



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

R2-B15

MAR 25 1992

Ms. Michele Landis
Oak Ridge Associated Universities
Post Office Box 117
Oak Ridge, TN 37831-117

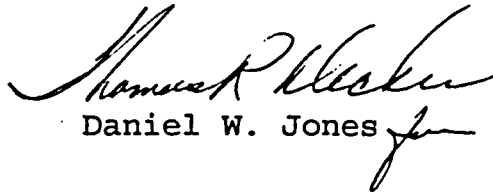
Dear Ms. Landis:

SUBJECT: COLUMBIA AREA SAMPLING PLAN

Enclosed please find a sampling plan for soil and water samples taken from an area near the Westinghouse-Columbia plant. Also enclosed is a copy of the presentation made to the NRC by Westinghouse which provided information regarding uranium contamination discovered beneath the floor of the processing area.

Please evaluate the sampling plan and advise us as to the number of these samples which should be analyzed in order to determine whether the contamination has spread from beneath the building. Also please provide a cost estimate for performing the analysis.

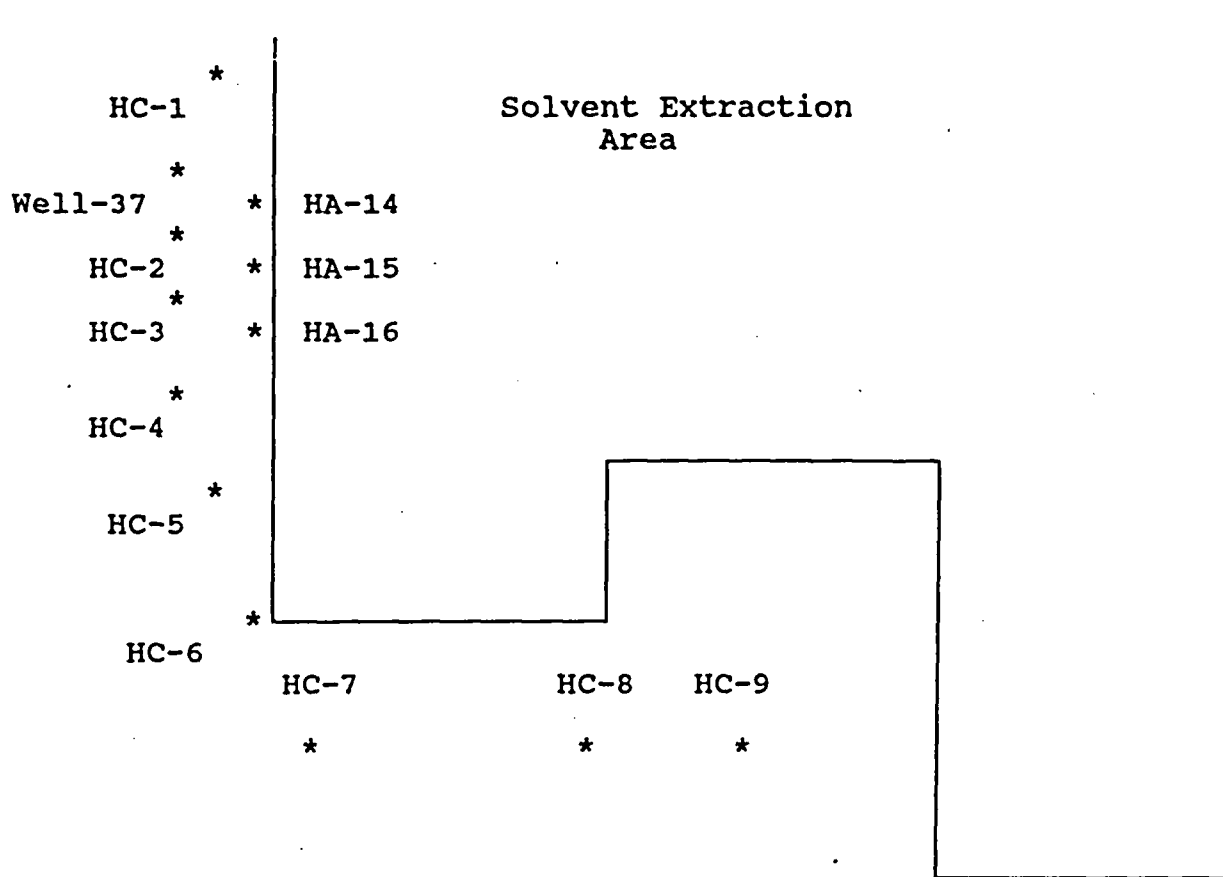
If you have any questions regarding this request, please call me at (FTS) 841-5592.


Daniel W. Jones

Enclosures:
As Stated

C-11

SAMPLING LOCATIONS
WESTINGHOUSE-COLUMBIA



HC-"Hydrocone" sampling locations

Soil samples taken from these locations at depths of 3 ft, 6 ft, and 9 ft.

Water samples taken from these locations at depths of 10ft and 20 ft.

HA-Hand Auger sampling locations

Soil samples taken from these locations at depths of 3 ft, 6 ft, and 9 ft.

NRC MEETING AGENDA

- **INTRODUCTION/BACKGROUND**
- **GENERAL AREA DESCRIPTION**
- **SITE DESCRIPTION**
- **SITE GEOHYDROLOGY**
- **BUILDING LAYOUT**
- **URANIUM RECOVERY AREA**
- **SOIL SAMPLING RESULTS**
- **MONITORING WELL RESULTS**
- **SOURCE TERM ELIMINATION**
- **CONFIRMATORY ACTION PLAN**

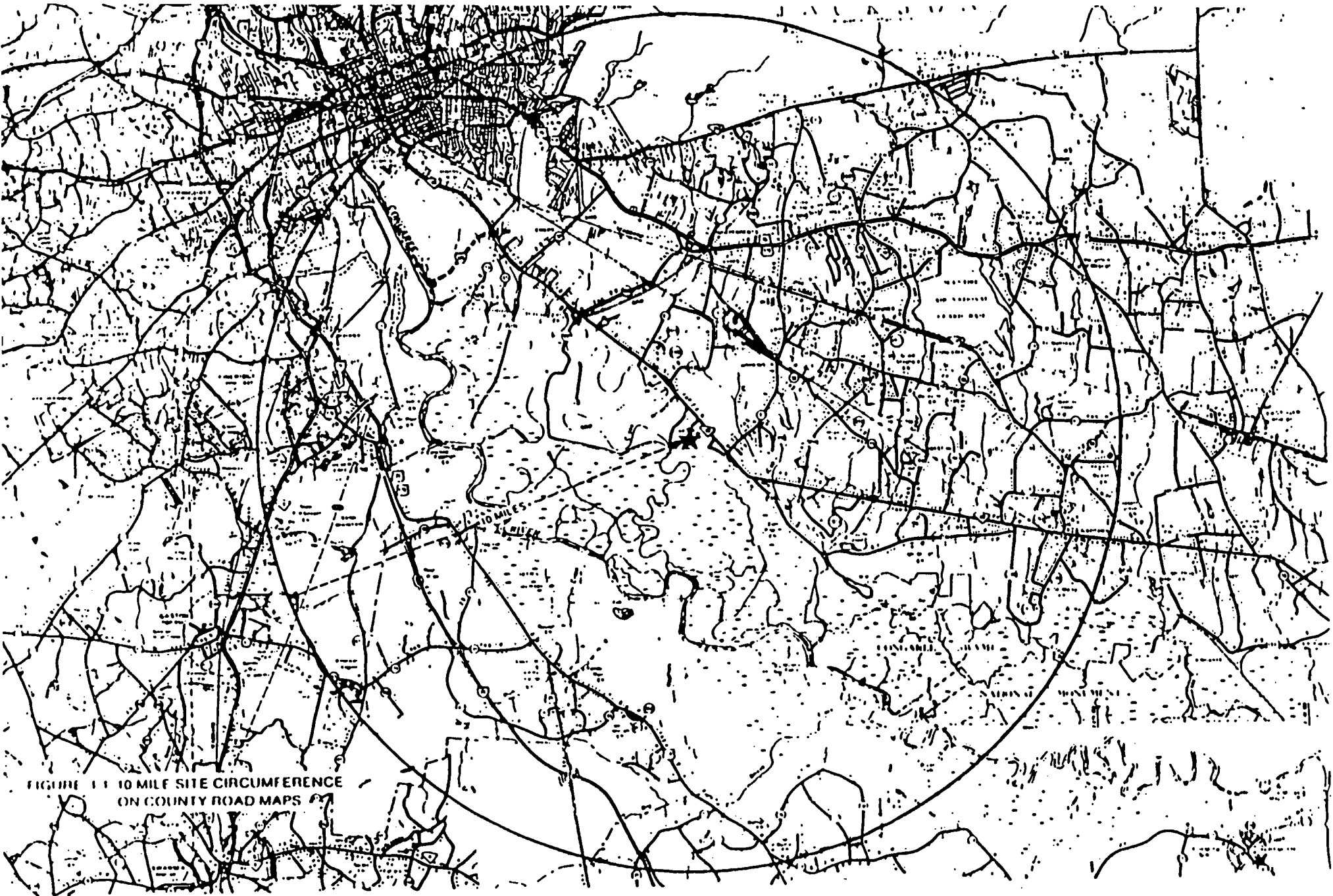
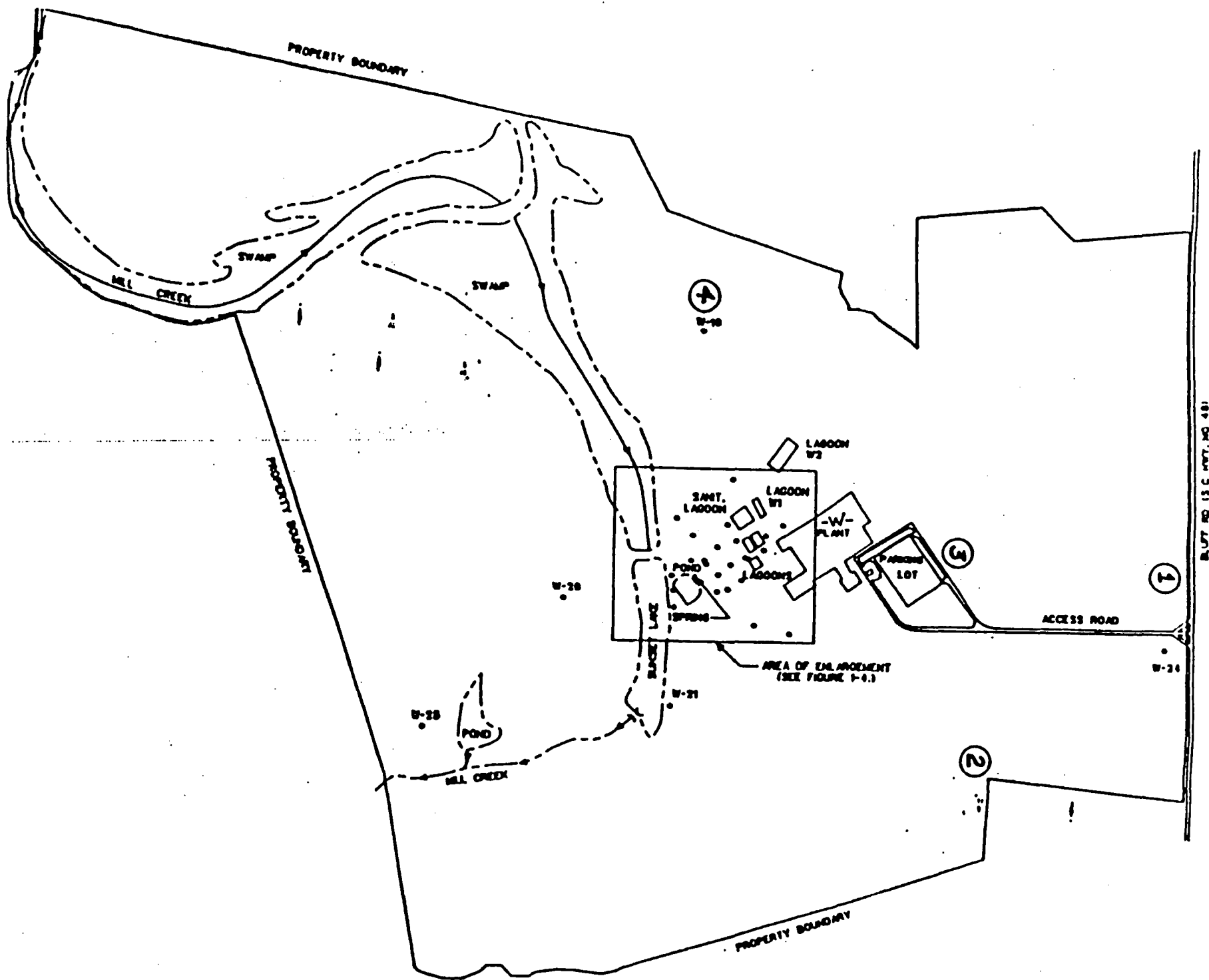


FIGURE 1-1 10 MILE SITE CIRCUMFERENCE
ON COUNTY ROAD MAPS



| HYDRO- GEOLOGIC UNITS | GENERALIZED STRATIGRAPHIC COLUMN | DESCRIPTION | FORMATION NAMES |
|-----------------------------|----------------------------------------|-----------------------------------------------|-----------------------------|
| UNIT I | 0 | POORLY SORTED CLAY, SILT, SAND AND GRAVEL | OKEEFENOKEE FORMATION |
| | 20-40 | | |
| UNIT II | | MASSIVE CLAY AND SHALE | BLACK MINGO FORMATION |
| | 75 | | |
| UNIT III | 95-115 | FINE TO COARSE SAND. | |
| | | | |
| UNIT IV | | FINE TO COARSE SAND INTERBEDDED WITH CLAY. | TUSCALOOSA FORMATION |
| | 240 | | |
| | | IGNEOUS AND METAMORPHIC ROCK. | CRYSTALLINE BEDROCK |

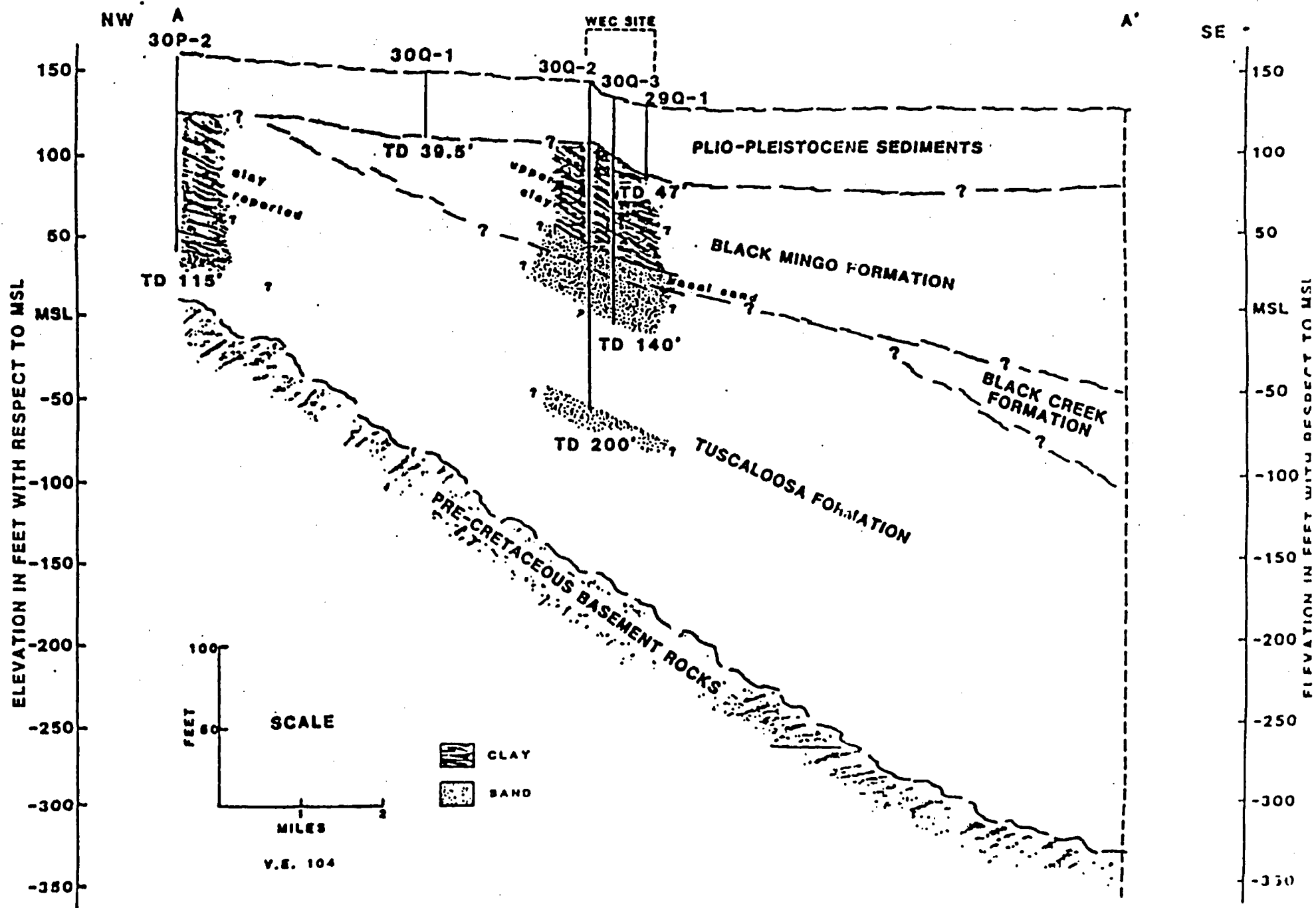
WESTINGHOUSE
COLUMBIA PLANT

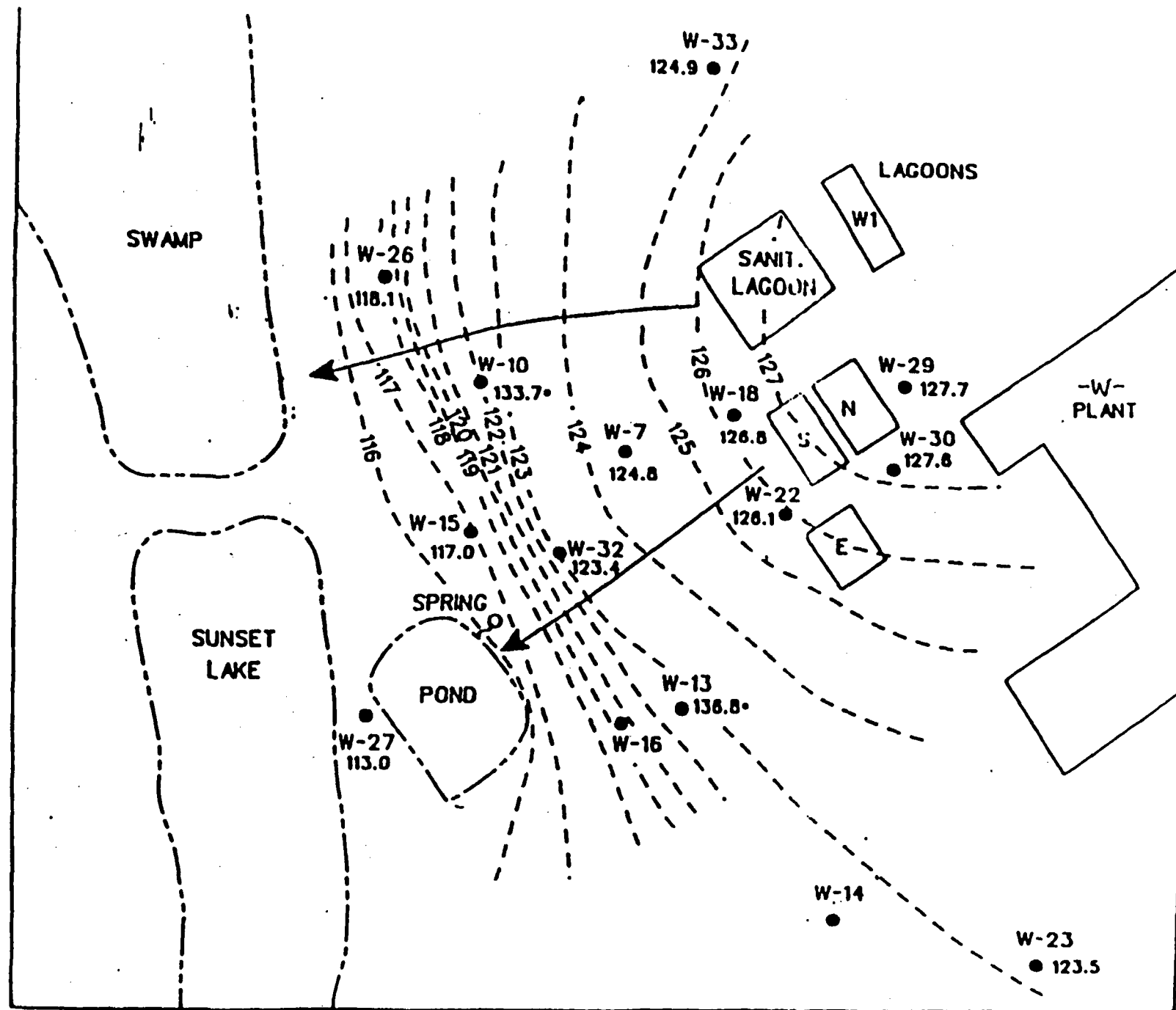


Westinghouse Environmental
and Geotechnical Services, Inc.

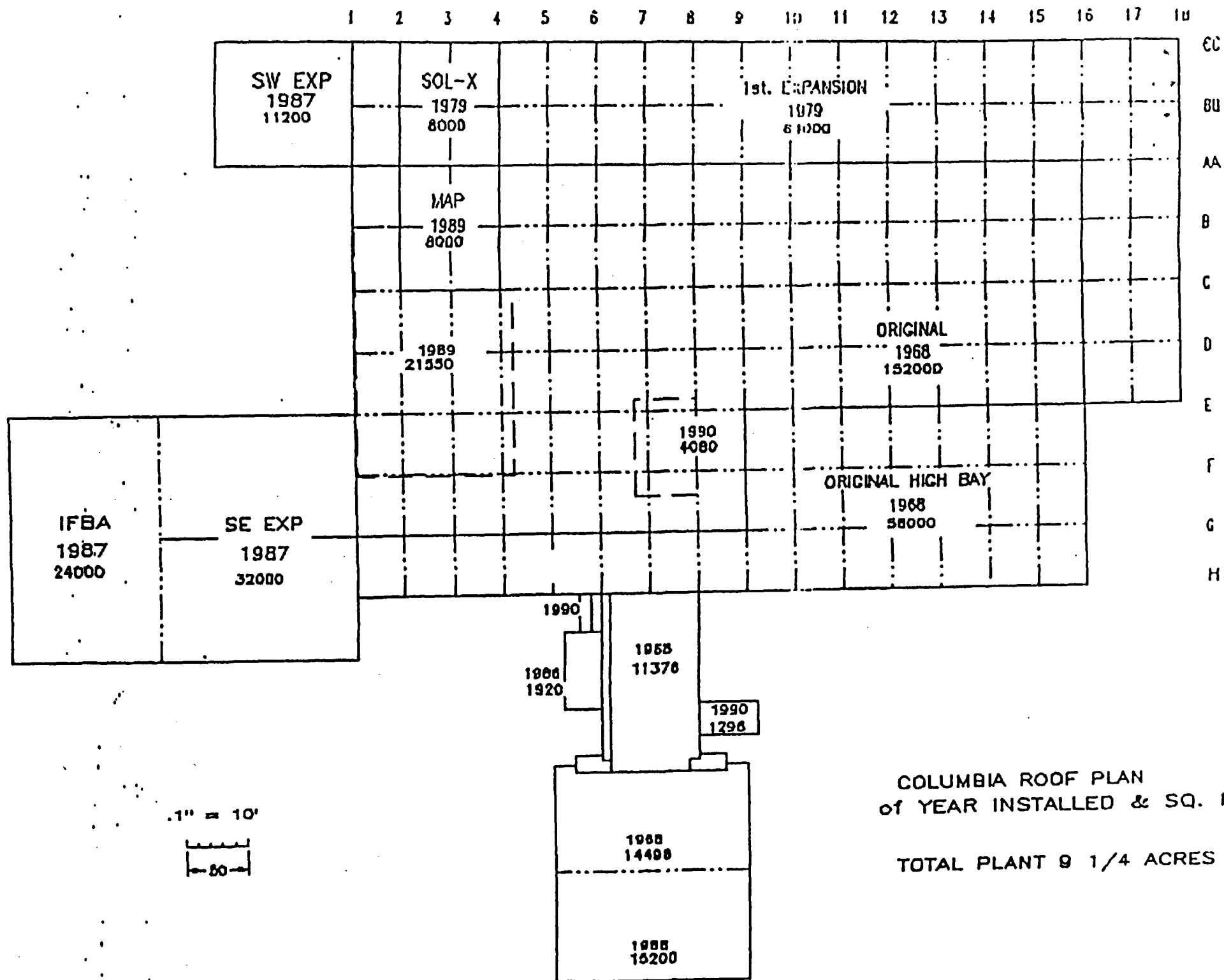
GENERALIZED
STRATIGRAPHIC COLUMN

FIGURE 3-1. GENERALIZED GEOLOGIC CROSS-SECTION A-A', of SOUTHERN RICHLAND COUNTY.





AREA OF ENLARGEMENT FROM FIGURE 1-3.



COMMERCIAL NUCLEAR FUEL DIVISION COLUMBIA, S. C. PLANT

URANIUM RECOVERY AREA

FEED
CONC.

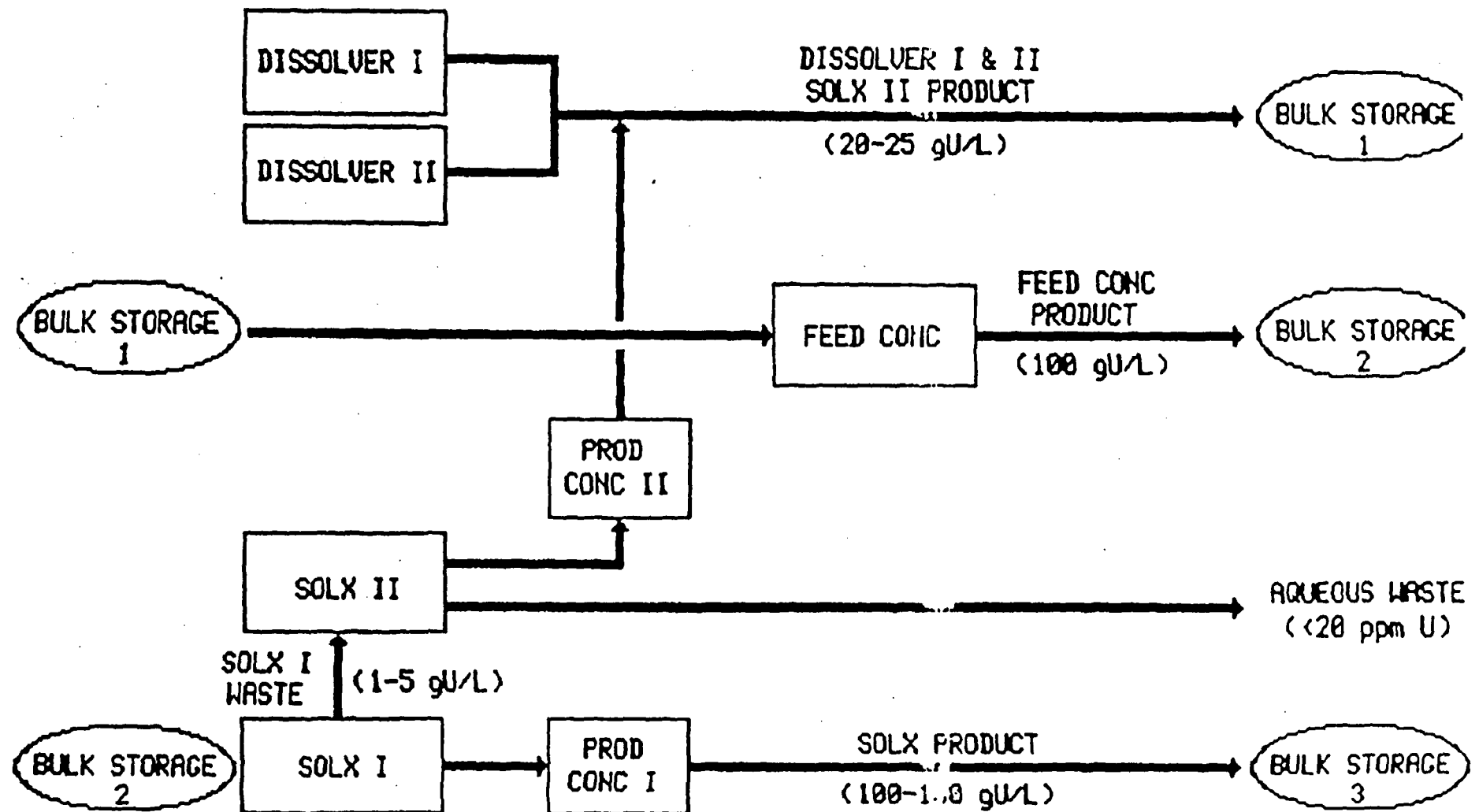
SOLVENT EXTRACTION
AREA

DISSOLVERS

PROD.
CONC.

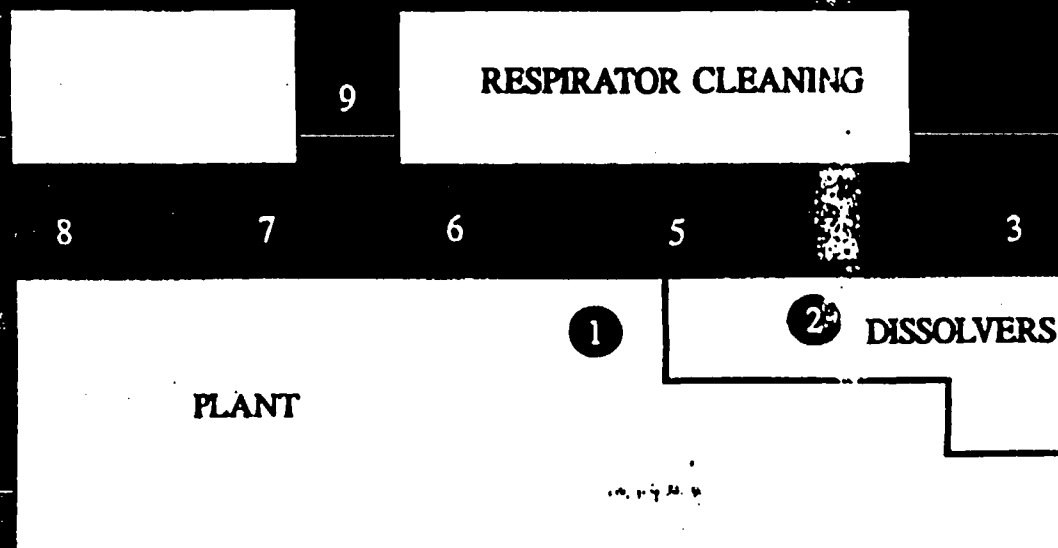
S. E.
CONTROL
ROOM

SOLVENT EXTRACTION FLOW SHEET



SOIL SAMPLING RESULTS

SAMPLE LOCATIONS WITHIN FACILITY

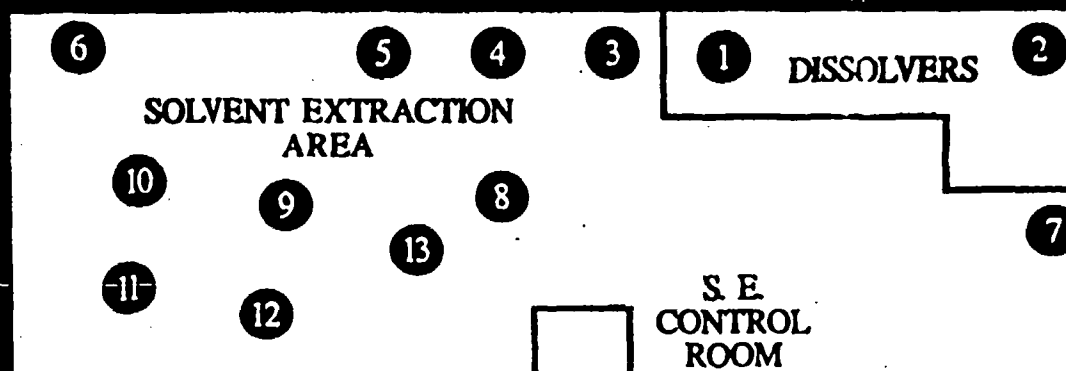


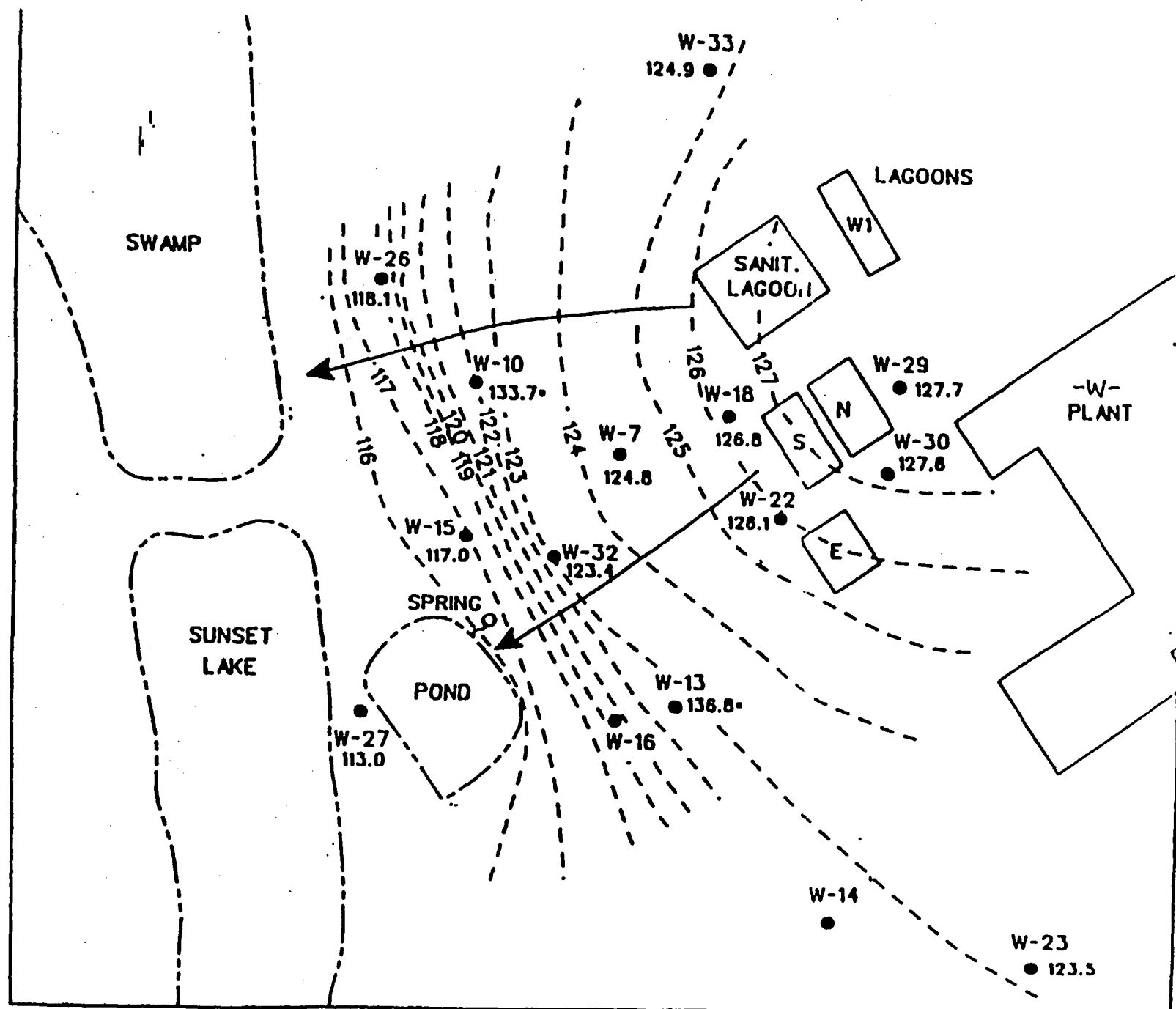
COMMERCIAL NUCLEAR FUEL DIVISION COLUMBIA, S. C. PLANT

SOIL SAMPLING RESULTS

| SAMPLE NUMBER | SAMPLE ACTIVITY(PCI/GM) " VARIOUS DEPTHS(FT) | | | | | |
|------------------|----------------------------------------------|------|------|------|------|-----|
| | 2' | 4' | 6' | 8' | 10' | 12' |
| 1 | 645 | 2068 | 2711 | 2584 | 2412 | — |
| 2 | 752 | 549 | 184 | — | — | — |
| 3 | 385 | 69 | 811 | 328 | 3 | — |
| 4 | 1962 | 1601 | 2045 | — | — | — |
| 5 | 44 | 11 | — | — | — | — |
| 6 | 3 | 5 | — | — | — | — |
| 7 | 208 | 8 | — | — | — | — |
| 8 | 9 | 10 | 5 | 4 | 6 | 2 |
| 9 | 3 | 5 | — | — | — | — |
| 10 | 24 | 5 | — | — | — | — |
| 11 | 24 | 27 | 11 | 34 | 3 | — |
| 12 | 16 | 5 | 3 | 3 | 2 | — |
| 13 | 252 | 183 | — | — | — | — |

SAMPLE LOCATIONS WITHIN FACILITY





AREA OF ENLARGEMENT FROM FIGURE 1-3.



MONITORING WELL RESULTS
AVERAGE GROSS ALPHA ACTIVITY

$\mu\text{Ci/ml} \times E^{-06}$

| <u>WELL</u> <u>NO</u> | <u>1981-1983</u> | <u>1990-1991</u> |
|----------------------------------------|-------------------------|-------------------------|
| 3A | 0.003 ^{ab} | 0.003 |
| 7 | 0.023 | 0.011 |
| 10 | 0.008 | 0.022 |
| 13 | 0.018 | 0.022 |
| 14 | 0.001 | 0.003 |
| 15 | 0.010 | 0.007 |
| 16 | 0.006 | 0.004 |
| 18 | 0.041 | 0.045 |
| 19 | 0.028 | 0.049 |
| 20 | 0.001 | 0.002 |
| 22 | 0.031 | 0.004 |
| 23 | 0.009 | 0.010 |
| 24 | 0.005 | 0.004 |
| 26 | 0.008 | 0.011 |
| 27 | 0.004 | 0.003 |
| 29 | 0.016 | 0.017 |
| 30 | 0.214 | 0.028 |
| 32 | 0.010 | 0.012 |

***EARLIEST DATA FROM 1985**

SOLVENT EXTRACTION SOIL SAMPLING

CHEMICAL RESULTS

NOVEMBER 22, 1991

| <u>SAMPLE</u> | <u>DEPTH</u> | <u>RESULT. PPM NO3</u> |
|---------------|--------------|------------------------|
| 1 | 12' | 1440 |
| 2 | 6' | 163 |
| 3 | 10' | 274 |
| 4 | 6' | 1620 |
| 5 | 4' | 109 |
| 6 | 4' | 67 |
| 7 | 4' | 91 |
| 8 | 10' | 71 |
| 9 | 4' | 13 |
| 10 | 4' | 13 |
| 11 | 10' | 8 |
| 12 | 10' | 15 |
| 13 | 3' | 391 |

MANUFACTURING IMPROVEMENTS IN THE SOLVENT EXTRACTION AREA

IMPROVEMENTS TO PROCESS EQUIPMENT

IMPROVEMENTS TO LEAK CONTAINMENT AND EQUIPMENT REPAIR

IMPROVED HOUSEKEEPING PRACTICES

ATTENTION TO FLOOR INTEGRITY

Manufacturing Improvements in the Solvent Extraction Area

Improved Process Equipment

- 1987 Introduced fluoride stripping of feed materials
- 1988 Discontinued using acid recovery system
- 1989/90 Improved piping in Dissolver area
 - Installed 2" dia SS Schedule 80 piping
 - Replaced elbows with Tees
 - Replaced unions with flanges
 - Used inconel welding rods
 - Removed idle piping
 - Replaced Teflon coated gaskets with solid
- 1989/90 Improved pumps in the dissolver area
 - Reduced motor speed
 - Replaced single mechanical seal with double mechanical seal/ water flush system
 - Instituted pump rebuild shop with dedicated mechanics

Manufacturing Improvements in the Solvent Extraction Area

Improved Leak Containment and Repair

- 1987/88 Installed drip pans under cartridge filter housings
- 1989/90 Installed improved pump bases with integral drip pans
- 1991/92 Focused management attention on leak prevention:
 - Formal supervisor performance objective
 - "Leak Log"
 - Formal procedure

Manufacturing Improvements in the Solvent Extraction Area

Improved Housekeeping

- Removed idle equipment
 - Centrifuge near dissolver #1
 - Leaching bag filter system
 - Precoat and water wash system
 - Acid storage tank
 - Acid recovery system pumps
- Designed drainage system for Wilfley pump system to preclude leaks during week-end shutdown
- Implemented formal housekeeping schedule

Manufacturing Improvements in the Solvent Extraction Area

Floor Repair and Upgrade

- 1987 Resurfaced 3600 sq. ft. of floor
 - Removed loose concrete
 - Patched subsurface with Swindless bond,
capped with epoxy/quartz sand mixture
 - Topcoated with clear epoxy, approx 1/4"
- 1988 Applied second coat of epoxy
- 1989 Replaced floor under dissever (64 sq. ft.)
- 1989/91 Performed minor patching and floor repair
- 1991/92 Coated aiseways with vinyl ester; patched with
epoxy due to adherence problems

CONFIRMATORY ACTION PLAN

| ACTION | DATE |
|-------------------------------------------------------------------------------------------|---------|
| • COLLECT "HYDROCONES" GROUNDWATER SAMPLES OUTSIDE WEST AND SOUTH WALLS OF PLANT BUILDING | 2/15/92 |
| • COLLECT SOIL SAMPLES OUTSIDE WEST WALL OF URANIUM RECOVERY AREA | 2/15/92 |
| • INSTALL PERMANENT WELL OUTSIDE WEST WALL OF URANIUM RECOVERY AREA | 2/21/92 |
| • ANALYZE SOIL AND GROUNDWATER SAMPLES, EVALUATE RESULTS AND IDENTIFY FUTURE ACTIONS | 4/30/92 |

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE PNO-11-92-01

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by the Region II staff on this date.

FACILITY: Westinghouse Electric Corporation
Columbia, SC
Docket No. 70-1151

Licensee Emergency Classification:
☐ Notification of Unusual Event
☐ Alert
☐ Site Area Emergency
☐ General Emergency
☒ Not Applicable

SUBJECT: URANIUM CONTAMINATION IN SOIL BELOW RECOVERY AREA FLOOR

At 3:25 p.m. on January 3, 1992, Westinghouse notified Region II that they had discovered uranium contamination beneath the floor of their Columbia, SC fuel fabrication facility. According to the licensee, the contamination appears to be restricted to the scrap recovery area within an area of 30 feet by 13 feet and to a depth of 12 feet with the most significant concentration being in the area beneath their dissolver. The maximum contamination detected was 2700 pCi/gram. Westinghouse obtained 13 core samples to a maximum depth of 12 feet and from those analyzed 45 samples in their initial scoping of the extent of the contamination. According to the licensee, there is sandy soil in the area to a depth of about 30 feet. The licensee is in the process of assuring that no additional contamination is entering the ground, and determining whether the existing contamination is migrating. The licensee is not seeing any elevated radioactivity at their normal monitoring wells. The licensee will meet with NRC in the near future to discuss the situation and possible remedial actions.

Region II will continue to monitor the situation.

The State of South Carolina has been notified.

This information is current as of 9:30 a.m. on January 6, 1992.

CONTACT: E. McAlpine - 841-5547

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5520: 1/06/92 0 TO REGIONS AND HQ
