MBC-717 | 36% | 24% | |
| MBC-718 | 20% | 17% | |
| MBC-719 | 19% | 22% | |
| MBC-720 | 24% | 19% | |
| MBC-721* | 16% | 19% | 14% |
| MBC-722* | 3% | 10% | 5% |

| Station# | 0-0.5' | 0.5-1.5' | 1.0-2.0' | 3-4' |
|---|---|---|---|---|
| MBC-723* | 12% | 15% | 14% | |
| MBC-724* | 8% | 12% | 13% | |
| MBC-725* | 5% | 10% | 7% | |
| MBC-726** | 9% | 12% | 8% | 16% |
| MBC-727** | 7% | 14% | | 9% |
| MBC-728** | 6% | 11% | 8% | 14% |

* "Dry" shore samples
** Lost Lake Outflow Ditch Samples

| Station# | 0-2' | 2-4' | 4-6' | 6-8' | 8-10' |
|---|---|---|---|---|---|
| MBC-801 | 7% | 10% | 8% | 11% | 9% |
| MBC-802 | 5% | 13% | 10% | 9% | 13% |

| Station# | 0-4' | 4-8' | 8-10' | 10-12' | 12-14' | 14-16' | 16-18' | 18-20' |
|---|---|---|---|---|---|---|---|---|
| MBC-803 | 12% | 14% | 13% | 13% | 15% | 13% | 12% | 13% |
| MBC-804 | 9% | 13% | 13% | 13% | 13% | 12% | 11% | 11% |

Table 4
Percent Moisture
Additional samples M-2 Outfall
and Lost Lake

| Station # | 0-1' | 1-3' | 3-6' |
|---|---|---|---|
| MBC-901* | 18% | 21% | 17% |
| MBC-902* | 22% | 21% | 15% |
| MBC-903* | 19% | 22% | 16% |
| MBC-904* | 18% | 22% | 17% |
| MBC-905** | 7% | 29% | 19% |
| MBC-906** | 13% | 21% | 16% |
| MBC-907** | 17% | 21% | 16% |
| MBC-908** | 15% | 17% | 19% |
| MBC-909** | 12% | 24% | 18% |

* Sampled under 1-2' of water
** Sampled on dry land or very shallow water

| Station# | 0-0.1 | 0.1-0.3 | 0.3-0.5 |
|---|---|---|---|
| MBC-729 | 30% | 15% | 18% |
| MBC-730 | 38% | 26% | 21% |
| MBC-731 | 21% | 10% | 9% |
| MBC-732 | 20% | 13% | 18% |
| MBC-733 | 24% | 15% | 14% |

Table 5

**Type "A" Analyses: Physical Parameters**

pH (water)
Conductivity (water)
Temperature (water)
TDS (water)
Specific gravity (water and sludge)
% Solid

**Type "B" Analyses: Inorganic Chemicals**

Ammonia (as N)
Chloride
Bromide
Fluoride
Nitrate/Nitrite (as N)
Phosphorus, total
Sulfate (as $SO_4$)
Sulfide (as S)
Cyanide

Aluminum
Barium
Boron
Iron, total
Magnesium
Calcium
Sodium
Potassium
Manganese
Tin
Titanium
Antimony
Arsenic

Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Zinc
Uranium

Radioactivity
- Gross Alpha (pCi/L)
- Gross Beta (pCi/L)
- Radium, total (pCi/L)

Total Organic Carbon
Total Organic Halogen

Table 5 con't.

**Type "C" Analyses: Full organic chemical scan, per Appendix VIII of 40 CFR 261.**

Acetonitrite
Acrolein
Acrylamide
Acrylonitrile
Benzene
Benz(a)anthracene
Benzo(a)pyrene
Benzotrichloride
Benzyl chloride
Benzo(b)fluoanthene
Bis(2-chloroethoxymethane)
Bis(2-chloroethyl)ether
Bis(2-chloroisopropyl)ether
Carbon disulfide
Carbon tetrachloride
Chlordane
Chlorinated dibenzodioxins
Chlorinated biphenyls
Chloroacetaldehyde
Chlorobenzene
Chloroform
Chloromethane (Methyl chloride)
2-Chlorophenol
Chrysene
Creosote
Cresol(s)
Cresylic Acid(s)
Dichlorobenzene(s)
1,1-Dichloroethane
1,2-Dichloroethane
Dichloromethane (Methylene dichloride)
Dichlorophenoxyacetic acid
Dichloropropanol
2,4-Dimethylphenol
Dinitrobenzene
4,6-Dinitro-o-cresol
2,4-Dinitrotoluene
Endrin
Ethyl ether
Formaldehyde
Formic acid
Heptachlor
Hexachlorobenzene
Hexachlorobutadiene
Hexachloroethane
Hexachlorocyclopentadiene
Lindane
Maleic anhydride
Methanol
Methomyl
Methyl ethyl ketone
Methyl isobutyl ketone
Napthalene
Napthoquinone
Nitrobenzene
4-Nitrophenol
Paraldehyde (trimer of acetaldehyde)
Pentachlorophenol
Phenol
Phorate
Phosphorodithioic acid esters
Phthalic anhydride
2-Picoline
Pyridine
Tetrachlorobenzene(s)
Tetrachloroethane(s)
Tetrachloroethene (perchloroethylene)
1,2 trans-Dichloroethylene*
Tetrachlorophenol
Toluene
Toluenediamine
Toluene diisocyanate(s)
Toxaphene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene (1,1,2-Trichloroethene)
Trichlorofluoromethane
Trichlorophenol(s)
2,4,5-Trichlorophenoxy propionic acid
Trichloropropane
Vinyl chloride (Chloroethene)
Vinylidene chloride (1,1-Dichloroethene)
Xylene
Bis(chloromethyl)ether**

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* Additional volatile organic not in 40 CFR 261 listing.
** Compound originally shown in Type D analyses.

Table 5 con't.

**Type "D" Analyses: Volatile Organics**

Acrolein
Acrylonitrile
Benzene
Bromoform
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Dichlorobromomethane
Dichlorodifluoromethane
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl bromide
Methyl chloride
Methylene chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Perclene®)
Toluene
1,2-trans-Dichloroethylene
1,1,1-Trichloroethane (1,1,1-TCE)
1,1,2-Trichloroethane
Trichloroethylene (Triclene®)
Trichlorofluoromethane
Vinyl Chloride

Table 5 con't.

**Type "E" (Reduced Level of Inorganic Analyses)**

| | | |
|---|---|---|
| Na | Cr | Cl |
| K | Pb | $NO_3$ (as N) |
| Ca | Ni | $NH_3$ (as N) |
| Mg | Cu | P, total |
| Fe | Hg | Total organic carbon |
| Al | Zn | Total organic halogen |
| Mn | U | |
| Cd | | |

Sample Container Description

| Container | Preservative | Analyses |
|---|---|---|
| Gal. Amber | Cold | A/B/N |
| Gal. Plastic | Cold | Radioactivity |
| Qt. Plastic | Cold | Physical Parameters |
| Qt. Plastic | Zinc Acetate+ NaOH | S= |
| Qt Plastic | NaOH | CN |
| 16 oz. Plastic | HNO3 | Metals |
| 16 oz. Amber | Cold | Total Organic Halogen |
| 8 oz. Amber | H2SO4 | NO3, NH3, Total Organic Carbon P, Total |
| 40 ml Glass vial | Cold | GCMS-VOA |

| TABLE 6 | COUNTS RATE | USING METER | LUDLAM | MODEL | 2200 | PORTA | BLE SCALER |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| 02-26-85 | BACK | GROUND | GAMMA | AVG | 528 | | |
| | | | | | | | |
| | DISH WEIGHT | DISH WT + SAMPLE | NET WT SAMPLE | ALPHA COUNTS | GAMMA COUNTS | BETA COUNTS | BETA+ABSORB. COUNTS |
| MBC-208 | 50.76 | 51.06 | 0.3 | 36 | 562 | 723 | 8 |
| SLUDGE | | | | 35 | 542 | 779 | 12 |
| | | | | 38 | 557 | 728 | 8 |
| MBC-203 | 50.74 | 51.41 | 0.67 | 0 | 527 | 19 | 8 |
| 0-1' | | | | 2 | 523 | 15 | 7 |
| | | | | 0 | 512 | 13 | 14 |
| MBC-612 | 50.74 | 51.12 | 0.38 | 14 | 524 | 237 | 13 |
| 0-1' | | | | 14 | 580 | 244 | 5 |
| | | | | 12 | 485 | 247 | 9 |
| MBC-617 | 50.76 | 51.6 | 0.84 | 2 | 506 | 29 | 11 |
| 1-2' | | | | 4 | 511 | 20 | 14 |
| | | | | 1 | 520 | 30 | 9 |
| MBC-803 | 50.74 | 51.3 | 0.56 | 1 | 554 | 14 | 15 |
| 4-8' | | | | 1 | 572 | 14 | 12 |
| | | | | 0 | 569 | 16 | 12 |
| MBC-804 | 50.74 | 51.29 | 0.55 | 0 | 518 | 12 | 14 |
| 4-8' | | | | 2 | 530 | 8 | 9 |
| | | | | 0 | 557 | 14 | 9 |

# APPENDIX 1
# SAMPLE TRACKING LOG

| | SAMPLE | TRACKING | SHEET | | |
|---|---|---|---|---|---|
| | | | | | |
| BORING | MBC-201 | | | | |
| LOCATION | BASIN | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| SLUDGE | 12-11-84 | 12-11-84 | 12-11-84 | 01-11-85 | 02-04-84 |
| 0-1' | 12-12-84 | 12-12-84 | 12-12-84 | 01-03-85 | 01-07-85 |
| 1-2' | 12-12-84 | 12-12-84 | 12-12-84 | 01-03-85 | 01-07-84 |
| 2-3' | 12-12-84 | 12-12-84 | 12-12-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-12-84 | 12-12-84 | 12-12-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-12-84 | 12-12-84 | 12-12-84 | 01-03-85 | 01-07-85 |
| 5-6' | 12-19-84 | 12-19-84 | 12-19-84 | 01-03-85 | 01-07-85 |
| | | | | | |
| | | | | | |
| BORING | MBC-202 | | | | |
| LOCATION | BASIN | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| SLUDGE | 12-12-84 | 12-12-84 | 12-12-84 | 01-11-85 | 02-04-85 |
| | | | | | |
| | | | | | |
| BORING | MBC-203 | | | | |
| LOCATION | BASIN | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| SLUDGE | 12-12-84 | 12-12-84 | 12-12-84 | 01-14-85 | 02-04-84 |
| 0-1' | 12-13-84 | 12-13-84 | 12-13-84 | 01-03-85 | 01-07-85 |
| 1-2' | 12-13-84 | 12-13-84 | 12-13-84 | 01-03-85 | 01-07-85 |
| 2-3' | 12-12-84 | 12-13-84 | 12-13-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-13-84 | 12-13-84 | 12-13-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-19-84 | 12-19-84 | 12-19-84 | 01-03-85 | 01-07-85 |
| 5-6' | 12-19-84 | 12-19-84 | 12-19-84 | 01-03-84 | 01-07-85 |
| | | | | | |
| | | | | | |
| BORING | MBC-204 | | | | |
| LOCATION | BASIN | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| SLUDGE | 12-13-84 | 12-13-84 | 12-13-84 | 01-14-85 | 02-04-85 |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| BORING | MBC-205 | | | | |
| LOCATION | BASIN | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| SLUDGE | 12-10-84 | 12-10-84 | 12-10-84 | 01-15-85 | 02-04-85 |
| 0-1' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 1-2' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 2-3' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-14-84 | 12-14-84 | 12-14-84 | 01-07-85 | 01-07-85 |
| 5-6' | 01-30-85 | 01-30-85 | 01-30-85 | 02-04-85 | 02-04-85 |
| BORING | MBC-206 | | | | |
| LOCATION | BASIN | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| SLUDGE | 12-13-84 | 12-13-84 | 12-13-84 | 01-16-85 | 02-04-85 |
| BORING | MBC-207 | | | | |
| LOCATION | BASIN | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| SLUDGE | 12-10-84 | 12-10-84 | 12-10-84 | 01-14-84 | 02-04-85 |
| 0-1' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 1-2' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 2-3' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| 5-6' | 12-10-84 | 12-10-84 | 12-10-84 | 01-03-85 | 01-07-85 |
| BORING | MBC-208 | | | | |
| LOCATION | BASIN | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| SLUDGE | 12-13-84 | 12-13-84 | 12-13-84 | 01-14-85 | 02-04-85 |

| | | | | | |
|---|---|---|---|---|---|
| BORING | MBC-301 | | | | |
| LOCATION | BASIN | | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-5' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 5-10' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 10-15' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 15-16' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 16-17' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 17-18' | NO SAMPLE | -- | | | |
| 18-19' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 19-20' | NO SAMPLE | -- | | | |
| 20-21' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| | | | | | |
| BORING | MBC-302 | | | | |
| LOCATION | BASIN | | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-5' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 5-10' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 10-15' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 15-16' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 16-17' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 17-18' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 18-19' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 19-20' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| 20-21' | 11-21-84 | -- | 11-21-84 | 11-29-84 | 12-03-84 |
| | | | | | |
| | | | | | |
| BORING | MBC-303 | | | | |
| LOCATION | BASIN | | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-5' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 5-10' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 10-15' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 15-16' | NO SAMPLE | RECOVERED | | | |
| 16-17' | 11-20-84 | -- | 11-20-84 | 11-28-84 | 12-03-84 |
| 17-18' | 11-20-84 | -- | 11-20-84 | 11-28-84 | 12-03-84 |
| 18-19' | 11-20-84 | -- | 11-20-84 | 11-28-84 | 12-03-84 |
| 19-20' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 20-21' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| BORING LOCATION | MBC-304 BASIN | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-5' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 5-10' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 10-15' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 15-16' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| 16-17' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 17-18' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 18-19' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 19-20' | 11-20-84 | -- | 11-20-84 | 11-29-84 | 12-03-84 |
| 20-21' | 11-20-84 | -- | 11-20-84 | 11-30-84 | 12-03-84 |
| BORING LOCATION | MBC-401 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 7-8' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| 8-9' | 12-12-84 | -- | 12-12-84 | 01-03-84 | 01-07-85 |
| 9-10' | 12-12-84 | -- | 12-12-84 | 01-03-84 | 01-07-85 |
| 10-11' | 12-12-84 | -- | 12-12-84 | 01-03-84 | 01-07-85 |
| 11-12' | 12-12-84 | -- | 12-12-84 | 01-03-84 | 01-07-85 |
| 12-13' | 12-12-84 | -- | 12-12-84 | 01-03-84 | 01-07-85 |
| BORING LOCATION | MBC-402 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 7-8' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 8-9' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 9-10' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 10-11' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 11-12' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 12-13' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |

| | | | | | |
|---|---|---|---|---|---|
| BORING LOCATION | MBC-403 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 7-8' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| 8-9' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| 9-10' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| 10-11' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| 11-12' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| 12-13' | 12-12-84 | -- | 12-12-84 | 01-03-85 | 01-07-85 |
| BORING LOCATION | MBC-404 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 7-8' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 8-9' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 9-10' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 10-11' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 11-12' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |
| 12-13' | 12-12-84 | -- | 12-12-84 | 12-27-84 | 12-31-84 |

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| BORING | MBC-405 | | | | |
| LOCATION | SEWER LINE | | | | |
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| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0-1' | 12-18-84 | -- | 12-18-84 | 12-20-84 | 12-31-84 |
| 1-2' | 12-18-84 | -- | 12-18-84 | 12-20-84 | 12-31-84 |
| 2-3' | 12-18-84 | -- | 12-18-84 | 12-20-84 | 12-31-84 |
| 3-4' | 12-18-84 | -- | 12-18-84 | 12-20-84 | 12-31-84 |
| 4-5' | 12-18-84 | -- | 12-18-84 | 12-20-84 | 12-31-84 |
| 5-6' | 12-18-84 | -- | 12-18-84 | 12-20-84 | 12-31-84 |
| | | | | | |
| | | | | | |
| BORING | MBC-406 | | | | |
| LOCATION | SEWER LINE | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0-1' | 12-18-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 1-2' | 12-18-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 2-3' | 12-18-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 3-4' | 12-18-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 4-5' | 12-18-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 5-6' | 12-18-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
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| BORING | MBC-407 | | | | |
| LOCATION | SEWER LINE | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0-1' | 12-18-84 | -- | 12-18-84 | 12-27-84 | 01-02-85 |
| 1-2' | 12-18-84 | -- | 12-18-84 | 12-27-84 | 01-02-85 |
| 2-3' | 12-18-84 | -- | 12-18-84 | 12-27-84 | 01-02-85 |
| 3-4' | 12-18-84 | -- | 12-18-84 | 12-27-84 | 01-02-85 |
| 4-5' | 12-18-84 | -- | 12-18-84 | 12-27-84 | 01-02-85 |
| 5-6' | 12-18-84 | -- | 12-18-84 | 12-27-84 | 01-02-85 |

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|---|---|---|---|---|---|
| BORING LOCATION | MBC-408 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-14-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 1-2' | 12-14-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 2-3' | 12-14-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-14-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-14-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 5-6' | 12-14-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| BORING LOCATION | MBC-409 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-19-84 | -- | 12-19-84 | 12-28-84 | 01-02-85 |
| 1-2' | 12-19-84 | -- | 12-19-84 | 12-28-84 | 01-02-85 |
| 2-3' | 12-19-84 | -- | 12-19-84 | 12-28-84 | 01-02-85 |
| 3-4' | 12-19-84 | -- | 12-19-84 | 12-28-84 | 01-02-85 |
| 4-5' | 12-19-84 | -- | 12-19-84 | 12-28-84 | 01-02-85 |
| 5-6' | 12-19-84 | -- | 12-19-84 | 12-28-84 | 01-02-85 |
| BORING LOCATION | MBC-410 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-19-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 1-2' | 12-19-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 2-3' | 12-19-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 3-4' | 12-19-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 4-5' | 12-19-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| 5-6' | 12-19-84 | -- | 12-19-84 | 12-26-84 | 12-31-84 |
| BORING LOCATION | MBC-411 SEWER LINE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 1-2' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 2-3' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 3-4' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 4-5' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 5-6' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |

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|---|---|---|---|---|---|
| BORING | MBC-412 | | | | |
| LOCATION | SEWER LINE | | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 1-2' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 2-3' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 3-4' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 4-5' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 5-6' | 12-14-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| | | | | | |
| BORING | MBC-413 | | | | |
| LOCATION | SEWER LINE | | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 1-2' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 2-3' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 5-6' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| | | | | | |
| BORING | MBC-414 | | | | |
| LOCATION | SEWER LINE | | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-13-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 1-2' | 12-13-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 2-3' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 3-4' | 12-13-84 | -- | 12-17-84 | 01-03-85 | 01-07-85 |
| 4-5' | 12-13-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| 5-6' | 12-13-84 | -- | 12-17-84 | 12-31-84 | 01-07-85 |
| | | | | | |
| BORING | MBC-501 | | | | |
| LOCATION | OVERFLOW | DITCH | | | |
| | | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| SLUDGE | 12-28-84 | -- | 12-28-84 | 01-25-85 | 01-28-85 |

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| BORING LOCATION | MBC-502 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-21-84 | -- | 12-21-84 | 01-11-85 | 01-14-85 |
| 1-1.5' | 12-21-84 | -- | 12-21-84 | 01-11-85 | 01-14-85 |
| 1.5-2.5' | 12-21-84 | -- | 12-21-84 | 01-07-85 | 01-14-85 |
| 2.5-3.5' | 12-21-84 | -- | 12-21-84 | 01-07-85 | 01-14-85 |
| 3.5-4.5' | 12-21-84 | -- | 12-21-84 | 01-03-85 | 01-07-85 |
| BORING LOCATION | MBC-503 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 12-20-84 | -- | 12-21-84 | 01-14-85 | 01-28-85 |
| 0.5-1.5' | 12-20-84 | -- | 12-21-84 | 01-04-84 | 01-07-85 |
| 1.5-2.5' | 12-20-84 | -- | 12-21-84 | 01-04-84 | 01-07-85 |
| 2.5-3.5' | 12-20-84 | -- | 12-21-84 | 01-04-84 | 01-14-85 |
| BORING LOCATION | MBC-504 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 12-19-84 | -- | 12-21-84 | 01-14-85 | 01-28-85 |
| 0.5-1.5' | 12-19-84 | -- | 12-21-84 | 01-07-85 | 01-14-85 |
| 1.5-2.5' | 12-19-84 | -- | 12-21-84 | 01-07-85 | 01-14-85 |
| 2.5-3.5' | 12-19-84 | -- | 12-21-84 | 01-07-85 | 01-14-85 |
| BORING LOCATION | MBC-505 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 11-19-84 | -- | 11-27-84 | 12-03-84 | 12-05-84 |
| 0.5-1.5' | 11-19-84 | -- | 11-27-84 | 12-03-84 | 12-05-84 |
| 1.5-2.5' | 11-19-84 | -- | 11-27-84 | 12-03-84 | 12-05-84 |
| 2.5-3.5' | 11-19-84 | -- | 11-27-84 | 12-03-84 | 12-05-84 |

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| BORING LOCATION | MBC-506 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 11-19-84 | -- | 11-27-84 | 12-03-84 | 12-05-84 |
| 0.5-1.5' | 11-19-84 | -- | 11-27-84 | 12-04-84 | 12-05-84 |
| 1.5-2.5' | 11-19-84 | -- | 11-27-84 | 12-04-84 | 12-05-84 |
| 2.5-3.5' | 11-19-84 | -- | 11-27-84 | 12-04-84 | 12-05-84 |
| BORING LOCATION | MBC-507 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-21-84 | -- | 12-28-84 | 01-14-85 | 01-17-85 |
| 1-1.5' | 12-21-84 | -- | 12-21-84 | 01-04-85 | 01-07-85 |
| 1.5-2.5' | 12-21-84 | -- | 12-21-84 | 01-04-85 | 01-07-85 |
| 2.5-3.5' | 12-21-84 | -- | 12-21-84 | 01-04-85 | 01-07-85 |
| 3.5-4.5' | 12-21-84 | -- | 12-21-84 | 01-04-85 | 01-07-85 |
| BORING LOCATION | MBC-508 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-21-84 | -- | 12-28-84 | 01-16-85 | 01-28-85 |
| 1-1.5' | 12-21-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |
| 1.5-2.5' | 12-21-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |
| 2.5-3.5' | 12-21-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |
| 3.5-4.5' | 12-21-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |

| BORING LOCATION | MBC-509 OVERFLOW | DITCH | | | |
|---|---|---|---|---|---|
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 11-19-84 | -- | 12-27-84 | 01-11-85 | 01-14-85 |
| 0.5-1.5' | 11-19-84 | -- | 12-27-84 | 01-04-85 | 01-07-85 |
| 1.5-2.5' | 11-19-84 | -- | 12-27-84 | 01-04-85 | 01-07-85 |
| 2.5-3.5' | 11-19-84 | -- | 12-27-84 | 01-04-85 | 01-07-85 |
| BORING LOCATION | MBC-510 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 12-26-84 | -- | 12-28-84 | 01-09-85 | 01-14-85 |
| 0.5-1.5' | 12-26-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |
| 1.5-2.5' | 12-26-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |
| 2.5-3.5' | 12-26-84 | -- | 12-28-84 | 01-03-85 | 01-14-85 |
| BORING LOCATION | MBC-511 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 11-19-84 | -- | 11-28-84 | 12-03-84 | 12-05-84 |
| 0.5-1.5' | 11-19-84 | -- | 11-27-84 | 12-03-84 | 12-05-84 |
| 1.5-2.5' | 11-19-84 | -- | 11-28-84 | 12-03-84 | 12-05-84 |
| 2.5-3.5' | 11-19-84 | -- | 11-28-84 | 12-03-84 | 12-05-84 |

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| BORING LOCATION | MBC-512 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-0.5' | 11-19-84 | -- | 11-19-84 | 11-30-84 | 12-05-84 |
| 0.5-1.5' | 11-19-84 | -- | 11-19-84 | 11-30-84 | 12-05-84 |
| 1.5-2.5' | 11-19-84 | -- | 11-19-84 | 11-30-84 | 12-05-84 |
| 2.5-3.5' | 11-19-84 | -- | 11-19-84 | 12-03-84 | 12-05-84 |
| BORING LOCATION | MBC-513 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1.0' | 12-26-84 | -- | 12-28-84 | 01-17-85 | 01-17-85 |
| 1.0-1.5' | 12-26-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 1.5-2.5' | 12-26-84 | -- | 12-28-84 | 01-03-85 | 01-07-85 |
| 2.5-3.5' | 12-26-84 | -- | 12-28-84 | 01-07-85 | 01-14-85 |
| 3.5-4.5' | 12-26-84 | -- | 12-28-84 | 01-03-85 | 01-07-85 |
| BORING LOCATION | MBC-514 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1.0' | 12-26-84 | -- | 12-28-84 | 01-16-85 | 01-17-85 |
| 1.0-1.5' | 12-26-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 1.5-2.5' | 12-26-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 2.5-3.5' | 12-26-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 3.5-4.5' | 12-26-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |

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| BORING LOCATION | MBC-515 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1.0' | 12-27-84 | -- | 12-28-84 | 01-28-85 | 01-28-85 |
| 1.0-1.5' | 12-27-84 | -- | 12-28-84 | 01-14-85 | 01-17-85 |
| 1.5-2.5' | 12-27-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 2.5-3.5' | 12-27-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 3.5-4.5' | 12-27-84 | -- | 12-28-84 | 01-03-85 | 01-07-85 |
| BORING LOCATION | MBC-516 OVERFLOW | DITCH | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1.0' | 12-27-84 | -- | 12-28-84 | 01-17-85 | 01-17-85 |
| 1.0-1.5' | 12-27-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 1.5-2.5' | 12-27-84 | -- | 12-28-84 | 01-08-85 | 01-14-85 |
| 2.5-3.5' | 12-27-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |
| 3.5-4.5' | 12-27-84 | -- | 12-28-84 | 01-04-85 | 01-07-85 |

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| BORING LOCATION | MBC-601 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-02-85 | 01-02-85 | 1-2-85 | 01-15-85 | 01-17-85 |
| BORING LOCATION | MBC-602 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-02-85 | 01-02-85 | 01-02-85 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-603 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-02-85 | 01-02-85 | 01-02-85 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-604 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-23-85 | 01-28-85 |
| 1-2' | 12-22-85 | 12-22-84 | 12-22-84 | 01-09-85 | 01-14-85 |

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| BORING LOCATION | MBC-605 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-28-85 | 01-28-85 |
| 1-2' | 12-22-84 | 12-22-84 | 12-22-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-606 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-28-85 | 01-28-85 |
| 1-2' | 12-22-84 | 12-22-84 | 12-28-84 | 01-15-85 | 01-17-85 |
| BORING LOCATION | MBC-607 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-18-85 | 01-21-85 |
| 1-2' | 12-22-84 | 12-22-84 | 12-22-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-608 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-25-85 | 01-28-85 |
| 1-2' | 12-31-84 | 12-31-84 | 12-31-84 | 01-09-85 | 01-14-85 |

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|---|---|---|---|---|---|
| BORING LOCATION | MBC-609 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-84 | 01-22-85 | 01-28-85 |
| 1-2' | 12-31-84 | 12-31-85 | 12-31-85 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-610 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-16-85 | 01-17-85 |
| 1-2' | 12-22-84 | 12-22-84 | 12-22-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-611 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-17-85 | 01-17-85 |
| 1-2' | 12-22-84 | 12-22-84 | 12-22-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-612 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-17-85 | 01-28-85 |
| 1-2' | 01-04-85 | 01-04-85 | 01-04-85 | 01-17-85 | 01-28-85 |

| | | | | | |
|---|---|---|---|---|---|
| BORING LOCATION | MBC-613 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-14-85 | -- | 01-04-85 | 01-23-85 | 01-28-85 |
| 1-2' | 12-31-85 | 12-31-85 | 12-31-85 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-614 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-22-85 | 01-28-85 |
| 1-2' | 12-31-84 | 12-31-84 | 12-31-84 | 01-11-85 | 01-14-85 |
| BORING LOCATION | MBC-615 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 12-26-84 | -- | 12-28-84 | 01-16-85 | 01-17-85 |
| 1-2' | 12-26-84 | 12-26-84 | 12-28-84 | 01-09-85 | 01-10-85 |

| BORING LOCATION | MBC-616 SEEP | | | | |
|---|---|---|---|---|---|
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-23-85 | 01-28-85 |
| 1-2' | 12-31-84 | 12-31-84 | 12-31-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-617 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-18-85 | 01-21-85 |
| 1-2' | 12-31-84 | 12-31-84 | 12-31-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-618 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-04-85 | -- | 01-04-85 | 01-25-85 | 01-28-85 |
| 1-2' | 12-31-84 | 12-31-84 | 12-31-84 | 01-09-85 | 01-14-85 |
| BORING LOCATION | MBC-619 SEEP | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 01-11-85 | -- | 01-11-85 | 01-22-85 | 01-28-85 |
| 1.0-1.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 1.5-2.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 2.5-3.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 3.5-4.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 4.5-5.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 5.5-6.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 6.5-7.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| BORING | MBC-620 | | | | |
| LOCATION | SEEP | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0-1' | 01-11-85 | -- | 01-11-85 | 01-25-85 | 01-28-85 |
| 1.0-1.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 1.5-2.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 2.5-3-5' | 01-14-85 | -- | 01-14-85 | 01-17-85 | 01-17-85 |
| 3.5-4.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 4.5-5.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| 5.5-6.5' | 01-11-85 | -- | 01-11-85 | 01-15-85 | 01-17-85 |
| | | | | | |
| BORING | MBC-701 | | | | |
| LOCATION | LOST LAKE | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0.0-0.5 | 11-30-84 | -- | 12-03-84 | 12-05-84 | 12-17-84 |
| 0.5-1.5 | 03-09-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.5-2.5' | 11-30-84 | -- | 12-03-84 | 12-05-84 | 12-17-84 |
| BORING | MBC-702 | | | | |
| LOCATION | LOST LAKE | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0.0-0.5 | 11-30-84 | -- | 12-03-84 | 12-06-84 | 12-07-84 |
| 0.5-1.5 | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.5-2.5 | 11-30-84 | -- | 12-03-84 | 12-06-84 | 12-07-84 |
| | | | | | |
| BORING | MBC-703 | | | | |
| LOCATION | LOST-LAKE | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0.0-0.5 | 12-07-84 | -- | 12-10-84 | 12-20-84 | 12-31-84 |
| 1.1-2.5 | 12-07-84 | -- | 12-10-84 | 12-19-84 | 12-31-84 |
| | | | | | |
| | | | | | |
| BORING | MBC-704 | | | | |
| LOCATION | LOST LAKE | | | | |
| | | | | | |
| SAMPLE | DATE | SAMPLE | SAMPLE SET | SAMPLE | SAMPLE |
| INTERVAL | SAMPLED | ARCHIVED | TO DRY | PROCESSED | SHIPPED |
| | | | | | |
| 0.0-0.5 | 12-07-84 | -- | 12-10-84 | 12-19-84 | 12-31-84 |
| 0.0-1.5 | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |

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|---|---|---|---|---|---|
| BORING LOCATION | MBC-705 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| 0.5-1.5' | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| BORING LOCATION | MBC-706 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-06-84 | -- | 12-10-84 | 12-17-84 | 12-31-84 |
| 0.5-1.5' | 12-06-84 | -- | 12-10-84 | 12-17-84 | 12-31-84 |
| BORING LOCATION | MBC-707 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5 | 12-07-84 | -- | 12-10-84 | 12-20-84 | 12-31-84 |
| 0.5-1.5 | 12-07-84 | -- | 12-10-84 | 12-20-84 | 12-31-84 |
| BORING LOCATION | MBC-708 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5 | 12-07-84 | -- | 12-10-84 | 12-20-84 | 12-31-84 |
| 0.5-1.5 | 12-07-84 | -- | 12-10-84 | 12-19-84 | 12-31-84 |
| BORING LOCATION | MBC-709 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-07-84 | -- | 12-10-84 | 12-20-84 | 12-31-84 |
| 0.5-1.5' | 12-07-84 | -- | 12-10-84 | 12-19-84 | 12-31-84 |

| | | | | | |
|---|---|---|---|---|---|
| BORING LOCATION | MBC-710 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-07-84 | -- | 12-10-84 | 12-17-84 | 12-31-84 |
| 0.5-1.5' | 12-07-84 | -- | 12-10-84 | 12-17-84 | 12-31-84 |
| BORING LOCATION | MBC-711 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| 0.5-1.5' | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| BORING LOCATION | MBC-712 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-06-84 | -- | 12-06-84 | 12-20-84 | 12-31-84 |
| 0.5-1.5' | 12-06-84 | -- | 12-06-84 | 12-19-84 | 12-31-84 |
| BORING LOCATION | MBC-713 LOST LAKE' | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-07-84 | -- | 12-10-84 | 12-19-84 | 12-31-84 |
| 0.5-1.5' | 12-07-84 | -- | 12-10-84 | 12-19-84 | 12-31-84 |
| BORING LOCATION | MBC-714 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-30-84 | -- | 12-03-84 | 12-05-84 | 12-17-84 |
| 0.5-1.5 | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.5-2.5' | 11-30-84 | -- | 12-03-84 | 12-05-84 | 12-17-84 |

| | | | | | |
|---|---|---|---|---|---|
| BORING LOCATION | MBC-715 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-30-84 | -- | 12-03-84 | 12-10-84 | 12-17-84 |
| 0.5-1.5' | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.5-2.5' | 11-30-84 | -- | 12-03-84 | 12-11-84 | 12-17-84 |
| BORING LOCATION | MBC-716 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.5-0.5' | 12-06-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| 0.5-1.5' | 12-06-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| BORING LOCATION | MBC-717 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-06-84 | -- | 12-06-84 | 12-19-84 | 12-31-84 |
| 0.5-1.5' | 12-06-84 | -- | 12-06-84 | 12-19-84 | 12-31-84 |
| BORING LOCATION | MBC-718 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-06-84 | -- | 12-06-84 | 12-11-84 | 12-17-84 |
| 0.5-1.5' | 12-06-84 | -- | 12-06-84 | 12-11-84 | 12-17-84 |
| BORING LOCATION | MBC-719 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |
| 0.5-1.5' | 12-07-84 | -- | 12-10-84 | 12-18-84 | 12-31-84 |

| BORING LOCATION | MBC-720 LOST LAKE | | | | |
|---|---|---|---|---|---|
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 12-06-84 | -- | 12-06-84 | 12-11-84 | 12-17-84 |
| 0.5-1.5' | 12-06-84 | -- | 12-06-84 | 12-11-84 | 12-17-84 |
| BORING LOCATION | MBC-721 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-30-84 | -- | 12-03-84 | 12-11-84 | 12-17-84 |
| 0.5-1.5 | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.5-2.5' | 11-30-84 | -- | 12-03-84 | 12-11-84 | 12-17-84 |
| BORING LOCATION | MBC-722 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-30-84 | -- | 12-03-84 | 12-06-84 | 12-17-84 |
| 0.5-1.5 | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.5'-2.5' | 11-30-84 | -- | 12-03-84 | 12-06-84 | 12-17-84 |
| BORING LOCATION | MBC-723 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-21-84 | -- | 11-28-84 | 12-04-84 | 12-05-84 |
| 0.5-1.5 | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.0-2.0' | 11-21-84 | -- | 11-28-84 | 12-03-84 | 12-05-84 |
| BORING LOCATION | MBC-724 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-21-84 | -- | 11-28-84 | 12-03-84 | 12-05-84 |
| 0.5-1.5 | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.0-2.0' | 11-21-84 | -- | 11-28-84 | 12-04-84 | 12-05-84 |

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|---|---|---|---|---|---|
| BORING LOCATION | MBC-725 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-21-84 | -- | 11-28-84 | 11-30-84 | 12-05-84 |
| 0.5-1.5' | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 1.0-2.0' | 11-21-84 | -- | 11-28-84 | 11-30-84 | 12-05-84 |
| BORING LOCATION | MBC-726 LOST LAKE | OVERFLOW | DITCH | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-21-84 | -- | 11-28-84 | 11-30-84 | 01-14-85 |
| 0.5-1.5' | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 3.0-4.0' | 01-07-85 | -- | 01-07-85 | 01-14-85 | 01-14-85 |
| BORING LOCATION | MBC-727 LOST LAKE | OVERFLOW | DITCH | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-21-84 | -- | 11-28-84 | 11-30-84 | 01-14-85 |
| 0.5-1.5' | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 3.0-4.0' | 11-21-84 | -- | 11-28-84 | 11-30-84 | 01-14-85 |
| BORING LOCATION | MBC-728 LOST LAKE | OVERFLOW | DITCH | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.5' | 11-21-84 | -- | 11-28-84 | 11-30-84 | 01-14-85 |
| 0.5-1.5' | 03-19-85 | -- | 03-20-85 | 03-21-85 | 03-22-85 |
| 3.0-4.0' | 01-07-85 | -- | 01-07-85 | 01-11-85 | 01-14-85 |
| BORING LOCATION | MBC-729 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.1' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.1-0.3' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.3-0.5' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-26-85 |

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| BORING LOCATION | MBC-730 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.1' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.1-0.3' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.3-0.5' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-26-85 |
| BORING LOCATION | MBC-731 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.1' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.1-0.3' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.3-0.5' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-26-85 |
| BORING LOCATION | MBC-732 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.1' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.1-0.3' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.3-0.5' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-26-85 |
| BORING LOCATION | MBC-733 LOST LAKE | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0.0-0.1' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.1-0.3' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-29-85 |
| 0.3-0.5' | 02-18-85 | -- | 02-19-85 | 02-26-85 | 02-26-85 |

| | | | | | |
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| BORING LOCATION | MBC-901 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-12-85 | -- | 02-12-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-12-85 | -- | 02-12-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-12-85 | -- | 02-12-85 | 02-20-85 | 02-29-85 |
| BORING LOCATION | MBC-902 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-13-85 | -- | 02-13-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-13-85 | -- | 02-13-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-13-85 | -- | 02-13-85 | 02-20-85 | 02-29-85 |
| BORING LOCATION | MBC-903 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-13-85 | -- | 02-13-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-13-85 | -- | 02-13-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-13-85 | -- | 02-13-85 | 02-20-85 | 02-29-85 |
| BORING LOCATION | MBC-904 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |

| BORING LOCATION | MBC-905 M-2 OUTFALL | | | | |
|---|---|---|---|---|---|
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-18-85 | -- | 02-18-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-18-85 | -- | 02-18-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-18-85 | -- | 02-18-85 | 02-20-85 | 02-29-85 |
| BORING LOCATION | MBC-906 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| BORING LOCATION | MBC-907 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-14-85 | -- | 02-14-85 | 02-20-85 | 02-29-85 |
| BORING LOCATION | MBC-908 M-2 OUTFALL | | | | |
| SAMPLE INTERVAL | DATE SAMPLED | SAMPLE ARCHIVED | SAMPLE SET TO DRY | SAMPLE PROCESSED | SAMPLE SHIPPED |
| 0-1' | 02-15-85 | -- | 02-15-85 | 02-20-85 | 02-29-85 |
| 1-3' | 02-15-85 | -- | 02-15-85 | 02-20-85 | 02-29-85 |
| 3-6' | 02-15-85 | -- | 02-15-85 | 02-20-85 | 02-29-85 |

## APPENDIX 2

## LABORATORY PROCEDURES USED IN DETERMINING GROSS ALPHA, BETA AND GAMMA COUNTS

a.) Prior to assessing the sediment samples, background gamma counts needed to be determined. Following a brief warmup period for the Ludlum instrument (approximately 15 minutes), the gamma probe was connected and inserted into the mount. The window of the probe rests directly on a clean sample dish. The voltage setting is placed on 370 and five one-minute counts taken. The determination of background gamma counts was performed every time the instrument was turned on. This is necessary because gamma background values can vary significantly and frequently due to the impact of natural phenomena and activities within the laboratory. For purposes of this study it was assumed the average count determined at the beginning of a session was representative of conditions throughout that specific session.

b.) Following the determination of background gamma, a small amount (approximately 0.5 grams) of processed sample was placed on a clean, preweighed sample dish. Care was taken that the sample was evenly spread so that its profile was not mounded but level within the tray's indention. The tray and sample were then weighed and net sample weight determined. A Fisher/Ainsworth Model MX-200 Digital Analytical Scale was used for this purpose. The sample ladden tray was then inserted into the probe mount and the gamma probe lowered onto it so that the probe's window rested directly over the sample. Three one-minute counts were then taken.

c.) The instrument was then turned off and the gamma probe removed from the mount and disconnected. The alpha probe was hooked up, the instrument's voltage setting placed on 330 and the probe inserted into the mount and placed on the sample tray over the sediments. The instrument was then turned on and three one-minute counts taken. Background alpha was assumed to be zero. Following completion of this procedure, the instrument was turned off, and the alpha probe removed from the mount and disconnected. Special care was taken in handling the alpha proble due to the fragile nature of the membrane covering its window.

d.) The beta probe was then connected to the instrument and inserted over the sample tray. The voltage setting was placed on 410, the instrument turned on, and three one-minute counts taken. Background beta counts were determined by raising the probe off the surface of the sample tray and placing a special absorber between it and the sediment sample. The probe was then lowered so that it rested on this filter and

three one-minute counts were taken. Care was taken while placing this filter over the sample so that the sediments were not disturbed, thereby destroying the original geometry or profile of the sample.

e.) Following the determination of beta counts, the instrument was turned off, the probe disconnected and the sample tray removed. The sediments were returned to their original container and the tray thoroughly cleaned by first scrubbing in a pan of distilled water, rinsing with acetone and then air drying.

Following is a step-by-step description of how curies/gram values were developed from the gross alpha, beta and gamma count data.

a.) determine average values for alpha, beta and gamma counts and their respective background counts.

b.) determine net counts for alpha, beta and gamma data. For purposes of this study, alpha background was assumed to be zero

NET COUNT = AVG GROSS COUNT - BACKGROUND COUNT

c.) determine minimum significant net count. This procedure was applicable only to beta and gamma data. Alpha counts were deemed significant if net counts were => 0.5.

MIN. SIG. NET CT. = (2.706 + /7.322 + 21.648 B)/2

where B = average background value.

d.) determine total count. Alpha, beta and gamma probe efficiencies utilized were .2989%, .4126% and .0845%, respectively.

TOTAL COUNT = NET COUNT / PROBE EFFICIENCY

e.) determine curies

CURIES = TOTAL COUNT / (2.22)(10^12)

f.) determine curies/gram. For beta and gamma, total curies were divided by sample weight.

CURIES/SAMPLE WEIGHT

For alpha, the factor .02 was divided into total curies instead of sample weight. This factor was assumed to represent the weight of sediment within the surface layer of the sample which would impact upon the window of the alpha probe.

CURIES/.02

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

ATOMIC ENERGY DIVISION
SAVANNAH RIVER LABORATORY
AIKEN, SOUTH CAROLINA 29808-0001
(TWX 810-771-2670 TEL 803-725-6211 WU AUGUSTA GA)

CC: W. P. Colven, SRP
D. E. Gordon, SRL
G/T Chron File

December 11, 1984

TO: C. B. SHEDROW
ENVIRODYNE ENGINEERS, INC.

**STORAGE AND HANDLING OF SAMPLES FROM M-AREA CHARACTERIZATION PROGRAM**

Per our discussions 11/21 and 11/26/84, we agreed to use the following procedures to store and handle the M-Area characterization program samples.

**Liquid Samples (from basin)**

- All liquid samples to be kept cold in portable freezer chests in the field, refrigerated at 4°C prior to shipment, and maintained at about 4°C (or less) during shipment to St. Louis for analysis. The liquid samples are to be analyzed for volatile organics within 2 weeks of sample collection.

**Solid Samples (sludge or soil/sediment)**

- The soil/sediment samples are to be kept cool in portable freezer chests in the field. After the portion to be analyzed for volatile organics (VOA's) has been separated, the VOA sample is to be refrigerated at 4°C (or less). The samples are to be maintained at 4°C (or less) until analysis is completed. The analysis for VOA's is to be completed as soon as possible (30 days desired, but not mandatory).

- The portions of the soil/sediment samples to be analyzed for metals, inorganic constituents, and acid base/neutral organics do not require refrigeration prior to air drying and grinding. However, if a long delay (1-2 weeks) should occur

prior to sample processing, the sludge samples should be refrigerated.

If there are any questions, please call me (X-5218).

Sincerely,

John B. Pickett

John B. Pickett
Environmental Sciences Division

attachments
JBP:ckf

ATTACHMENTS

1. E. William Loy (Chemist, USEPA Region IV, Environmental Sciences Division), Letter to Barry Shedrow (Envirodyne Engineers), November 29, 1984.

2. T. C. Kurimcak (Director, Analytical Services Division, SCDHEC), Letter to C. Barry Shedrow (Envirodyne Engineers), November 29, 1984.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ENVIRONMENTAL SERVICES DIVISION
ATHENS, GEORGIA 30613

REF: 4 ES/AS

November 29, 1984

Mr. Barry Shedrow
Envirodyne Engineers
12161 Lackland Rd.
St. Louis, MO 63146

Dear Mr. Shedrow:

In regard to.your request for information on holding times for sediment/soil samples for purgeable and extractable organics, the following is provided. Currently, EPA has no specific holding times for this type of sample other than, refrigerate at 4°C after sampling and analyze as soon as possible.

Sincerely yours,

E. William Loy Jr.

E. William Loy, Chemist
Chemistry Section

# South Carolina Department of Health and Environmental Control

2600 Bull Street
Columbia, S.C. 29201

Commissioner
Robert S. Jackson, M.D.

Board
Moses H. Clarkson, Jr., Chairman
Leonard W. Douglas, M.D., Vice-Chairman
Barbara P. Nuessle, Secretary
Gerald A. Kaynard
Oren L. Brady, Jr.
James A. Spruill, Jr.
William H. Hester, M.D.

November 29, 1984

Mr. C. Barry Shedrow, Manager
Envirodyne Engineering Corp.
Savannah River Plant
Aiken, SC 29801

Dear Mr. Shedrow:

This letter will serve to confirm our conversation of November 29, 1984, concerning the holding times and preservation techniques of sediment samples for volatile organic analysis.

Presently, we do not have any specific guidance relative to holding times or preservation techniques for sediment samples. We store the samples in a refrigerator maintained at 4°C, and we analyze the samples as soon as possible.

You may follow this sediment sample preservation protocol for submission of data to the Office of Environmental Quality Control. Please refer questions concerning this matter to Mr. Jerry E. Watson or the writer.

Sincerely,

Thomas C. Kurimcak

Thomas C. Kurimcak, Director
Analytical Services Division
Bureau of EQC Laboratories

TCK/njb

cc: Mr. Jerry E. Watson

APPENDIX D

# SOIL GAS SURVEY ALONG PROCESS SEWER LINE FROM M AREA TO THE SETTLING BASIN

## APPENDIX D

## SOIL GAS SURVEY ALONG PROCESS SEWER LINE FROM A-AREA TO THE SETTLING BASIN

The results of a soil/gas survey were compared with the previous data from a TV scan along the inside of the process sewer line to define soil core sampling locations for the extended characterization program. The TV camera scan (conducted in November 1981 by RCE, Rehabilitation Specialists, of Fern Park, FL) had shown that the process sewer had numerous cracks, breaks, and misalignments. Analysis of groundwater samples from monitoring wells near the pipeline had indicated significant chlorinated hydrocarbon contamination in that area. Therefore, a portable organic vapor analyzer was used to measure the concentrations of organic vapors in the surface (1 to 2 feet deep) soils above the pipeline. It was assumed that a high organic vapor concentration would correspond to a crack in the sewer pipe, and therefore that location would have the highest probability of finding inorganic or organic contamination in the soils underneath the sewer pipe.

An "hnu Systems" photoionization analyzer (Model Pl 101) was used for the soil gas analyses. A 10.2 eV lamp, which is specifically sensitive to chlorinated hydrocarbons was used as the detector. A cylindrical hole, approximately 3/4 inch in diameter, was prepared by driving a sharpened steel rod into the soil, to a depth(s) of one (or two) feet. The 1/4-inch-diameter detection probe was immediately placed in the hole, with care taken to be sure that loose soil did not plug the probe. A low suction through the probe was developed by an internal fan, which transferred the soil vapors to the photoionization detector. The concentration, in micrograms of total organic vapor per gram of air (ppm), was read immediately, and then after a "steady-state" level was reached (1 to 2 minutes later). The samples were taken at approximately 20 foot intervals along the sewer line, and also close to manhole No. 6 (M.H. No. 6) the closest manhole to the M-Area settling basin. A schematic diagram of the sewer line is shown in Figure 1. The results of the soil gas surveys are given in Tables 1, 2, and 3.

The data in Table 1 indicated that the highest concentration of organic vapors occurred approximately 204 to 205 feet from M.H. No. 6 toward M-Area. The "peak" and "steady-state" concentrations were as high as 90 and 15 ppm, respectively (vs. a background of <1.0 ppm). This location was also found to correspond to a "long top crack," as determined by the TV scan.

The second location was chosen based on the data shown in Table 2, where the highest organic vapor concentration occurred 275 feet from M.H. No. 5 toward M-Area. That location corresponded with a "minor misalignment" as detected by the TV scan.

The third location chosen was in the immediate vicinity of M.H. No. 6, the closest manhole to the basin. Those sample locations also demonstrated relatively high organic vapor concentrations vs. background (20 to 36 vs. <1.0 ppm, respectively). The sample locations are shown in Table 3.

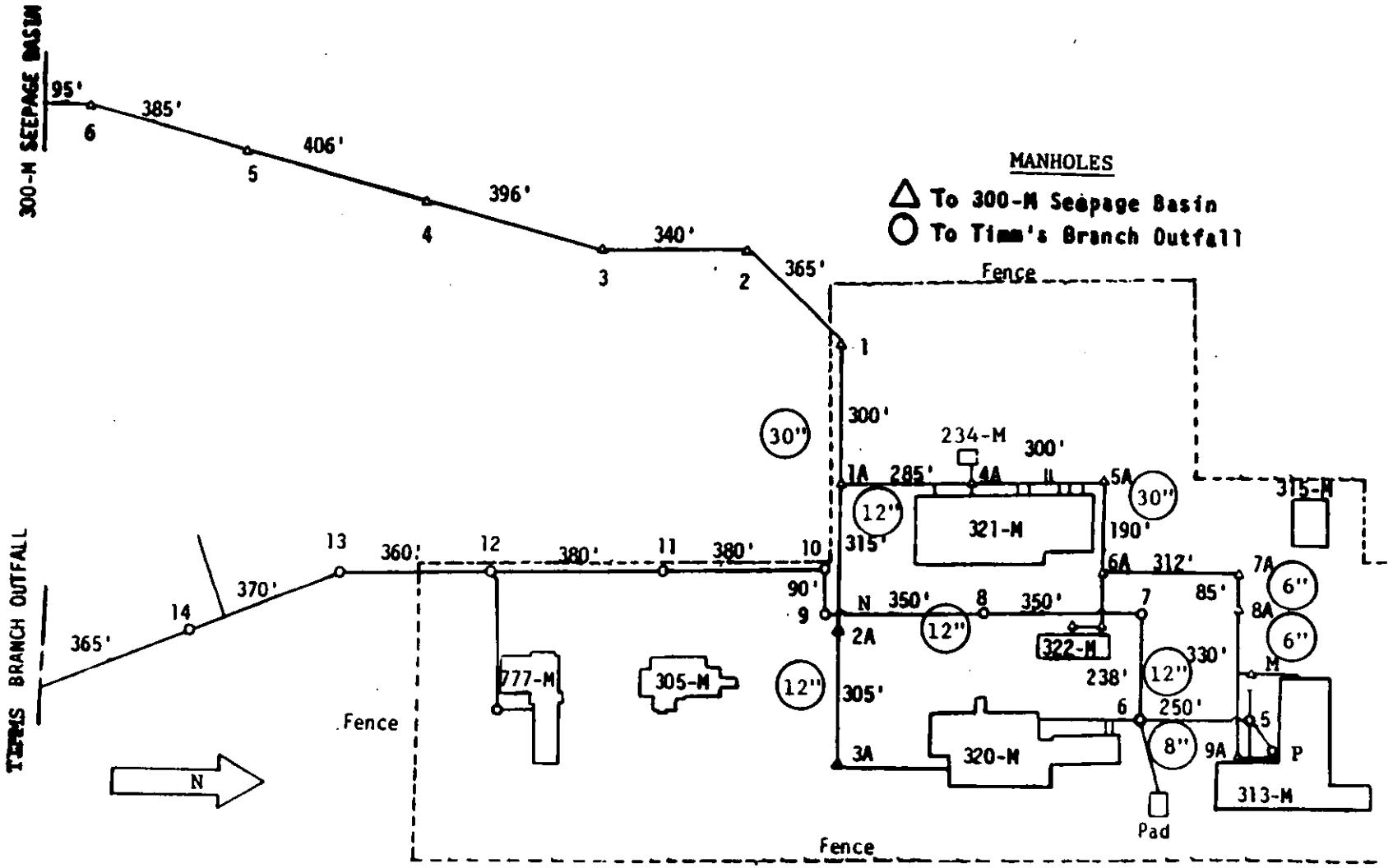



FIGURE 1. Location of 300-M Area Process Sewer Lines Between Process Buildings and Settling Basin and A-14 Outfall

TABLE 1

**Soil Gas Determination and TV SCAN Information Section of Process Sewer Between Manhole Nos. 6 & 5.**

| SAMPLE DESIGNATION | LOCATION* | HNu PROBE DEPTH (FT) | CONCENTRATION, PPM PEAK | CONCENTRATION, PPM STEADY | PIPELINE DESCRIPTION (TV CAMERA SCAN) |
|---|---|---|---|---|---|
| 6 | 18 | 1 | 6 | 4.0† | CIRCLE CRACK |
| 5 | 22 | 1 | 10 | 2.0 | CIRCLE CRACK |
| 1A | 72 | 1 | -- | 0.8 | CIRCLE CRACK |
| 1B | 72 | 1 | 5 | 0.4 | |
| 2A | 87 | 1 | 4 | 0.4 | LONG TOP CRACK |
| 2B | 87 | 1 | 5 | 0.6 | |
| 3A | 100 | 1 | 6 | 1.0 | LONG TOP CRACK |
| 3B | 100 | 1 | 4 | 1.0 | |
| 4A | 116 | 1 | 8 | 1.2 | LONG TOP CRACK |
| 4B | 116 | 1 | 14 | 3.0 | |
| 7A | 146 | 1 | 3 | 1.0 | CIRCLE CRACK |
| 7B | 146 | 1 | 2.5 | 1.0 | |
| 8A | 175 | 1 | 15.5 | 1.8†† | LONG TOP CRACK + |
| 8B | 175 | 1 | 13 | <0.1 | SIDE CRACK |
| 9C | 204 | 1 | 55 | 2.0 | LONG TOP CRACK |
| 9F | 204 | 2 | 90 | 15 | |
| 9A | 205 | 1 | > 20 | 1.5 | |
| 9B | 205 | 1 | -- | 0.1 | |
| 9G | 205 | 2 | 60 | 9 | |
| 9D | 207 | 1 | 30 | 20 | |
| 9E | 207 | 1 | 22 | 6 | |
| 10A | 237 | 1.0 | 17 | 2 | BREAK, TOP & RIGHT |
| 10B | 237 | 1 | 20 | 2 | |
| 12A | 255 | 1 | 8 | 1.2 | TOP CRACK + ROOTS |
| 11A | 267 | 1 | 8 | 2 | TOP CRACK, SIDE CRACK, ROOTS |
| 15A | 297 | 1 | 8 | 5 | TOP CRACK |
| 14A | 343 | 1 | 3.5 | 0.8 | TOP CRACK |
| 13A | 358 | -- | | | -- |
| MANHOLE NO. 5 | 373 | -- | | | -- |

* Distance (feet) from Manhole No. 6 toward Manhole No. 5.

† Instrument open to air gave reading of 0.4 ppm.

†† Instrument "rezeroed", open air reading equaled 0.6 ppm.

TABLE 2

Soil Gas Determination and TV SCAN Information.
Section of Process Sewer Between Manhole Nos. 5 & 4.

| SAMPLE DESIGNATION | LOCATION** | HNu PROBE DEPTH (FT) | CONCENTRATION, PPM PEAK | CONCENTRATION, PPM STEADY | PIPELINE DESCRIPTION (TV CAMERA SCAN) |
|---|---|---|---|---|---|
| 16 | 10 | 1 | 4 | 1.2 | -- |
| 17 | 25 | 1 | 40 | 7 | TOP CRACK |
| 17A | 25 | 2 | 10 | 8 | |
| 18 | 45 | 1 | 14 | 2 | SEVERE TOP CRACK |
| 19 | 65 | 2 | 10 | 1.5 | CIRCLE CRACK |
| 20 | 105 | 1 | 2.5 | 0.5 | TOP AND CIRCLE CRACK, ROOTS |
| 21 | 135 | 2 | 1.0 | 0.5 | CIRCLE CRACK |
| 22 | 170 | 1 | 6 | 1.0 | CRACK (LEFT SIDE), |
| 22A | 170 | 2 | 8 | 1.2 | ROOTS |
| 23 | 200 | 1 | 0.8 | 0.5 | CIRCLE CRACK |
| 24 | 230 | 1 | 0.8 | 0.5 | TOP CRACK, ROOTS |
| 25 | 275 | 1 | 8 | 1.5 | MINOR MISALIGNMENT |
| 25A | 275 | 2 | 18 | 9 | |
| 26 | 295 | 1 | 4 | 0.5 | SEVERELY CRUSHED, |
| 26A | 295 | 2 | 4 | 1.0 | ALL SIDES |
| 27 | 320 | 1 | 2 | 0.8 | SEVERE CRACKS + ROOTS |
| 28 | 340 | 1.5 | 6 | 1.2 | TOP CRACKS + ROOTS |
| 29 | 370 | 2 | 1.5 | 1.4 | CIRCLE CRACK |
| 30 | 391 | 1 | 1.2 | 0.5 | TOP CRACK |
| 30A | 391 | 2 | 1.4 | 0.5 | |
| MANHOLE NO. 4 | 406 | -- | -- | -- | -- |

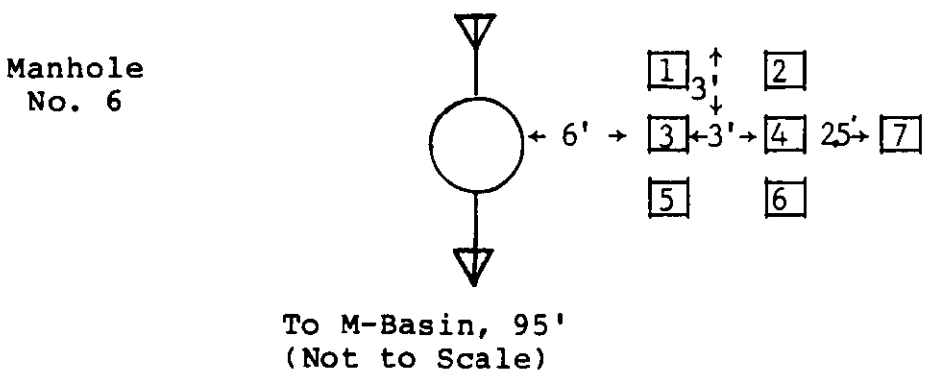
** Distance (ft) from Manhole No. 5 toward Manhole No. 4.

TABLE 3

Soil Gas Determinations Close to Manhole No. 6.

| SAMPLE DESIGNATION | DEPTH (FT) | CONCENTRATION, PPM PEAK | STEADY |
|---|---|---|---|
| 1 | 1 | 6 | 5 |
| 2 | 1 | 3 | 2 |
| 3 | 1 | >20 | 4 |
| 4 | 1 | 3 | 1.5 |
| 5 | 1 | 36 | 15 |
| 6 | 1 | 4.5 | 1.5 |
| 7 | 1 | 20 | 4 |

SCHEMATIC DIAGRAM OF SOIL-GAS SAMPLE LOCATIONS



APPENDIX E

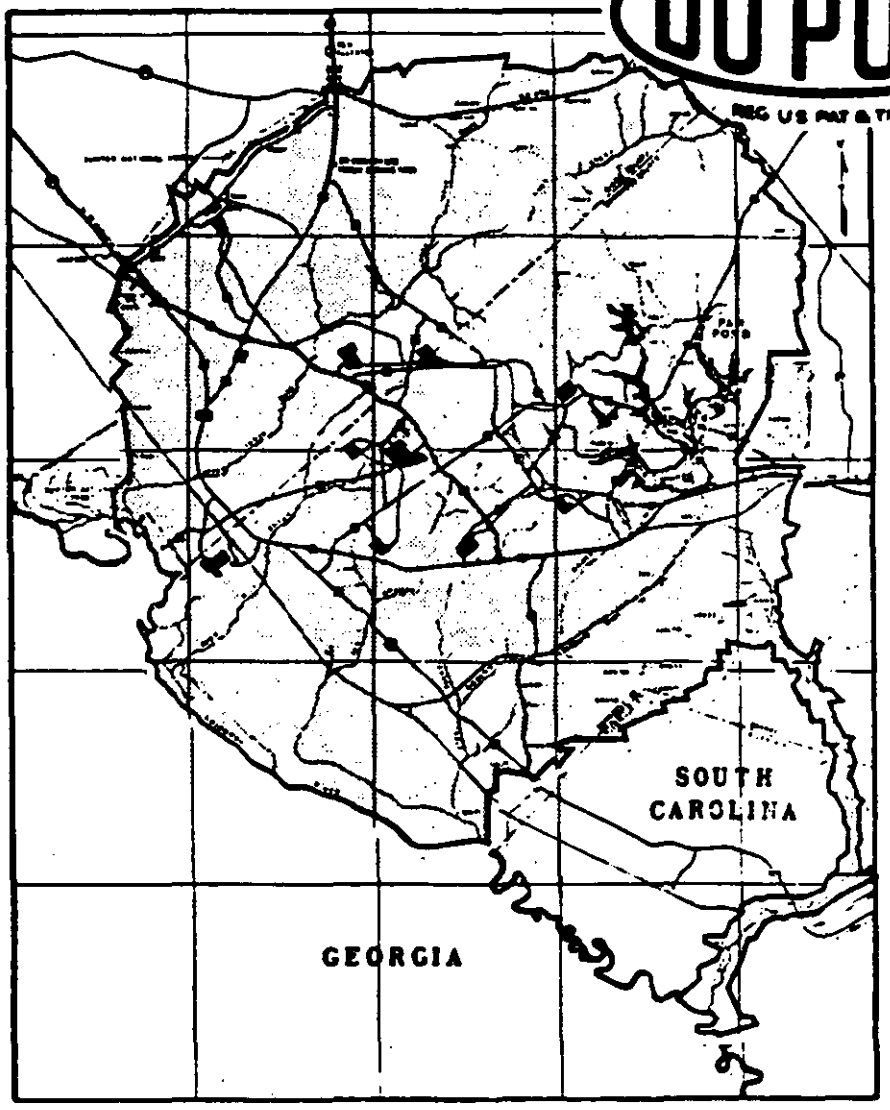
# M-AREA SETTLING BASIN
# LABORATORY DATA REPORT

# E.I. DU PONT DE NEMOURS & COMPANY

INCORPORATED

## M-AREA SETTLING BASIN

## LABORATORY DATA REPORT




SAVANNAH RIVER PLANT

AIKEN, SOUTH CAROLINA

ENVIRODYNE ENGINEERS INC.

12161 Lackland Road St. Louis, Missouri 63146,(314)434-6960

# M-AREA BASIN LABORATORY DATA

Process effluents from the M-Area metal finishing operations have been released to the M-Area settling basin since 1958. The effluents from the basin overflow through an engineered ditch to a natural seepage area, and subsequently to a surface depression called "Lost Lake." The settling basin is filled with water to a depth of approximately 15 feet, the seep area is approximately 2 to 4 feet deep, and Lost Lake ranges from 4 to 10 feet at the center (depending on natural rainfall and surface runoff). Characterization of the settling basin was needed in order to close the settling basin pursuant to state and federal regulations for closure of hazardous waste facilities. The drainage ditch, natural seep area and Lost Lake are not considered to be hazardous waste sites. However, these areas also required characterization to determine if any custodial actions are needed.

A copy of the computerized print-out containing the laboratory data from the characterization study is enclosed. A magnetic computer tape containing these data was submitted to DuPont independently of this report. The field data accumulated during this project were sent by data tape to DuPont on March 1, 1985, and shall be addressed in a separate report. This report will address the laboratory efforts only.

The Quality Assurance/Quality Control (QA/QC) practices utilized during this project from the point of sample collection through analysis and to data handling were discussed in detail in the Quality Control Plan developed for the M-Area Basin Project and submitted to DuPont on December 4, 1984. Contained within that report were specific discussions covering the chain-of-custody procedures, sample storage, preparation, identification and logging procedures, analytical procedures, as well as a discussion concerning detecting "out-of-control" situations. Also included in that plan was a compilation of the analytical methods to have been used during the study. Enclosed herein is an updated list of the methods used including copies of those methods substituted for earlier proposed methods. Those substituted methods are:

| | |
|---|---|
| Specific Gravity | Standard Method 213E |
| Bromide | EPA Method 300.0 |
| Gross Alpha, Beta | CEP Method |
| Phosphorus, Total | EPA Method 365.1 |
| Uranium | Colorimetric Method |

Also included is a brief description of the preparatory steps taken on each sediment sample prior to analysis as well as a list of all the applicable detection limits. The standard analytical lot size and basic QC per lot is also provided.

Initially, a total of 293 soil/sediment, 52 sludge and 21 water samples were analyzed for the required parameters. This breaks down to 73 samples for Type A analysis, 22 samples for Types B and C analyses, 307 samples for Type D analysis, and 346 samples for Type E analysis. A description of the Types A through E analyses is enclosed. Added to this group were nine soil samples for EP Toxicity metals, 27 soil samples for Type D analysis, 42 soil samples for Type E analysis, 2 water samples (influent/effluent) for Types A, B and C analyses, and 6 water samples (influent/effluent) for Types A, D and E analyses.

Several VOA field blank samples were also analyzed. As an added quality control measure, a sample of the water supply used to rinse the sampling equipment was taken and measured for all project parameters. Excluding the addition samples listed above, approximately 24,800 data records were generated for this project.

All samples requiring Types B and C analyses were library searched for organics per Appendix VIII of 40 CFR 261. The data for the library search are included on the enclosed print-out. Detection limits for the compounds found during the library searches are, on the most part, unknown since these compounds are not generally searched during the normal GC/MS analysis and the limits have not been previously determined.

The analyses of the extra samples mentioned above do not fall under the original deadline of this project. As such, those results will be provided later as a supplement to this report.

During the course of this project, several samples were found to contain high levels of interference which obscured or made-suspect the data in question. Those samples are:

| Sample | Parameter |
|---|---|
| MBL 114 8' | F, $SO_4$ |
| MBL 101 2' | F |
| MBL 120 0.5' | B (no data available) |
| Rinse Water | B (no data available) |
| MBC 502 0-1' | Br, Sulfide |
| MBC 205 13.7-15.2' | Br, Sulfide |
| MBC 207 12.8-14.9' | Br, Sulfide |
| MBC 612 0-1' | Br, Sulfide |
| MBC 612 1-2' | Sulfide |

Due to the presence of phosphates in the samples, the originally proposed uranium method was substituted for an Arsenazo II colorimetric method which experienced no interference by anions. A copy of the substituted method is enclosed. The use of the Inductively-Coupled Plasma AA unit was considered, but the best the detection limits would have been was 100 ug/g (ppm) for soils and 2 ug/ml (ppm) for waters.

The analyses not carried out were few in number and included:

| Sample | Parameter |
|---|---|
| MBC 612 0-1' | Uranium [Insufficient sample (Types B&C Analyses)] |
| 1/16/85 Field Blank | VOA GC/MS (Equipment Malfunction) |

For several samples, the TOH and VOA-GC/MS sample dates differ from the sample dates on the processed (dried) form of the sample. This is the result of resampling at those sites to replace sample lost due to bottle breakage during shipment to St. Louis. These sites are:

| | | |
|---|---|---|
| MBC 704 0-0.5' | MBC 708 0.5-1.5' | MBC 715 0-0.5' |
| MBC 705 0-0.5' | MBC 709 0-0.5' | MBC 716 0-0.5' |
| MBC 706 0-0.5' | MBC 710 0-0.5' | MBC 716 0.5-1.5' |
| MBC 707 0-0.5' | MBC 711 0-0.5' | MBC 717 0-0.5' |
| MBC 708 0-0.5' | MBC 712 0-0.5' | MBC 718 0-0.5' |

The new computer codes developed during this project and utilized both on the computerized data tape and the enclosed print-out are:

| Test | Code | Method | Instrument | Matrix |
|---|---|---|---|---|
| Bromide | BR | 7F | 31 | S |
| Bromide | BR | 7D | 31 | W |
| Specific Gravity | SPGR | 9A | 16 | S |
| Specific Gravity | SPGR | 9B | 16 | W |
| Total Organic Carbon | TOC | 9K | 24 | S |
| Total Organic Halides | TOX | 9U | 21 | S |
| Total Uranium | TU | 9Y | 03 | S |

The new library search organic test codes are:

| Code | Compound |
|---|---|
| CLMEC | chlorotoluene |
| CL4BP | tetrachlorobiphenyl |
| C10A | decanoic acid |
| C13 | tridecane |
| C16ABE | hexadecanoic acid, butyl ester |
| C16ADE | hexadecanoic acid, dioctyl ester |
| C16AME | hexadecanoic acid, methyl ester |
| C18A | octadecanoic acid |
| C18ADC | octadecanoic acid, 9,10-dichloromethyl ester |
| C18AMF | 9,12,15-octadecatrienoic acid, methyl ester (71486 #10) |
| C8A | octanoic acid |
| DMPEN | dimethyl pentane |
| ETOX | ethyloxirane |
| HDEC | heptadecane |
| KETONE | ketone |
| LABDIE | 13,16,14-labdien-8-ol |
| N1MIA | nitro-1,methylimidazole |
| PDEC | pentadecane |
| TCLTFM | freon, 1,1,2-trichlorotrifluoromethane |
| TDEC | tetradecane |
| 1C2MBZ | 1,chloro,2-methylbenzene |
| 12BADE | 1,2-benzene dicarboxylic acid, diheptal ester |
| 12BAIE | 1,2-benzene dicarboxylic acid, diisodecyl ester |
| 12BANE | 1,2-benzene dicarboxylic acid, dinonyl ester |
| 2BFTT | 2(4H)-benzofuranone, 5,6,7,7A-tetrahydro-4,4,7a-trimethyl (71393 #4) |
| 2ETOXE | 2(2-ethoxyethoxy)ethanol |
| 2HDTM | 2-hexadecen-1-ol,3,7,11,15-tetramethyl |
| 2M2D2H | 2-methyl-2,2-dimethyl-1(2-hydroxy-1-methylethyl)-propyl ester of propanoic acid (MB3709 #4) |
| 2PDEC | 2-propyl decane |
| 25DMH | 2,5-dimethyl heptane |
| 25F3EM | 2,5-furandone-3-ethyl-4-methyl |
| 3LICOS | 3-licosene |
| 6CHDEC | 6-cyclohexyldodecane |

(Note: Samples with no peaks were reported with test code XXXXXX, result 0.)

For the EP Toxicity samples, identification from the other metals analyses can be made by the laboratory ID number and by the units assigned. All of the EP Toxicity (metals) samples are numbered from 71143 to 71151, and are all in units of mg/l (except for Hg which are in ug/l). For the organic data listed without an analysis time, those samples were set-up on an automatic sampler to run overnight. As such, the exact analysis times are not available.

During data entry for this project, a dual-entry technique was used to assure the accuracy of the data entered. What this technique entails is the entry of the same data by two separate operators at two separate times. The two groups of entries are compared against each other, and all discrepancies are identified and corrected. As it turned out, this techniques was found to be very effective. Very few data entry errors were found during a manual check of all data. All errors were corrected prior to submission of data.

The laboratory data print-out was transmitted in three separately bound volumes.

## SUMMARY OF METHODS FOR M-AREA BASIN PROGRAM

| Parameters | Reference | Method Description |
|---|---|---|
| **Type A:** | | |
| pH | EPA Method 150.1 | |
| Conductivity (water) | EPA Method 120.1 | |
| Temperature (water) | EPA Method 170.1 | |
| TDS (water) | EPA Method 160.2 | |
| Specific Gravity (water and sludge) | Standard Method 213E | |
| Percent Solids | EPA Method 160.3 | |
| **Type B - Waters:** | | |
| Aluminum | EPA Method 200.7 | Inductively Coupled Plasma |
| Antimony | EPA Method 204.2 | Furnace Method AA |
| Arsenic | EPA Method 206.3 | AA, Hydride Method |
| Barium | EPA Method 200.7 | Inductively Coupled Plasma |
| Beryllium | EPA Method 200.7 | Inductively Coupled Plasma |
| Boron | Technicon Method | Auto Analyzer |
| Bromide | EPA Method 300.0 | Ion Chromatograph |
| Cadmium | EPA Method 200.7 | Inductively Coupled Plasma |
| Calcium | EPA Method 200.7 | Inductively Coupled Plasma |
| Chloride | EPA Method 300.0 | Ion Chromatograph |
| Chromium | EPA Method 200.7 | Inductively Coupled Plasma |
| Copper | EPA Method 200.7 | Inductively Coupled Plasma |
| Fluoride | EPA Method 300.0 | Ion Chromatograph |
| Gross Alpha | Standard Method 703 | Gross Alpha, Gross Beta Radioactivit |
| Gross Beta | Standard Method 703 | Gross Alpha, Gross Beta Radioactivit |
| Iron | EPA Method 200.7 | Inductively Coupled Plasma |
| Lead | EPA Method 200.7 | Inductively Coupled Plasma |
| Magnesium | EPA Method 200.7 | Inductively Coupled Plasma |
| Manganese | EPA Method 200.7 | Inductively Coupled Plasma |
| Mercury | EPA Method 245.1 | Manual cold vapor |
| $NH_3$-N | EPA Method 350.1 | Auto Analyzer |
| $NO_3/NO_2$-N | EPA Method 300.0 | Ion Chromatograph |
| Nickel | EPA Method 200.7 | Inductively Coupled Plasma |
| Phosphorus, Total | EPA Method 365.1 | Auto Analyzer |
| Potassium | EPA Method 200.7 | Inductively Coupled Plasma |
| Radioactivity | Standard Method 705 | Radium by Precipitation |
| Radium, Total | Standard Method 705 | Radium by Precipitation |
| Selenium | EPA Method 270.3 | AA, Hydride Method |
| Silver | EPA Method 200.7 | Inductively Coupled Plasma |
| Sodium | EPA Method 200.7 | Inductively Coupled Plasma |
| Sulfate | EPA Method 300.0 | Ion Chromatograph |
| Sulfide | EPA Method 300.0 | Ion Chromatograph |
| Tin | EPA Method 200.7 | Inductively Coupled Plasma |
| Titanium | EPA Method 200.7 | Inductively Coupled Plasma |
| Total Organic Carbon | EPA Method 415.1 | Combustion Method |
| Total Organic Halogen | EPA Method 450.1 | Combustion Method |
| Uranium | | Colorimetric Method |
| Zinc | EPA Method 200.7 | Inductively Coupled Plasma |

SUMMARY OF METHODS FOR M-AREA BASIN PROGRAM
(Continued)

Type B - Soils/Sediment/Sludges:
a) Metals-Leachates: USEPA CRI Method Nos. 601, 604, 607 and 595
b) Method of Determination of Inorganic Substances in Water and Fluvial Sediments
   1) Ammonia: 1-6523-78, pages 491-421
   2) Ion Chromatograph (Extraction Method only): 1-6545-78, pages 441-444
Analysis methods remain the same as water.

Type C - Waters:
Parameters per Appendix VIII of 40 CFR 261; EPA Test Method 624 and 625 for Volatile and Acid/Base/Neutral Analysis.

Type C - Soils/Sediments/Sludges:
Requires soil extraction prior to analysis.

Type D - Volatile Organics, Water: EPA Method 624 Purgeable Organics
Acrolein
Acrylonitrile
Benzene
Bis(chloromethyl)ether
Bromoform
Carbon tetrachloride
Chlorobenzene
Chlorodibromomethane
Chloroethane
2-Chloroethylvinyl ether
Chloroform
Dichlorobromomethane
1,2-Dichloroethane
Dichlorodifluoromethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2-Dichloropropane
1,3-Dichloropropylene
Ethylbenzene
Methyl bromide
Methyl chloride
Methylene chloride
Methyl chloride
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (perclene)
Toluene
1,2-Trans-Dichloroethylene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluoromethane
Vinyl chloride

Type D - Volatile Organics, Soils/Sediments/Sludges: Requires gram of sample in place of 5 ml water sample.

SUMMARY OF METHODS FOR M-AREA BASIN PROGRAM
(Continued)

| Parameters | Reference | Method Description |
|---|---|---|
| **Type E - Water:** | | |
| Sodium | EPA Method 200.7 | Inductively Coupled Plasma |
| Potassium | EPA Method 200.7 | Inductively Coupled Plasma |
| Calcium | EPA Method 200.7 | Inductively Coupled Plasma |
| Magnesium | EPA Method 200.7 | Inductively Coupled Plasma |
| Iron | EPA Method 200.7 | Inductively Coupled Plasma |
| Aluminum | EPA Method 200.7 | Inductively Coupled Plasma |
| Maganese | EPA Method 200.7 | Inductively Coupled Plasma |
| Cadmium | EPA Method 200.7 | Inductively Coupled Plasma |
| Chromium | EPA Method 200.7 | Inductively Coupled Plasma |
| Lead | EPA Method 200.7 | Inductively Coupled Plasma |
| Nickel | EPA Method 200.7 | Inductively Coupled Plasma |
| Copper | EPA Method 200.7 | Inductively Coupled Plasma |
| Zinc | EPA Method 200.7 | Inductively Coupled Plasma |
| Hg | EPA Method 245.1 | Manual Cold Vapor |
| Uranium | | Colorimetric Method |
| Chloride | EPA Method 300.0 | Ion Chromatograph |
| $NO_3$-N | EPA Method 300.0 | Ion Chromatograph |
| $NH_3$-N | EPA Method 350.1 | Auto Analyzer |
| P-Total | EPA Method 365.1 | Auto Analyzer |
| Total Organic Carbon | EPA Method 415.1 | Combustion Method |
| Total Organic Halogen | EPA Method 450.1 | Combustion Method |

**Type E - Soils/Sediments/Sludges:**
**Requires extraction similar to that used in Type B parameters.**

DETECTION LIMITS
M-AREA BASIN

| Parameter | Soils (µg/g) | Waters (mg/l) |
|---|---|---|
| Ag | 1.0 | 0.0005 |
| Al | 2.0 | 0.004 |
| As | 0.12 | 0.001 |
| B | 1.0 | 0.02 |
| Ba | 2.0 | 0.004 |
| Be | 1.0 | 0.002 |
| Br | 2.5 | 0.1 |
| Ca | 1.0 | 0.002 |
| Cd | 1.0 | 0.002 |
| Cl | 0.5 | 0.5 |
| CN | 0.25 | 0.005 |
| Cr | 2.0 | 0.004 |
| Cu | 2.0 | 0.004 |
| F | 0.5 | 0.1 |
| Fe | 2.0 | 0.004 |
| Hg | 0.2 | 0.0002 |
| K | 2.5 | 0.05 |
| Mg | 1.0 | 0.002 |
| Mn | 1.0 | 0.002 |
| Na | 2.0 | 0.004 |
| $NH_3N$ | 1.5 | 0.3 |
| Ni | 2.0 | 0.004 |
| $NO_2N$ | 0.06 | 0.5 |
| $NO_3N$ | 0.56 | 0.5 |
| $PO_4$ (total) | 0.01 | 0.01 |
| Pb | 2.0 | 0.004 |
| Sulfide | 12.5 | 1.0 |
| Sb | 1.0 | 0.003 |
| Se | 0.12 | 0.001 |
| Sn | 10.0 | 0.01 |
| $SO_4$ | 5.0 | 5.0 |
| TOC | 10.0 | 1.0 |
| TOH | 10.0 | 0.005 |
| Ti | 10.0 | 0.2 |
| U | 5.0 | 0.2 |
| Zn | 1.0 | 0.002 |

DETECTION LIMITS
M-AREA BASIN
GC/MS ORGANICS

Sample Matrix: Water

## VOLATILES

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (2V) | 107-02-8 | acrolein | 100 u |
| (3V) | 107-13-1 | acrylonitrile | 100 u |
| (4V) | 71-43-2 | benzene | 5 u |
| (6V) | 56-23-5 | carbon tetrachloride | 5 u |
| (7V) | 108-90-7 | chlorobenzene | 5 u |
| (10V) | 107-06-2 | 1,2-dichloroethane | 1 u |
| (11V) | 71-55-6 | 1,1,1-trichloroethane | 5 u |
| (13V) | 75-34-3 | 1,1-dichloroethane | 5 u |
| (14V) | 79-00-5 | 1,1,2-trichloroethane | 5 u |
| (15V) | 79-34-5 | 1,1,2,2-tetrachloroethane | 10 u |
| (16V) | 75-00-3 | chloroethane | 10 u |
| (19V) | 110-75-8 | 2-chloroethylvinyl ether | 10 u |
| (23V) | 67-66-3 | chloroform | 5 u |
| (29V) | 75-35-4 | 1,1-dichloroethene | 5 u |
| (30V) | 156-60-5 | trans-1,2-dichloroethene | 5 u |
| (32V) | 78-87-5 | 1,2-dichloropropane | 10 u |
| (33V) | 10061-02-6 | trans-1,3-dichloropropene | 5 u |
| | 10061-01-05 | cis-1,3-dichloropropene | 5 u |
| (38V) | 100-41-4 | ethylbenzene | 5 u |
| (44V) | 75-09-2 | methylene chloride | 5 u |
| (45V) | 74-87-3 | chloromethane | 10 u |
| (46V) | 74-83-9 | bromomethane | 10 u |
| (47V) | 75-25-2 | bromoform | 10 u |
| (48V) | 75-27-4 | bromodichloromethane | 5 u |
| (49V) | 75-69-4 | fluorotrichloromethane | 5 u |
| (50V) | 75-71-8 | dichlorodifluoromethane | — |
| (51V) | 124-48-1 | chlorodibromomethane | 5 u |
| (85V) | 127-18-4 | tetrachloroethene | 5 u |
| (86V) | 108-88-3 | toluene | 5 u |
| (87V) | 79-01-6 | trichloroethene | 5 u |
| (88V) | 75-01-4 | vinyl chloride | 10 u |
| | 67-64-1 | acetone | 5 u |
| | 78-93-3 | 2-butanone | 5 u |
| | 75-15-0 | carbondisulfide | 1 u |
| | 519-78-6 | 2-hexanone | 5 u |
| | 108-10-1 | 4-methyl-2-pentanone | 5 u |
| | 100-42-5 | styrene | 5 u |
| | 108-05-4 | vinyl acetate | 5 u |
| | 1330-20-7 | total xylenes | 5 u |

## PESTICIDES

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (89P) | 309-00-2 | aldrin | 0.0018 u |
| (90P) | 60-57-1 | dieldrin | 0.0019 u |
| (91P) | 57-74-9 | chlordane | 0.0148 u |
| (92P) | 50-29-3 | 4,4'-DDT | 0.0028 |
| (93P) | 72-55-9 | 4,4'-DDE | 0.0015 u |
| (94P) | 72-54-8 | 4,4'-DDD | 0.0015 u |
| (95P) | 115-29-7 | $\alpha$-endosulfan | 0.0027 u |
| (96P) | 115-29-7 | $\beta$-endosulfan | 0.0017 u |
| (97P) | 1031-07-8 | endosulfan sulfate | 0.0026 u |
| (98P) | 72-20-8 | endrin | 0.0022 u |
| (99P) | 7421-93-4 | endrin aldehyde | 0.0026 u |
| (100P) | 76-44-8 | heptachlor | 0.0019 u |
| (101P) | 1024-57-3 | heptachlor epoxide | 0.0019 u |
| (102P) | 319-84-6 | $\alpha$-BHC | 0.0015 u |
| (103P) | 319-85-7 | $\beta$-BHC | 0.0023 u |
| (104P) | 319-86-8 | $\delta$-BHC | 0.0024 u |
| (105P) | 58-89-9 | $\gamma$-BHC (lindane) | 0.0019 u |
| (106P) | 53469-21-9 | PCB-1242 | 0.036 u |
| (107P) | 11097-69-1 | PCB-1254 | 0.013 u |
| (108P) | 11104-28-2 | PCB-1221 | 0.133 u |
| (109P) | 11141-16-5 | PCB-1232 | 0.062 u |
| (110P) | 12672-29-6 | PCB-1248 | 0.023 u |
| (111P) | 11096-82-5 | PCB-1260 | 0.012 u |
| (112P) | 12674-11-2 | PCB-1016 | 0.034 u |
| (113P) | 8001-35-2 | toxaphene | 0.437 u |

## DIOXINS

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (129B) | 1746-01-6 | 2,3,7,8-tetrachlorodibenzo-p-dioxin | |

DETECTION LIMITS
M-AREA BASIN
GC/MS ORGANICS

mple Matrix: Water

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (21A) | 88-06-2 | 2,4,6- trichlorophenol | 10 u |
| (22A) | 59-50-7 | p-chloro-m-cresol | 10 u |
| (24A) | 95-57-8 | 2- chlorophenol | 10 u |
| (31A) | 120-83-2 | 2,4-dichlorophenol | 10 u |
| (34A) | 105-67-9 | 2,4-dimethylphenol | 10 u |
| (57A) | 88-75-5 | 2- nitrophenol | 20 u |
| (58A) | 100-02-7 | 4-nitrophenol | 50 u |
| (59A) | 51-28-5 | 2,4-dinitrophenol | 50 u |
| (60A) | 534-52-1 | 4,6-dinitro-2-methylphenol | 20 u |
| (64A) | 87-86-5 | pentachlorophenol | 10 u |
| (65A) | 108-95-2 | phenol | 10 u |
| | 65-85-0 | benzoic acid | 100 u |
| | 95-48-7 | 2-methylphenol | 5 u |
| | 108-39-4 | 4-methylphenol | 5 u |
| | 95-95-4 | 2,4,5-trichlorophenol | 100 u |
| (1B) | 83-32-9 | acenaphthene | 10 u |
| (5B) | 92-87-5 | benzidine | 40 u |
| (8B) | 120-82-1 | 1,2,4-trichlorobenzene | 10 u |
| (9B) | 118-74-1 | hexachlorobenzene | 10 u |
| (12B) | 67-72-1 | hexachloroethane | 10 u |
| (18B) | 111-44-4 | bis(2-chloroethyl)ether | 10 u |
| (20B) | 91-58-7 | 2-chloronaphthalene | 10 u |
| (25B) | 95-50-1 | 1,2-dichlorobenzene | 10 u |
| (26B) | 541-73-1 | 1,3-dichlorobenzene | 10 u |
| (27B) | 106-46-7 | 1,4-dichlorobenzene | 10 u |
| (28B) | 91-94-1 | 3,3'-dichlorobenzidine | 20 u |
| (35B) | 121-14-2 | 2,4-dinitrotoluene | 20 u |
| (36B) | 606-20-2 | 2,6-dinitrotoluene | 20 u |
| (37B) | 122-66-7 | 1,2-diphenylhydrazine | 20 u |
| (39B) | 206-44-0 | fluoranthene | 10 u |
| (40B) | 7005-72-3 | 4-chlorophenyl phenyl ether | 10 u |
| (41B) | 101-55-3 | 4-bromophenyl phenyl ether | 10 u |
| (42B) | 39638-32-9 | bis (2-chloroisopropyl) ether | 20 u |
| (43B) | 111-91-1 | bis (2-chloroethoxy) methane | 20 u |

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (52B) | 87-68-3 | hexachlorobutadiene | 10u |
| (53B) | 77-47-4 | hexachlorocyclopentadiene | 10u |
| (54B) | 78-59-1 | isophorone | 10u |
| (55B) | 91-20-3 | naphthalene | 10u |
| (56B) | 98-95-3 | nitrobenzene | 10u |
| (61B) | 62-75-9 | N-nitrosodimethylamine | 10u |
| (62B) | 86-30-6 | N-nitrosodiphenylamine | 10u |
| (63B) | 621-64-7 | N-nitrosodipropylamine | 10u |
| (66B) | 117-81-7 | bis (2-ethylhexyl) phthalate | 10u |
| (67B) | 85-68-7 | benzyl butyl phthalate | 10u |
| (68B) | 84-74-2 | di-n-butyl phthalate | 10u |
| (69B) | 117-84-0 | di-n-octyl phthalate | 10u |
| (70B) | 84-66-2 | diethyl phthalate | 10u |
| (71B) | 131-11-3 | dimethyl phthalate | 10u |
| (72B) | 56-55-3 | benzo(a)anthracene | 10u |
| (73B) | 50-32-8 | benzo(a)pyrene | 20u |
| (74B) | 205-99-2 | benzo(b)fluoranthene | 20u |
| (75B) | 207-08-9 | benzo(k)fluoranthene | 20u |
| (76B) | 218-01-9 | chrysene | 20u |
| (77B) | 208-96-8 | acenaphthylene | 10u |
| (78B) | 120-12-7 | anthracene | 10u |
| (79B) | 191-24-2 | benzo(ghi)perylene | 20u |
| (80B) | 86-73-7 | fluorene | 10u |
| (81B) | 85-01-8 | phenanthrene | 10u |
| (82B) | 53-70-3 | dibenzo(a,h)anthracene | 20 |
| (83B) | 193-39-5 | indeno(1,2,3-cd)pyrene | u |
| (84B) | 129-00-0 | pyrene | 10u |
| | 62-53-3 | aniline | 5u |
| | 100-51-6 | benzyl alcohol | 20 |
| | 106-47-8 | 4-chloroaniline | 50u |
| | 132-64-9 | dibenzofuran | 10u |
| | 91-57-6 | 2-methylnaphthalene | 20u |
| | 88-74-4 | 2-nitroaniline | 100u |
| | 99-09-2 | 3-nitroaniline | 100u |
| | 100-01-6 | 4-nitroaniline | 100u |

DETECTION LIMITS
M-AREA BASIN
GC/MS ORGANICS

Sample Matrix: Soil

## VOLATILES

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (2V) | 107-02-8 | acrolein | 100u |
| (3V) | 107-13-1 | acrylonitrile | 100u |
| (4V) | 71-43-2 | benzene | 10u |
| (6V) | 56-23-5 | carbon tetrachloride | 30u |
| (7V) | 108-90-7 | chlorobenzene | 10u |
| (10V) | 107-06-2 | 1,2-dichloroethane | 20u |
| (11V) | 71-55-6 | 1,1,1-trichloroethane | 20u |
| (13V) | 75-34-3 | 1,1-dichloroethane | 20u |
| (14V) | 79-00-5 | 1,1,2-trichloroethane | 20u |
| (15V) | 79-34-5 | 1,1,2,2-tetrachloroethane | 10u |
| (16V) | 75-00-3 | chloroethane | 30u |
| (19V) | 110-75-8 | 2-chloroethylvinyl ether | 20u |
| (23V) | 67-66-3 | chloroform | 10u |
| (29V) | 75-35-4 | 1,1-dichloroethene | 20u |
| (30V) | 156-60-5 | trans-1,2-dichloroethene | 20u |
| (32V) | 78-87-5 | 1,2-dichloropropane | 20u |
| (33V) | 10061-02-6 | trans-1,3-dichloropropene | 10u |
| | 10061-01-05 | cis-1,3-dichloropropene | 10u |
| (38V) | 100-41-4 | ethylbenzene | 10u |
| (44V) | 75-09-2 | methylene chloride | 10u |
| (45V) | 74-87-3 | chloromethane | 10u |
| (46V) | 74-83-9 | bromomethane | 30u |
| (47V) | 75-25-2 | bromoform | 20u |
| (48V) | 75-27-4 | bromodichloromethane | 20u |
| (49V) | 75-69-4 | fluorotrichloromethane | 50u |
| (50V) | 75-71-8 | dichlorodifluoromethane | — |
| (51V) | 124-48-1 | chlorodibromomethane | 10u |
| (85V) | 127-18-4 | tetrachloroethene | 10u |
| (86V) | 108-88-3 | toluene | 10u |
| (87V) | 79-01-6 | trichloroethene | 10u |
| (88V) | 75-01-4 | vinyl chloride | 30u |
| | 67-64-1 | acetone | 100u |
| | 78-93-3 | 2-butanone | 100u |
| | 75-15-0 | carbondisulfide | 10u |
| | 519-78-6 | 2-hexanone | 20u |
| | 108-10-1 | 4-methyl-2-pentanone | 30u |
| | 100-42-5 | styrene | 10u |
| | 108-05-4 | vinyl acetate | 20u |
| | 1330-20-7 | total xylenes | 20u |

## PESTICIDES

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (89P) | 309-00-2 | aldrin | 0.288u |
| (90P) | 60-57-1 | dieldrin | 0.315u |
| (91P) | 57-74-9 | chlordane | 2.368u |
| (92P) | 50-29-3 | 4,4'-DDT | 0.448u |
| (93P) | 72-55-9 | 4,4'-DDE | 0.245u |
| (94P) | 72-54-8 | 4,4'-DDD | 0.248u |
| (95P) | 115-29-7 | α-endosulfan | 0.427u |
| (96P) | 115-29-7 | β-endosulfan | 0.280u |
| (97P) | 1031-07-8 | endosulfan sulfate | 0.424u |
| (98P) | 72-20-8 | endrin | 0.358u |
| (99P) | 7421-93-4 | endrin aldehyde | 0.427u |
| (100P) | 76-44-8 | heptachlor | 0.309u |
| (101P) | 1024-57-3 | heptachlor epoxide | 0.306u |
| (102P) | 319-84-6 | α-BHC | 0.232u |
| (103P) | 319-85-7 | β-BHC | 0.376u |
| (104P) | 319-86-8 | δ-BHC | 0.384u |
| (105P) | 58-89-9 | γ-BHC (lindane) | 0.304u |
| (106P) | 53469-21-9 | PCB-1242 | 5.744u |
| (107P) | 11097-69-1 | PCB-1254 | 2.032u |
| (108P) | 11104-28-2 | PCB-1221 | 21.28u |
| (109P) | 11141-16-5 | PCB-1232 | 10.00u |
| (110P) | 12672-29-6 | PCB-1248 | 3.632u |
| (111P) | 11096-82-5 | PCB-1260 | 1.920u |
| (112P) | 12674-11-2 | PCB-1016 | 5.472u |
| (113P) | 8001-35-2 | toxaphene | 69.92u |

## DIOXINS

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (129B) | 1746-01-6 | 2,3,7,8-tetrachlorodibenzo-p-dioxin | |

DETECTION LIMITS
M-AREA BASIN
GC/MS ORGANICS

Sample Matrix: Soil

SEMIVOLATILE COMPOUNDS

CONCENTRATION: LOW MEDIUM HIGH (circle one)
DATE EXTRACTED/PREPARED: _____
DATE ANALYZED: _____
PERCENT MOISTURE: _____
CONC./DILUTION FACTOR: _____

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (21A) | 88-06-2 | 2,4,6- trichlorophenol | 800u |
| (22A) | 59-50-7 | p-chloro-m-cresol | 400u |
| (24A) | 95-57-8 | 2- chlorophenol | 200u |
| (31A) | 120-83-2 | 2,4-dichlorophenol | 300u |
| (34A) | 105-67-9 | 2,4-dimethylphenol | 400u |
| (57A) | 88-75-5 | 2- nitrophenol | 400u |
| (58A) | 100-02-7 | 4-nitrophenol | 350u |
| (59A) | 51-28-5 | 2,4-dinitrophenol | 700u |
| (60A) | 534-52-1 | 4,6-dinitro-2-methylphenol | 700u |
| (64A) | 87-86-5 | pentachlorophenol | 350u |
| (65A) | 108-95-2 | phenol | 150u |
| | 65-85-0 | benzoic acid | 400u |
| | 95-48-7 | 2-methylphenol | 200u |
| | 108-39-4 | 4-methylphenol | 200u |
| | 95-95-4 | 2,4,5-trichlorophenol | 400u |
| (1B) | 83-32-9 | acenaphthene | 150u |
| (5B) | 92-87-5 | benzidine | 700u |
| (8B) | 120-82-1 | 1,2,4-trichlorobenzene | 300u |
| (9B) | 118-74-1 | hexachlorobenzene | 350u |
| (12B) | 67-72-1 | hexachloroethane | 500u |
| (18B) | 111-44-4 | bis(2-chloroethyl)ether | 150u |
| (20B) | 91-58-7 | 2-chloronaphthalene | 200u |
| (25B) | 95-50-1 | 1,2-dichlorobenzene | 200u |
| (26B) | 541-73-1 | 1,3-dichlorobenzene | 200u |
| (27B) | 106-46-7 | 1,4-dichlorobenzene | 200u |
| (28B) | 91-94-1 | 3,3'-dichlorobenzidine | 700u |
| (35B) | 121-14-2 | 2,4-dinitrotoluene | 350u |
| (36B) | 606-20-2 | 2,6-dinitrotoluene | 800u |
| (37B) | 122-66-7 | 1,2-diphenylhydrazine | 150u |
| (39B) | 206-44-0 | fluoranthene | 100u |
| (40B) | 7005-72-3 | 4-chlorophenyl phenyl ether | 150u |
| (41B) | 101-55-3 | 4-bromophenyl phenyl ether | 350u |
| (42B) | 39638-32-9 | bis (2-chloroisopropyl) ether | 150u |
| (43B) | 111-91-1 | bis (2-chloroethoxy) methane | 200u |

| PP # | CAS # | | ug/l or ug/kg (circle one) |
|---|---|---|---|
| (52B) | 87-68-3 | hexachlorobutadiene | 800u |
| (53B) | 77-47-4 | hexachlorocyclopentadiene | 800u |
| (54B) | 78-59-1 | isophorone | 100u |
| (55B) | 91-20-3 | naphthalene | 100u |
| (56B) | 98-95-3 | nitrobenzene | 200u |
| (61B) | 62-75-9 | N-nitrosodimethylamine | 150u |
| (62B) | 86-30-6 | N-nitrosodiphenylamine | 350 |
| (63B) | 621-64-7 | N-nitrosodipropylamine | 200u |
| (66B) | 117-81-7 | bis (2-ethylhexyl) phthalate | 150u |
| (67B) | 85-68-7 | benzyl butyl phthalate | 150u |
| (68B) | 84-74-2 | di-n-butyl phthalate | 100u |
| (69B) | 117-84-0 | di-n-octyl phthalate | 100u |
| (70B) | 84-66-2 | diethyl phthalate | 150u |
| (71B) | 131-11-3 | dimethyl phthalate | 200u |
| (72B) | 56-55-3 | benzo(a)anthracene | 100u |
| (73B) | 50-32-8 | benzo(a)pyrene | 600u |
| (74B) | 205-99-2 | benzo(b)fluoranthene | 200u |
| (75B) | 207-08-9 | benzo(k)fluoranthene | 200u |
| (76B) | 218-01-9 | chrysene | 100u |
| (77B) | 208-96-8 | acenaphthylene | 100u |
| (78B) | 120-12-7 | anthracene | 100u |
| (79B) | 191-24-2 | benzo(ghi)perylene | 300u |
| (80B) | 86-73-7 | fluorene | 150u |
| (81B) | 85-01-8 | phenanthrene | 100u |
| (82B) | 53-70-3 | dibenzo(a,h)anthracene | 3[illegible] |
| (83B) | 193-39-5 | indeno(1,2,3-cd)pyrene | [illegible]u |
| (84B) | 129-00-0 | pyrene | 100u |
| | 62-53-3 | aniline | 150u |
| | 100-51-6 | benzyl alcohol | 200u |
| | 106-47-8 | 4-chloroaniline | 300u |
| | 132-64-9 | dibenzofuran | 100u |
| | 91-57-6 | 2-methylnaphthalene | 200u |
| | 88-74-4 | 2-nitroaniline | 400u |
| | 99-09-2 | 3-nitroaniline | 350u |
| | 100-01-6 | 4-nitroaniline | 350u |

WATER SAMPLES
M-AREA BASIN

Basic QA/QC: 10% Duplicates
10% Standards
10% Blanks (Reagent)

Lot size consist of 10 samples plus above basic QC. Internal laboratory control charts are used to verify quality of data. Where sediment is apparent, decanting is used before analysis. Standard additions are used to verify recovery ability.

Reference used:

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, (march, 1979).

The above reference is used for methods, preservatives, and holding times. Any deviation from this reference is noted in test method.

All instrumentation used on project are verified for accuracy on a daily basis.

Basic QC: 10% Duplicates
10% Blanks
10% Standards

Sample lots consisted of 10 samples plus the above quality control.

The following pre-analysis steps were taken on each sediment:

| | |
|---|---|
| $NO_3/NO_2/SO_4$/ F/S | a) 10 g of sample mixed with 100 mls of deionized water<br>b) placed on shaker for two hours, filtered, and filtrate is analyzed |
| $NH_3$ | a) 5 g to 250 ml deionized water<br>b) placed on shaker for one hour, filtered, and filtrate is analyzed |
| Boron | a) 2.5 g to 100 ml deionized water<br>b) placed on shaker for one hour, filtered, and filtrate is analyzed |
| Chlorine | a) 5 g to 100 ml deionized water<br>b) sample is then titrated |
| Cyanide | a) 5 g of sample to 500 ml deionized water<br>b) Proceed as identified in EPA Method 335.2 |
| Phosphate | a) 1.0 g to 50 ml deionized water<br>b) digest down to 10 ml with 5 ml of 11N $H_2SO_4$<br>c) filter, adjust pH, bring total volume to 100 ml with deionized water |
| Metals | 5 g to 100 ml and proceed with attached digestion |

Standard additions were applied when necessary to verify quality of data. Standard used for quality assurance was supplied by National Bureau of Standards, concentration of which is attached. All normal internal quality control programs were applied including control charts and blind check standards.

For purgeable halocarbons (Method 624) - 1 g into 5 ml

For acid/base-neutral (Method 625) - 20 g placed into continuous soxhlet extractor with 200 ml methylene chloride. Extracted for 12 hours and concentrated to 1 ml in Kuderna-Danish concentrator.

ATTACHMENT 1

ACID DIGESTION OF SEDIMENTS, SLUDGES AND SOILS

1. Scope and Application

1.1 This method is an acid digestion procedure used to prepare sediments, sludges, and soil samples for analysis by flame or furnace atomic absorption spectroscopy (AAS) or by inductively coupled argon plasma spectroscopy (ICP). Samples prepared by this method may be analyzed by AAS or ICP for the following metals:

| | | |
|---|---|---|
| Aluminum | Chromium | Selenium |
| Antimony | Cobalt | Silver |
| Arsenic | Copper | Sodium |
| Barium | Iron | Thallium |
| Beryllium | Lead | Tin |
| Cadmium | Magnesium | Vanadium |
| Calcium | Manganese | Zinc |
| | Nickel | |
| | Potassium | |

2. Summary of Method

NOTE: A separate digestion procedure is required for furnace AA and ICP analysis.

2.1 A representative 1 g (wet weight) sample is digested in nitric acid and hydrogen peroxide. The digestate is then refluxed with either nitric acid or hydrochloric acid. Hydrochloric acid is used as the final reflux acid for the furnace AA analysis of Sb and Sn, the flame AA or ICP analysis of Al, Sb, Ba, Be, Ca, Cd, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Ag, Na, Tl, Sn, V and Zn. Nitric acid is employed as the final reflux acid for the furnace AA analysis of As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Ag, Tl, V, and Zn. A separate sample shall be dried for a total solids determination (Exhibit D, Attachment 9).

3. Apparatus and Materials

3.1 Conical beakers - 250 ml Phillips beaker or other appropriate vessel.

3.2 Watch glasses

3.3 Thermometer that covers range of 0° to 200°C

3.4 Whatman No. 42 filter paper or equivalent

4. Reagents

4.1 ASTM Type II water (ASTM D1193): Water must be monitored.

4.2 Concentrated Nitric Acid (sp. gr. 1.41)

4.3 Concentrated Hydrochloric Acid (sp. gr. 1.19)

4.4 Hydrogen Peroxide (30%): Tin-free grade.

5. Sample Preservation, and Handling

5.1 Non-aqueous samples must be refrigerated upon receipt until analysis.

6. Procedure

6.1 Mix the sample thoroughly to achieve homogeniety. For each digestion procedure, weigh and transfer to a conical beaker a 1.0 g portion (to the nearest 0.01 gms) of sample.

6.2 Add 10 ml of 1:1 nitric acid ($HNO_3$), mix the slurry, and cover with a watch glass. Heat the sample to 95°C and reflux for 10 minutes without boiling. Allow the sample to cool, add 5 ml of concentrated $HNO_3$, replace the watch glass, and reflux for 30 minutes. Do not allow the volume to be reduced to less than 5 ml while maintaining a covering of solution over the bottom of the beaker.

6.3 After the second reflux step has been completed and the sample has cooled, add 2 ml of Type II water and 3 ml of 30% hydrogen peroxide ($H_2O_2$). Return the beaker to the hot plate for warming to start the peroxide reaction. Care must be taken to ensure that losses do not occur due to excessively vigorous effervescence. Heat until effervescence subsides, and cool the beaker.

6.4 Continue to add 30% $H_2O_2$ in 1 ml aliquots with warming until the effervescence is minimal or until the general sample appearance is unchanged. (NOTE: Do not add more than a total of 10 ml 30% $H_2O_2$.)

6.5 If the sample is being prepared for the furnace AA analysis of Sn and Sb, the flame AA or ICP analysis of Al, Sb, Ba, Be, Ca, Cd, Cr, Co, Cu, Fe, Pb, Mg, Mn, Ni, K, Ag, Na, Tl, Sn, V, and Zn, add 5 ml of 1:1 HCl and 10 ml of Type II water, return the covered beaker to the hot plate, and heat for an additional 10 minutes. After cooling, filter through Whatman No. 42 filter paper (or equivalent) and dilute to 100 ml with Type II water (or centrifuge the sample - see Note 1). The diluted sample has an approximate acid concentration of 2.5% (v/v) HCl and 5% (v/v) $HNO_3$. Dilute the digestate 1:5 with the deionized water. The sample is now ready for analysis.

6.6 If the sample is being prepared for the furnace analysis of As, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Mi, Se, Ag, Tl, V, and Zn, continue heating the acid-peroxide digestate until the volume has been reduced to approximately 2 ml, add 10 ml of Type II water, and warm the mixture. After cooling, filter through Whatman No. 42 filter paper (or equivalent - see Note 1) and dilute to 100 ml with Type II water (or centrifuge the sample). The diluted digestate solution contains approximately 2% (v/v) $HNO_3$. Dilute the digestate 1:5 with deionized water. For analysis, withdraw aliquots of appropriate volume, and add any required reagent or matrix modifier. The sample is now ready for analysis.

7. Calculations

7.1 A separate determination of percent solids must be performed (Exhibit D, Attachment 9).

7.2 The concentrations determined in the digest are to be reported on the basis of the dry weight of the sample.

$$\text{Concentration (dry wt.) (mg/kg)} = \frac{C \times V}{W \times S}$$

where C = Concentration (mg/L)
V = 0.1L (Final volume in liters after sample preparation)
W = 0.002 kg (weight in kg of wet sample)
S = % Solids/100

REF: Modification of Method 3050 from SW-846, Test Methods for Evaluating Solid Waste, EPA Office of Solid Waste and Emergency Response, July 1982.

# National Bureau of Standards

# Certificate of Analysis

## Standard Reference Material 1645

### River Sediment

This Standard Reference Material (SRM) is intended for use for the calibration of apparatus and the verification of methods used in the analysis of river sediments and material with a similar matrix.

Certified Values of Constituent Elements: The certified values for the constituent elements are shown in Table 1. The analytical techniques used and the names and affiliations of the analysts are shown in Table 3. Certified values are based on results obtained by reference methods of known accuracy and analyses performed by two or more analysts; or alternatively, from results obtained by two or more independent, reliable analytical methods. Noncertified values are given for information only in Table 2. All values are based on measurements made on a dried sample of at least 100 mg for all constituents except iron and chromium for which a 1-g sample was used.

Notice and Warnings to Users:

Expiration of Certification: This certification is invalid 5 years from the date of purchase.

Stability: This material has been freeze-dried and is essentially free of moisture. However, its stability has not been rigorously assessed. NBS will continue to monitor this material and if substantive changes in certification occur the purchasers will be notified. The material should be kept in its original bottle and stored at temperatures between 10-30 °C. The material should be dried without heat to a constant weight before using. Recommended procedures for drying are: (1) drying for 24 hours using a cold trap at or below −50 °C and a pressure not greater than 30 Pa (0.2 mm Hg); (2) drying for 24 hours in a desiccator over $P_2O_5$ or $Mg(ClO_4)_2$.

Use: Material of this kind is intrinsically heterogeneous. Consequently, the analyst should endeavor to minimize any segregation by thoroughly mixing the contents of the bottle by shaking and/or rolling before each use. In addition, when taking a portion for analysis, the analyst should strive to remove as representative a sample as possible.

Source and Preparation of Material: The material for this SRM was prepared from material dredged from the bottom of the Indiana Harbor Canal near Gary, Indiana. The material was screened to remove foreign objects, freeze-dried, and sieved to pass a No. 80 (180 μm) screen. The material was thorougly mixed in a V-blender and bottled. The bulk material was radiation-sterilized to minimize alteration due to biological activity.

The collection, freeze-drying and homogenization of this SRM were performed under the supervision and direction of H.L. Rook, Gas and Particulate Science Division.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of J.K. Taylor, Center for Analytical Chemistry.

The technical and support aspects involved in the preparation, current and previous certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by T.E. Gills and W.P. Reed.

Washington, D.C. 20234
May 5, 1982
(Revision of Certificate dated 11-16-78)

George A. Uriano, Chief
Office of Standard Reference Materials

Homogeneity Assessment and Certification: The homogeneity of this material was established using a minimum sample size of 100 milligrams for all constituents except iron and chromium for which the sample size was 1.0 gram.

Randomly selected bottles were used for the analytical measurements. Each analyst examined at least 6 different bottles, some of them measuring replicate samples from each bottle. Accordingly, it is believed that all bottles of this SRM have substantially the same composition. Measurements and calibrations were made to reduce random and systematic errors to no more than one percent, relative.

Table 1. Certified Values of Constituent Elements

Major Constituents

| Element | Content wt. percent[a] |
|---|---|
| Aluminum[b] | 2.26 ± 0.04 |
| Chromium | 2.96 ± 0.28 |
| Iron | 11.3 ± 1.2 |
| Potassium[b] | 1.26 ± 0.05 |

Minor Constituents

| Element | Content wt. percent[a] |
|---|---|
| Magnesium[b] | 0.74 ± 0.02 |
| Sodium[b] | 0.54 ± 0.01 |
| Zinc | 0.172 ± 0.017 |

Trace Constituents

| Element | Content μg/g[a] |
|---|---|
| Cadmium | 10.2 ± 1.5 |
| Copper | 109 ± 19 |
| Cobalt[b] | 10.1 ± 0.6 |
| Lead | 714 ± 28 |
| Manganese | 785 ± 97 |
| Mercury | 1.1 ± 0.5 |

| Element | Content μg/g[a] |
|---|---|
| Nickel | 45.8 ± 2.9 |
| Thallium | 1.44 ± 0.07 |
| Thorium | 1.62 ± 0.22 |
| Uranium | 1.11 ± 0.05 |
| Vanadium | 23.5 ± 6.9 |

[a] The uncertainties of the certified values for the elements, except those noted by superscript "b," include those errors associated with both measurement and material variability. They represent the 95 percent tolerance limits for an individual sub-sample, i.e., 95 percent of the sub-samples from a unit of this SRM would be expected to have a composition within the indicated range of values 95 percent of the time.

[b] These elements are certified as a part of the NBS update certification program. For each element a "best value" is given based on all methods of measurement that were used as well as a *standard error* of this value. Both are based on considerations of variability both within and between analytical methods.

## Supplemental Information

Note: The following values are not certified because they are not based on the results of either a reference method or of two or more independent methods. These values are included for information only.

Table 2. Noncertified Values for Constituent Elements

| Element | Content wt. Percent | Element | Content μg g |
|---|---|---|---|
| Calcium | (2.9) | Antimony | (51) |
| Fluorine | (0.09) | Arsenic | (66) |
| Sulfur | (1.1) | Lanthanum | (9) |
| | | Scandium | (2) |
| | | Selenium | (1.5) |

Additional Information: The values listed below are based on measurements made in one laboratory and while no reason exists to suspect systematic bias in these numbers, no attempt was made to evaluate such bias attributable to either the method or the laboratory. The method used for each set of measurements is also listed. The indicated uncertainties are two times the standard deviation of the mean. These values are included for information only.

Table 3

| Constituent | Content wt. percent |
|---|---|
| Kjeldahl Nitrogen | ( 0.0797% ± 0.0048) |
| Total Phosphorus | ( 0.051% ± 0.001) [1] |
| Loss on Ignition (800 °C) | (10.72% ± 0.28) |
| Oil and Grease (Freon) | ( 1.71% ± 0.26) [3] |
| Chemical Oxygen Demand (Dichromate) | (149,400 mg/kg ± 9,000) [2] |

References


1. ASTM Method E-350
2. Standards Methods for the Examination of Water and Waste Water, 14th Edition (1975), Section 508, pp 550.
3. Ibid., Section 502, pp 518.

Table 3A Methods and Analysts

| Method/ Element | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| Aluminum | • | | • | | • | |
| Arsenic | | | • | | | |
| Antimony | • | | | | | |
| Cadmium | | | • | • | | |
| Calcium | | | • | | | |
| Chromium | | • | • | | | |
| Cobalt | | | • | | • | |
| Copper | | • | • | | | |
| Fluorine | | | | | | • |
| Iron | • | | • | | | |
| Lanthanum | | | • | | | |
| Lead | | • | | • | | |
| Magnesium | • | | | | • | |
| Manganese | | • | • | | | |
| Mercury | • | | • | | | |
| Nickel | | • | | • | | |
| Potassium | • | | • | | | |
| Scandium | | | • | | | |
| Selenium | • | | | | | |
| Sodium | • | | • | | | |
| Sulfur | | | | | | • |
| Thallium | | • | | | | |
| Thorium | | • | | | | |
| Uranium | | • | | | | |
| Vanadium | • | | • | | | |
| Zinc | • | | | • | | |

Analytical Methods

A. Atomic Absorption Spectrometry
B. Isotope Dilution Mass Spectrometry
C. Neutron Activation Analysis
D. Polarography
E. D. C. Plasmas Atomic Emission Spectrometry
F. Ion Chromatography

ENVIRODYNE
ENGINEERS

June 18, 1985
1981-05000

Mr. John B. Pickett
E. I. DuPont de Nemours & Co.
Savannah River Plant
Bldg. 773-42A, Rm. 247
Aiken, SC 29808

Dear Mr. Pickett:

Enclosed is a print-out of the data generated for the additional analyses on the M-area soil, influent and effluent samples. These data serve as a supplement to the data provided in the final laboratory report sent to you earlier.

The data in this submittal include:

1) The mercury re-analyses for the 0.5-1.5 intervals at Lost Lake (the re-analyses were required to confirm that the mercury levels in these samples were below the limit of detection).

2. The uranium re-analyses for all soil samples by Inductively Coupled Plasma.

3. The inorganic analyses for the additional Lost Lake samples (MBC 729-733).

4. The organic and inorganic analyses for the MBC 900 series sites.

5. The organic and inorganic analyses for the influent and effluent samples, week 1 through week 10.

With these data, the total analyses carried out to date are: 93 samples for Type A analysis, 24 samples for Types B and C analyses, 365 Type D analysis, 400 Type E analysis, 11 samples for EP Toxicity Metals, and 32 samples for Total Suspended Solids.

Additional computer codes developed for this latest group of data and which are used both on the computerized data tape and the enclosed print-out are:

| Code | Compound |
|---|---|
| 11 BCHX | 1,1-bicyclohexyl |
| 1375 TA | 1,3,5,7-tetrazatricyclo (3,3.1.13,7) decane |
| C18 ABE | Octadecanoic Acid, Butyl Ester |
| TDA | Tetradecanoic Acid |

ENVIRODYNE ENGINEERS



| Test | Code | Method | Instrument | Matrix |
|---|---|---|---|---|
| Total Suspended Solids | TSS | 8G | 16 | W |
| Total Solids | TS | 8J | 16 | W |
| Total Solids | TS | 8I | 16 | S |
| Bromide | Br | 64 | 16 | W |

There were no new or different methods developed or used for the enclosed analyses. However, the re-analyses of uranium was done by Inductively Coupled Plasma using a 10X concentrated digested sample, yielding a soils detection limit of 10 µg/g (ppm).

If you have any questions or if we may be of further assistance, please feel free to call.

Sincerely,

John J Coniglio
Program Manager

JJC/bsm
Enclosure

METHODS

## Analytical Methods

The following procedures are routinely used by CEP in the analyses of environmental samples. The analytical methods used have been studied collaboratively and found acceptable. CEP's analytical procedures are the same as, equal to, or better than those currently used by the Environmental Protection Agency. All data reported by CEP and the limit of sensitivity to each analytical measurement technique is at the 95% confidence level. These methods are derived from, "EML Procedure Manual", HASL-300, U.S. Department of Energy, New York, N.Y., U.S. Environmental Protection Agency "Radiochemical Method Manual", Los Alamos Scientific Laboratory "Radiochemical Procedures", LA-1721, J.J. Mueller, "Radio and Water Chemistry Manual", June 1966, ACNP-66538 and "Prescribed Procedures for Measurements of Radiochemistry in Drinking Water" EPA Methods, 600/4-80-032, 1980.

### Water Samples

#### Gross Alpha and Beta (Total)

A 1.0 liter of aliquot of water is evaporated to dryness and transferred to a weighed planchet. The Gross Alpha and Gross Beta radioactivity is measured by counting the planchet in an internal gas flow, proportional low background counter System which has at least a sixty percent beta efficiency using Strontium/Yttrium-90 and forty percent alpha efficiency using Plutonium-239. A self-absorption correction is performed on all samples based on $mg/cm^2$ of dissolved and suspended solids collected on the planchet.

### Sediment Samples

#### Sample Preparation Method

The following sediment sample preparation method is used routinely by CEP:

1.) Sample containers are opened when they arrive at the CEP laboratory and their contents transferred into new clean drying pans.

2.) The drying pans filled with sediments are placed into an oven at 110°C and allowed to dry thoroughly.

3.) After the sediment is thoroughly dried, it is pulverized to approximately one-hundred mesh.

4.) After the entire sediment sample is ground to one-hundred mesh, it is mixed and separated using a splitter box technique.

5.) The thoroughly mixed sediment sample is spread out on new clear plastic, marked off into quarters and aliquots taken from each quarter until a five-hundred gram sample (when possible) is collected for analysis.

**Gross Alpha and Beta Analysis**

A 10-gram aliquot of the pulverized sample is ashed in a muffle furnace and dissolved in hydrofluoric-nitric acid mixture. The residue is dissolved in a dilute hydrochloric acid and evaporated several times with 8N nitric acid, transferred to a tared planchet. The Gross Alpha and Gross Beta radioactivities are determined using a low background gas flow proportional counter. The Gross Alpha and Gross Beta activities are corrected for self-absorption.

# PHOSPHORUS, ALL FORMS

## Method 365.1 (Colorimetric, Automated, Ascorbic Acid)

**STORET NO. See Section 4**

1. Scope and Application
   - 1.1 These methods cover the determination of specified forms of phosphorus in drinking, surface and saline waters, domestic and industrial wastes.
   - 1.2 The methods are based on reactions that are specific for the orthophosphate ion. Thus, depending on the prescribed pre-treatment of the sample, the various forms of phosphorus given in Figure 1 may be determined. These forms are defined in Section 4.
     - 1.2.1 Except for in-depth and detailed studies, the most commonly measured forms are phosphorus and dissolved phosphorus, and orthophosphate and dissolved orthophosphate. Hydrolyzable phosphorus is normally found only in sewage-type samples. Insoluble forms of phosphorus are determined by calculation.
   - 1.3 The methods are usable in the 0.01 to 1.0 mg P/l range. Approximately 20-30 samples per hour can be analyzed.
2. Summary of Method
   - 2.1 Ammonium molybdate and antimony potassium tartrate react in an acid medium with dilute solutions of phosphorus to form an antimony-phospho-molybdate complex. This complex is reduced to an intensely blue-colored complex by ascorbic acid. The color is proportional to the phosphorus concentration.
   - 2.2 Only orthophosphate forms a blue color in this test. Polyphosphates (and some organic phosphorus compounds) may be converted to the orthophosphate form by manual sulfuric acid hydrolysis. Organic phosphorus compounds may be converted to the orthophosphate form by manual persulfate digestion[2]. The developed color is measured automatically on the AutoAnalyzer.
3. Sample Handling and Preservation
   - 3.1 If benthic deposits are present in the area being sampled, great care should be taken not to include these deposits.
   - 3.2 Sample containers may be of plastic material, such as cubitainers, or of Pyrex glass.
   - 3.3 If the analysis cannot be performed the same day of collection, the sample should be preserved by the addition of 2 ml conc. $H_2SO_4$ per liter and refrigeration at 4°C.
4. Definitions and Storet Numbers
   - 4.1 Total Phosphorus (P) – all of the phosphorus present in the sample regardless of form, as measured by the persulfate digestion procedure. (00665)
     - 4.1.1 Total Orthophosphate (P-ortho)–inorganic phosphorus [$(PO_4)^{-3}$] in the sample as measured by the direct colorimetric analysis procedure. (70507)

Approved for NPDES, pending approval for Section 304(h), CWA
Issued 1971
Editorial revision 1974 and 1978

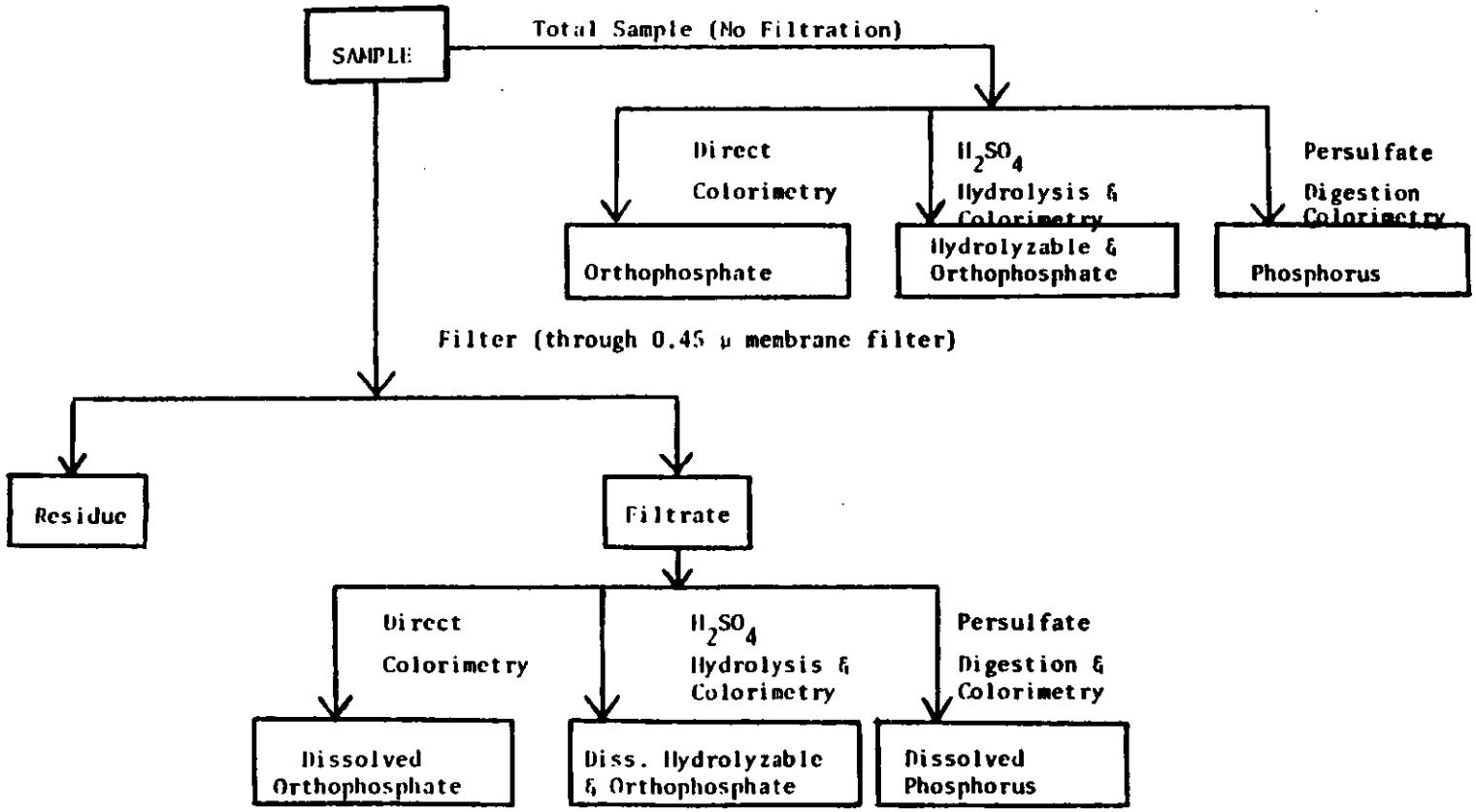



**FIGURE 1. ANALYTICAL SCHEME FOR DIFFERENTIATION OF PHOSPHORUS FORMS**

4.1.2 Total Hydrolyzable Phosphorus (P-hydro)–phosphorus in the sample as measured by the sulfuric acid hydrolysis procedure, and minus predetermined orthophosphates. This hydrolyzable phosphorus includes polyphosphates [$(P_2O_7)^{-4}$, $(P_3O_{10})^{-5}$, etc.] plus some organic phosphorus. (00669)

4.1.3 Total Organic Phosphorus (P-org)–phosphorus (inorganic plus oxidizable organic) in the sample as measured by the persulfate digestion procedure, and minus hydrolyzable phosphorus and orthophosphate. (00670)

4.2 Dissolved Phosphorus (P–D) – all of the phosphorus present in the filtrate of a sample filtered through a phosphorus-free filter of 0.45 micron pore size and measured by the persulfate digestion procedure. (00666)

4.2.1 Dissolved Orthophosphate (P–D, ortho) – as measured by the direct colorimetric analysis procedure. (00671)

4.2.2 Dissolved Hydrolyzable Phosphorus (P–D, hydro) – as measured by the sulfuric acid hydrolysis procedure and minus predetermined dissolved orthophosphates. (00672)

4.2.3 Dissolved Organic Phosphorus (P–D, org) – as measured by the persulfate digestion procedure, and minus dissolved hydrolyzable phosphorus and orthophosphate. (00673)

4.3 The following forms, when sufficient amounts of phosphorus are present in the sample to warrant such consideration, may be calculated:

4.3.1 Insoluble Phosphorus (P–I) = (P) – (P–D). (00667)

4.3.1.1 Insoluble orthophosphate (P–I, ortho) = (P, ortho) – (P–D, ortho). (00674)

4.3.1.2 Insoluble Hydrolyzable Phosphorus (P–I, hydro) = (P, hydro) – (P–D, hydro). (00675)

4.3.1.3 Insoluble Organic Phosphorus (P–I, org) = (P, org) – (P–D, org). (00676)

4.4 All phosphorus forms shall be reported as P, mg/1, to the third place.

5. Interferences

5.1 No interference is caused by copper, iron, or silicate at concentrations many times greater than their reported concentration in sea water. However, high iron concentrations can cause precipitation of and subsequent loss of phosphorus.

5.2 The salt error for samples ranging from 5 to 20% salt content was found to be less than 1%.

5.3 Arsenate is determined similarly to phosphorus and should be considered when present in concentrations higher than phosphorus. However, at concentrations found in sea water, it does not interfere.

5.4 Sample turbidity must be removed by filtration prior to analysis for orthophosphate. Samples for total or total hydrolyzable phosphorus should be filtered only after digestion. Sample color that absorbs in the photometric range used for analysis will also interfere.

6. Apparatus

6.1 Technicon AutoAnalyzer consisting of:

6.1.1 Sampler.
6.1.2 Manifold (AAI) or Analytical Cartridge (AAII).
6.1.3 Proportioning pump.
6.1.4 Heating bath, 50°C.
6.1.5 Colorimeter equipped with 15 or 50 mm tubular flow cell.
6.1.6 650–660 or 880 nm filter.
6.1.7 Recorder.
6.1.8 Digital printer for AAII (optional).

6.2 Hot plate or autoclave.

6.3 Acid-washed glassware: All glassware used in the determination should be washed with hot 1:1 HCl and rinsed with distilled water. The acid-washed glassware should be filled with distilled water and treated with all the reagents to remove the last traces of phosphorus that might be adsorbed on the glassware. Preferably, this glassware should be used only for the determination of phosphorus and after use it should be rinsed with distilled water and kept covered until needed again. If this is done, the treatment with 1:1 HCl and reagents is only required occasionally. Commercial detergent should never be used.

7. Reagents

7.1 Sulfuric acid solution, 5N: Slowly add 70 ml of conc. $H_2SO_4$ to approximately 400 ml of distilled water. Cool to room temperature and dilute to 500 ml with distilled water.

7.2 Antimony potassium tartrate solution: Weigh 0.3 g $K(SbO)C_4H_4O_6 \cdot 1/2H_2O$, dissolve in 50 ml distilled water in 100 ml volumetric flask, dilute to volume. Store at 4°C in a dark, glass-stoppered bottle.

7.3 Ammonium molybdate solution: Dissolve 4 g $(NH_4)_6Mo_7O_{24} \cdot 4H_2O$ in 100 ml distilled water. Store in a plastic bottle at 4°C.

7.4 Ascorbic acid, 0.1M: Dissolve 1.8 g of ascorbic acid in 100 ml of distilled water. The solution is stable for about a week if prepared with water containing no more than trace amounts of heavy metals and stored at 4°C.

7.5 Combined reagent (AAI): Mix the above reagents in the following proportions for 100 ml of the mixed reagent: ~~50~~ 100 ml of 5N $H_2SO_4$ (7.1), ~~5~~ 10 ml of antimony potassium tartrate solution (7.2), ~~15~~ 30 ml of ammonium molybdate solution (7.3), and 30 ml of ascorbic acid solution (7.4). Mix after addition of each reagent. All reagents must reach room temperature before they are mixed and must be mixed in the order given. If turbidity forms in the combined reagent, shake and let stand for a few minutes until the turbidity disappears before processing. This volume is sufficient for 4 hours operation. Since the stability of this solution is limited, it must be freshly prepared for each run.

Double amounts and omit ascorbic acid.
100 ml 5N $H_2SO_4$
10 ml A.P.T
30 ml A.M.
140 ml

NOTE 1: A stable solution can be prepared by not including the ascorbic acid in the combined reagent. If this is done, the mixed reagent (molybdate, tartrate, and acid) is pumped through the distilled water line and the ascorbic acid solution (~~30 ml~~ of 7.4 diluted to 100 ml with distilled water) through the original mixed reagent line.

60 ml stock (7.4) bring up to 200 ml 7.6

Sulfuric acid solution, 11 N: Slowly add 310 ml conc. $H_2SO_4$ to 600 ml distilled water. When cool, dilute to 1 liter.

8 N NaOH - 160 g NaOH in 500 ml $H_2O$.

8.2.2 Boil gently on a pre-heated hot plate for 30–40 minutes or until a final volume of about 10 ml is reached. Do not allow sample to go to dryness. Alternatively, heat for 30 minutes in an autoclave at 121°C (15–20 psi).

8.2.3 Cool and dilute the sample to 50 ml. If sample is not clear at this point, filter.

8.2.4 Determine phosphorus as outlined in (8.3.2) with acid wash water (7.8) in wash tubes.

8.3 Orthophosphate

8.3.1 Add 1 drop of phenolphthalein indicator solution (7.9) to approximately 50 ml of sample. If a red color develops, add sulfuric acid solution (7.6) drop-wise to just discharge the color. Acid samples must be neutralized with 1 N sodium hydroxide (40 g NaOH/1).

8.3.2 Set up manifold as shown in Figure 2, AAI or Figure 3, AAII.

8.3.3 Allow both colorimeter and recorder to warm up for 30 minutes. Obtain a stable baseline with all reagents, feeding distilled water through the sample line.

8.3.4 For the AAI system, sample at a rate of 20/hr, 1 minute sample, 2 minute wash. For the AAII system, use a 30/hr, 2:1 cam, and a common wash.

8.3.5 Place standards in Sampler in order of decreasing concentration. Complete filling of sampler tray with unknown samples.

8.3.6 Switch sample line from distilled water to Sampler and begin analysis.

9. Calculation

9.1 Prepare a standard curve by plotting peak heights of processed standards against known concentrations. Compute concentrations of samples by comparing sample peak heights with standard curve. Any sample whose computed value is less than 5% of its immediate predecessor must be rerun.

10. Precision and Accuracy (AAI system)

10.1 Six laboratories participating in an EPA Method Study, analyzed four natural water samples containing exact increments of orthophosphate, with the following results:

| Increment as Orthophosphate mg P/liter | Precision as Standard Deviation mg P/liter | Accuracy as Bias, % | Accuracy as Bias, mg P/liter |
|---|---|---|---|
| 0.04 | 0.019 | +16.7 | +0.007 |
| 0.04 | 0.014 | - 8.3 | -0.003 |
| 0.29 | 0.087 | -15.5 | -0.05 |
| 0.30 | 0.066 | -12.8 | -0.04 |

10.2 In a single laboratory (EMSL), using surface water samples at concentrations of 0.04, 0.19, 0.35, and 0.84 mg P/1, standard deviations were ±0.005, ±0.000, ±0.003, and ±0.000, respectively.

10.3 In a single laboratory (EMSL), using surface water samples at concentrations of 0.07 and 0.76 mg p/1, recoveries were 99% and 100%, respectively.

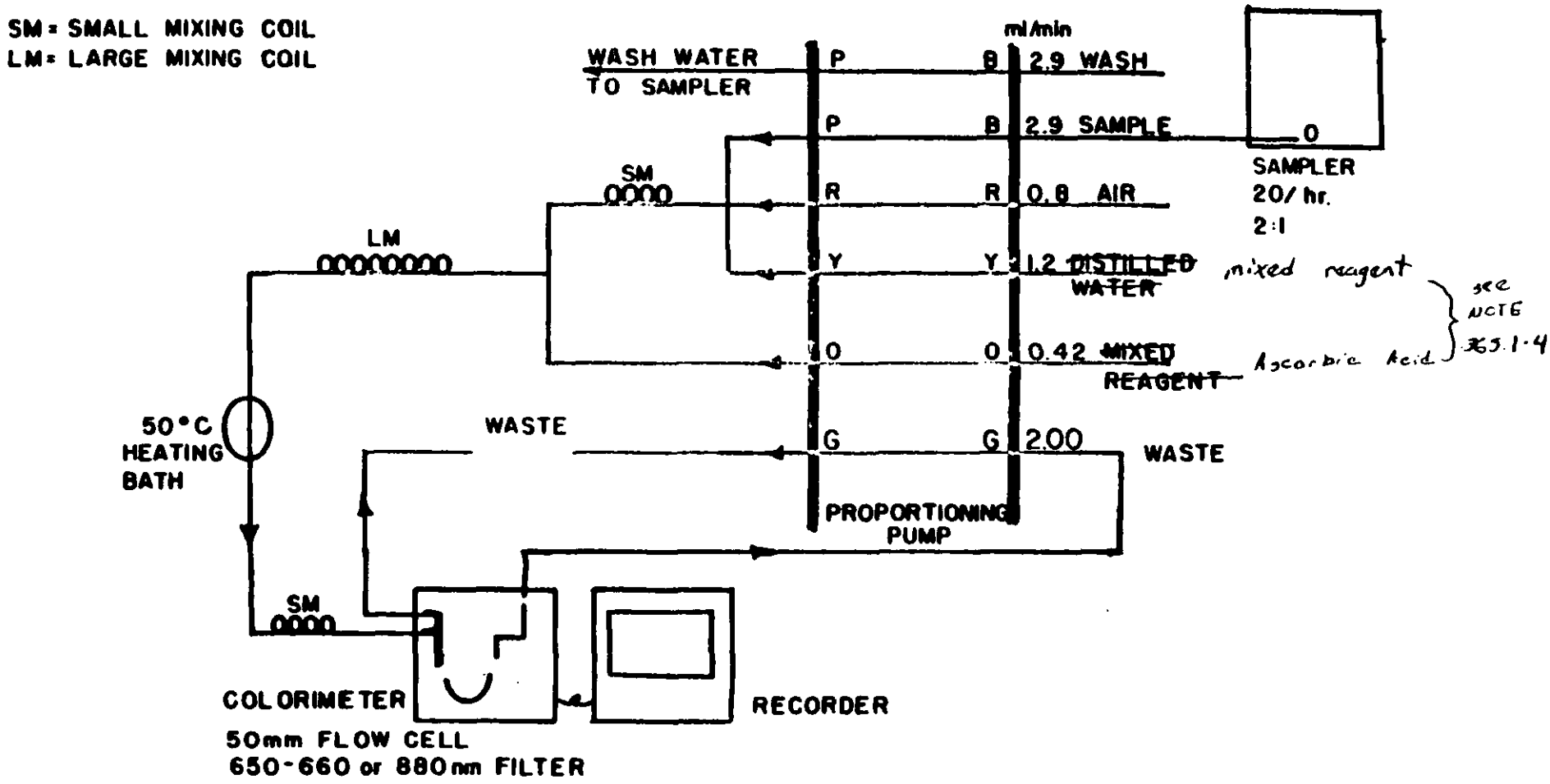



FIGURE 2 PHOSPHORUS MANIFOLD AA I

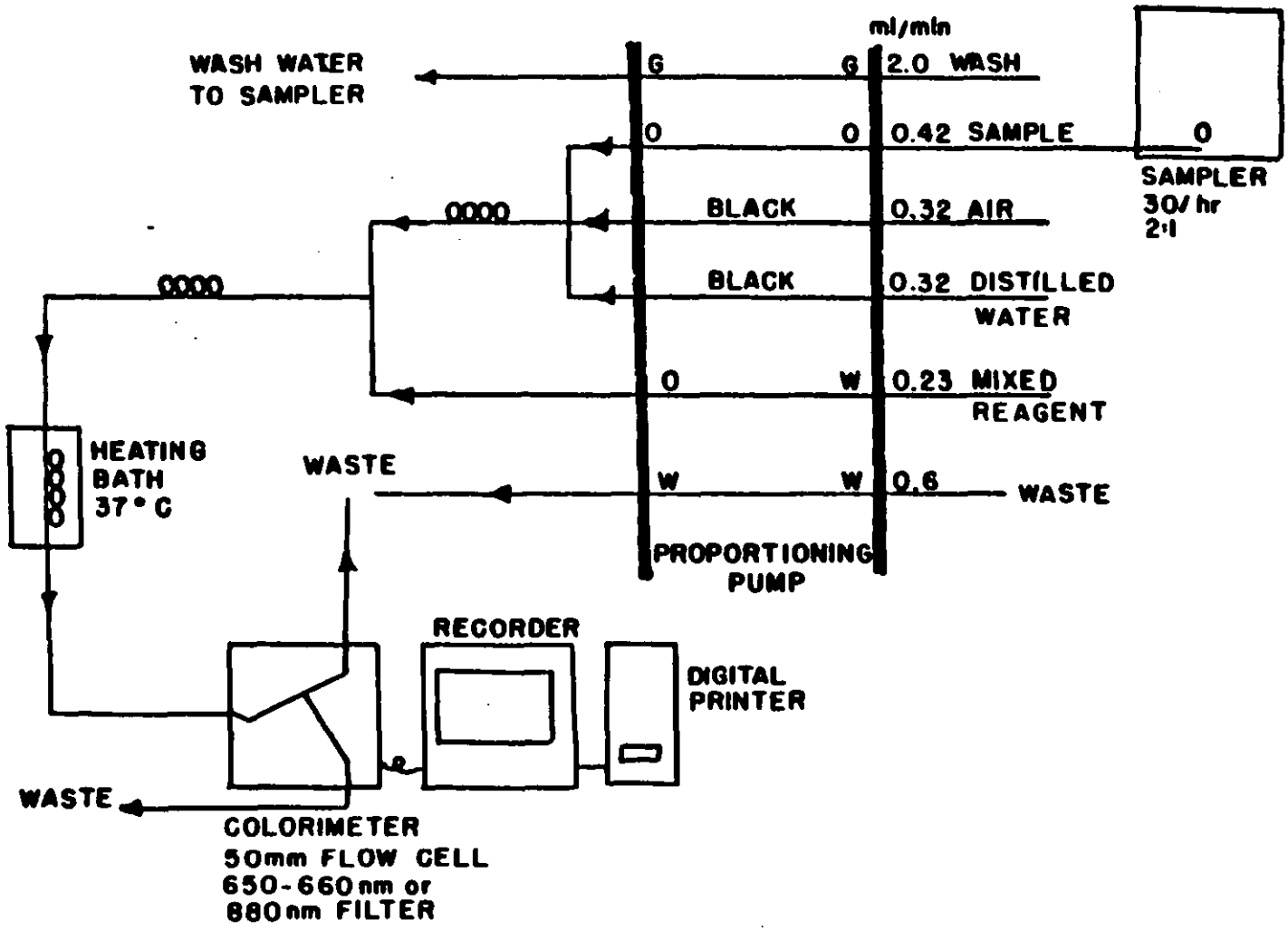



FIGURE 3 PHOSPHORUS MANIFOLD AA II

APPENDIX F

ENVIROSPHERE COMPANY
REPORT ON M-AREA SLUDGE STABILIZATION STUDY

**envirosphere company**
A Division of EBASCO SERVICES INCORPORATED
145 Technology Park/Atlanta, Norcross, Georgia 30092, (404) 449-6639

May 30, 1985

Dr. John B. Pickett
Staff Chemist
E. I. DuPont de Nemours, Inc.
Savannah River Laboratory
Aiken, South Carolina 29808

Dear Dr. Pickett:

To provide data to SRL to allow an assessment of the feasibility and costs of closing the M-Area Basin in-place, Envirosphere Company has conducted the sludge stabilization studies outlined in our proposal to you dated March 29, 1985, as amended by our personal communications on April 22, 1985. The amended scope of work deleted the chemical property determination and added the consideration of stabilization of the sludge using native sandy clay soils. All engineering testing of the samples was performed by SRL personnel.

Figure 1 depicts the moisture-density relationship of the "10%" sludge/flyash mixtures. From this Figure it may be extrapolated that the optimum sludge/flyash ratio to obtain maximum density is approximately 2:1 sludge to flyash on a wet weight (volume) to dry weight (field moisture conditions) basis. No reactions were observed during mixing of the flyash and sludge and no self-hardening of the mixtures was observed.

Table 1 lists the results of the compressive strength testing of the sludge/cement mixtures; Type 1 Portland Cement was used. Table 2 lists "Maximum Allowable Soil Bearing Pressure Under Vertical Static Loading" for comparison with the determined sludge/cement strength values.

Figure 1 also depicts the results of the moisture-density relationship of mixtures of "20%" sludge and native soil. Insufficient data exists for conclusive evaluation and exact mixture ratio recommendations. The native soil acted similar to the flyash in adsorbing the "liquid" phase of the sludge and did not "self-harden."

It can be concluded from the data obtained during this testing that all three media can be used to stabilize the sludge in the M-Area Basin prior to an in-place closure. However, based on our observations, it is our opinion that the cement/sludge mixtures should be considered for use over the flyash and/or natural soils. The self-hardening properties of the cement/sludge mixture would tend to minimize leachate generation due to "chemical fixation" of sludge constituents by the cement and because of the lower permeabilities exhibited by concrete over most natural soils. Additonally, the production of a self-hardened cement/sludge mass would reduce the potential for windborn dispersion of contaminants during closure

Dr. John B. Pickett May 30, 1985

activities. The optimum mixture ratio for stabilizing the M-Area Basin sludge based on the data collected during this study appears to be in the range of 1:0.5 sludge/cement for the "10%" sludge and less than 1:0.5 sludge/cement for the "20%" sludge.

If you have any questions concerning the data/conclusions contained herein, please contact me in Austin, Texas, at (512) 472-6064. If we may be of further service in this matter, please let us know.

Very truly yours,

Rod Kimbro
Principal Scientist

RK:trh
Enclosures

TABLE 1

COMPRESSIVE STRENGTH

| "10%"[1] Sludge/Cement Ratio | $\overline{CS}$ (Tons/Ft$^2$) |
|---|---|
| 1:0.5 (2000 ML/1000g) | 2.11 |
| 1:1 (1000 ML/1000g) | 38.23 |
| **"20%"[2] Sludge/Cement Ratio** | |
| 1:0.5 (1000 ML/500g) | 11.44 |
| 1:1 (1000 ML/1000g) | 24.26 |
| 1:3 (500 ML/1500g) | 205.41 |

[1] "10%" Sludge = 5.7% Solids

[2] "20%" Sludge = 19.5% Solids

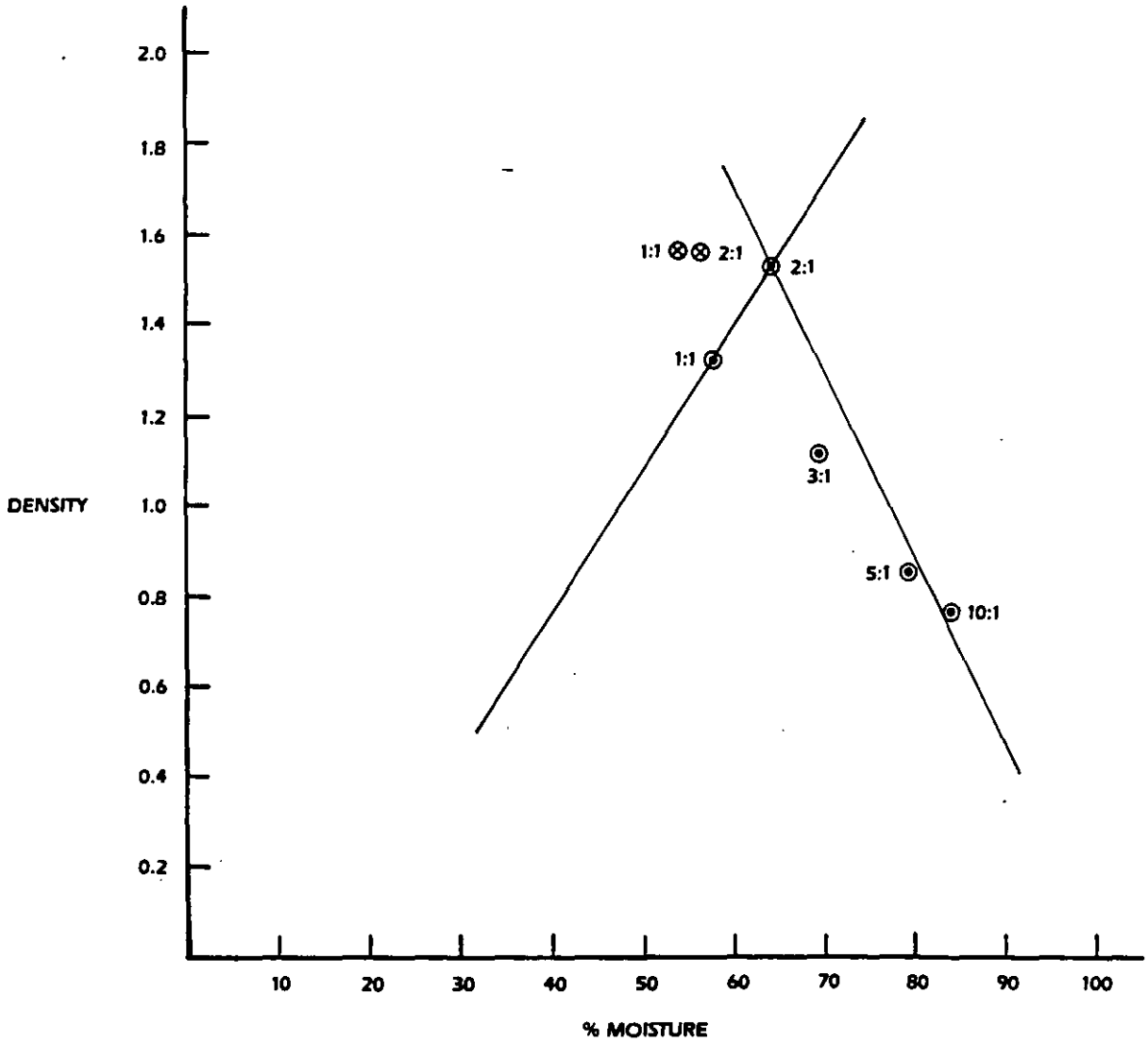
TABLE 2

MAXIMUM ALLOWABLE SOIL BEARING PRESSURES
UNDER VERTICAL STATIC LOADING

| | |
|---|---|
| Crystalline Bedrock (Sound) | 100 Tons/Ft$^2$ |
| Hard Limestones/Hard Sandstones | 40 |
| Hard Shales/Hard Mudstones/Sandstones | 20 |
| Soft Shales/Soft Mudstones | 6-10 |
| Hard Chalk/Soft Limestone | 6 |
| Hard Stiff Clay | 3-6 |
| Compact Course Sand | 3-6 |
| Soft Clay | 1 |

Wilun, Zenon and Krzysztof Starzewski, Soil Mechanics in Foundation Engineering, Vol. 2, Theory and Practice, Halsted Press, New York, 1972.

## FIGURE 1




**LEGEND**
"10%" SLUDGE/FLYASH MIXTURE ⊙
"20%" SLUDGE/SOIL MIXTURE ⊗

APPENDIX G

SOLID TEK SYSTEMS, INC.
REPORT ON M-AREA SLUDGE STABILIZATION STUDY

SolidTek Systems Inc.
5371 Cook Road • P.O. Box 888 • Morrow, Georgia 30260-0888 • 404/361-6181

# GENERIC STABILIZATION TECHNIQUES FOR THE HYDROXIDE SLUDGE AT THE BOTTOM OF M-AREA SETTLING BASIN

REQUESITION NUMBER T61664

ORDER NUMBER AX0682023

FOR

E.I. DU PONT DE NEMOURS & COMPANY, INC.

(U.S. DEPARTMENT OF ENERGY)

SAVANNAH RIVER PLANT

AIKEN, SOUTH CAROLINA, 29808

MAY 15, 1985

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# SECTION I

# INTRODUCTION

Solidification systems are chemically reactive formulations which, together with the water and other components in sludges and other aqueous wastes, form stable solids. "Stable," in this sense, means that the solids are physically stable under normal or expected environmental conditions and will not revert to the original liquid or semi-liquid state. Ten years ago the words "solidification" and "chemical fixation" were not part of the environmental engineer's vocabulary. Today there is substantial technology and application of these techniques. Many of the chemical systems being employed are considered proprietary and little specific information is available. However, the generic types of solidifying systems are outlined in the literature.

Before going further, let us define the terms "solidification" and "chemical fixation." In the industry, there is a tendency to use the words "solidification" and "chemical fixation" interchangeably. "Solidification" is the process which physically alters liquid or semi-liquid materials to a stable solid. "Chemical fixation" is a process used to destroy, de-toxify, immobilize, insolublize, or render a waste component less hazardous or less capable of introducing itself into the environment.

Solidification or the transformation of a material into a physical form which is more suitable for storage or burial, does not, by itself, affect the hazard potential of the waste. It may reduce the potential by means of physical processes which set up a barrier between waste particles and the environment, limiting permeability of the waste to water or reducing the affected surface area available for diffusion.

A short history of the development of solidification systems dates back to the 1970s with only a few exceptions. These exceptions include the solidification of relatively small amounts of radioactive wastes in drums, cemented backfill in certain mining operations, and the production of stabilized base courses for road construction using lime-flyash systems. There are also a number of isolated instances where waste residue generators - and especially waste disposal site operators - have used cement, lime, flyash, soil, and various combinations of these materials to solidify liquid waste for disposal in non-secure landfills. Nearly all of the early work in commercial utilization of solidification processes was involved with a need for solidification only and rarely, if ever, were leaching tests or other technical evaluations of the performance of the process conducted.

Beginning about 1975, solidification and chemical fixation systems began to receive attention from the government, from waste generators, and from consulting engineering firms which had largely ignored this technology until that time. A series of projects was initiated in the EPA's Office of Solid Waste Management to evaluate various solidification processes, to explore other possible systems, and to develop the necessary testing and evaluation criteria. A number of organic solidification processes were announced as being in the developmental stage by both government funded and privately funded research organizations, and some hazardous waste management firms and engineering organizations began to tentatively offer solidification processes to their customers.

Chemical solidification systems have now become an accepted, if not widely understood, operation in the field of environmental control and waste disposal. New processes and variations of old ones are being announced with increasing frequency. In fact, a rather bewildering array of processes, systems, and chemicals has suddenly sprung on the market. These are partly listed and described in several recent articles and books and has created a great deal of confusion because the promotional jargon suggests that there is a large number of totally different chemical systems involved. In fact, the number of systems which differ substantially from each other in the chemical sense is quite small, and will be described generically in the next section.

SECTION II

# GENERIC SOLIDIFICATION SYSTEMS

Solidification and/or chemical fixation systems can be divided into three basic types: non-chemical systems, such as absorption; inorganic systems; and organic systems. These terms refer to the method used to produce fixation and/or solidification and not to the condition of the waste residue itself. Absorption-type systems should not be part of the chemical solidification/fixation industry, but rather a separate technology which has other uses. Consequently, this discussion will center around both inorganic and organic chemical systems and primarily the inorganic systems, since these are the really well-proven systems that have been developed and used to date.

## Inorganic Systems

Inorganic chemical solidification and fixation processes which have been either used or proposed for use include:

- Portland Cement
- Lime-Pozzolan (lime-flyash or lime-kiln dust)
- Lime-Portland Cement
- Lime-Plaster of Paris
- Calcium aluminate cement
- Portland Cement-sodium silicate
- Lime-sodium silicate
- Flyash-sodium silicate
- Calcium chloride-sodium silicate
- Soil-lime
- Portland Cement-flyash (or kiln dust)
- Portland Cement - fluoro silicate
- Carbonate Cement

Many of the various permutations and combinations of these systems, including various types of additives, are patented or are covered with patents applied for.

The most important systems at the moment are lime-flyash, Portland cement-flyash, Portland cement-lime and Portland cement-sodium silicate. Portland cement alone has also been widely used in the past, but now is used mostly in combination with one of the other ingredients. In volume of waste treated, the lime-flyash process has probably been the most used, although it has been very narrowly applied primarily to flue gas desulfurization sludges. For other types of wastes and industrial sludges, the Portland cement based processes are the most widely used at the present time. In the United States, the most diversified technique has been the Portland cement-sodium silicate process. This type of process has been applied to a variety of wastes and a reasonably good technical base, including leaching test information, is available and will be discussed later in this document. Another technique, the cement-flyash process, has been used in Europe but has not been applied very broadly in the United States to date. This process works well with certain types of waste, but like the lime-flyash process, involves very large additions of the solidifying agents and, therefore, very large volume increases - a characteristic which is generally undesirable in a solidification system. The Portland cement-sodium silicate type of process, on the other hand, usually involves very moderate volume increases but does not make use of waste products such as flyash which can be obtained inexpensively.

In summary, the inorganic systems are characterized by:

- Relatively low cost
- Good long-term stability, both physically and chemically
- Documented use on a variety of industrial wastes over a period of at least ten years
- Wide spread availability of the chemical ingredients
- Non-toxicity of the chemical ingredients
- Ease of use in processing (processes normally operate at ambient temperature and pressure and without unique or very special equipment)
- Relatively low volume increases with some of the processes
- Inertness to ultraviolet radiation
- High resistance to biodegradation
- Low water solubility
- Relatively low water permeability
- Good mechanical and structural characteristics

## Organic Systems

With the exception of processes for the incorporation of waste residues into liquid bitumen, or gross encapsulation in polythylene jackets, organic systems consist of monomers or prepolymers which are polymerized or cross linked by the use of catalysts or accelerators after being mixed with the liquid waste. This kind of system is almost infinite in potential variety, but for practical purposes has been limited so far to the following:

- Urea-formaldehyde
- Polybutadiene
- Acrylamid gel
- Urea-formaldehyde with plaster of Paris
- Polyolefin encapsulation
- Bitumen asphalt
- Polyurethane

Many combinations of the above and of other organic polymer systems are conceivable. One of the main problems in organic systems is that most have been solvent based and are primarily hydrophobic in nature. Difficulties are, therefore, encountered when incorporating the usual water based residuals. In addition to these physical problems, the presence of water and other ingredients in the wastes often interferes with the polymerization reaction. These systems, however, could be useful for the solidification of certain waste organics - hydrocarbons, chlorinated hydrocarbons, pesticides, etc. - which do not have a water base.

In most cases, the action of the organic polymer is primarily permeation limiting. Usually there is no direct reaction between the waste constituents and the polymer, nor does the system actually insolublize, detoxify, or destroy the hazardous constituents. However, since these polymers generally have a very low order of permeability, they are more effective in this respect than many inorganic systems. Actually, the mechanism of most organic systems is microencapsulation of the waste material, which separates the waste from its environment. One of the technical advantages of many of the organic processes is that a given polymer can be applied to a wide variety of waste types since there usually is no direct

chemical interaction between the polymer and the waste. This is advantageous when dealing with a complex mixture of wastes or a wide variety of individual wastes in a given disposal situation. The primary disadvantage of the organic processes to date has been cost. The urea-formaldehyde and bitumen processes are probably the least expensive, but are still costlier than the most widely used inorganic processes. In fact, most organic processes at this time are of little interest commercially except in the solidification of special hazardous materials such as radioactive waste, and for organic-base wastes which for some reason cannot be thermally destroyed.

In summary, the characteristics of organic systems are:

- High cost
- Very low permeability
- Potential of using one system with a wide variety of wastes
- Wide range of volume increase
- Relative instability in the presence of microorganisms
- Potential long term degradation effects on the polymer matrix by certain waste constituents
- Unproven long term stability even in the laboratory
- Very unlimited commercial use experience except with radioactive waste, and no long term commercial scale field test data
- Systems are more difficult to use and require more technical expertise than with the inorganic systems
- Some system components, especially catalysts, initiators and accelerators, are hazardous.

The word "stability" has been used with great frequency here and in other discussions of solidification technology. But how do we determine stability? In fact, we have only three ways of determining the long term stability of solidified waste, or for that matter, of any other material. These are:

1. Accelerated testing - designed to speed up the natural processes which might be involved in degradation of the material so as to simulate the results at any point in time in the future.
2. Actual environmental testing - placing the solidified material into real and actual environmental conditions for the period of time constituting its expected life.
3. Chemical modeling - determining the life time of the material by means of "paper" analysis of the chemistry of the system and its relationship to other systems of known stability.

Since we expect the solidified waste to be stable for an indefinite and infinite period of time, it is obviously not possible to run actual environmental tests before such systems are put into commercial use. There are many accelerated tests developed for other types of materials which could be applied to solidified wastes; however, no standards have yet been set in this area. While various physical and mechanical tests have been run on solidified wastes, these are intended primarily for the purpose of determining suitability of a particular waste for structural uses, such as landfill or road base, or for permeability determination if the solidified waste is to be used in a landfill. Most accelerated testing has been involved in determining leaching characteristics which are primarily associated with toxicity rather than with physical stability.

The products formed from the chemical reactions involved in the solidification process are thermodyanamically and kinetically stable under normally encountered ambient temperature conditions. We need concern ourselves only with other environmental factors such as ground water activity, wind and rain erosion, biological degradation and the effects of ultraviolet radiation. If the solidified waste is to be buried or covered, as is normally the case, then erosion and the effects of ultraviolet radiation are not very important, and the primary factors are the effects of ambient ground water and biological degradation. It is here that the use of inorganic siliceous systems provide the degree of confidence which is necessary in the solidification business. The basic chemistry of these systems is the same as that of rock, clay, concrete, brick, glass and other such materials which are known to be the most stable physical forms on earth. They are not affected by ultraviolet radiation, they are non-biodegradable, and they have a very high degree of resistance to ground or surface water. Because of these characteristics, and our knowledge of the kinetics and thermodynamics of these materials, it can be expected that properly formulated solidification systems will change only very slowly in the ground - on the same time scale as natural rocks and minerals. The possibility of a sudden or catastrophic change in such materials is almost non-existent.

The only other question then, if the matrix is stable, is whether toxic components can be leached from the matrix. This question can be answered only by properly designed leaching tests. Considerable controversy still rages over how these leaching tests should be run and with what leachants, but much of the basic protocol for running different types of tests has already been established.

Finally, a primary consideration in formulating solidification systems is that the chemicals used in the systems be fundamentally non-toxic and safe to handle.

These systems are formulated from natural or synthetic materials which have a long history of industrial use, and are considered to be generally non-hazardous. OSHA data sheets are available for all of the materials. Since some of the formulations are quite alkaline, and nearly all of them contain very fine powders which can be irritating to mucous membranes, it is necessary to utilize normal caution in handling the chemicals - for example, eye protection and, in closed environments, dust masks - essentially the precautions that one would take in handling lime or Portland cement.

SECTION III

SCOPE OF WORK
DETERMINE GENERIC STABILIZATION TECHNIQUES FOR THE HYDROXIDE SLUDGE AT THE BOTTOM OF M-AREA SETTLING BASIN
PURCHASE REQUISITION T61664

The objective of this test is to determine the applicability of several generic materials in the stabilization/solidification of the hydroxide sludge from the bottom of the M-Area basin. The following materials will be studied: kiln dust, fly ash, crusher run, lime, or others as recommended by the vendor. The fly ash utilized will be fly ash resulting from the SRP-"A" area power plant operations.

1. Vendor personnel will perform the blending and mixing of the materials with the M-Area sludge on site; e.g.: at the M-Area basin. This is due to the fact that the sludge contains low levels of depleted uranium. The samples will remain on site, and be tested by Du Pont for structural stability characteristics. Any equipment supplied by vendor will be decontaminated and cleaned by Health Protection before leaving the site.

2. Du Pont will supply the vendor with a 5-10 lb. sample of the fly ash for pre-testing. Du Pont will provide 5-10 gallons of the sludge for the on site mixing and blending tests.

3. The sample size of the mixtures is to be approximately 350 mls, which will enable the samples to be easily characterized.

4. The vendor will test a range of mixture ratios (generic material to sludge) to determine the recommended stabilization material and mixing ratio.

5. Mixing tests with or information pertaining to any proprietary stabilization materials is not requested.

6. Du Pont will transmit the results of the structural stability measurements to the vendor, and the vendor will submit a final report.

SECTION IV

M-AREA BASIN BACKGROUND

The M-Area Basin is a settling basin used to settle particulate from an up stream process that generates a high volume, low solids, waste water flow. Because of the nature of the process, the M-Area settling basin is considered a part of a hazardous waste treatment facility. The metal processing system contributes chromium, nickel, and mercury to the waste water and subsequently, is settled out in the basin. The approximate size of the basin is 250 ft. x 250 ft. and 15 ft. deep. Under another program, the depth of the sludge blanket was determined to be approximately 2 ft. on the average. The intent of the solidification project was to determine if the material in the bottom two feet could be solidified to a strength capable of supporting an overburden of fill material that would be placed back into the basin after the water had been removed.

Using approximate values, it can be determined what that loading will be;

| | |
|---|---|
| Volume of basin to be filled by overburden | 30,000 cu. yd. |
| Weight of overburden @ 1.5 ton/cu. yd. | 45,000 tons |
| Area of basin 250' x 250' | 62,500 sq. ft. |

$$\frac{45,000}{62,500} + 0.72 \text{ ton/sq. ft.}$$

For a comfortable unconfined compressive strength to support the overburden, 2.0 to 4.0 tons per square foot would be adequate.

SECTION V

APPLICATION OF GENERIC SOLIDIFICATION

SYSTEMS TO THE M-AREA BASIN SLUDGE

Samples of the M-Area Basin sludge were supplied to SolidTek personnel by Du Pont. These samples were accepted as representative of the sludge in the bottom of the basin. No analysis was performed on the sludge other than pH, specific gravity/density and total solids.

It was predetermined that the sample size for solidification testing should be 250 to 300 ml. It was also important to test the on site fly ash from area A as an additive or solidification agent. The sludge itself was a typical metal hydroxide sludge with a total solids content of 6%. The sludge had a grey-green color with a slightly musty odor. The viscosity appeared to be relatively low, and it was assumed this type of material would pump easily. The pH of the sludge was alkaline in the range of 10 to 11. The specific gravity/density was in the range of 1.02 to 1.06.

The following generic systems were applied to the 6% sludge sample:

| Generic | Ratio |
|---|---|
| Fly Ash | a) 1:1 ratio (sludge to fly ash) |
| | b) 1:2 ratio (sludge to fly ash) |
| | c) 1:5 ratio (sludge to fly ash) |
| Fly Ash + 10% hydrated lime | *4 lb. per gallon addition |
| | *5 lb. per gallon addition |

| Generic | Ratio |
|---|---|
| Fly Ash + 20% Portland Cement | 4 lb. per gallon addition |
| Cement - Portland Type I | *4 lb. per gallon addition |
| | *5 lb. per gallon addition |
| Lime | *4 lb. per gallon addition |
| | *5 lb. per gallon addition |
| Kiln Dust | **3 lb. per gallon addition |
| GXC Absorbent | **3 lb. per gallon addition |
| GXF Absorbent | **3 lb. per gallon addition |

* The ratios of 4 lb. and 5 lb. per gallon have been found to work well on other metal hydroxides when applied in the SolidTek Systems, Inc. laboratory...

**Ratio of 3 lb./gal. worked well with this type of reagent in the SolidTek Systems, Inc. laboratory

A second set of samples was solidified using a 23% solids material. This material had been prepared from basin sludge that had been dried in porcelain pans for several days in the sun.

The following generic systems were applied to the 23% sludge samples:

| Generic | Ratio |
|---|---|
| Fly Ash | 2 lb. per gallon addition |
| Cement | 2 lb. per gallon addition |
| Lime | 2 lb. per gallon addition |
| Kiln Dust | 2 lb. per gallon addition |

The 2 lb. per gallon addition was an additive rate that had been successful on metal hydroxides in the SolidTek Systems, Inc. laboratory.

A final set of samples was solidified for testing in the Du Pont laboratories using the following generic solidification systems:

| Generic | Ratio |
|---|---|
| Cement | 4 lb. per gallon additive at 6% solids |
| (Portland Type I) | 4 lb. per gallon additive at 23% solids |
| 80% Fly Ash + 20% Cement | |
| (Portland Type I) | 4 lb. per gallon additive at 23% solids |

These samples were prepared and placed in molds for further unconfined compressive strength testing by Du Pont.

The application of the generic solidification systems to both the 6% solids material and the 23% solids material was to determine the system choice and volume increase in an existing condition and a dewatered condition. The concept of reducing the volume by solar evaporation was a concern if more material had to be placed back into the basin as a result of the accepted closure plan.

The criteria for developing a stable solid or one able to support the overburden was based entirely on the measurement of unconfined compressive strength. The method employed for rapid testing was the Soil-Test Pocket Penetrometer, Model 700. This simple device can determine unconfined compressive strength by simple penetration of the surface of the sample to a predetermined depth. The pressure needed to accomplish this is

measured by a calibrated spring resisting the penetration. Direct readings can be taken from the instrument. Additional data and information is supplied for this instrument in the appendix.

Additional data gathered during the solidification testing would enable Du Pont to determine the feasibility of applying that solidification system to the basin closure program. Most of the data would be physical handling of the sludge. Did the reagents mix well? Did the addition of reagents cause a temperature rise? Were any fumes given off during mixing? Was the viscosity changed dramatically during mixing? All of these questions pertain to the actual application of a solidification system to the basin sludge.

SECTION VI

TEST DATA AND RESULTS

Observations:

Fly Ash 1:1 The fly ash samples were important at the beginning of the study, but were less important as the tests proceeded. The mixture of fly ash at a 1:1 ratio with the 6% sludge resulted in a material that had about one centimeter of standing water on the surface of the sample. The sample was allowed to air dry for 24 hours and the level of standing water dropped to 0.75 centimeters. The mix was still fluid after 24 hours. In general, a solidification system shows some signs of gelling or hardening at 24 to 48 hours. This mixture did not exhibit any indication of ever getting solid. Unconfined Compressive Strength (UCCS) tests were done periodically during the first day and then again during the second and third days to confirm this observation. The volume increase as measured was approximately 41%.

Fly Ash 1:2 This sample showed the same standing water on the surface, only less volume; 0.5 centimeters initially, 0.25 centimeters after 24 hours. The sample was fluid after 24 hours and continued to be fluid for the remainder of the test. The volume increase was approximately 82%.

Fly Ash 1:5 This sample was a damp solid after mixing, with no standing water. It appeared to be a granular material similar to the sample of fly ash that was used as a solidification reagent. This sample appeared to be a solid, but it exhibited no unconfined compressive strength. The volume increase was approximately 200%.

Fly Ash + 10% Lime Since it was important to incorporate the fly ash into the solidification mixes, hydrated lime was added to the ash from the 700A area. A 10% by weight addition of hydrated lime made a lime fly ash mix that fits the generic solidification specification. The addition rate of 4 pounds per gallon showed similar characteristics to the plain fly ash. About 1 centimeter of water was on the surface, and the mix remained fluid after 24 hours. The 5 pounds per gallon addition rate had less water on the surface, but still was fluid after 24 hours. The volume increase was 29% and 35% respectively.

Cement (Portland Type I) This sample at the 4 pound per gallon addition rate showed no water at the surface. The reagent mixed into the sludge easily and the material seemed to gel in a short time. Initial UCCS tests were low, but after 24 hours the UCCS test measured 2.0 tons per square foot. The volume increase was measured at 17.7%. The 5 pound per gallon addition rate also had no standing water, and showed a rapid strength development. The UCCS test was 3.0 tons per square foot after 24 hours. The volume increase was measured at 20.6%.

Lime Hydrated lime was used as a solidification agent in place of quick-lime because of the potential of rapid heat rise due to the heat of solution as the quick-lime comes in contact with the water present in the sludge. It has been our experience that at solidification rates of 3 to 4 pounds per gallon, enough heat is liberated to cause a steam cloud. Because of the nature of the material that may be contained in the sludge, this steam may not be advantageous. The hydrated lime at

both the 4 and 5 pound addition rate resulted in a mix that exhibited very low UCCS tests after 24 and 48 hours. No standing water was on the surface, and the volume increases were 20.6% and 23.5% respectively.

Kiln Dust Kiln Dust with a very small particle size generally absorbs liquids and if added at 2 to 3 pounds per gallon solidifies metal hydroxide sludges to fairly good solids. In this case, the kiln dust at 3 pounds per gallon gelled, but never solidified.

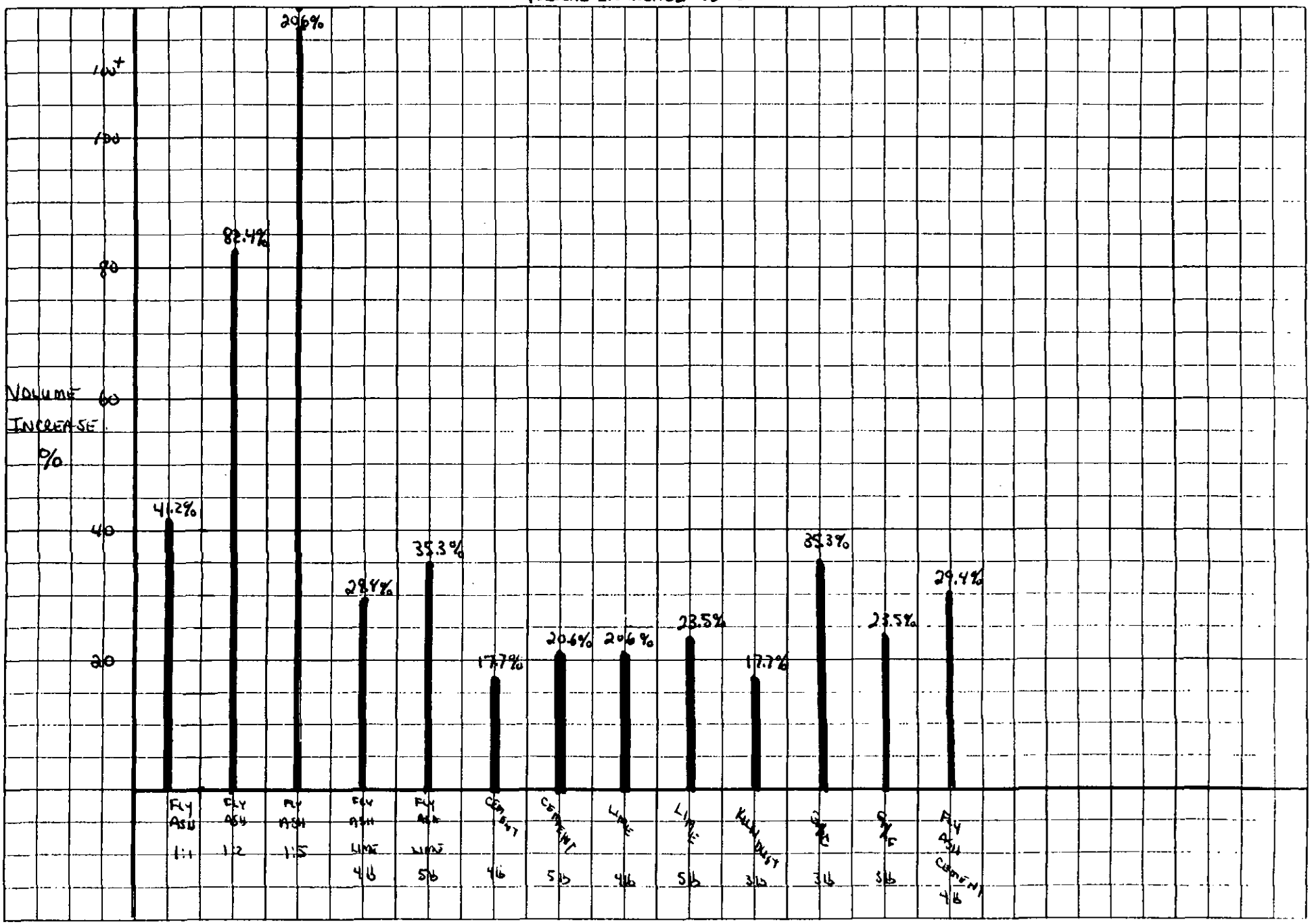
GXC and GXF These are commercial absorbents that are available in large quantities in South Carolina. Because of the addition rate at 3 pounds per gallon, the sludge should have solidified. The GXC gelled the sludge after a short time, but the mix never attained a UCCS to be a solid. The GXF, which is the same reagent but ground very fine, did not even gel the sample. It remained a fluid throughout the test. The volume increase for GXC at 3 pounds per gallon addition was 35%. For the finer ground material, the volume increase was 24%.

Fly Ash + 20% Cement The fly ash cement was tried after the apparent failure of the other fly ash systems. It appeared to gel the mix in a short time, and take on some of the properties of a solid. After 24 hours though, it still exhibited a UCCS of zero. The volume increase of approximately 30% was not very good either.

## VOLUME INCREASE MEASUREMENTS

| Solidification Test | Addition Rate | Volume Increase |
|---|---|---|
| Fly Ash | 1:1 | 41.2% |
| | 1:2 | 82.4% |
| | 1:5 | 206.0% |
| Fly Ash Plus 10% Lime | 4 lb./gal. | 29.4% |
| | 5 lb./gal. | 35.3% |
| Cement (Portland Type I) | 4 lb./gal. | 17.7% |
| | 5 lb./gal. | 20.6% |
| Lime (Hydrated) | 4 lb./gal. | 20.6% |
| | 5 lb./gal. | 23.5% |
| Kiln Dust | 3 lb./gal. | 17.7% |
| GXC | 3 lb./gal. | 35.3% |
| GXF | 3 lb./gal. | 23.5% |
| Fly Ash Plus 20% Cement | 4 lb./gal. | 29.4% |

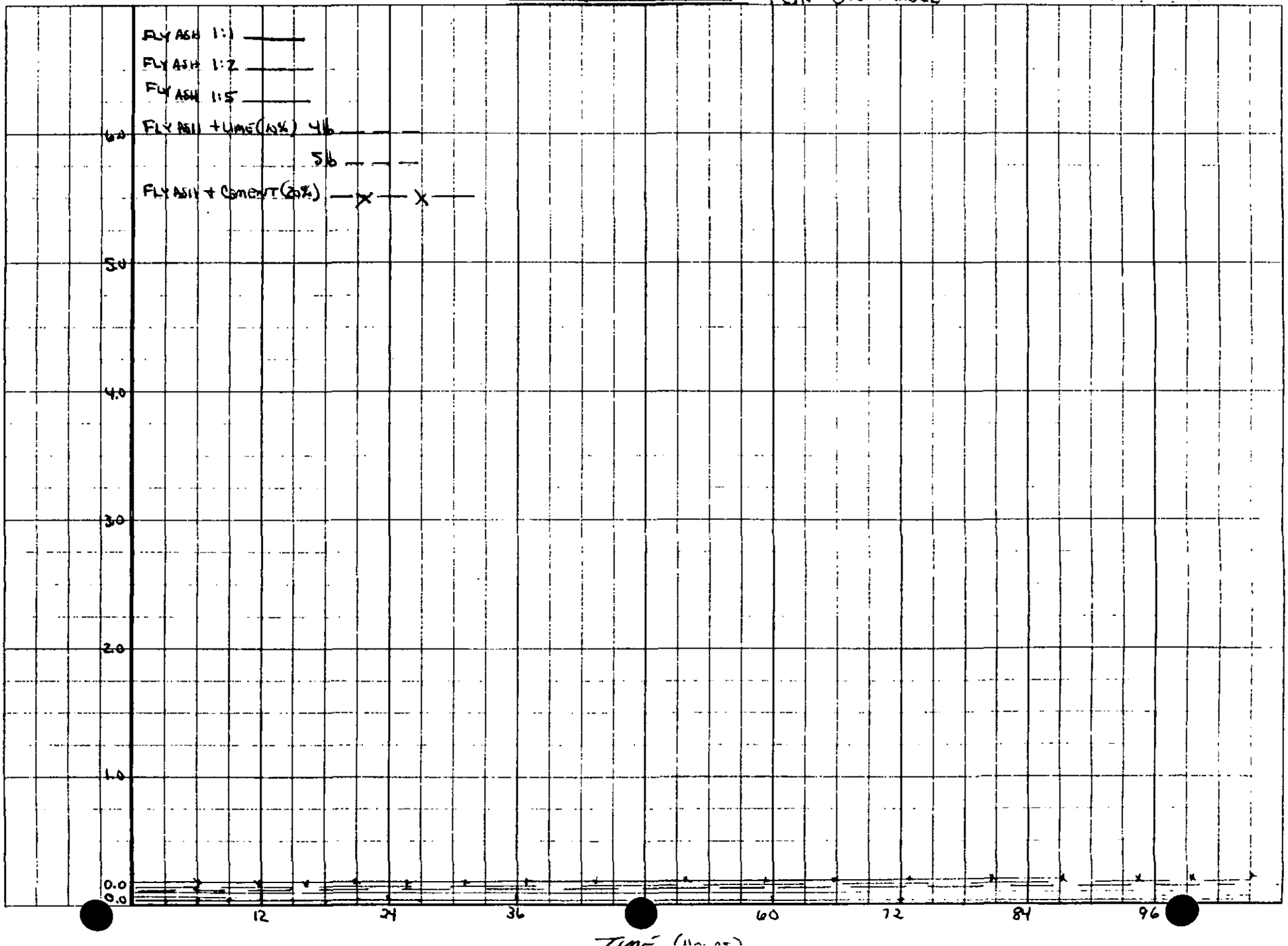
VOLUME INCREASE VS SOLIDIFICATION SYSTEM



K•E 4 X 4 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.



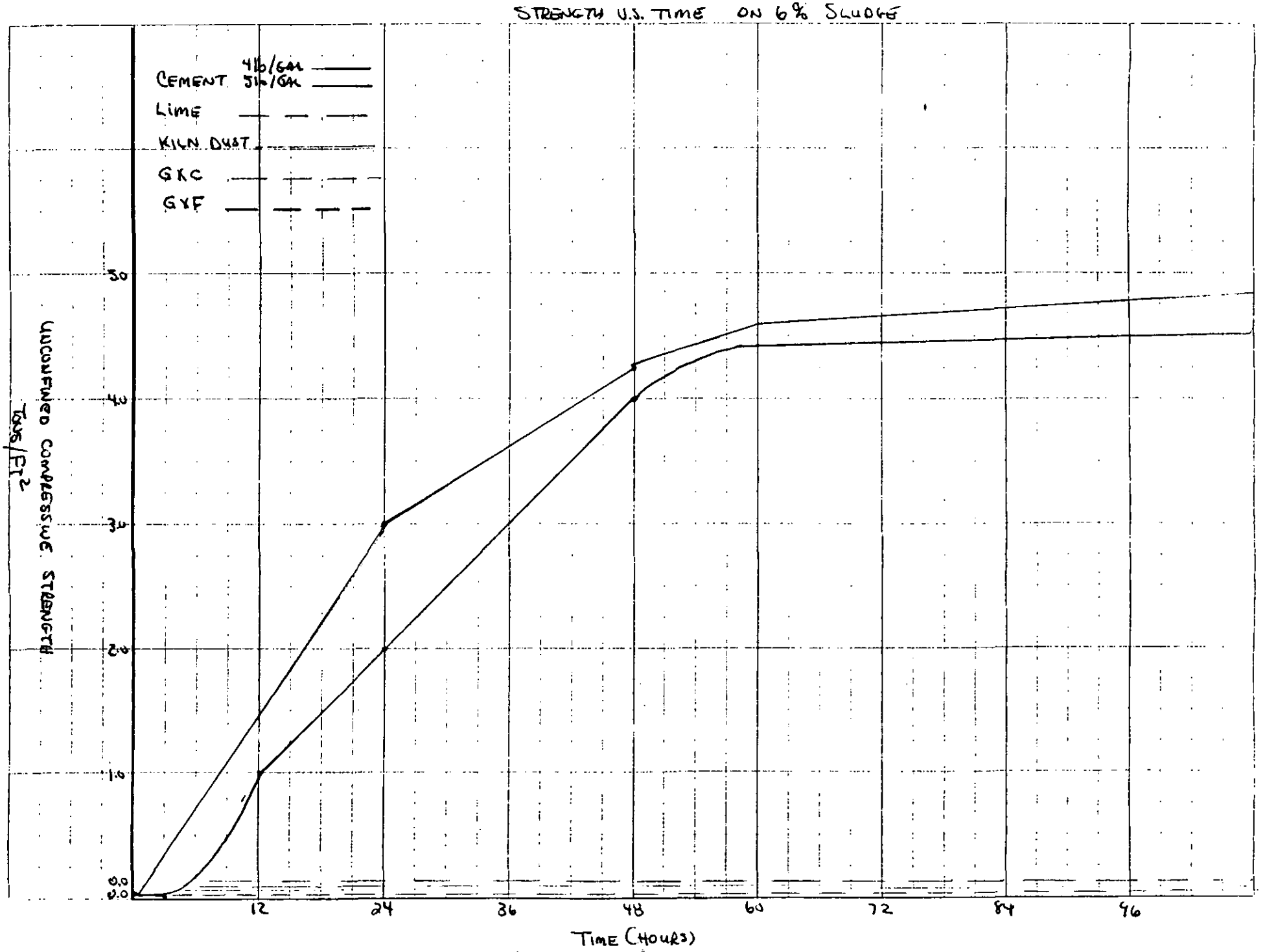
# STRENGTH VS. TIME ON 6% SLUDGE

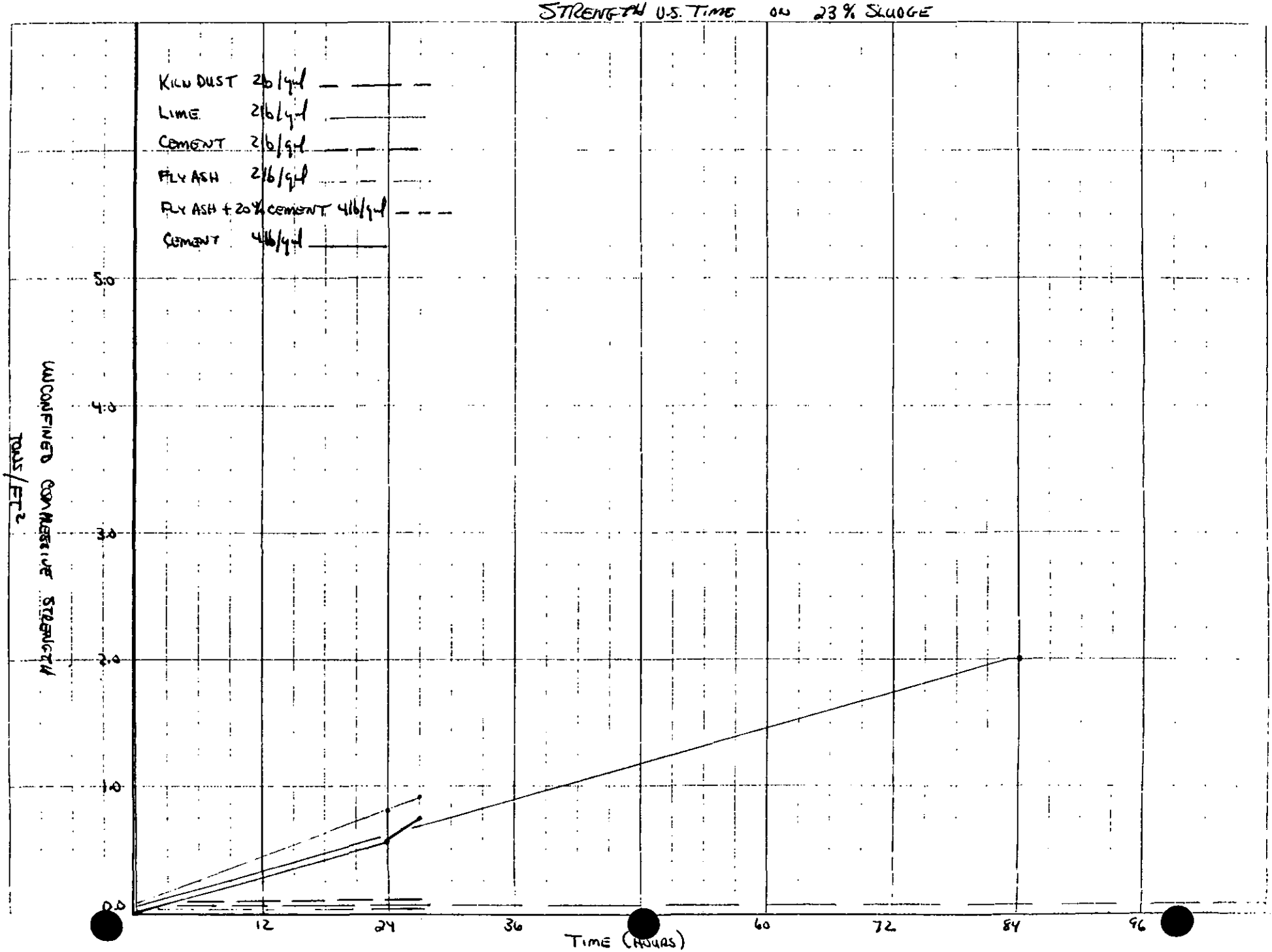



UNCONFINED COMPRESSIVE STRENGTH TON/FT²

K&E 4 X 4 TO THE INCH
KEUFFEL & ESSER CO






STRENGTH VS. TIME ON 23% SLUDGE
KILN DUST 2lb/yd
LIME 2lb/yd
CEMENT 2lb/yd
FLY ASH 2lb/yd
FLY ASH + 20% CEMENT 4lb/yd
CEMENT 4lb/yd
UNCONFINED COMPRESSIVE STRENGTH
TONS/FT²
5.0
4.0
3.0
2.0
1.0
0.0
12
24
36
60
72
84
96
TIME (HOURS)

## SECTION VII

## SUMMARY

Based on the observations and data recorded, the only generic material that appeared to work was Portland Cement. Using the graphs for both the 6% solids sludge and 23% solids sludge, it can be seen that the Portland Cement addition developed a solid having unconfined compressive strengths of 2 to 4 tons per square foot. All the others (except the lime dosage on the 23% solids) failed to develop any detectable compressive strength. The duration of the test was three days. This is generally long enough to do sample testing for developing a solidification system. The data recorded by the SolidTek personnel covered this period and the findings were confirmed by the Du Pont laboratory. The unconfined compressive strengths necessary to support the intended overburden are met adequately by the addition of 4 to 5 pounds of Portland Cement per gallon of sludge.

Let us look at this Portland Cement addition and take time to clearly describe the solid developed by this type of system. In the nuclear industry "grouting" is generally a term applied to a cement additive for solidifying liquids. This "grouting" may exhibit very high unconfined compressive strengths of 2,000 to 3,000 pounds per square inch. That equates to 144 to 216 tons per square foot. The type of solid generated from this lagoon sludge by Portland Cement addition or other appropriate formulation will produce a solid that will adequately support the overburden but which will still be handled easily by standard earth moving equipment. The solid is designed to resemble a hard-packed clay with good support characteristics and handling properties.

The formulation that appeared to be appropriate for solidifying the basin sludge was based on a sample that was supposed to be representative. The material in the basin may vary. In fact, the client's intent is to increase the per cent solids by dewatering, in order to reduce the volume for solidification. As observed briefly in the testing of the high solids materials, there were some results that differed significantly from the 6% solids materials. The unconfined compressive strength of the higher solids material was lower than the 6% solids material. This could be due to mixing, curing time, and/or concentration of the blocking agents that may be present in the sludge.

In conclusion, successful solidification of the subject sludge was demonstrated, using a generic material, Portland Cement. Based on SolidTek's considerable experience, the project appears to be feasible.

Problems which can be anticipated in scaling from laboratory study to project implementation include:

1) Uncertain moisture/solids content at time of the implementation
2) Potential chemical inhomogeniety within the lagoon
3) Changes in composition over time intervals
4) Portland Cement is not a single product, it is a formulation or blend, and it, too, varies with time from a single producer and with time of storage between manufacture and use.
5) Seasonal weather considerations cause variations.

Having encountered and dealt with these factors repeatedly, it is our conclusion that our quality control and formula modification capabilities would allow effective solidification using a Portland Cement base material, if the Portland Cement itself becomes less than totally adequate.

# APPENDIX I

# FIELD APPLICATION OF THE POCKET PENETROMETER

RECEIVED
AUG 3 1984

# FIELD APPLICATION OF THE POCKET PENETROMETER

By
Francisco J. Cordova, P. E.
President and Chief Engineer
of
WESTVILLE ENGINEERING COMPANY, INC.
WESTVILLE, INDIANA

During the last few years, extensive research has been conducted in the branch of soil mechanics with the ultimate purpose of seeking simple, but rather accurate, field tests for the determination of the density of cohesionless soil as well as the consistency of the cohesive ones.

Among the multitude of tests which have been proposed, the Penetration Resistance Test, as devised by Terzaghi and Peck, has received the widest acceptance in this country and abroad. The test actually aims to correlate the unconfined compressive strength of the cohesive soil and the consistency of the cohesionless materials with the penetration resistance of a standard soil sampler. In practice, this is accomplished by driving a 1-3/8-inch ID, 2-inch OD, split-barrel sampler, of standard design, 12 inches into the underlying soil by means of a 140-pound drive weight with a free fall of 30 inches. The number of blows necessary to drive the sampling device the required depth of 12 inches, is recorded and compared with the table devised by its promulgators. This table, widely used by soil engineers, is shown below, and the data given applies to sampling operations in water-filled bore holes.

PENETRATION RESISTANCE AND SOIL PROPERTIES

| Cohesionless Soils | | Cohesive Soils | | |
|---|---|---|---|---|
| Blows Foot | Relative Density | Blows Foot | Consistency or Density | Compressive Strength $q_u$ |
| Below 4 | Very loose | Below 2 | Very soft | Below 0.25 |
| 4 - 10 | Loose | 2 - 4 | Soft | 0.25 - 0.50 |
| 10 - 30 | Medium | 4 - 8 | Medium | 0.50 - 1.00 |
| 30 - 50 | Dense | 8 - 15 | Stiff | 1.00 - 2.00 |
| Over 50 | Very dense | 15 - 30 | Very stiff | 2.00 - 4.00 |
| | | Over 30 | Hard | Over 4.00 |

Sampler 2-in. OD, 1-3/8-in. ID  Hammer 140 lb., 30-in. drop  $q_u$, tons/sq.ft.

However, like most of the dynamic penetration tests, the Terzaghi and Peck penetration method presents certain irregularities resulting in a wide divergence of results in the field, specifically when correlating the penetration resistance of the sampling device with the unconfined compressive strength or the shearing strength of the cohesive soils.

In extensive test boring contracts, for large engineering projects in this country, the Specification writers have failed to describe the penetration test procedure in detail and, as a consequence, the results acquired in the field are somewhat deceiving and their application for design purposes could unquestionably lead to faulty design. Experience, in large highway projects in Ohio, Illinois and Indiana, has shown a wide divergence of results by independent drilling contractors and soil engineering firms even if the boring explorations were conducted in the same geologic terrain.

The split-barrel sampling device has an approximate weight of 9.60 pounds.

An analysis of the above table indicates that there is an appreciable difference in the weight of driving rods in proportion to the depth at which sampling operations are taking place. Obviously the energy absorption will vary with the type of drilling rods used in the bore hole.

The rate of blows application can materially effect the penetration record, specifically in clays and slightly cohesive silts. Experience has indicated that the sampling device will require 20% to 40% more blows to penetrate a depth of 12 inches when driven at a slow rate of 30 to 40 blows per minute than when driven at a fast rate of 60 to 80 blows per minute. In their excellent dissertation "Engineering Properties of the Chicago Subsoil", University of Illinois, Bulletin Vol. 51, No. 44, Peck and Reed, as a result of correlating the unconfined compressive strength of "Shelby" tube samples and blows penetration concluded that

$$q_u = \frac{N}{6}$$

$q_u$ = Unconfined compressive strength

N = Number of blows to drive the standard sampling device 12 inches into the soil.

Experience of this author during the last few years has failed to prove unquestionably the heretofore stated expression. The following chart actually shows his conclusions, in a graphical form, of the results of over a thousand test borings made in several states bordering the Great Lakes.

It has become a general practice by drilling contractors and engineers, including those engaged in soil mechanics, to rely on the blows penetration and to assign the state of density and consistency as a result of the penetration record attained by the Terzaghi and Peck criteria. In the absence of complementary unconfined compression tests of the cohesive soils, this practice could mislead structural engineers, principally those not very well versed in the science of soil engineering.

Until all the factors which effect the penetration test procedure are somewhat standardized, the writer issues a warning in the application of field test data acquired as a result of this method.

In view of the inconsistencies developed in the field in the application of the penetration test, a new approach to this problem is vitally needed. The writer's experience has shown that the Pocket Penetrometer is a logical approach to a more uniform designation of the consistency of the cohesive soils, which of course, are generally the most critical from the foundation point of view.

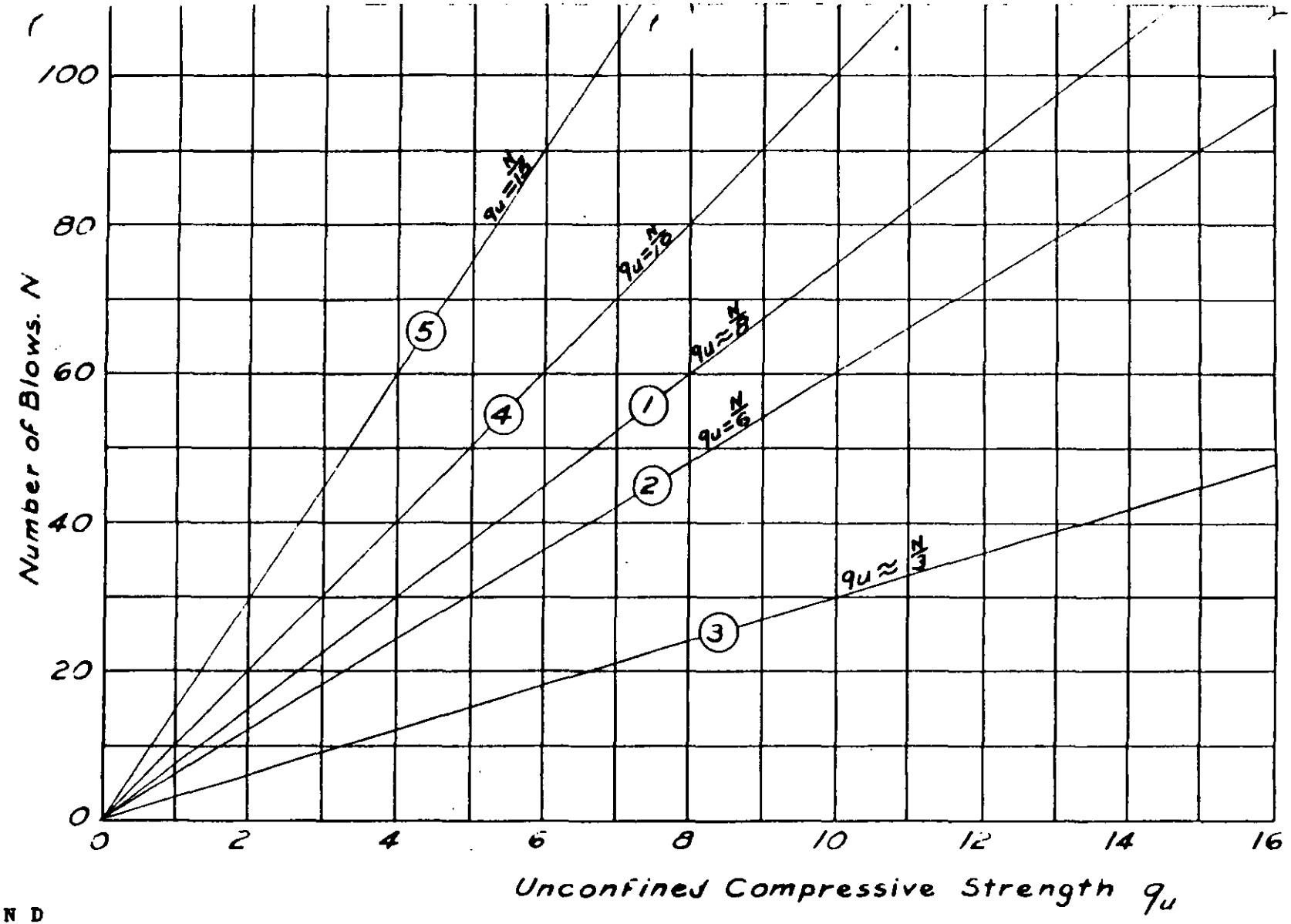
Studies made in the laboratory on cohesive materials have revealed that a good correlation exists between the unconfined compressive strength of undisturbed samples and the values attained by the Pocket Penetrometer. In some instances, the strength shown by the Pocket Penetrometer were slightly lower than that acquired by the unconfined compression test on samples from the Shelby tube, however, the calibration of the Pocket Penetrometer under certain field conditions can be easily made within a short period.

In a large soil engineering organization engaged in boring operations, in scattered areas, the primary requirement is the uniformity of logging operations, principally when drilling with cohesive soils. In such a case, the Pocket Penetrometer has unparalleled value.

The advantage of the Pocket Penetrometer can be better understood by considering the fact that in a sample of clay, 1-3/8-inch in diameter and 3-inches long, a large number of penetration tests can be performed. Not all samples which are recovered during the standard penetration test are suitable for unconfined compression tests. In some cases, the presence of inclusions prevent the trimming of a sample to the required height for the performance of the unconfined compression test. In a case like this, the Pocket Penetrometer could readily determine the unconfined compressive strength by selecting those zones in the core sample devoid of scattered inclusions.

A large number of soil and foundation engineers still continue the practice of assigning the state of consistency of cohesive soil by merely "feeling" or pressing the soil between the fingers. It is obvious that the application of this practice will result in a non-uniform system when the test is performed by various individuals. However, a more uniform description in the consistency of the cohesive material could be performed by various individuals with the aid of the Pocket Penetrometer.

Another case which deserves special consideration is the determination of the consistency of cohesive soil in an excavation for a footing, caisson, or trench. The Pocket Penetrometer is a useful tool for the determination of the unconfined compressive strength of the exposed soils in situ inasmuch as determinations could be performed in all areas exposed by the excavations.






LEGEND

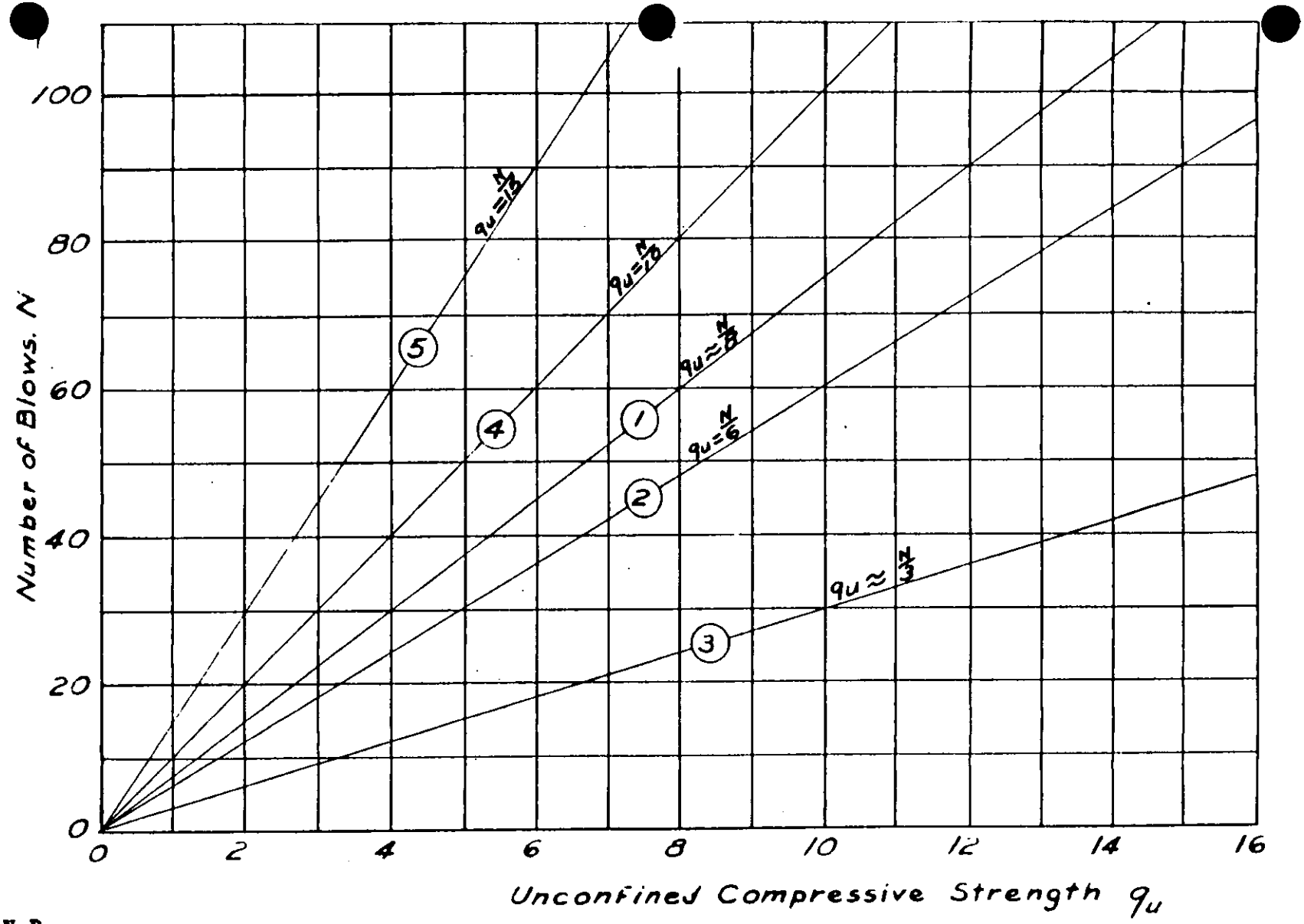
Line 1 Terzaghi and Peck Standard Penetration Table (1948).

Line 2 Peck and Reed, "Engineering Properties of Chicago Subsoil", Bulletin Volume 51, No. 44, February 1954.

Line 3 Boring Contractor A shows relationship between unconfined compressive strength and penetration resistance. Unconfined compression tests performed on sample cores from split-barrel sampler. Driving rods consisted of standard 1-inch diameter pipe.

Line 4 Boring Contractor B shows relationship between unconfined compressive strength and penetration resistance. Unconfined compression tests performed on sample cores from "Shelby" tube samples. Driving rods consisted of standard "A" rods.

Line 5 Boring Contractor C shows relationship between unconfined compressive strength and penetration resistance.



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SOILTEST, INC.
2205 LEE STREET
EVANSTON, ILLINOIS U.S.A.
SUBSIDIARY OF CENCO INSTRUMENTS CORPORATION • TELEPHONE 312 869 5500 • CABLE: SOILTEST

# OPERATING INSTRUCTIONS

| MODEL | DESCRIPTION | DATE |
|---|---|---|
| CL-701 | PENETROMETER ADAPTER FOOT | May 1972 |

1. General: The CL-701 Penetrometer adapter foot is an accessory for the CL-700 pocket penetrometer when it is used for measuring the compressive strength of very soft materials. The adapter foot has a diameter of 1 inch compared to the $\frac{1}{4}$ inch diameter of the pocket penetrometer piston. Thus the effective area of the piston is increased 16 times when the adapter foot is attached to the CL-700, Therefore the reading in tons per square foot should be divided by 16 to get the correct compressive strength of the material.

2. Operation:

   2.1 Mounting the adapter foot: Screw out the fixing screw on the adapter foot sufficiently, slip the adapter foot on to the penetrometer piston as far as it can go, and tighten the fixing screw.

   2.2 Move the red ring up to the lowest reading on the scale. When the ring is in its proper position it should rest against the lower edge of the instrument handle.

   2.3 Grip the knurled portion of the handle and push the piston with steady pressure into the soil (test material) up to the full thickness ($\frac{1}{4}$ inch) of the adapter foot.

   2.4 Take the reading in tons per square foot or kilograms per sq. cm. on the low-load side of the red ring and divide it by 16 to get the unconfined compressive strength of the test material.

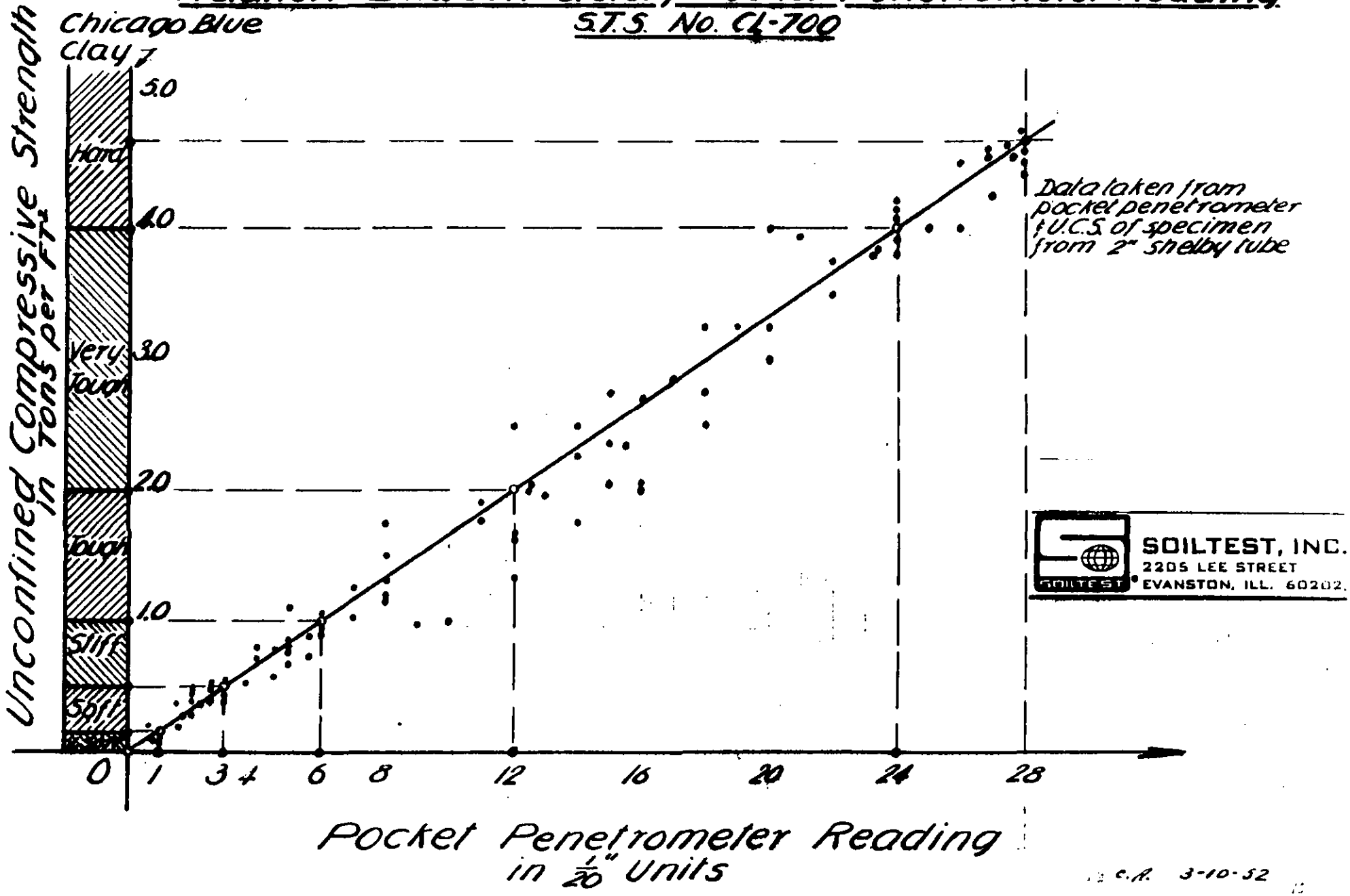
OP-344



ENGINEERING TEST EQUIPMENT FOR ... CONSTRUCTION MATERIALS

# Relation Between U.C.S. & Pocket Penetrometer Reading

## S.T.S. No. CL-700




C.A. 3-10-52

CL .00

G-41

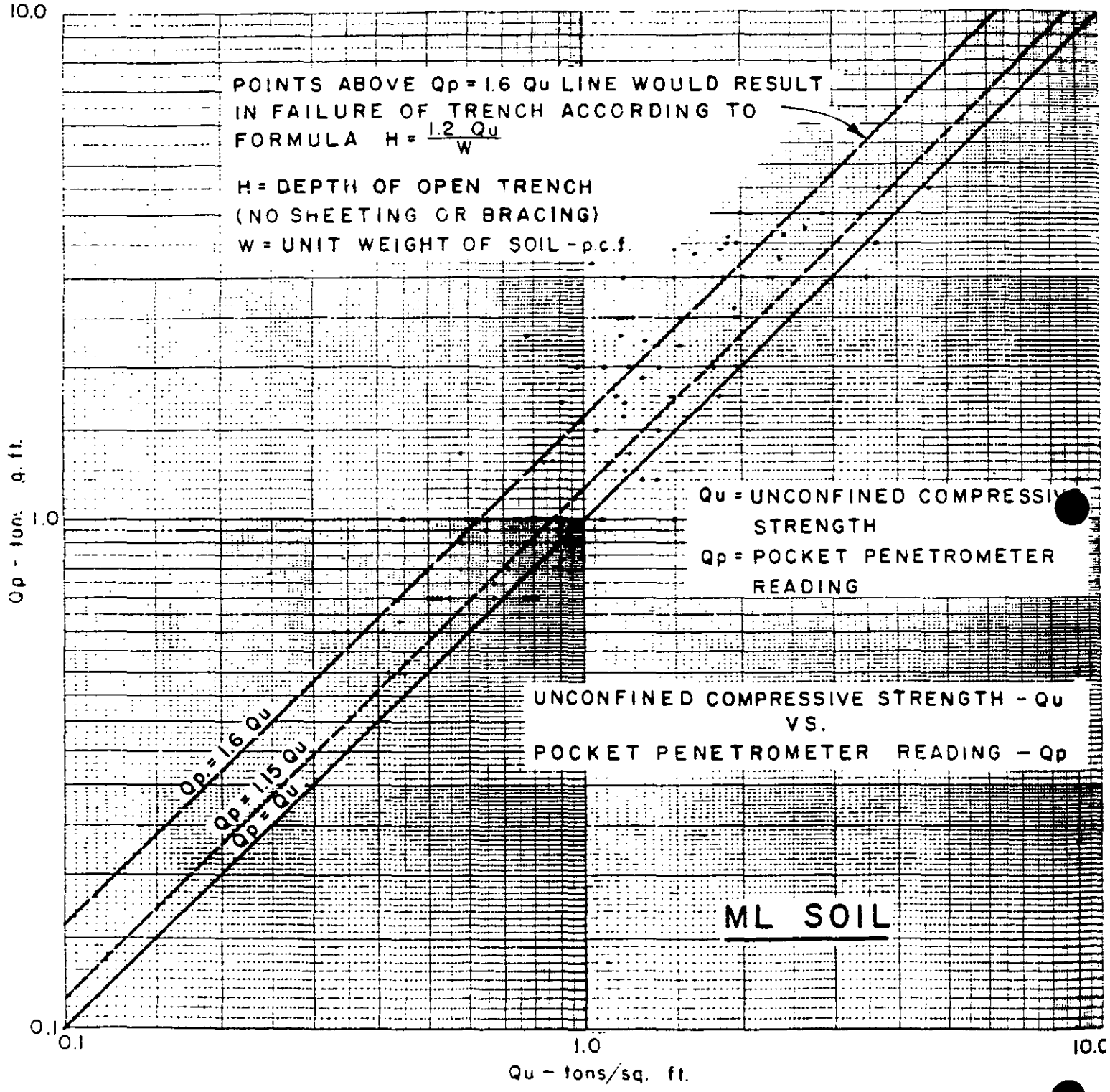
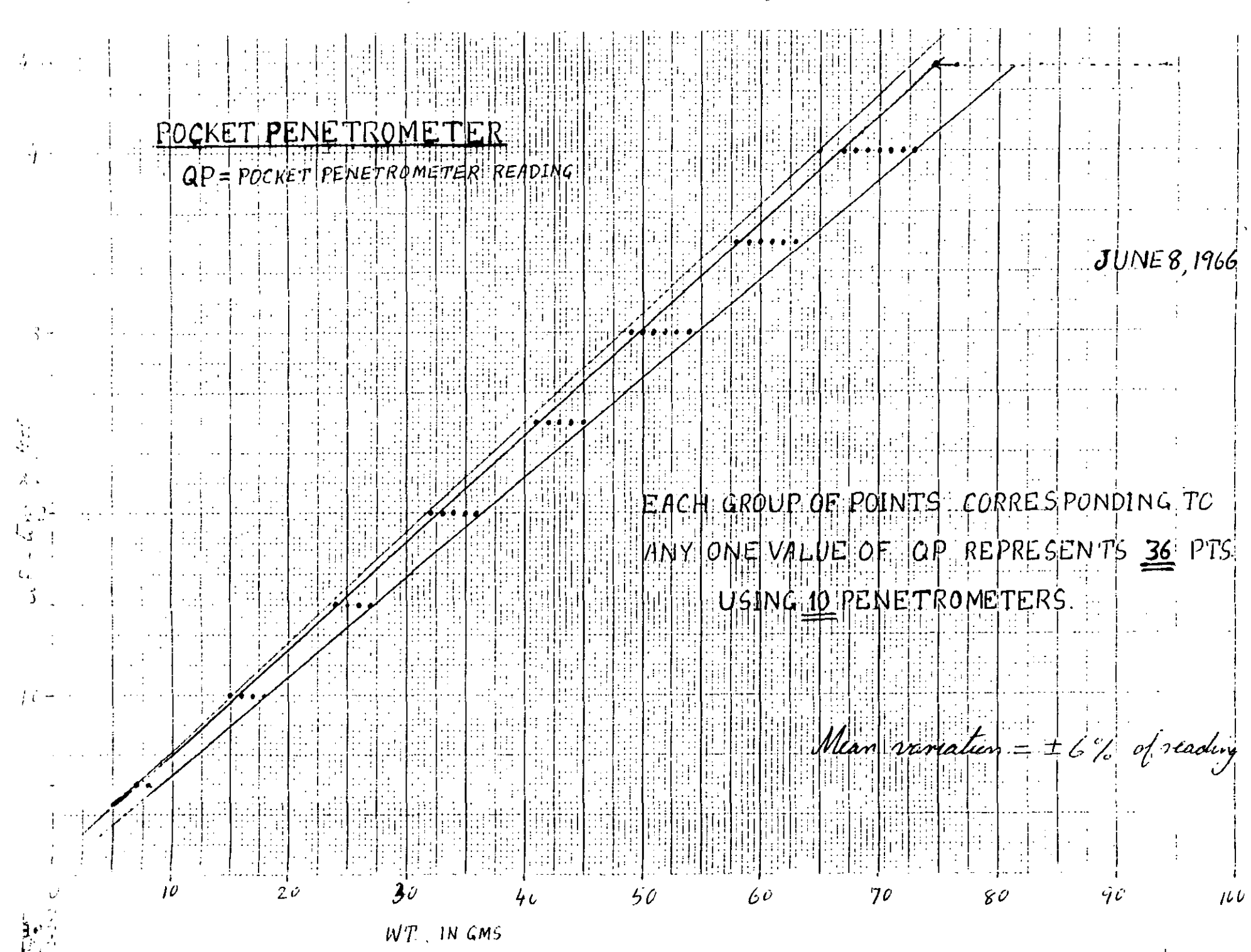

10.0
1.0
0.1
0.1
1.0
10.0
Qp - tons/sq. ft.
Qu - tons/sq. ft.
POINTS ABOVE Qp = 1.6 Qu LINE WOULD RESULT IN FAILURE OF TRENCH ACCORDING TO FORMULA H = 1.2 Qu / W
H = DEPTH OF OPEN TRENCH (NO SHEETING OR BRACING)
W = UNIT WEIGHT OF SOIL - p.c.f.
Qu = UNCONFINED COMPRESSIVE STRENGTH
Qp = POCKET PENETROMETER READING
UNCONFINED COMPRESSIVE STRENGTH - Qu VS. POCKET PENETROMETER READING - Qp
Qp = 1.6 Qu
Qp = 1.15 Qu
Qp = Qu
ML SOIL

FIGURE 2


POCKET PENETROMETER
QP = POCKET PENETROMETER READING
JUNE 8, 1966
EACH GROUP OF POINTS CORRESPONDING TO
ANY ONE VALUE OF QP REPRESENTS 36 PTS.
USING 10 PENETROMETERS.
Mean variation = ± 6% of reading
10
20
30
40
50
60
70
80
90
100
WT. IN GMS

SOILTEST, INC.
2205 LEE STREET
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SUBSIDIARY OF CENCO INCORPORATED • TELEPHONE 312/869-5500 • CABLE: SOILTEST, EVANSTON

# OPERATING INSTRUCTIONS

| MODEL | DESCRIPTION | DATE |
|---|---|---|
| CT-421 | POCKET CONCRETE PENETROMETER | Sept. 1978 |

1. General:

The Pocket Concrete Penetrometer can be used by everyone who produces concrete and/or constructs and designs structures of concrete. The pocket style concrete mortar penetrometer is used for fast evaluation of the "initial set" of concrete.

It has been established that "initial set" of concrete is reached when the penetration resistance is 500 psi. "Initial set" is the semi-hardened, partially hydrated condition of the concrete beyond which it can no longer be worked or consolidated by vibration.

The penetrometer can also be used on light weight concrete, special roof mixes and to test concrete additives.

The penetrometer shaft has a cross section area of 1/20 square inch.

2. Test Procedure:

2.1 Hold on the sleeve of the penetrometer and slide the indicator ring towards the sleeve until the ring touches the sleeve.

2.2 Holding the shaft at right angles to the concrete mortar surface, force the shaft into the mortar to a depth of one inch (scribed on the shaft).

2.3 Pull out the penetrometer and take the reading on the scale at the low-reading edge of the indicator ring.

2.4 Before doing another test, slide the indicator ring to the sleeve edge.

2.5 Take several readings and calculate the average value in PSI.

NOTE: Clean the shaft, wiping the wet mortar off with a piece of rag immediately after each penetration test.

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