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INTEGRATED ENVIRONMENTAL MONITORING PLAN/ON-SITE DISPOSAL FACILITY AIR MONITORIN GAND CONSTRUCTION QUALITY ASSURANCE AGENDA AND HANDOUTS FROM SEPTEMBER 12, 1996 PUBLIC WORKSHOP

09/12/96

DOE-FN/FERMCO PUBLIC
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AGENDA/OVE

Public Workshop

Integrated Environmental Monitoring Plan/ On-Site Disposal Facility Air Monitoring and Construction Quality Assurance

7 p.m. Thurs., Sept. 12
Alpha Bldg. Classroom B

AGENDA

I. Introduction/Opening Remarks (Gary Stegner)

II. IEMP presentation (Kathy Nickel)

- -- Background and Integration Strategy
- -- Overview of IEMP Sampling Programs
- -- Reporting Strategy

III. OSDF presentation (Mike Hickey)

- -- Air Monitoring
- -- Groundwater Monitoring
- -- Quality Assurance
- -- Quality Control

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ON-SITE DISPOSAL FACILITY

PUBLIC WORKSHOP
September 12, 1996

TOPICS FOR DISCUSSION:

- AIR MONITORING
- GROUNDWATER MONITORING
- CONSTRUCTION QUALITY ASSURANCE/ QUALITY CONTROL

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ON-SITE DISPOSAL FACILITY AIR MONITORING

OSDF AIR MONITORING

EMISSION SOURCES

Potential airborne particulate emissions during OSDF construction, filling & closure:

- filling of the OSDF with impacted soil, building demolition debris, concrete, and other remediation waste materials;
- movement of *non-contaminated* soil during construction of the OSDF cover system;
- vehicle movement; and
- wind erosion of exposed soil surfaces.

PARTICULATE EMISSION CONTROLS

Potential emissions will be controlled through work practice:

- administrative controls — placement of impacted materials in the OSDF only when wind speeds are less than certain levels, limits on vehicle speeds.

- engineering controls — dust suppression (*e.g.*, application of water to exposed soil surfaces).

OSDF AIR MONITORING

FUNDAMENTALS

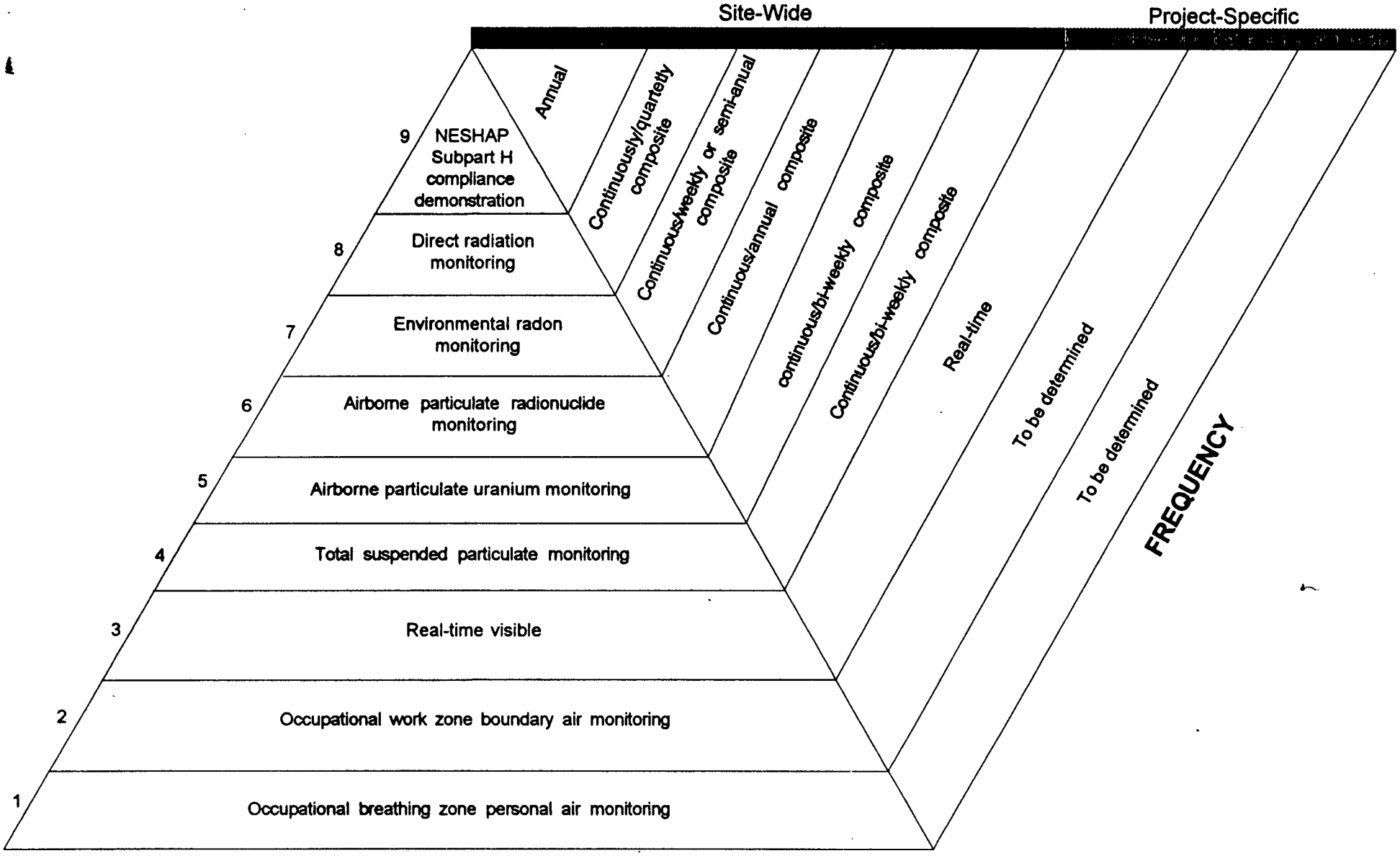
- Potential emissions are airborne particulates.
- Mechanisms for control of visible particulate emissions, and visual evaluation of visible particulate emissions as the assessment mechanism, are prescribed by the environmental regulations.
- *Without accounting for the emission control mechanisms,* predicted levels of potential concentrations, risks & doses are significantly lower than environmental regulatory compliance thresholds.

FUNDAMENTALS (cont.)

- Environmental regulatory exposure thresholds' point of exposure/point of compliance are defined as public exposure.
- Environmental regulatory exposure thresholds are defined based on a one year exposure period.
- Annual demonstration of compliance with the established regulatory exposure thresholds via modeling on a site-wide basis is prescribed by the environmental regulations.

OSDF AIR MONITORING

FEMP



ELEMENT DESCRIPTION

OSDF AIR MONITORING

BASELINE AIR MONITORING

- Existing site-wide networks & data serve as comparison baseline

AIR MONITORING DURING OSDF REMEDIAL ACTIVITIES

- Begin real-time visible particulate emissions monitoring
- Continue existing site-wide monitoring

OSDF AIR MONITORING

DATA INTERPRETATION & RESPONSE

VISIBLE PARTICULATE EMISSIONS — REAL-TIME

- Increase dust suppression activities &/or modify work practices

AIR PARTICULATES & URANIUM — BI-WEEKLY

- Air particulate uranium is indicator of approximately:
  - 85 percent of potential concentration (mass basis)
  - 45 percent of potential concentration (activity basis)
  - 25 percent of potential dose

- Trending analysis against baseline, previous & predicted values

OSDF AIR MONITORING

DATA INTERPRETATION & RESPONSE (cont.)

AIR PARTICULATES & URANIUM (cont.) BI-WEEKLY

- Modify dust suppression activities & administrative controls as needed

AIR PARTICULATE RADIONUCLIDES ANNUALLY

- Trending analysis against baseline, previous & predicted values, doses & dose limits

- Modify engineering & administrative controls as needed

OSDF AIR MONITORING

DATA INTERPRETATION & RESPONSE (cont.)

OSDF AIR MONITORING PROGRAM REVIEW	ANNUALLY
• Effectiveness of engineering & administrative controls	CONTINUOUSLY
• Number & location of monitoring stations prevailing wind direction & nearby off-property population	AT LEAST ANNUALLY
• Frequency of monitoring	AT LEAST ANNUALLY
• Advances in monitoring & analytical technologies that become field-proven, commercially available, and acceptable to the regulatory agencies	AT LEAST ANNUALLY

ON-SITE DISPOSAL FACILITY GROUNDWATER MONITORING

OSDF GROUNDWATER MONITORING

GROUNDWATER MONITORING REQUIREMENTS

- Ohio Administrative Code (OAC) 3745-27-10 -- Groundwater Monitoring Program for a Solid Waste Landfill Facility

- Requires that a Groundwater Monitoring Program be implemented that is capable of determining the impact of the disposal facility on the quality of groundwater

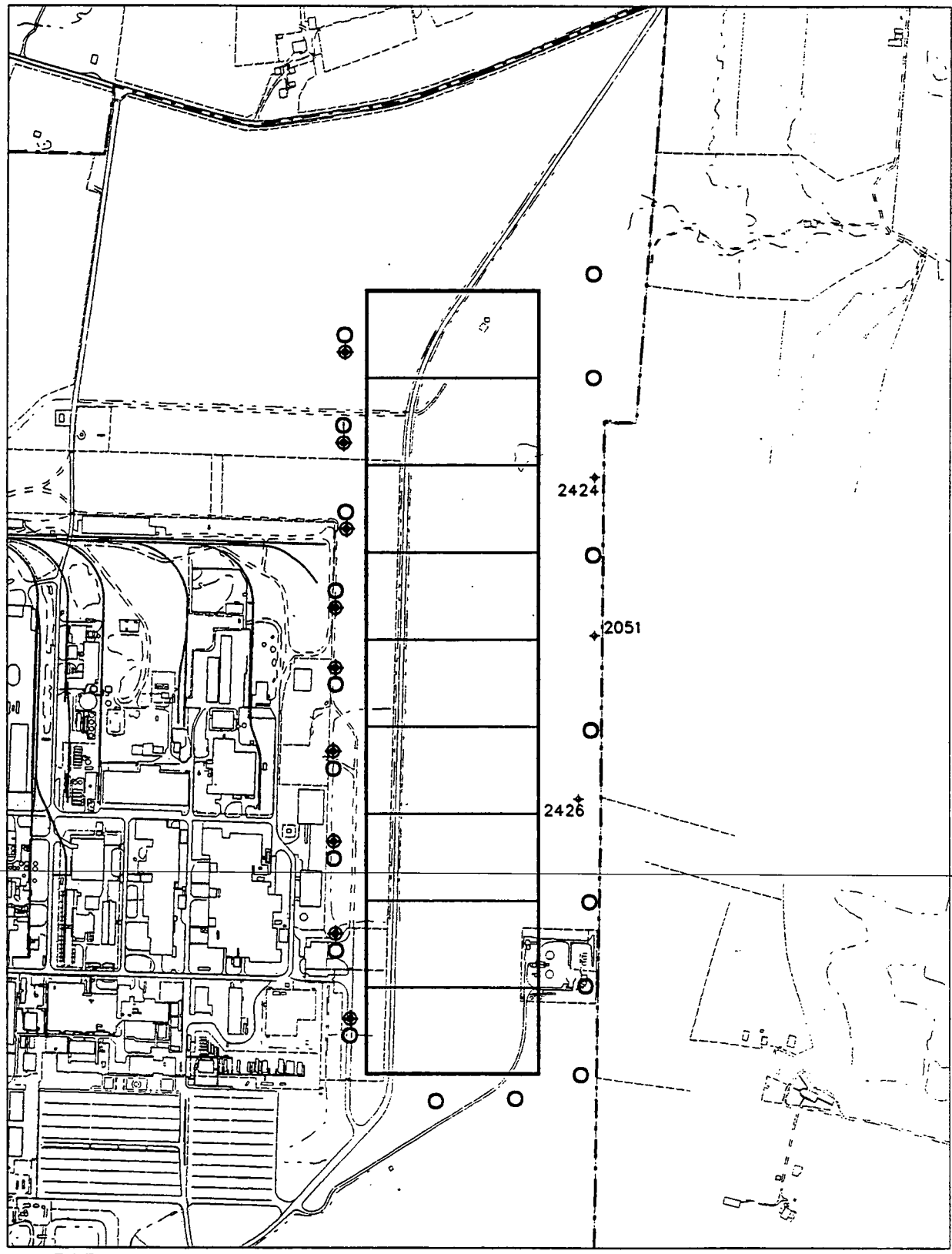
- An appropriate number of wells must be installed at appropriate locations and depths to yield groundwater samples that represent the quality of groundwater both upgradient and downgradient of the disposal facility

OSDF GROUNDWATER MONITORING

TYPES OF MONITORING

- Two types of monitoring will comprise the complete OSDF groundwater monitoring system:
  - Great Miami Aquifer monitoring
  - Glacial Till monitoring

/USR/ERMA1/CRU5/DGN/MAP/HOR/DPTH/C51MP075.DGN FER OU5 5/21/96 STATE PLANAR COORDINATE SYSTEM 1927



LEGEND:

FEMP BOUNDARY

PROPOSED OSDF GMA DETECTION MONITORING WELL

PROPOSED OSDF TILL DETECTION MONITORING WELL

SCALE

700 350 0 700 FEET

DRAFT

FIGURE B.2. OSDF GROUNDWATER MONITORING SYSTEM

OSDF GROUNDWATER MONITORING

GREAT MIAMI AQUIFER MONITORING

- After the baseline for each GMA groundwater monitoring well has been established, wells will be sampled quarterly

- Analysis for the following proposed list:
  - uranium (total)
  - technetium-99
  - pH
  - specific conductance
  - total organic carbon
  - total organic halogens

OSDF GROUNDWATER MONITORING

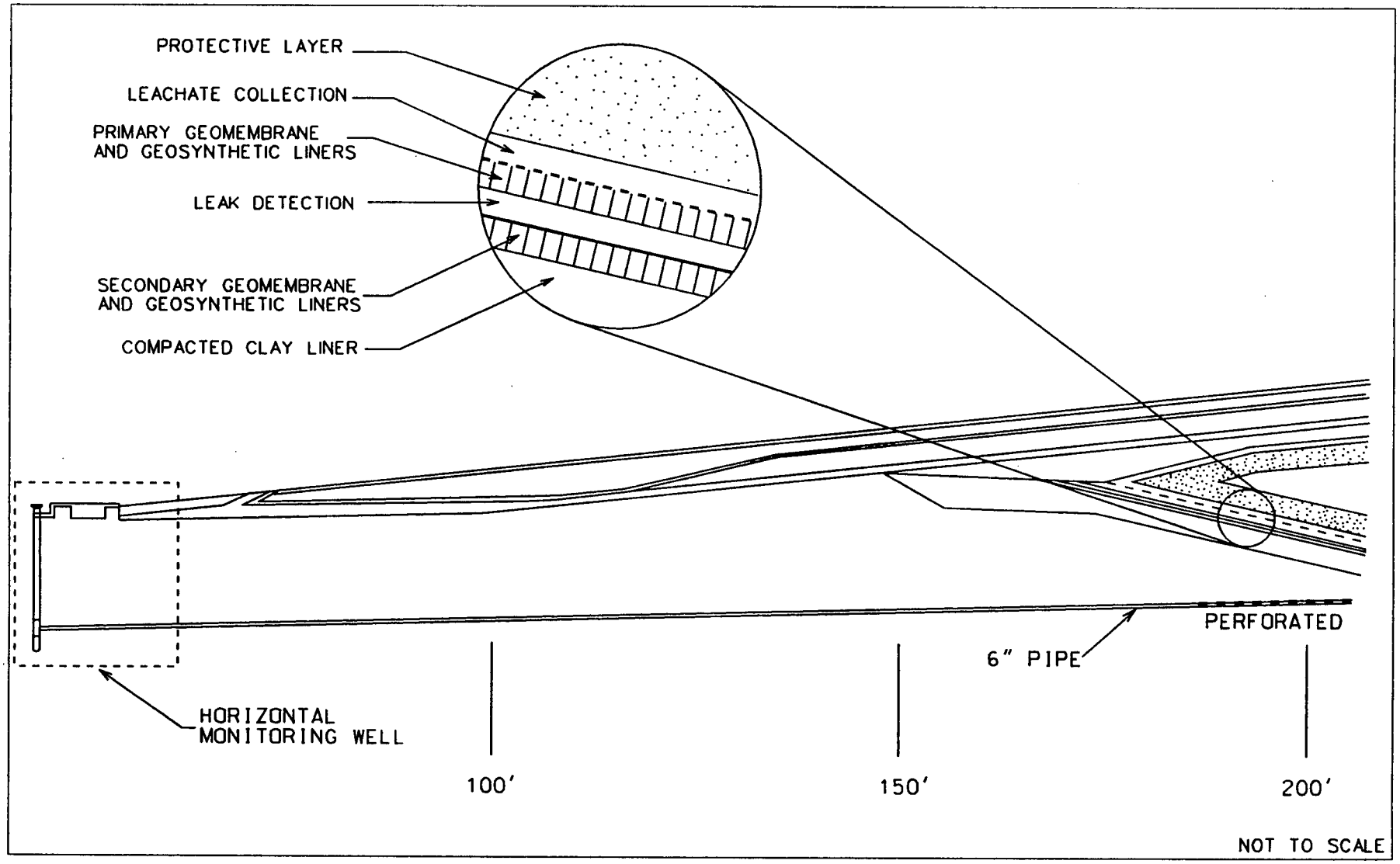
GREAT MIAMI AQUIFER MONITORING (cont.)

- Wells will be installed in a phased approach concurrent with OSDF construction
- Results from OSDF groundwater monitoring will be reported quarterly and also included in the Integrated Environmental Monitoring Program (IEMP) Reports

OSDF GROUNDWATER MONITORING

GLACIAL TILL MONITORING

- In addition to monitoring of the Great Miami Aquifer, horizontal wells will be installed to provide an early detection system
- Horizontal wells will be installed at the low point of each cell in the OSDF (anticipate 8 horizontal wells)
- Wells will monitor at the most likely place for a leak to occur
- A leak would be detected by the horizontal well much earlier than by one of the Great Miami Aquifer monitoring wells



LEGEND:

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/USR/ERMA5/5CRW2/DGN/MAP/HOR/DPTH/C5DPS022.DGN.DGN
9/9/96

FIGURE B-3. HORIZONTAL MONITORING WELL

DATA EVALUATION

- Qualitative evaluation of data
- Perform trend analysis
- Compare sample results from the horizontal wells, leachate collection system, and leak detection system with results from Great Miami Aquifer monitoring
- "Holistic approach" - evaluating the whole system together rather than each individual part

ON-SITE DISPOSAL FACILITY CONSTRUCTION QUALITY ASSURANCE/ QUALITY CONTROL

OSDF CONSTRUCTION QA/QC

QUALITY ASSURANCE

What is Quality Assurance?

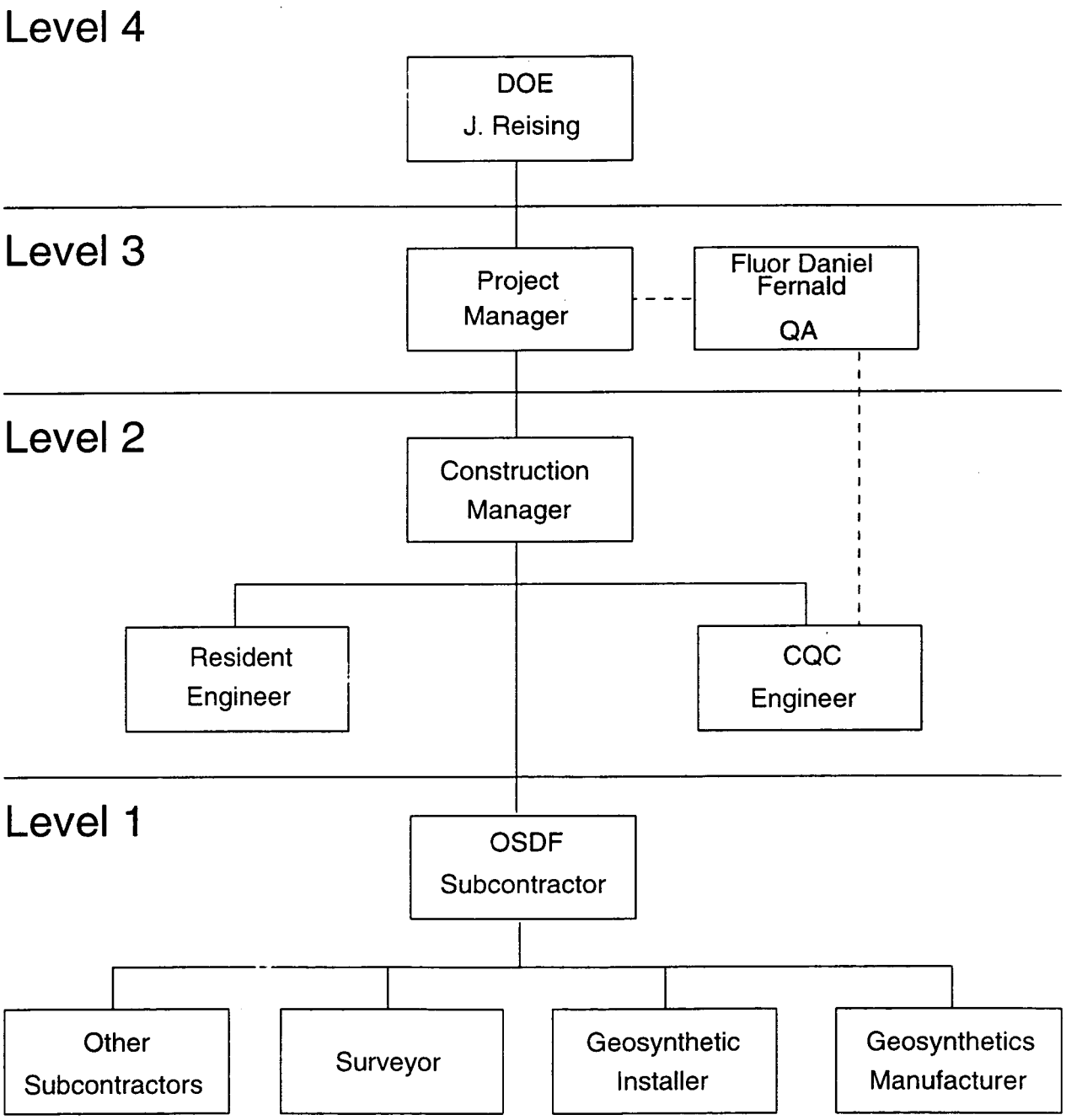
- independent
- oversight role

QUALITY CONTROL

What is Quality Control?

- testing
- inspection

OSDF Construction Organization Chart



LEVELS OF QUALITY CONTROL AND ASSURANCE

Contractor -	Must perform contractor quality control (Level 1) testing of all materials to be used. Must perform all work in accordance with the specifications.
CQC Engineer -	Performs engineering quality control (Level 2) testing of materials and contractor's completed work to document that the specification requirements are satisfied.
Fluor Daniel, Fernald -	Provides independent audit and oversight of Levels 1 and 2 QC (Level 3).
DOE -	Provides independent audit and oversight of Levels 1, 2 & 3 (Level 4).
OEPA/USEPA -	Performs independent quality control and assurance activities to ensure conformance with laws and regulations (Level 5).

OSDF CONSTRUCTION QA/QC

LEVELS OF QC AND QA

Contractor -	Must perform contractor quality control (Level 1) testing of all materials to be used. Must perform all work in accordance with the specifications.
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OSDF CONSTRUCTION QA/QC

LEVELS OF QC AND QA (cont.)

DOE - Provides independent audit and oversight of Levels 1, 2 & 3 (Level 4).

OEPA/USEPA - Performs independent quality control and assurance activities to ensure conformance with laws and regulations (Level 5).

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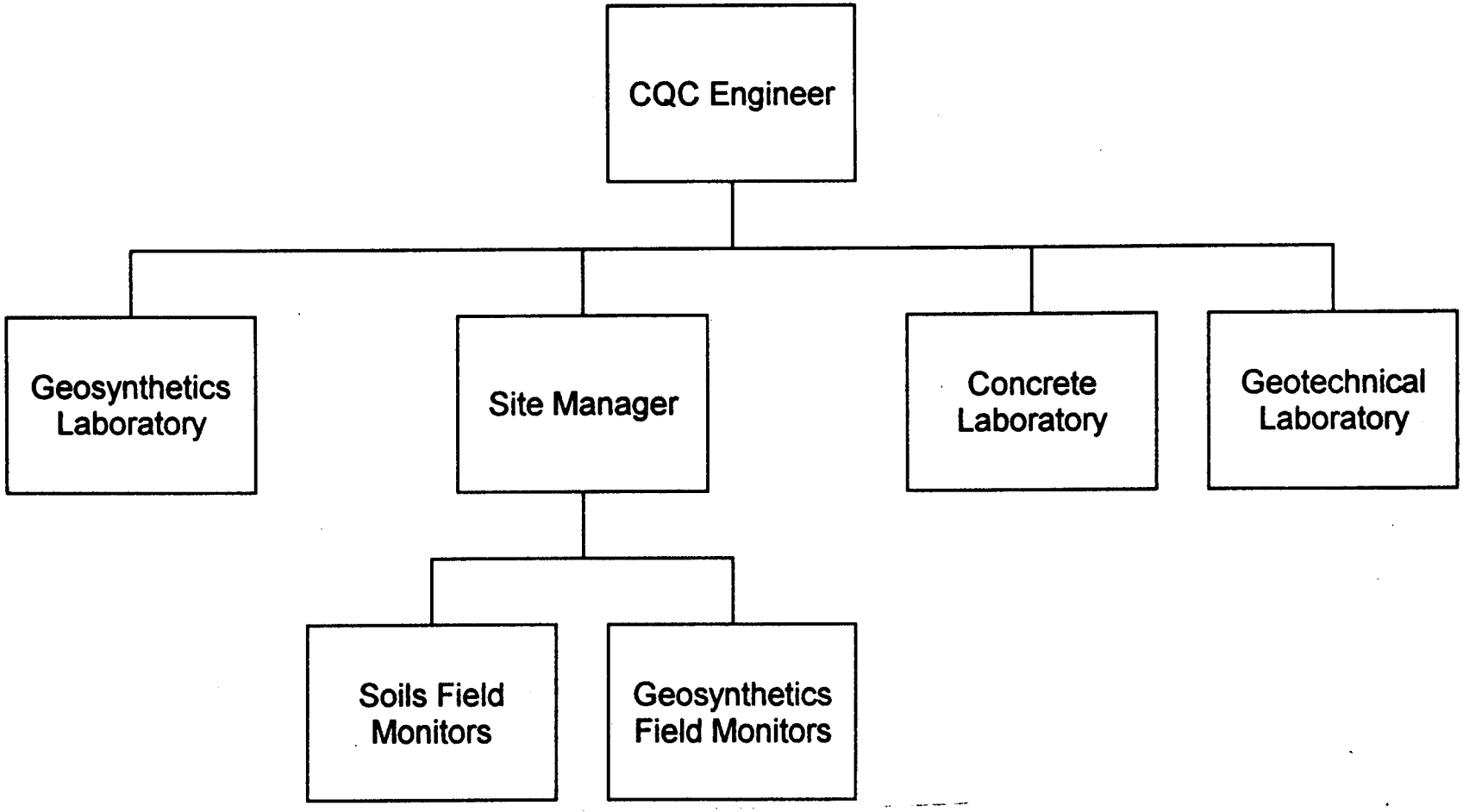
CONSTRUCTION QUALITY ASSURANCE

ON-SITE DISPOSAL FACILITY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

SEPTEMBER 1996

OSDF CQC Organization Chart (Level 2)



Approach to Quality Assurance

- Manage quality separate from schedule and cost control
- Require submittals to be approved before work is performed
- Collect and review contract CQC test results on a daily basis
- Provide timely (weekly) management review of CQA and CQC documentation
- Use field forms which can be directly incorporated into final CQA/RA report

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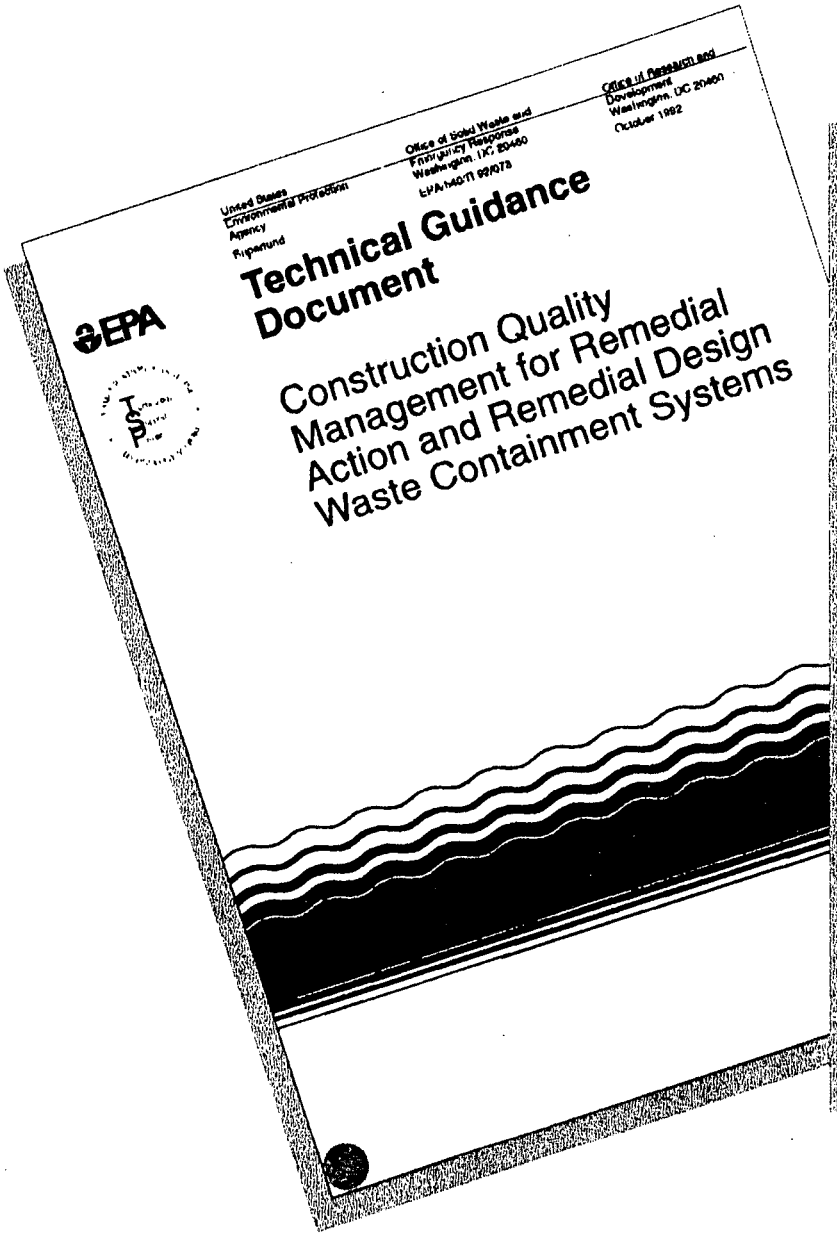
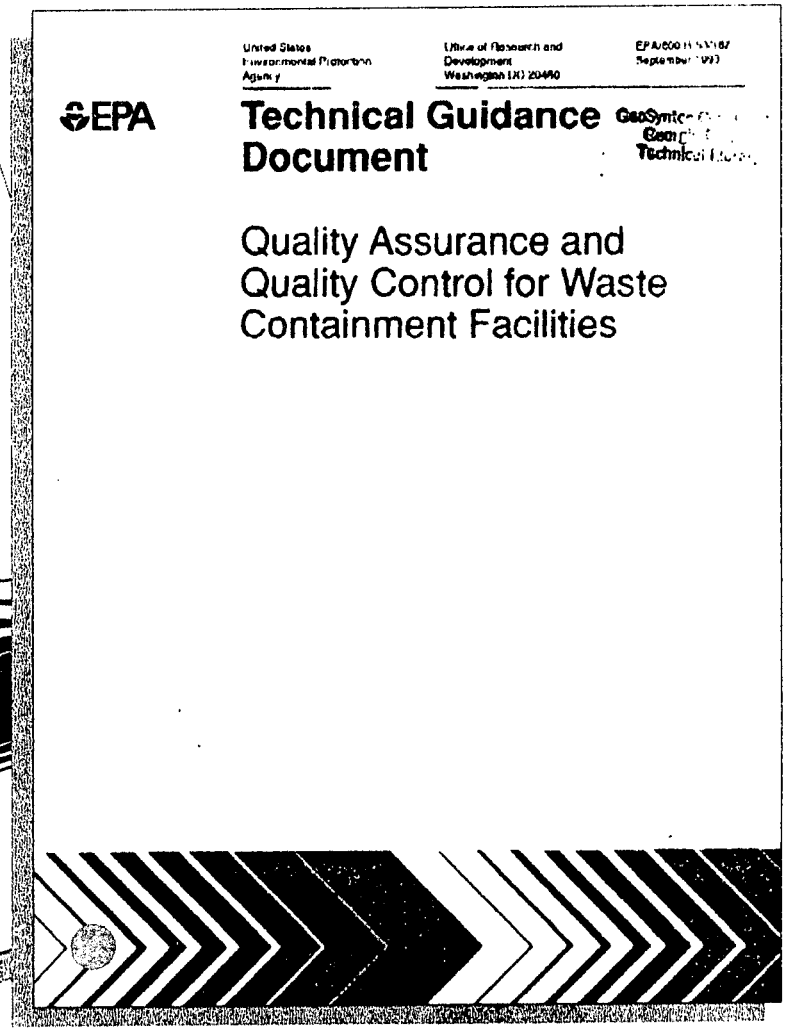
CONSTRUCTION QUALITY CONTROL / QUALITY ASSURANCE PROCEDURES ARE WELL ESTABLISHED





Soils Conformance Testing
OSDF Liner System

TEST	COMPACTED FILL	COMPACTED CLAY LINER	LDS DRAINAGE LAYER	LCS DRAINAGE LAYER
Particle Size Analysis	1 test/5,000 yd^3	1 test/1,500 yd^3	1 test/3,000 yd^3	1 test/3,000 yd^3
Atterberg Limits	1 test/5,000 yd^3	1 test/1,500 yd^3	N/A	N/A
Moisture Content	1 test/5,000 yd^3	1 test/1,500 yd^3	N/A	N/A
Soil Classification	1 test/5,000 yd^3	1 test/1,500 yd^3	1 test/3,000 yd^3	1 test/3,000 yd^3
Standard Proctor	1 test/5,000 yd^3	1 test/1,500 yd^3	N/A	N/A
Hydraulic Conductivity	N/A	1 test/1,500 yd^3	1 test/3,000 yd^3	1 test/3,000 yd^3
Carbonate Content	N/A	N/A	1 test/5,000 yd^3	1 test/5,000 yd^3

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Soils Performance Testing
OSDF Liner System

TEST NAME TEST METHOD	COMPACTED FILL	MANHOLE AND PIPE EMBEDMENT FILL	ANCHOR TRENCH BACKFILL	COMPACTED CLAY LINER
Moisture Content	2 tests/acre/lift	1 test/250'/lift	1 test/250'/lift	5 tests/acre/lift
Dry Density	2 tests/acre/lift	1 test/250'/lift	1 test/250'/lift	5 tests/acre/lift

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GE3900-1.1\F9620022

IN-PLACE SOIL NUCLEAR MOISTURE/DENSITY TESTING

TESTING FORMS BECOME A PART OF THE FINAL PROJECT RECORD

Geomembrane Conformance Testing

TEST

- Thickness
- Specific Gravity
- Tensile Strength
  - Yield
  - Break
- Elongation
  - Yield
  - Break
- Carbon Black
  - Content
  - Dispersion

FREQUENCY

- All testing at once per 100,000 ft.^{2} or once per lot (whichever is greater)

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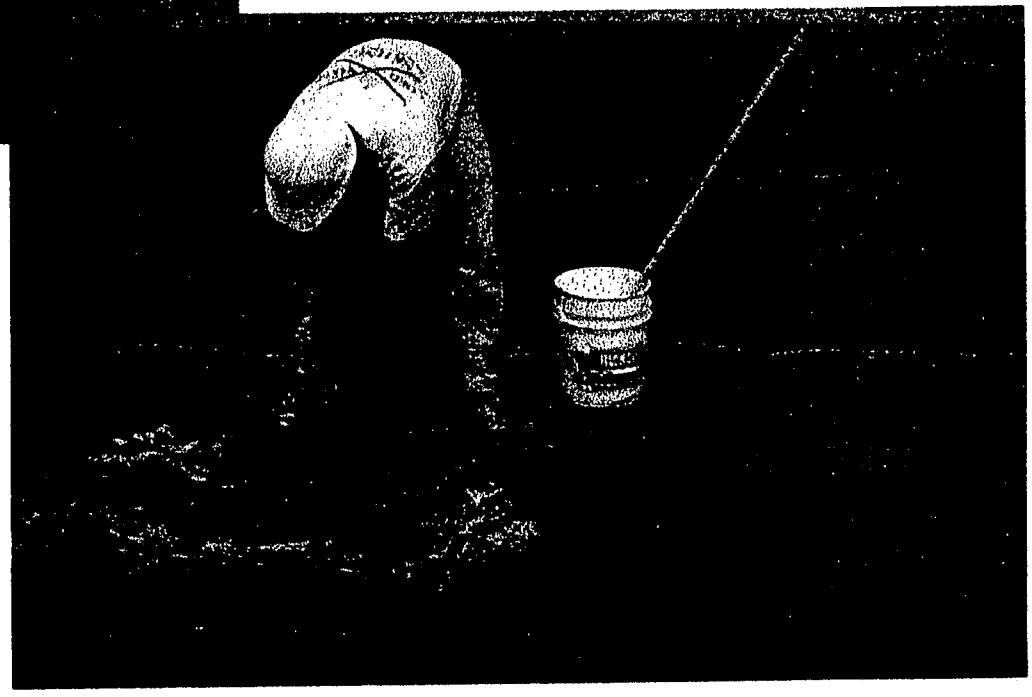
EXTRUSION WELDING

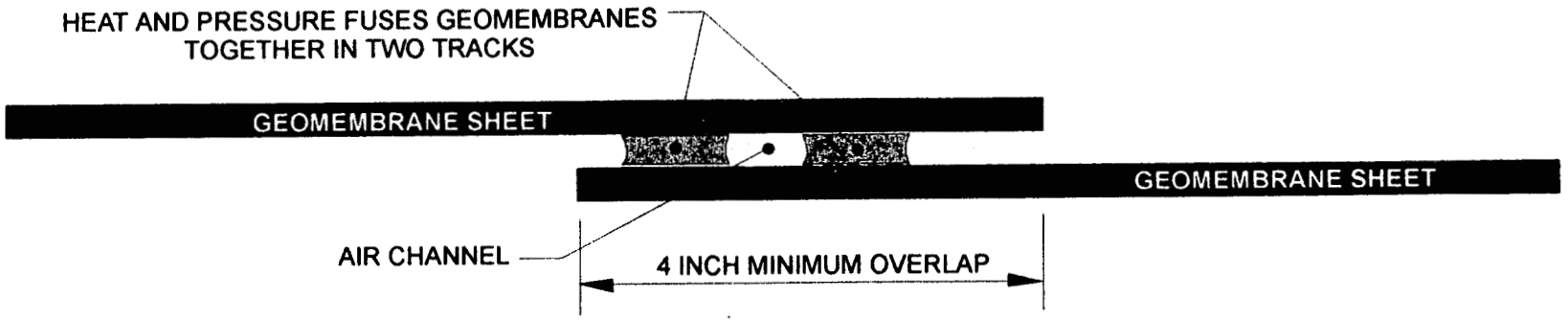


NON-DESTRUCTIVE TESTING OF EXTRUSION-WELDED SEAMS

DOUBLE-TRACT FUSION WELDING PROCESS

NON-DESTRUCTIVE AIR PRESSURE TESTING OF FUSION SEAMS

DOUBLE TRACK FUSION-WELDED SEAM



Geomembrane Seam Testing

TEST	FREQUENCY
◆ Peel Strength	◆ Once per 500 ft. of seam length
◆ Bonded Strength	◆ Once per 500 ft. of seam length
◆ Vacuum Box	◆ All extrusion seams
◆ Air Pressure	◆ All fusion seams

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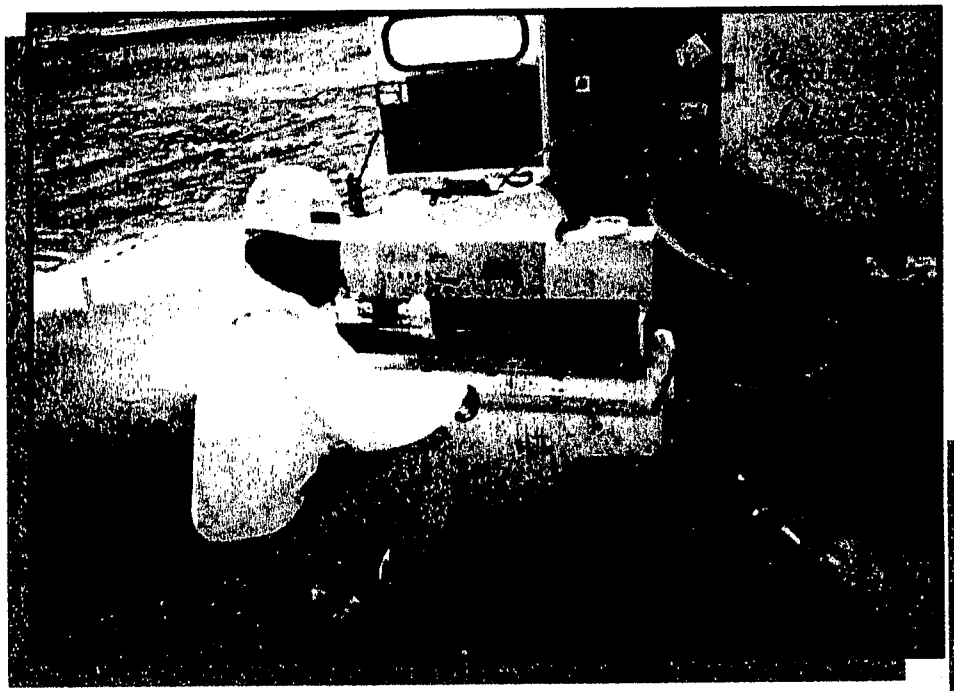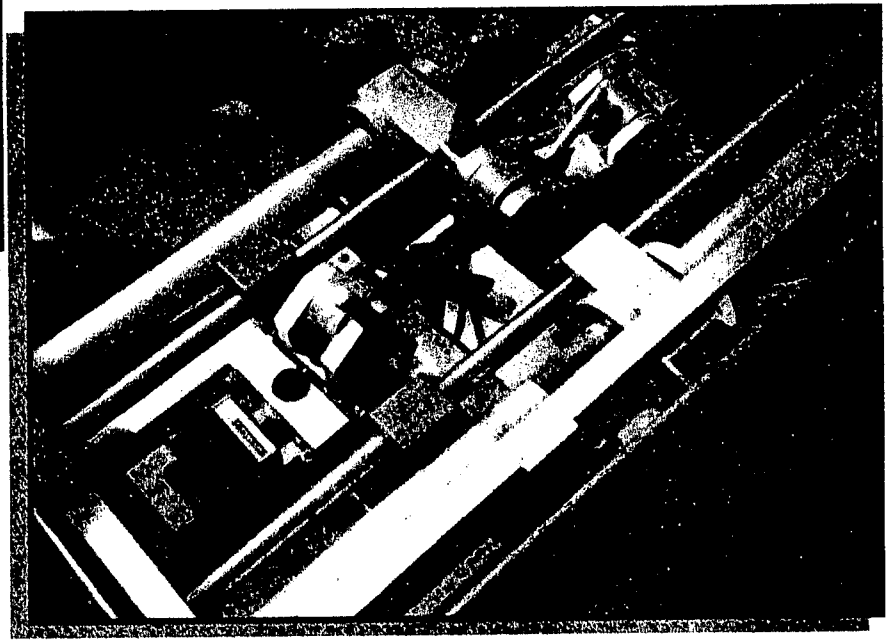
GEOMEMBRANE SEAM TESTING