



U.S. Department of Energy

Oakland Operations Office, Oakland, California

ADDENDUM TO SAMPLING AND ANALYSIS PLAN FOR CHLORDANE STOCKPILE CHARACTERIZATION

For the:

LABORATORY FOR ENERGY-RELATED HEALTH
RESEARCH (LEHR)
UNIVERSITY OF CALIFORNIA AT DAVIS, CALIFORNIA

Prepared for:

United States Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, California 95612-5208

Prepared by:

Weiss Associates
5500 Shellmound Street
Emeryville, CA 94608-2411

July 10, 1998
Rev. 0

DOE Oakland Operations Contract DE-AC03-96SF20686

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1. STOCKPILE SAMPLING PLAN

The following sampling and analysis plan (SAP) is prepared as an addendum to the Work Plan for the Removal Action (RA) at the Southwest Trenches Area. This SAP focuses on chlordane stockpile characterization.

1.1 Stockpile Volume

During the RA at Southwest Trenches, a total of 260 cubic yards (CY) in-place volume (bank) of soil was excavated and stockpiled in the Western Dog Pen Area (third paved aisle from the north). Six stockpiles, with an estimated volume of 350 CY, have been generated and require characterization. Table 1 summarizes the dimensions and approximate volume of each pile.

1.2 Sampling Plan

As described in the Work Plan, soil samples will be collected to characterize each pile and determine an appropriate disposal option. The stockpile sampling summary is presented in Table 2 and described below.

- 1 composite sample will be collected per 20 CY of soil;
- 4 discrete samples will be collected and combined to prepare a composite sample;
- Discrete samples will be collected using a trowel from a two-dimensional grid system overlying the stockpile;
- Discrete sample locations will be determined using a random number generation;
- Discrete samples will be collected from within 6 inches of the pile surface;
- Samples from all four locations will be placed in a stainless steel bowl and homogenized in the field;
- Each composite sample will be placed in three 8-oz glass jars;
- Two 8-oz glass jars will be labeled and shipped to the laboratory for analysis;
- One 8-oz glass jar will be combined with 8-oz jars from other composite samples for a secondary composite sample collection (one per 100 CY); and

- One Merinelli beaker will be filled with each composite sample and the beaker top sealed with electric tape as soon as the sample is collected from the stockpile.

A two-dimensional grid system was designed and superimposed on each stockpile. Based on the stockpile dimensions, the grid spacing was selected as 2 feet. The stockpiles with volumes greater than 20 CY were divided into sections equal or less than 20 CY. Each section contained its own grid system. Within each grid system, grid blocks were assigned consecutive numbers and a random number generator was used to select four grids for composite sample collection. Attachment 1 presents the grid system and stockpile dimensions for each pile.

Table 1. Chlordane Stockpile Area and Volume Calculation

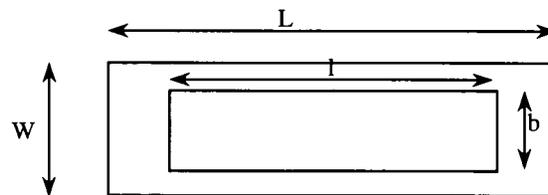
STOCKPILE	Base Length L	Base Width W (ft)	Top Width b (ft)	Top Length l (ft)	Side s (ft)	Calculated Height h (ft)	Measured Bank Volume Vb (CY)	Calculated Stockpile Volume Vs (CY)
W2S8 Pile	10	18	10	4	5	3.0	7.5	12
W4S14/W4S11/W7S14 Pile	12	16	9	6	5	3.6	11	16
0-1' Pile	39	20	7	26	8	4.7	63	83
1-2' Pile	39	19	6	26	8	4.7	63	77
2-3.5' Pile	55	20	8	43	7.5	4.5	95	120
0-3.5' EXTRA Pile	24	18	7	13	7	4.3	22	42
TOTAL							262	351

Assumption: Stockpiles are shaped as Trapezoids.

Equations:

$$h = \sqrt{\left(\frac{W - b}{2}\right)^2 - s^2}$$

$$V_s = \frac{h \times 0.5 \times (W \times L + b \times l)}{27}$$



STOCKPILE PLAN VIEW

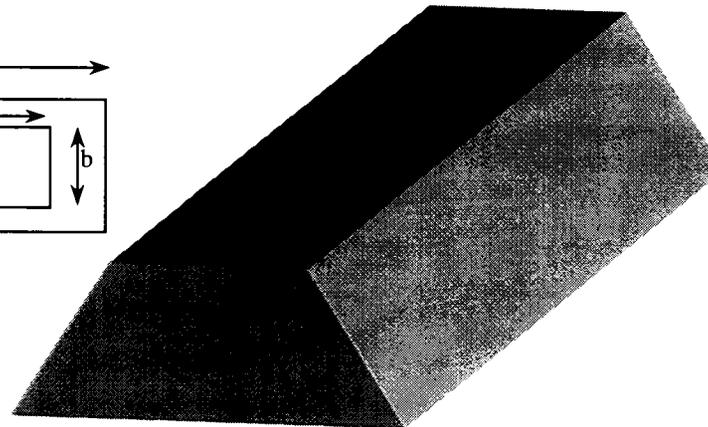


Table 2. Chlordane Stockpile Sampling and Analysis Plan

STOCKPILE	Calculated Stockpile Volume Vs (CY)	Composite Sample Number	Corresponding Composite Grids	Sample jar/volume per Analysis	
				Full Suite of Radionuclides and Pesticides/PCBs	VOCs, metals, SVOCs
W2S8 Pile	12	CWDTC001	5, 16, 34, 40	2 8-oz jars	1 8-oz jar
W4S14/W4S11/W7S14 Pile	16	CWDTC002	18, 25, 27, 44	2 8-oz jars	1 8-oz jar
0-3.5' EXTRA Pile	42	CWDTC003	9, 18, 22, 31	2 8-oz jars	1 8-oz jar
		CWDTC004	13, 28, 32, 47	2 8-oz jars	1 8-oz jar
0-1' Pile	83	CWDTC005	12, 34, 45, 55	2 8-oz jars	1 8-oz jar
		CWDTC006	14, 19, 25, 32	2 8-oz jars	1 8-oz jar
		CWDTC007	5, 7, 23, 26	2 8-oz jars	1 8-oz jar
		CWDTC008	7, 14, 30, 53	2 8-oz jars	1 8-oz jar
1-2' Pile	77	CWDTC009	23, 25, 27, 53	2 8-oz jars	1 8-oz jar
		CWDTC010	17, 18, 38, 39	2 8-oz jars	1 8-oz jar
		CWDTC011	12, 24, 26, 38	2 8-oz jars	1 8-oz jar
		CWDTC012	7, 9, 14, 42	2 8-oz jars	1 8-oz jar
		CWDTC013	Dup. 7, 9, 14, 42	2 8-oz jars	2 8-oz and 1 4-oz jars
2-3.5' Pile	120	CWDTC014	2, 8, 22, 30	2 8-oz jars	1 8-oz jar
		CWDTC015	10, 13, 25, 39	2 8-oz jars	1 8-oz jar
		CWDTC016	8, 10, 16, 39	2 8-oz jars	1 8-oz jar
		CWDTC017	7, 19, 23, 27	2 8-oz jars	1 8-oz jar
		CWDTC018	8, 14, 23, 33	2 8-oz jars	1 8-oz jar
		CWDTC019	12, 24, 45, 49	2 8-oz jars	1 8-oz jar
		CWDTC020	Dup. 12, 24, 45, 49	2 8-oz jars	2 8-oz and 1 4-oz jars
		EBDTC001	Equipment Blank		
TOTAL	351				

2. ANALYSIS PLAN

The analytical parameters for the chlordane stockpile sampling are presented in Table 2 and described below.

- 1 composite sample will be analyzed per 20 CY of soil for full suite of radionuclides and pesticides/PCBs by an offsite analytical laboratory;
- 1 composite sample will be analyzed per 20 CY of soil for radium-226, cesium-137 and strontium 90 by the onsite analytical laboratory;
- 1 composite sample will be analyzed per 100 CY pile for metals, volatile organic compounds (VOCs) and semi-VOCs by an offsite analytical laboratory.

Each composite sample collected for radionuclide and pesticide/PCBs analyses will be placed in two 8-oz jars. For metals, VOCs, and SVOCs analyses, an additional 8-oz jar will be collected from the 20 CY composite sample and further combined with other 20 CY composite samples from the pile to prepare two 8-oz and one 4-oz glass jars. In addition, the composite sample to be analyzed for Ra-226, Cs-137, and Sr-90 by the onsite laboratory will be placed in a Marinelli beaker and sealed with electric tape.

The offsite laboratory will analyze all samples using the EPA SW-846 methodologies. The onsite laboratory will analyze samples for Ra-226, Cs-137, and Sr-90 using the gamma spectrometer and beta scintillation detector.

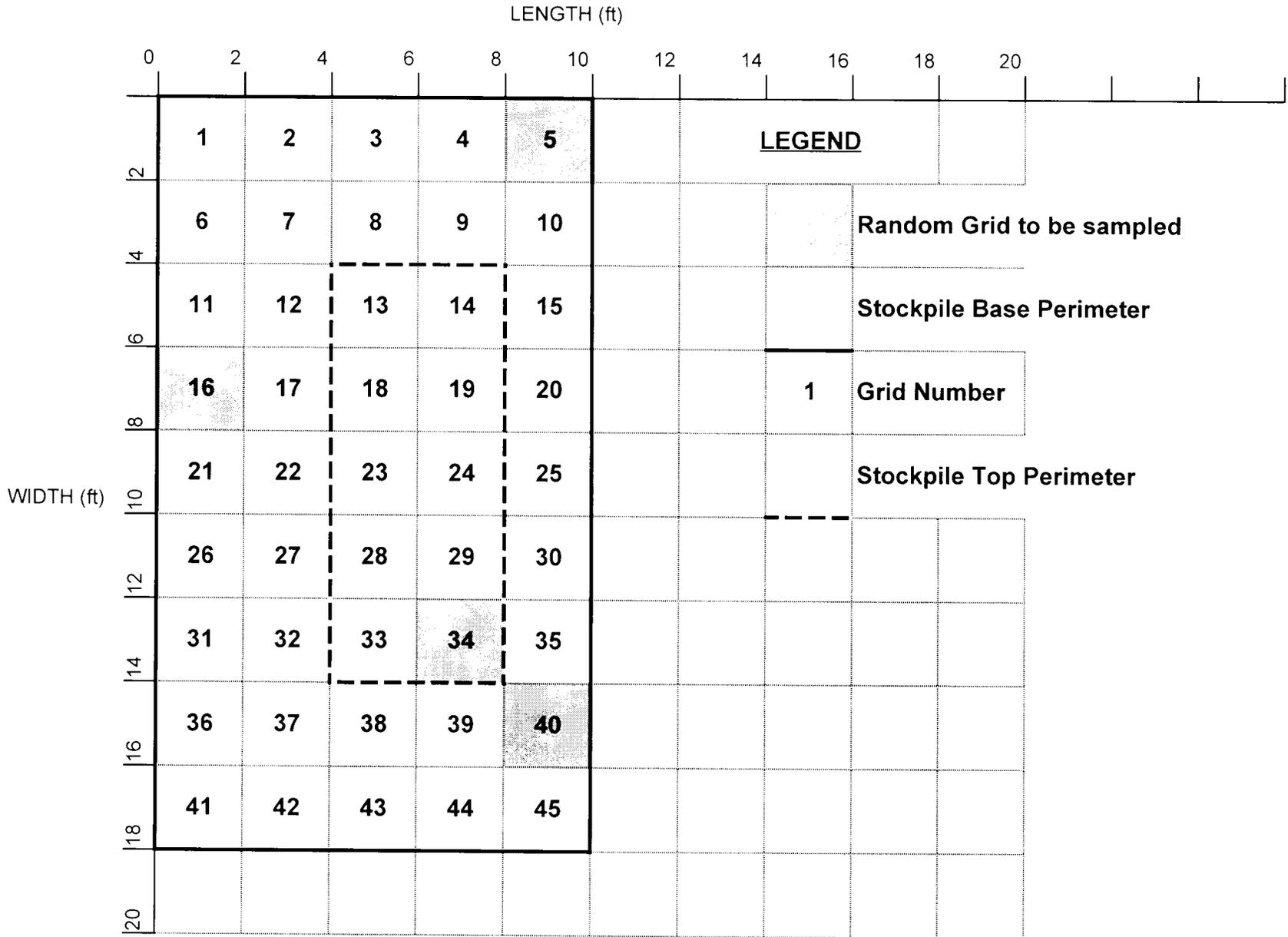
3. QUALITY CONTROL

Duplicate samples will be collected from the composite samples at a rate of 10% and analyzed for pesticides/PCBs, full suite of radionuclides, VOCs, metals, and SVOCs. Two duplicate samples will be collected. In addition, one rinsate blank will be collected and analyzed for pesticides/PCBs, full suite of radionuclides, VOCs, metals, and SVOCs.

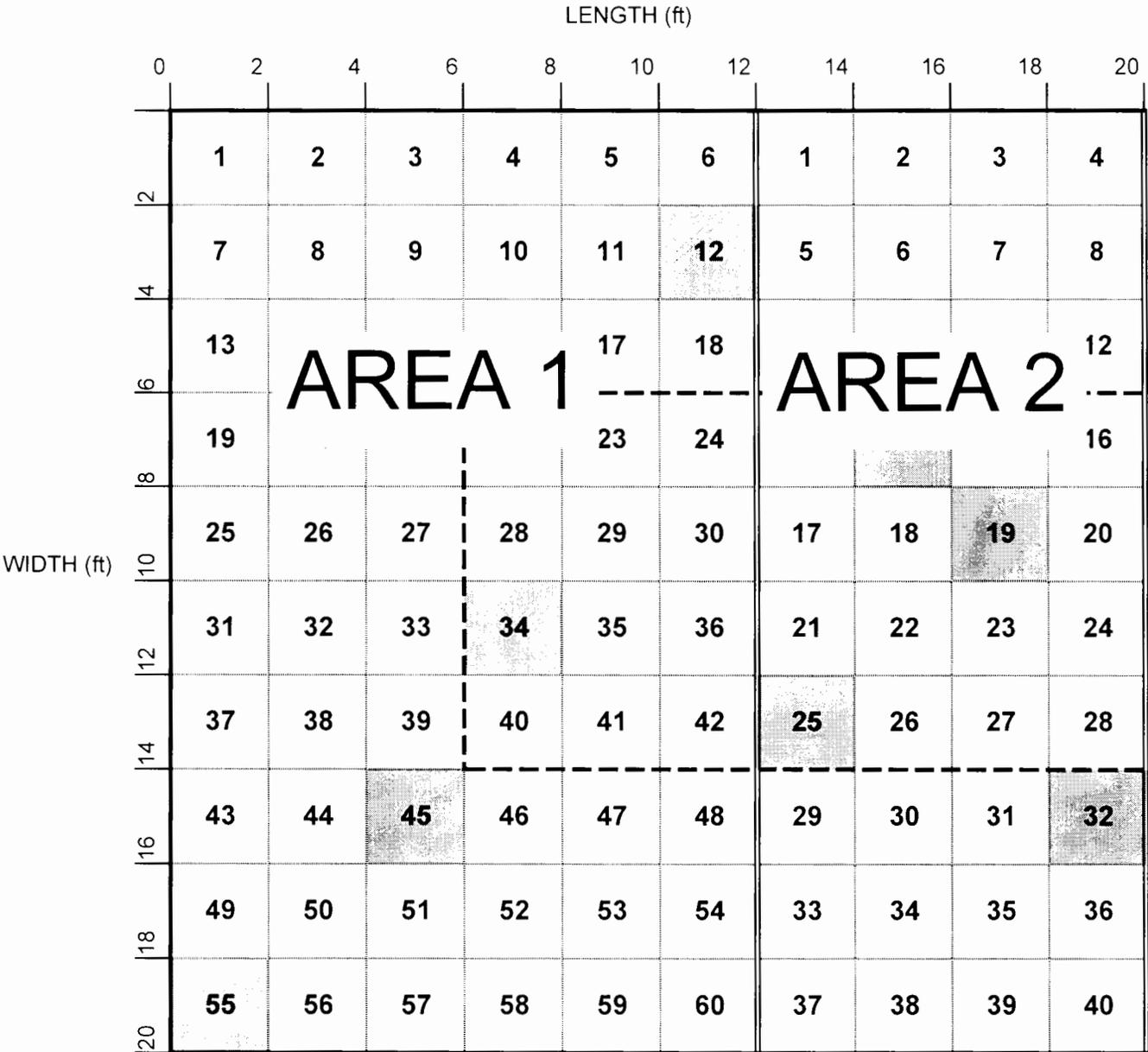
ATTACHMENT 1

STOCKPILE GRID LAYOUT

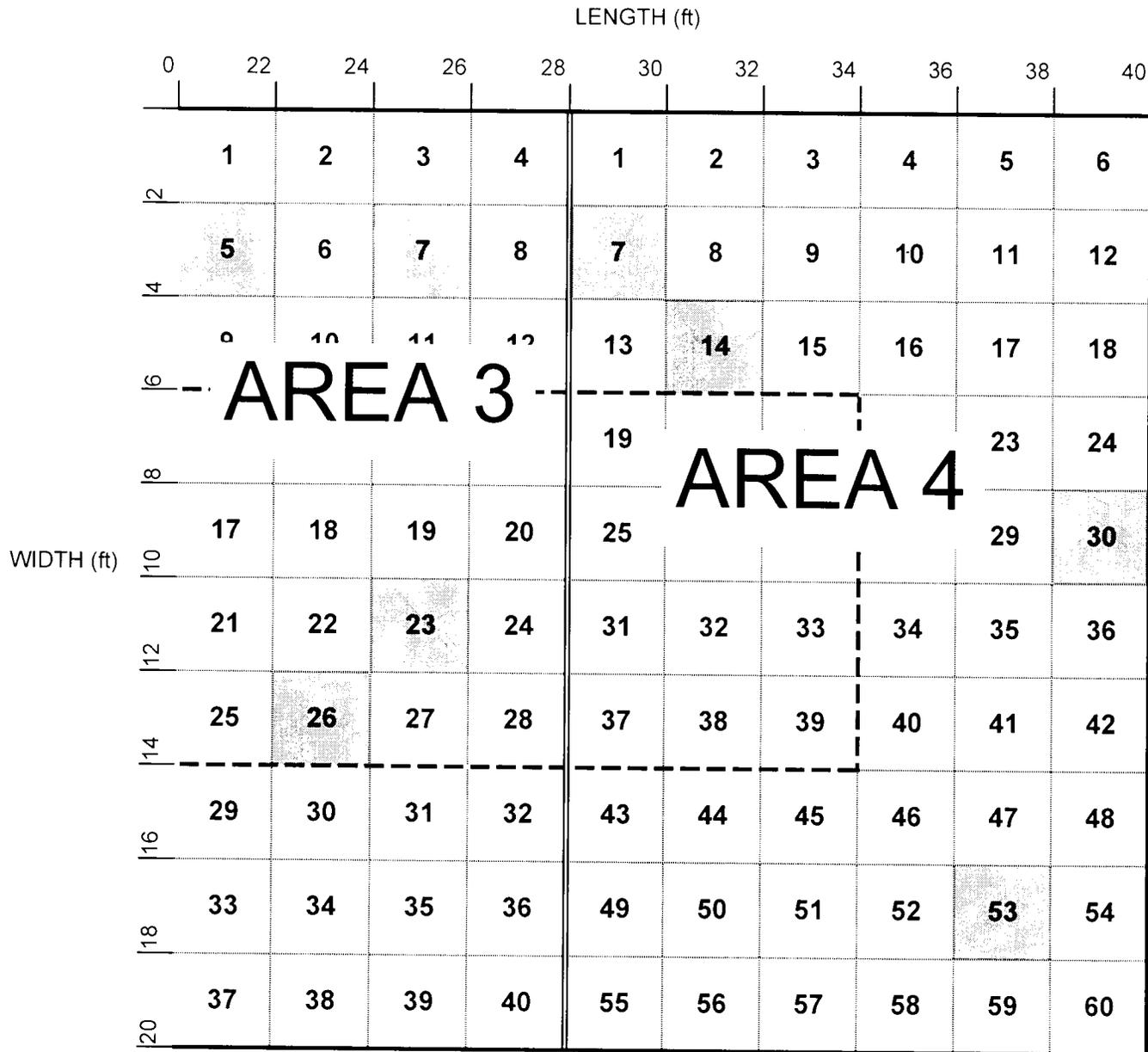
W2S8 Stockpile Grid Sampling



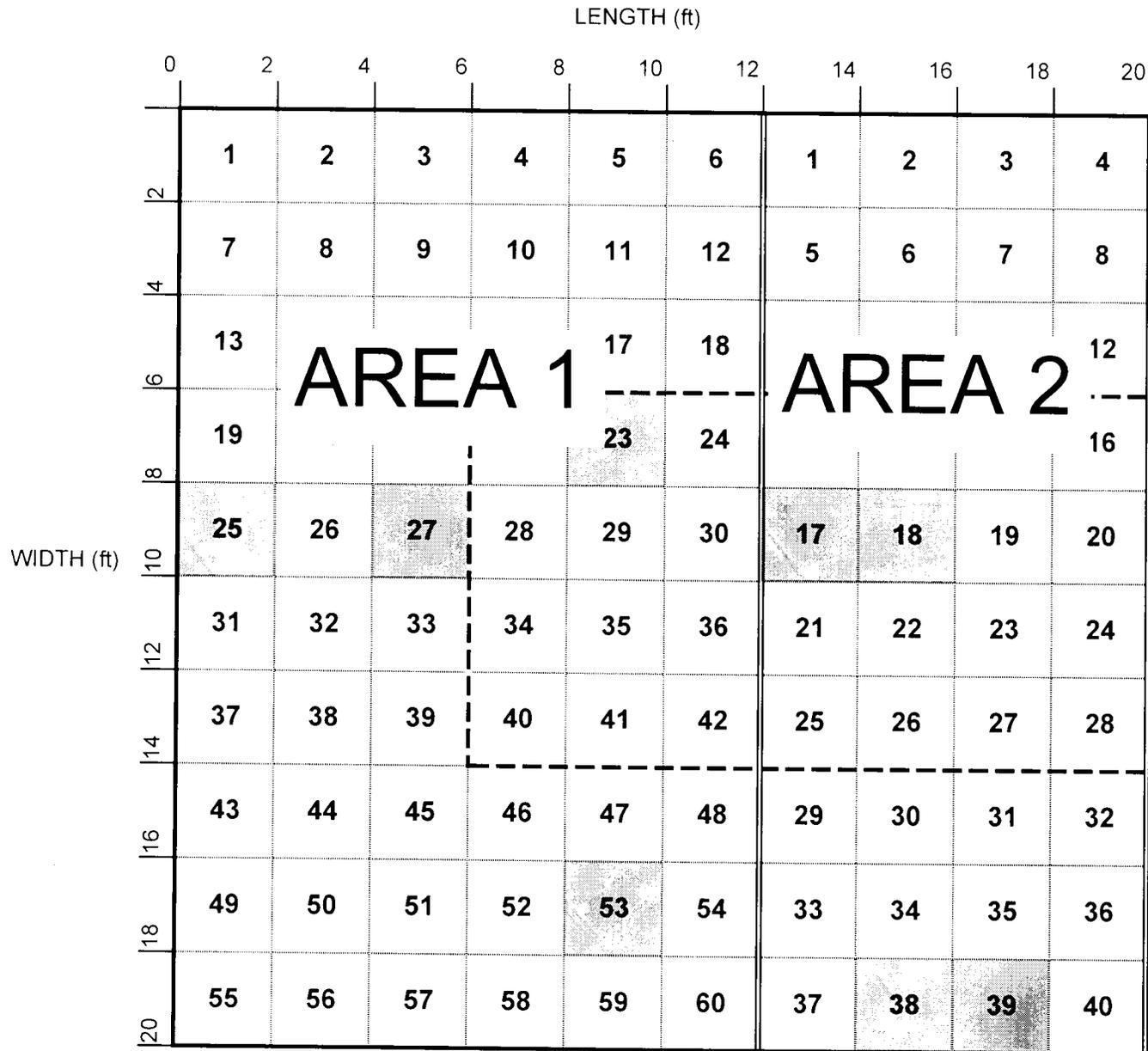
Stockpile 0-1' Depth Grid Sampling



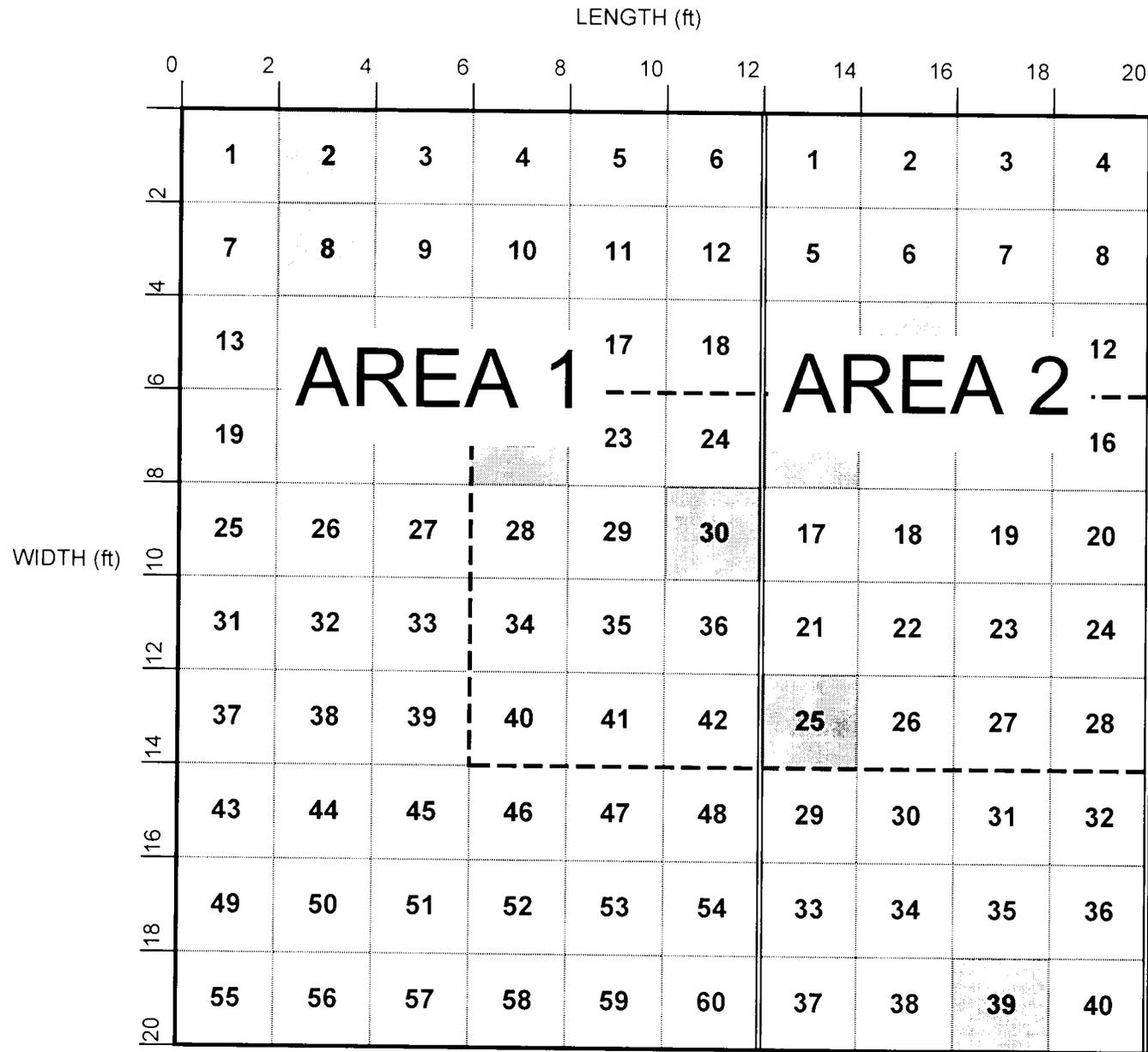
Stockpile 0-1' Depth Grid Sampling



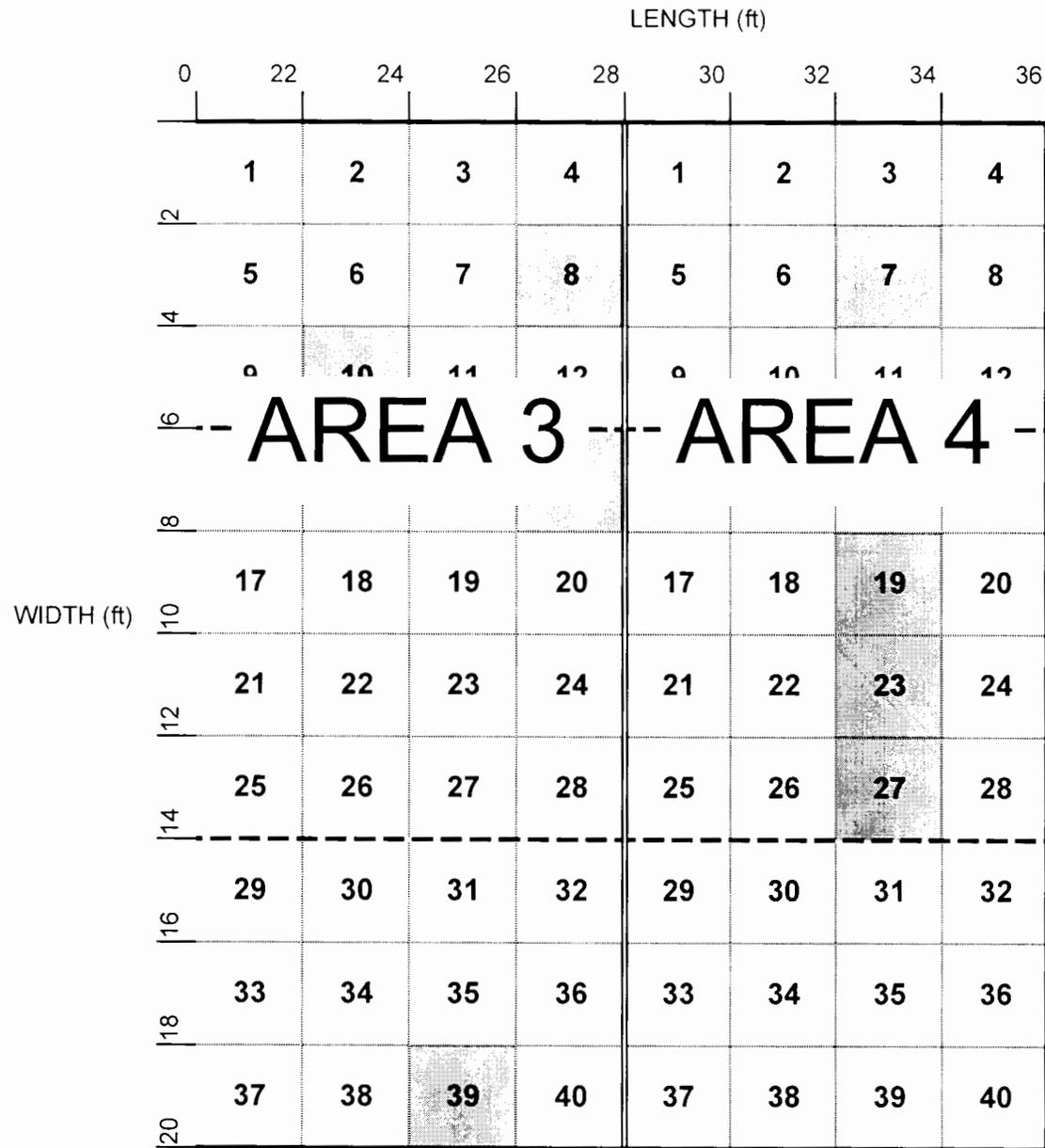
Stockpile 1-2' Depth Grid Sampling



Stockpile 2-3.5' Depth Grid Sampling



Stockpile 2-3.5' Depth Grid Sampling



Stockpile 2-3.5' Depth Grid Sampling

