

**On-Site Disposal Facility Workshop
Alpha Building, Classroom B**

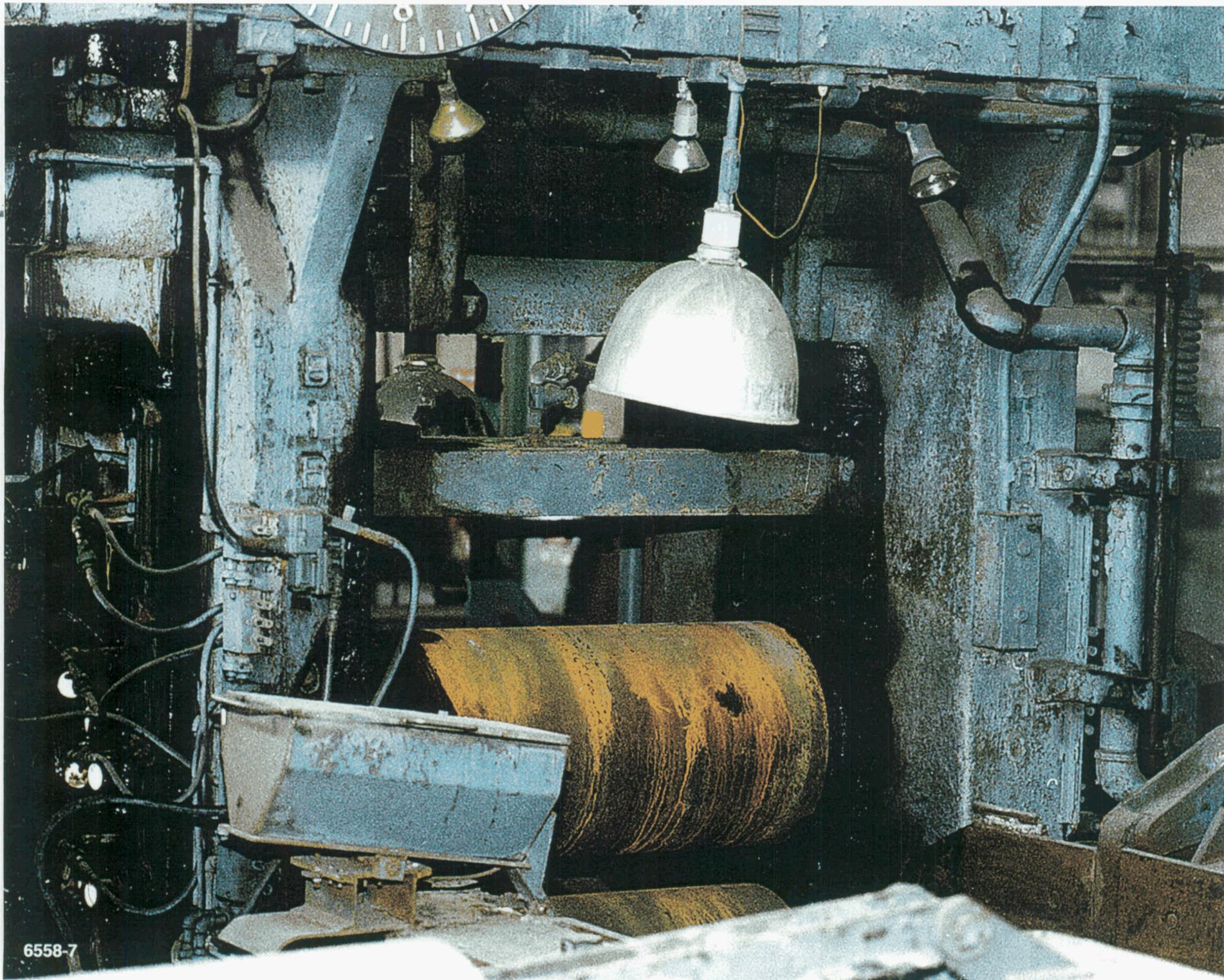
**June 24, 1997
7:00 - 9:00 p.m.**

AGENDA

7:00	WELCOME/ANNOUNCEMENTS	Gary Stegner
7:10	OSDF STATUS	Mike Hickey
7:25	OSDF PERFORMANCE	Rudy Bonaparte
7:50	ECONOMIC EVALUATION OF OVER-SIZED MATERIALS	Dennis Carr
8:15	QUESTIONS & ANSWERS	Gary Stegner
8:50	CONCLUDING REMARKS	Gary Stegner

DOE and FDF personnel will be available after the meeting to discuss with the public any of the material presented tonight.

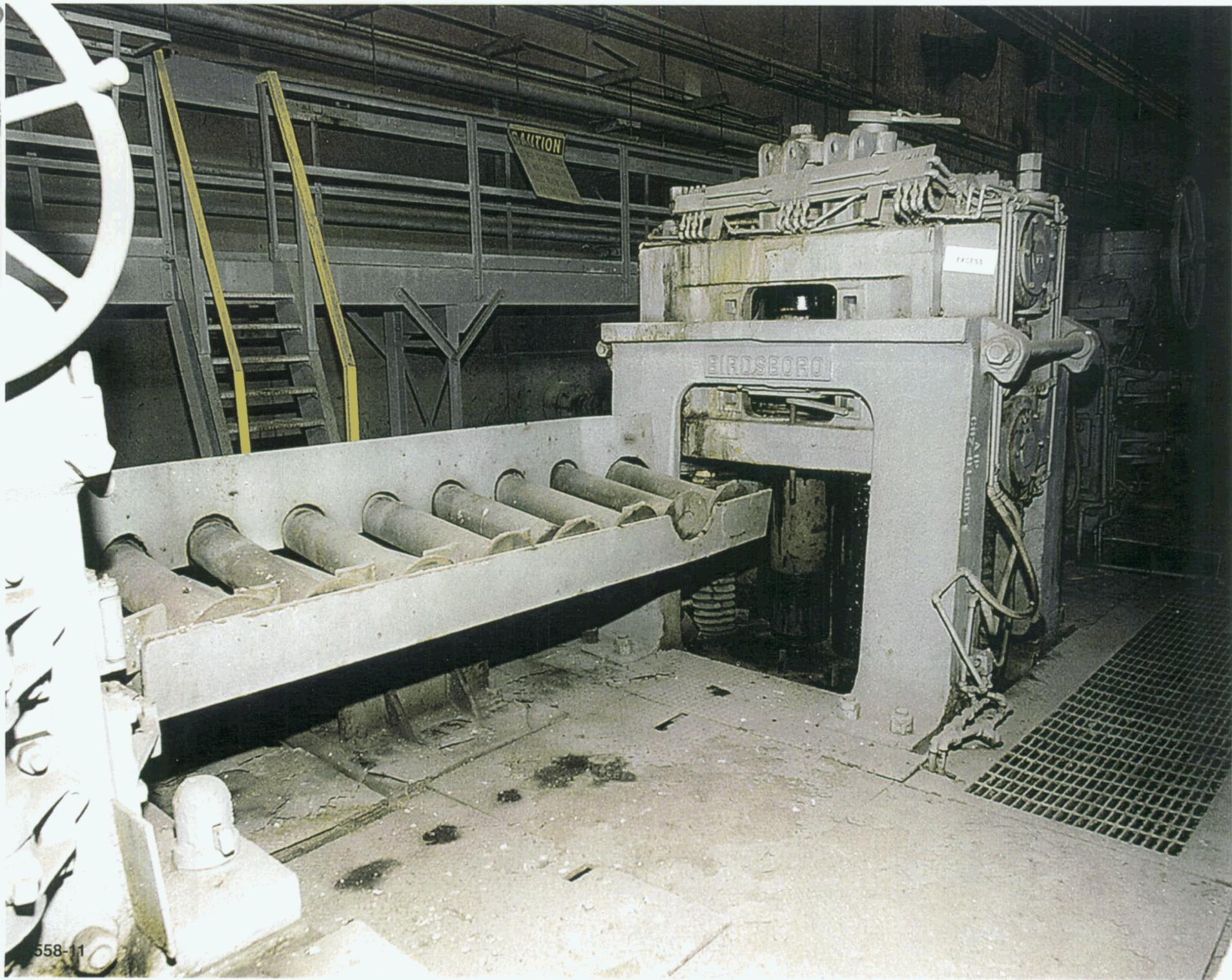
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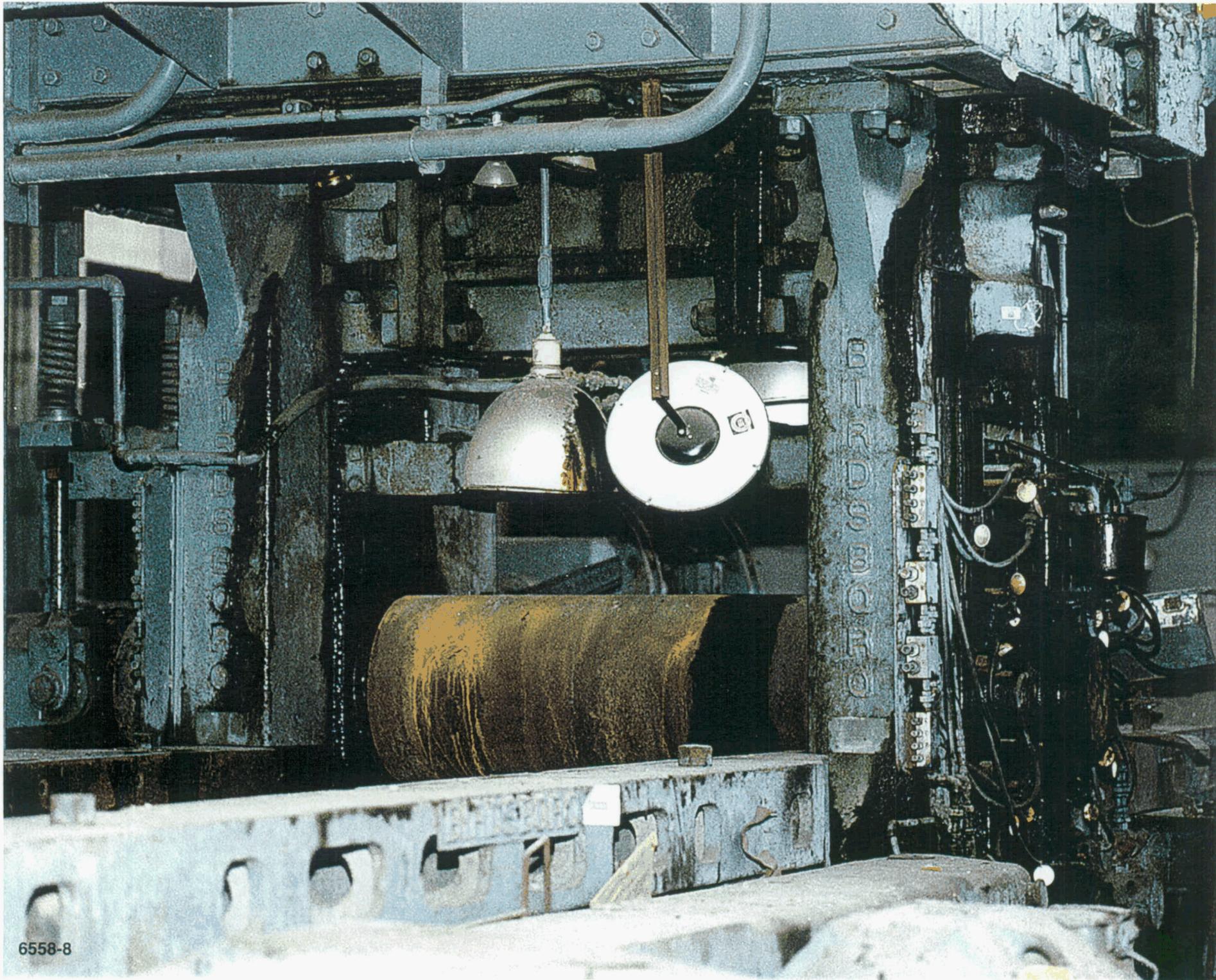
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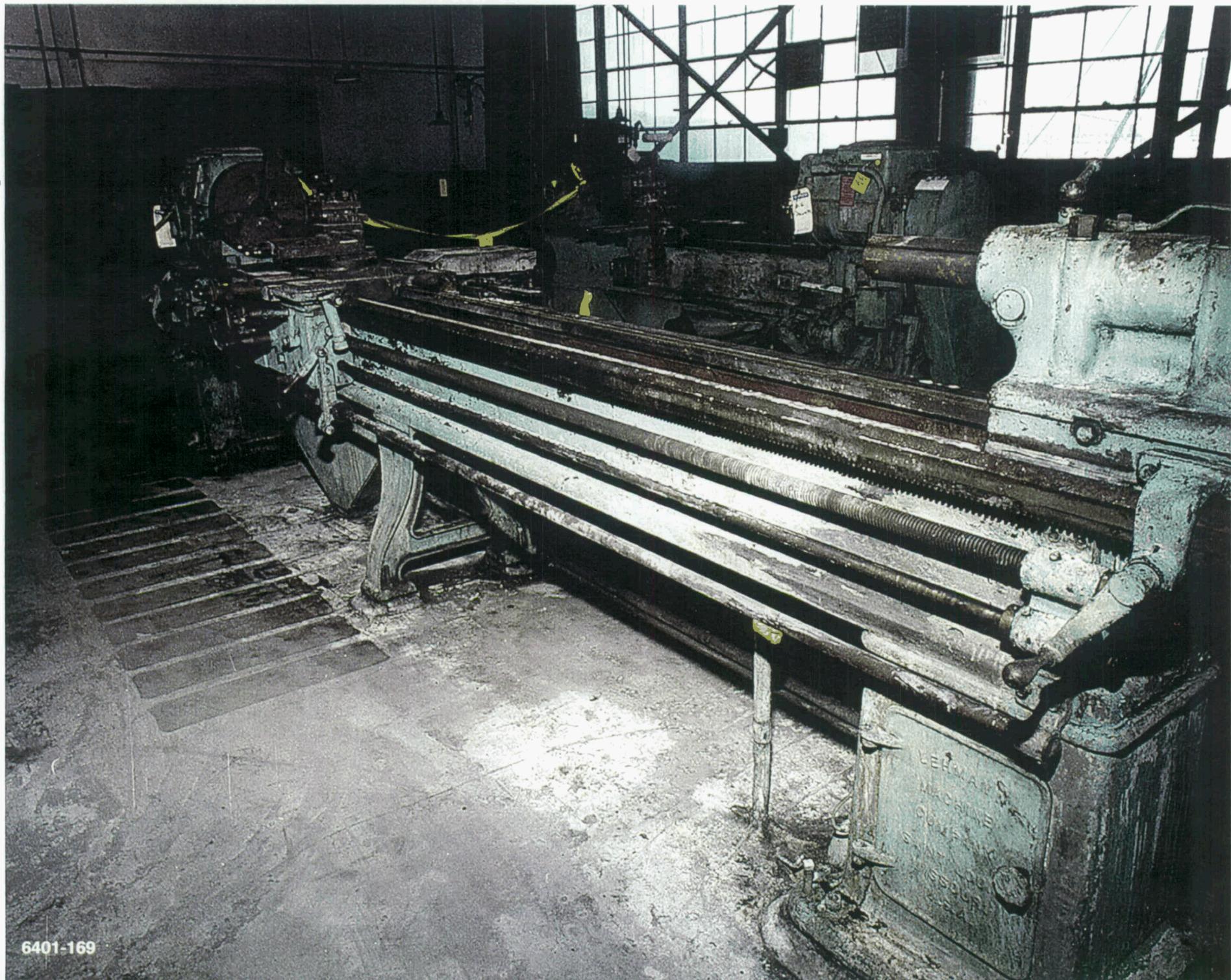
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ON-SITE DISPOSAL FACILITY

WORKSHOP

JUNE 24, 1997

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OSDF PROJECT

FEMP

- **Project Scope**
- **Current Year Construction Schedule**
- **North Entrance Road**
- **Category 5 Oversized Material Discussion**

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PROJECT SCOPE

FEMP

- **Construct the OSDF**
- **Construct the Leachate Conveyance System**
- **Construct Roads**
 - **Haul Road**
 - **Rerouted North Entrance Road**

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CURRENT YEAR CONSTRUCTION SCHEDULE

FEMP

	Start	End
Leachate Conveyance System	01/27/97	09/16/97
Haul Road	02/24/97	11/11/97
Groundwater Wells	03/31/97	09/30/97
North Entrance Road	07/01/97	10/31/97
OSDF Phase I	06/20/97	12/31/97

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CATEGORY 5 MATERIAL PLACEMENT

FEMP

- **Category 5 Materials are materials that require special handling. Examples are:**
 - **Highly-Compressible Impacted Materials (e.g. Double Bagged Asbestos).**
 - **Sludges**
 - **Piping Insulation**

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OVERSIZED MATERIAL DISCUSSION

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- OSDF Volume 2.5 Million Cubic Yards**
- Oversize Material estimated at 10,000 to 20,000 cubic yards**
- Less than 1 Percent of Total Volume**

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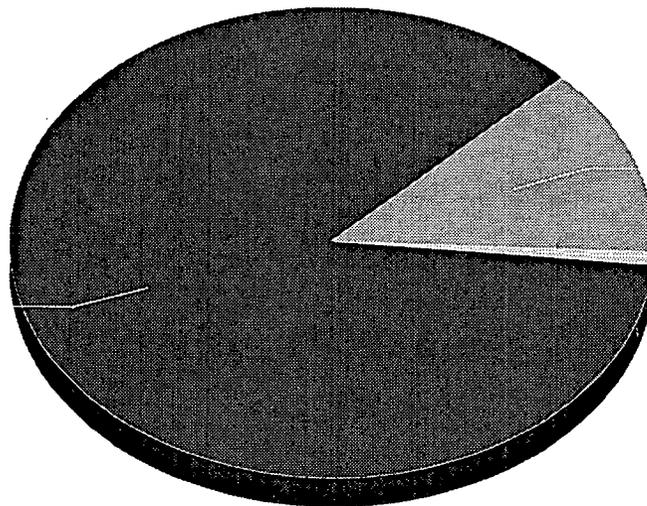


ESTIMATED VOLUMES OF OSDF IMPACTED MATERIAL

FERNALD

2.5 Million Cubic Yards Total

Soil 86.0%



Debris 13.0%

Oversized Material 1.0%

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Graphics 4651.1 6/97

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OVERSIZED MATERIAL DISCUSSION

FEMP

- **Mill Rolls**
- **Mill Stands and Housings**
- **Machine Stands (e.g., Lathe Beds, Mill Stands, etc.)**
- **Category "A" (Structural Steel)**

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OVERSIZED MATERIAL DISCUSSION

FEMP

OVERSIZED DEBRIS:

Category:

Number:

Mill Rolls

40

Mill Stand Housings

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Machine Stands

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OVERSIZED MATERIAL DISCUSSION

FEMP

- **95 Percent (9,500 - 19,000 cubic yards) of oversized material will be either shipped off site or will meet physical WACs**
- **5 Percent (500 - 1,000 cubic yards) open for discussion**

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OVERSIZED MATERIAL DISCUSSION

FEMP

- **5 Percent represents the most likely material for recycling, including Category "A"**
- **Why are these items being discussed**
 - **Conserve Resources**
 - **Safety Issues**

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OVERSIZED MATERIAL DISCUSSION

FEMP

- **GeoSyntec Consultants Inc. performed assessment.**
- **Evaluation**
 - **Static Performance**
 - **Dynamic Performance**

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EVALUATION OF
DISPOSAL OF
OVERSIZED OBJECTS IN OSDI

LUOR DANIEL
ERNALD

JUNE 1997

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POTENTIAL IMPACTS OF OVERSIZED OBJECTS

- SLOPE STABILITY
- FOUNDATION SETTLEMENT
- COMPRESSIVE STRESS
- POTENTIAL FOR OBJECT COLLAPSE
- POTENTIAL FOR LINER OR COVER SYSTEM PUNCTURE

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DESCRIPTION OF OBJECTS

- Mill Rolls
- Mill Stands
- Lathe Beds

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GEOSYNTEC CONSULTANTS



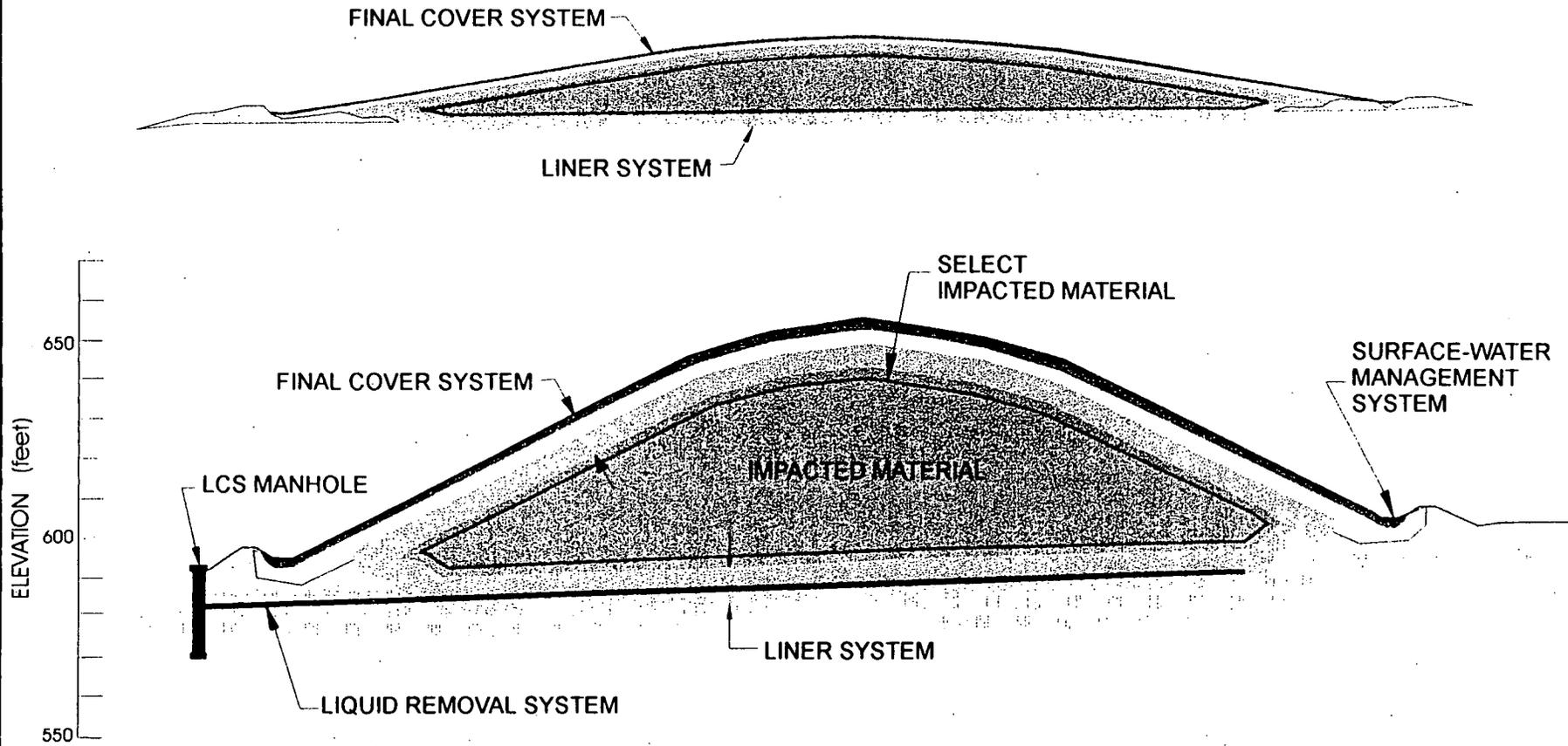
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QUANTITY OF OVERSIZED MATERIAL

- 500 to 1,000 yd³ of oversized objects
- OSDF capacity = 2,500,000 yd³
- Oversized objects \cong 0.02 to 0.04 percent of total OSDF capacity
- For analysis, oversized objects were assumed to equal 1 percent of total OSDF capacity
- Factor of safety for analyses = 25 to 50



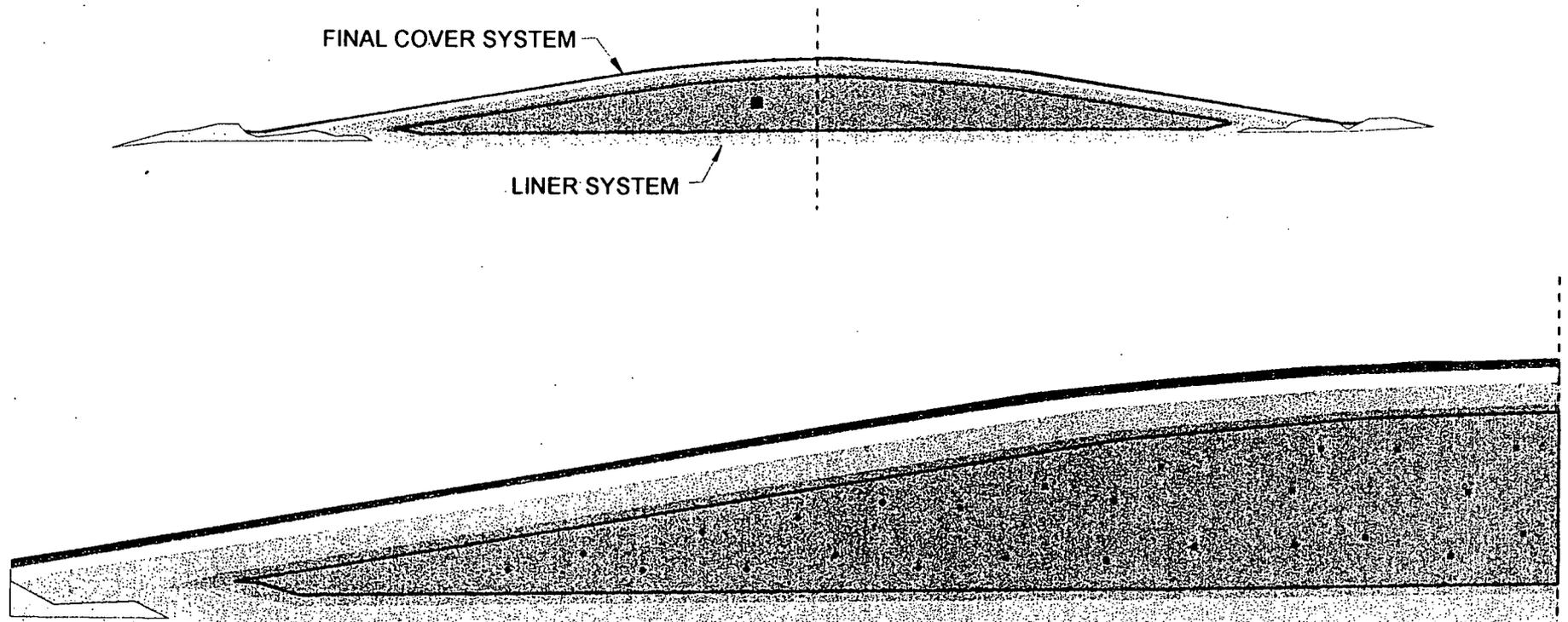
ON-SITE DISPOSAL FACILITY (OSDF) COMPONENTS



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REPRESENTATION OF 1 PERCENT OVERSIZED OBJECTS



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ASSUMPTIONS FOR ANALYSES

- All oversized objects are solid metal
- Unit weight of metal = 490 pcf
- Unit weight of soil = 125 pcf
- Stability, settlement, and compressive stress analyses: use average unit weight (γ_a)
 - no oversized material: $\gamma_a = 125$ pcf
 - 1% oversized material: $\gamma_a = 129$ pcf



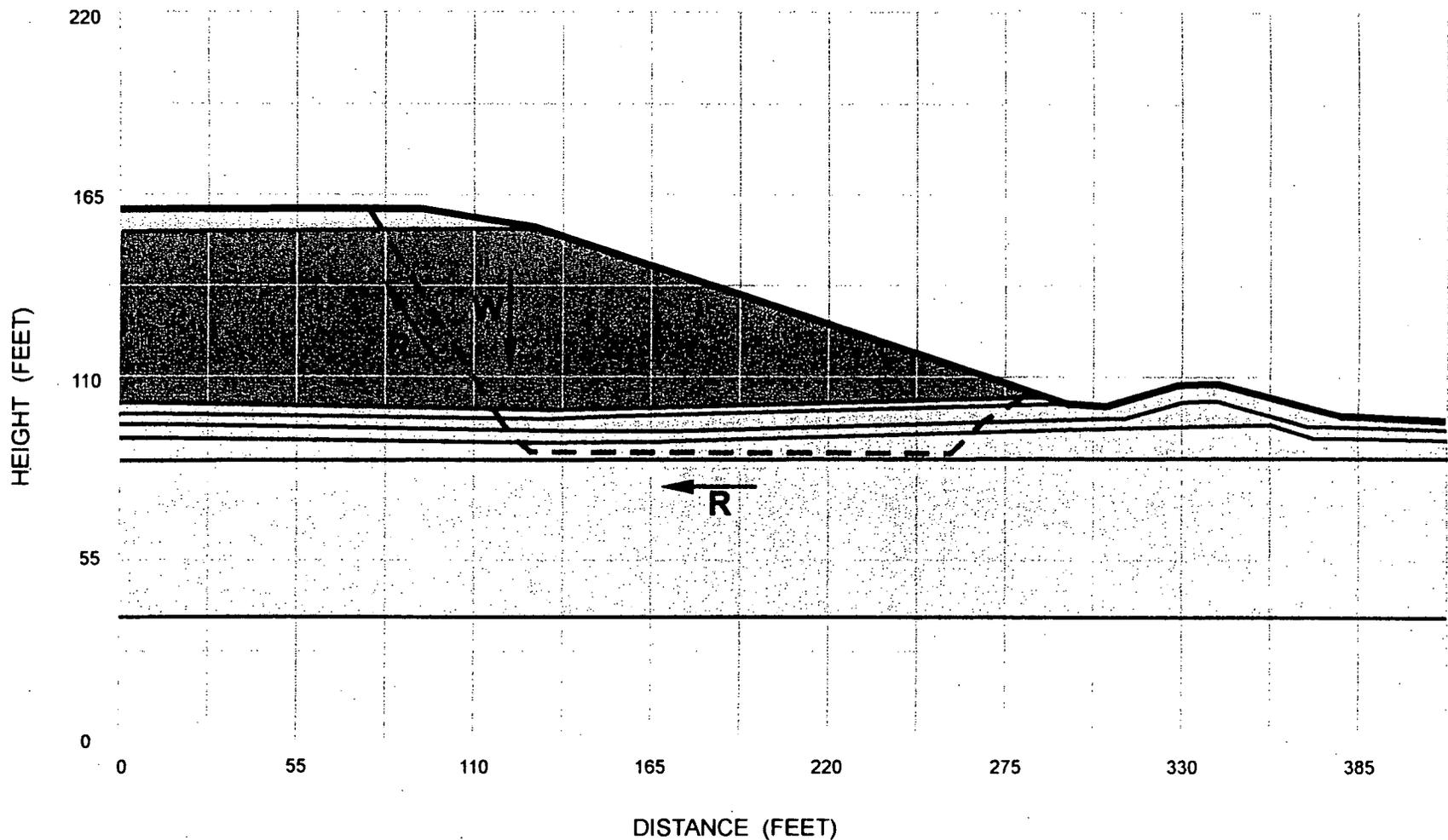
POTENTIAL FOR ADVERSE SLOPE STABILITY IMPACT

Required and Calculated Factor of Safety (FS)				
		Required FS (from DCP)	Calculated FS	
			<u>125 pcf</u>	<u>129 pcf</u>
Case 1A =	Post-construction stability of OSDF at intermediate filling stage	1.3	1.51	1.47
Case 1C =	Post-construction stability of OSDF at intermediate filling stage	1.3	1.61	1.58
Case 2APP =	Long-term stability of OSDF at intermediate filling stage	1.5	1.76	1.72
Case 2CPP =	Long-term stability of OSDF at intermediate filling stage	1.5	2.01	2.12
Case 7B3 =	Long-term stability of OSDF at after closure	1.25	1.54	—

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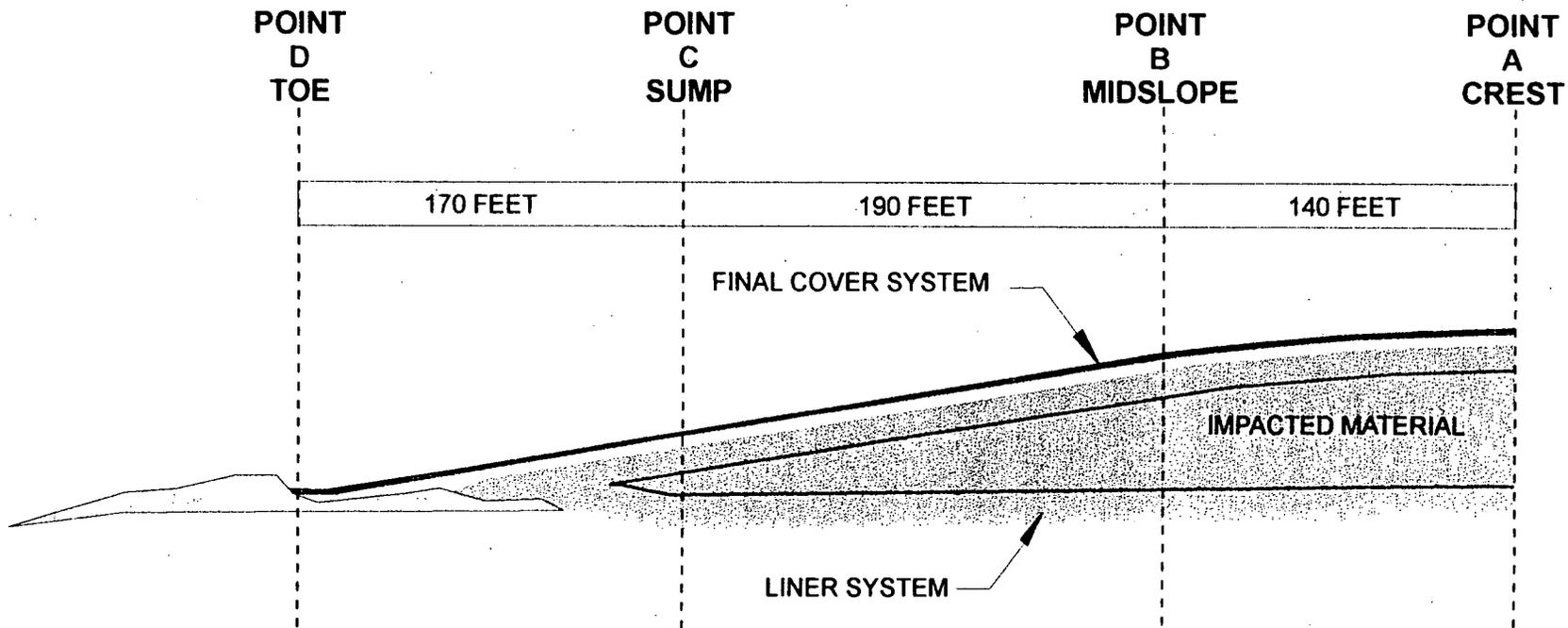
STABILITY ANALYSIS



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SETTLEMENT ANALYSIS



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POTENTIAL FOR ADVERSE FOUNDATION SETTLEMENT IMPACT

Point	Average Unit Weight (pcf)	
	<u>125 pcf</u>	<u>129 pcf</u>
A	2.84 ft	2.89 ft
B	2.76 ft	2.81 ft
C	1.60 ft	1.63 ft
D	0.23 ft	0.24 ft

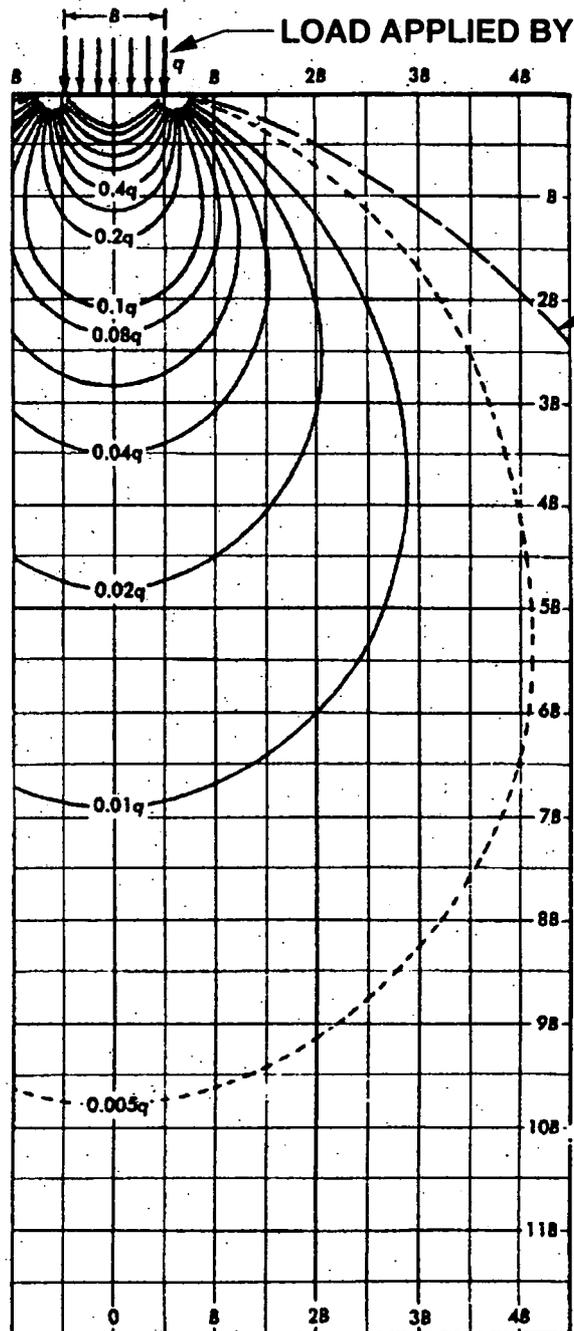
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POTENTIAL FOR ADVERSE COMPRESSIVE STRESS IMPACT

- Assume 40,000 lb mill roll placed on top of impacted material layer (5 ft above geomembrane)
- Calculate stress increase on geomembrane = 255 psf
- Maximum total vertical stress on geomembrane due to filling of OSDF plus mill roll = 8,125 psf
- Allowable vertical stress on geomembrane to avoid puncture by LCS drainage layer = 25,000 psf





LOAD APPLIED BY MILL ROLL

STRESS DISSIPATION CONTOURS

COMPRESSIVE STRESS ANALYSIS

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Square foundation

GEO SYNTEC CONSULTANTS



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POTENTIAL FOR ADVERSE OBJECT COLLAPSE

- Oversized objects are all solid metal - there exists no inherent potential for collapse
- Corrosion of metal should not be appreciable due to lack of oxygen in OSDF
- Corrosion by-product (rust) has larger volume than intact metal

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POTENTIAL FOR LINER OR COVER SYSTEM PUNCTURE

- Design includes soil layers at least 4-ft thick to protect liner and final cover systems
 - protective and contouring layers
 - select impacted material layers
- All oversized material will be separated from liner and cover system components by at least a 4-ft thickness of soil
- The minimum 4-ft separation is more than adequate to protect liner and final cover system components from puncture or other potential damage



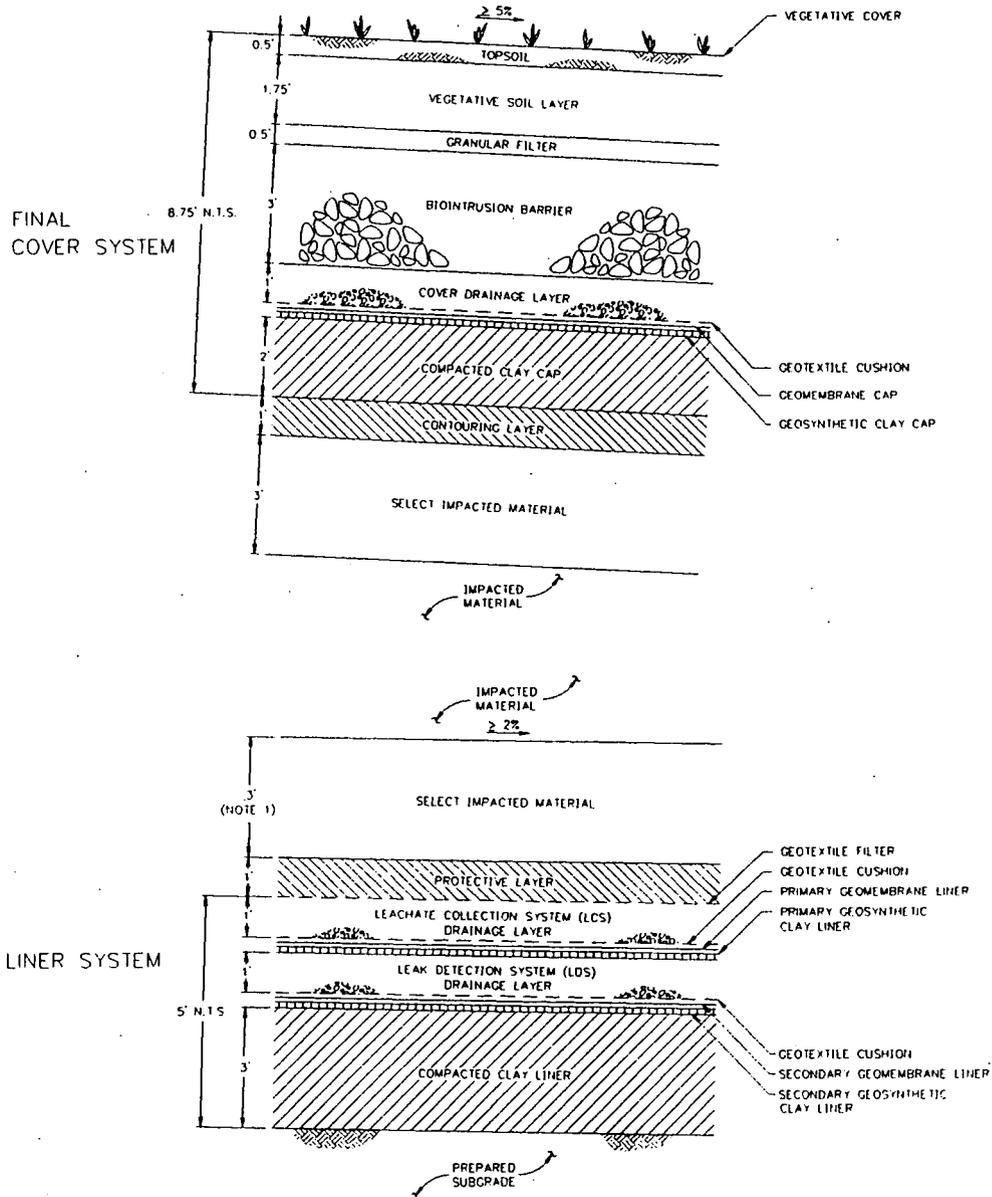
PLACEMENT PROCEDURES

- Oversized object placement procedures will be in accordance with the OSDF Impacted Material Placement Plan
- Each oversized object will be placed flat against impacted material surface
- Adjacent oversized objects will be placed at least 8 ft apart
- Backfilling and compaction around oversized objects will be in accordance with Category 3 impacted material placement procedures described in the Impacted Material Placement Plan

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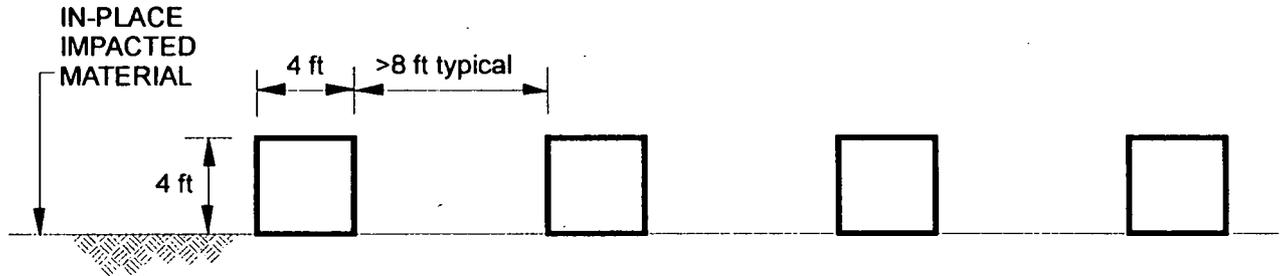
ON-SITE DISPOSAL FACILITY LINER AND COVER SYSTEM DESIGN



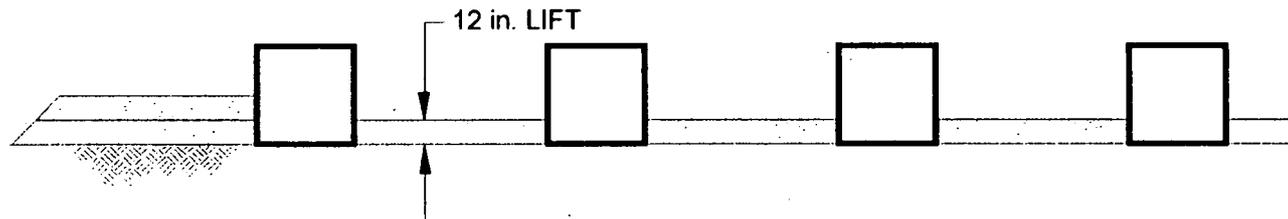
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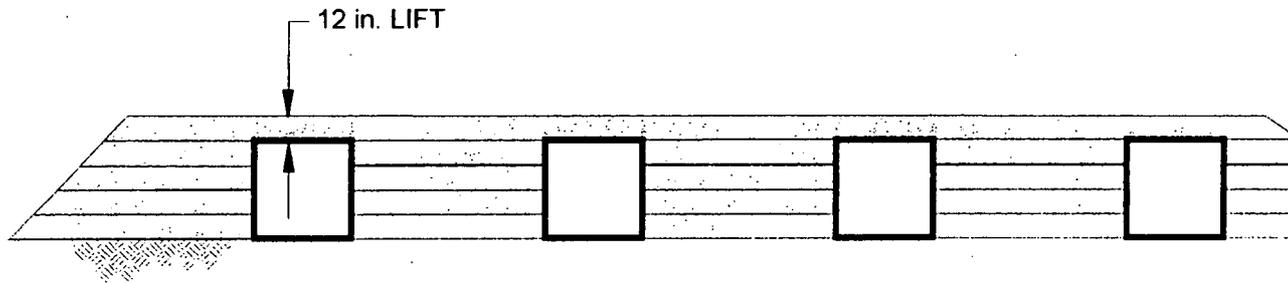
CATEGORY 3 MATERIAL PLACEMENT SEQUENCE



1. PLACED IN A REGULAR PATTERN



2. SPACE FILLED WITH 12 in. LIFTS



3. FINAL 12 in. LIFT PLACED ABOVE GROUPS

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NOTE: THIS FIGURE FOR ILLUSTRATION ONLY. SUBCONTRACTOR SHALL PLACE IMPACTED MATERIAL LAYERS TO THE LIMITS SHOWN ON CONSTRUCTION DRAWINGS.



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CONCLUSIONS

- Oversized objects will constitute only 0.02 to 0.04 percent of the OSDF volume.
- Impact analysis conservatively assumes that oversized objects will occupy 1 percent of OSDF volume.
- Oversized objects will have a negligible affect on OSDF slope stability.
- Oversized objects will have a negligible affect on OSDF foundation settlement.



CONCLUSIONS (CONTINUED)

- Oversized objects will not significantly increase the compressive stress applied to the liner system.
- Oversized objects will be solid metal and thus have no potential for collapse.
- Oversized objects will be encapsulated by at least 4-ft thick protective, contouring, and select material soil layers. These layers will eliminate any potential for oversized objects to puncture or otherwise damage the OSDF liner and final cover system components.



OVERSIZED MATERIAL DISCUSSION

FEMP

Current Status of OU3 Structural Steels:

- **Plant 7 Steel not free-released by Alaron is stored in bulk at the Plant 1 Pad in lengths which meet standard OSDF criteria.**
- **Plant 4 Steel was cut to meet OSDF standard length criteria and stacked at the Plant 4 Slab.**
- **Plant 1 Complex Steel was cut in approximately 18 foot lengths to improve its potential for free-release cleaning and is stored on the Plant 1 Slab.**
- **Boiler Plant/Water Plant Complex Steel will be cut in approximately 18 foot lengths to improve its potential for free-release cleaning. It will be stored near the Boiler Plant Slab.**
- **Plant 9 Complex steel will be cut in approximately 18 foot lengths to retain its potential for free-release cleaning.**

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OVERSIZED MATERIAL DISCUSSION

FEMP

Engineering Cost Estimates for Oversized Material Disposition:

<u>Category</u>	<u>To OSDF As Is</u>	<u>To OSDF After Cut</u>	<u>To NTS @ \$7.75/CF</u>
Mill Rolls (40)	\$25,000	\$40,000	\$69,000
Mill Stands (8)	\$14,000	\$23,000	\$69,000
Machine Stands (8)	\$22,000	\$36,000	\$23,000
Extra Length Steel Beams (~ 14,000 pieces)	---	+ \$1.6 Million	Not Applicable

Note: Costs reflect total of category rather than per piece rate.
Number following category reflects estimated number of pieces based on facility walkdowns.

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