Final Status Survey Report

Westinghouse Electric Company, LLC
Waltz Mill Facility
Madison, Pennsylvania

Volume 1 of 2

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Table of Contents

Page

Volume 1 of 2

1.0 Introduction 1
- 1.1 Site Description 1
- 1.2 Background 1
- 1.3 Description of Study Areas 2
- 1.4 Soil Remediation Objectives 3
- 1.5 Report Organization 4

2.0 Final Status Survey Design 5
- 2.1 Soil Remediation Criteria 5
  - 2.1.1 DCGL for Soil Remediation 5
  - 2.1.2 Elevated Measurement Criteria - $DCGL_{EMC}$ 7
  - 2.1.3 MARSSIM's Sign Test 7
- 2.2 Soil Sampling 8
- 2.3 Null and Alternative Hypothesis 8
- 2.4 Survey Unit Decisions and Decision Errors 8
- 2.5 Surrogate Radionuclides 9
  - 2.5.1 Determination of the Appropriate Surrogate-Correlated Radionuclide Relationships 10
  - 2.5.2 Scaling Factors for Correlated Radionuclides 11
- 2.6 Method to Determine Sample Collection Density 15
- 2.7 Method for Locating Sample Collection Points 17
- 2.8 Alternate Method for Locating Sample Collection Points 18

3.0 Land Area Classifications 19
- 3.1 Study Area/Survey Unit Classifications 19
- 3.2 Final Status Survey Land Area Classification Changes 20
- 3.3 Scanning Surveys and Effective Land Area Views 21
- 3.4 Final Status Scan Survey Minimum Detectable Concentration 22

4.0 Surveying and Sampling 23
- 4.1 Field Instrumentation 23
- 4.2 Soil Sampling and Associated Radiological Surveys 24
  - 4.2.1 Surface Soil Sampling Technique 25
  - 4.2.2 ABM Sampling Technique 25
- 4.3 Laboratory Analysis 26

5.0 Changes to the Survey Plan 28

6.0 Final Status Survey Results 34
- 6.1 Study Area 1 34
  - 6.1.1 Survey Unit 1 R 34
  - 6.1.2 Survey Unit 1 35
  - 6.1.3 Survey Unit 4 36

Table of Contents
(Continued)

	Page
6.1.4 Survey Unit 5	36
6.1.4.1 Survey Unit 5 – Bottom of Excavation	37
6.1.4.2 Survey Unit 5 – First Lift of ABM	37
6.1.4.3 Survey Unit 5 – Second Lift of ABM	38
6.1.5 Survey Units 7, 8, 9, and 10	38
6.1.5.1 Survey Unit 7	39
6.1.5.2 Survey Unit 8	40
6.1.5.3 Survey Unit 9	41
6.1.5.4 Survey Unit 10	42
6.2 Study Area 2	43
6.2.1 Survey Unit 1	43
6.2.1.1 Survey Unit 1B – Bottom of LWRB	44
6.2.1.2 Survey Unit 1W – Walls of LWRB	44
6.2.1.3 Survey Unit 1 – First Lift of ABM	45
6.2.1.4 Survey Unit 1 – Second Lift of ABM	46
6.2.1.5 Survey Unit 1 – Third Lift of ABM	46
6.2.1.6 Survey Unit 1 – Fourth Lift of ABM	47
6.2.1.7 Survey Unit 1 – Fifth Lift of ABM	48
6.2.1.8 Survey Unit 1 – Sixth Lift of ABM	48
6.2.2 Survey Unit 2	49
6.2.2.1 Survey Unit 2 – Trench Excavation Bottom	49
6.2.2.2 Survey Unit 2 – Trench – 1st Lift of ABM	50
6.2.2.3 Survey Unit 2 – Trench – 2nd Lift of ABM	51
6.2.2.4 Survey Unit 2 – Trench – 3rd Lift of ABM	52
6.2.2.5 Survey Unit 2 – Trench – 4th Lift of ABM	53
6.2.3 Survey Unit 3	53
6.2.3.1 Survey Unit 3 – Excavation Bottom	54
6.2.3.2 Survey Unit 3 – 1st Lift of ABM	54
6.2.3.3 Survey Unit 3 – 2nd Lift of ABM	55
6.2.3.4 Survey Unit 3 – 3rd Lift of ABM	56
6.2.3.5 Survey Unit 3 – 4th Lift of ABM	57
6.2.4 Survey Unit 4	57
6.2.5 Survey Unit 5	58
6.2.6 Survey Unit 6	58
6.2.7 Survey Unit 7	59
6.2.8 Survey Unit 8	60
6.2.9 Survey Unit 11	61
6.2.10 Survey Unit 12	61
6.2.11 Survey Unit 13	62
6.2.12 Bag Farm – North and South	63
6.2.13 ABM West (1), Center, and East	64
6.2.14 ABM North, South, and West (2)	64
6.3 Study Area 3	65
6.3.1 Survey Units 1 and 2	65
6.3.1.1 Survey Units 1 and 2 – Bottom of WTR Basin 1	66
6.3.1.2 Survey Units 1 and 2 – First Lift of ABM	66
6.3.1.3 Survey Units 1 and 2 – Second Lift of ABM	67

Table of Contents
(Continued)

	Page
6.3.1.4 Survey Units 1 and 2 – Third Lift of ABM	68
6.3.1.5 Survey Units 1 and 2 – Fourth Lift of ABM	68
6.3.1.6 Survey Units 1 and 2 – Fifth Lift of ABM	69
6.3.1.7 Survey Unit 1 – Sixth Lift of ABM	70
6.3.1.8 Survey Unit 1 – Seventh Lift of ABM	70
6.3.2 Survey Unit 3	71
6.3.3 Survey Unit 4	72
6.3.4 Survey Unit 5	73
6.3.5 Survey Unit 6	74
6.3.6 Survey Unit 7	74
7.0 Quality Assurance Activities	76
7.1 Introduction	76
7.2 Performance Assessments	76
7.3 Final Status Survey Data Packages	76
7.4 Laboratory Measurements	77
7.4.1 Laboratory Performance Evaluation	77
7.4.2 Laboratory Field Performance Evaluation	78
7.4.3 As-Collected Sample Analysis Bias	79
7.5 Surrogate – Correlated Radionuclide Relationships	80
7.6 Field Measurements	81
8.0 Summary and Conclusions	82
References	86

Tables

Table 6.0 – Final Status Scan Survey Observed Minimum Detectable Concentrations
Table 6.1-1 – Study Area 1B – Survey Unit 1R, Final Status Survey Results
Table 6.1-2 – Study Area 1B – Survey Unit 1, Final Status Survey Results
Table 6.1-3 – Study Area 1B – Survey Unit 4, Final Status Survey Results
Table 6.1-4 – Study Area 1B – Survey Unit 5, Excavation Bottom, Final Status Survey Results
Table 6.1-5 – Study Area 1B – Survey Unit 5, 1st Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.1-6 – Study Area 1B – Survey Unit 5, 2nd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.1-7 – Study Area 1B – Survey Unit 7, Final Status Survey Results
Table 6.1-8 – Study Area 1B – Survey Unit 8, Final Status Survey Results
Table 6.1-9 – Study Area 1A – Survey Unit 9, Final Status Survey Results
Table 6.1-10 – Study Area 1A – Survey Unit 10, Gross Gamma Survey Data
Table 6.1-11 – Study Area 1A – Survey Unit 10, Final Status Survey Results
Table 6.2-1 – Study Area 2 – Survey Unit 1B, Bottom of LWRB Excavation, Final Status Survey Results

Table of Contents
(Continued)

Table 6.2-2 – Study Area 2 – Survey Unit 1W, LWRB Excavation Walls, Final Status Survey Results
Table 6.2-3 – Study Area 2 – Survey Unit 1, 1st Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-4 – Study Area 2 – Survey Unit 1, 2nd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-5 – Study Area 2 – Survey Unit 1, 3rd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-6 – Study Area 2 – Survey Unit 1, 4th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-7 – Study Area 2 – Survey Unit 1, 5th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-8 – Study Area 2 – Survey Unit 1, 6th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-9 – Study Area 2 – Survey Unit 2 "Trench and Non-Trench", Bottom of Excavation, Final Status Survey Results
Table 6.2-10 – Study Area 2 – Survey Unit 2 "Trench", 1st Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-11 – Study Area 2 – Survey Unit 2 "Trench", 2nd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-12 – Study Area 2 – Survey Unit 2 "Trench", 3rd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-13 – Study Area 2 – Survey Unit 2 "Trench and Non-Trench", 4th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-14 – Study Area 2 – Survey Unit 3, WTR Basins 2 and 3 Excavation Bottom, Final Status Survey Results
Table 6.2-15 – Study Area 2 – Survey Unit 3, 1st Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-16 – Study Area 2 – Survey Unit 3, 2nd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-17 – Study Area 2 – Survey Unit 3, 3rd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-18 – Study Area 2 – Survey Unit 3, 4th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.2-19 – Study Area 2 – Survey Unit 4, Final Status Survey Results
Table 6.2-20 – Study Area 2 – Survey Unit 5, Final Status Survey Results
Table 6.2-21 – Study Area 2 – Survey Unit 6, Final Status Survey Results
Table 6.2-22 – Study Area 2 – survey Unit 7, Final Status Survey Results
Table 6.2-23 – Study Area 2 – Survey Unit 8, Final Status Survey Results
Table 6.2-24 – Study Area 2 - Survey Unit 11, Final Status Survey Results
Table 6.2-25 – Study Area 2 – Survey Unit 12, Final Status Survey Results
Table 6.2-26 – Study Area 2 – Survey Unit 13, Elevated Measurement Comparison
Table 6.2-27 – Study Area 2 – Survey Unit 13, Final Status Survey Results
Table 6.2-28 – Study Area 2 – Bag Farm North, Final Status Survey Results
Table 6.2-29 – Study Area 2 – Bag Farm South, Final Status Survey Results
Table 6.2-30 – Study Area 2 – ABM West (1), Final Status Survey Results
Table 6.2-31 – Study Area 2 – ABM Center, Final Status Survey Results

Table of Contents
(Continued)

Table 6.2-32 – Study Area 2 – ABM East, Final Status Survey Results
Table 6.2-33 – Study Area 2 – ABM North, Final Status Survey Results
Table 6.2-34 – Study Area 2 – ABM South, Final Status Survey Results
Table 6.2-35 – Study Area 2 – ABM West (2), Final Status Survey Results
Table 6.3-1 – Study Area 3B – Survey Unit 1, WTR Basin 1 Excavation Bottom, Final Status Survey Results
Table 6.3-2 – Study Area 3B – Survey Unit 2, WTR Basin 1 Excavation Bottom, Final Status Survey Results
Table 6.3-3 – Study Area 3B – Survey Unit 1, 1st Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-4 – Study Area 3B – Survey Unit 2, 1st Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-5 – Study Area 3B – Survey Unit 1, 2nd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-6 – Study Area 3B – Survey Unit 2, 2nd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-7 – Study Area 3B – Survey Unit 1, 3rd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-8 – Study Area 3B – Survey Unit 2, 3rd Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-9 – Study Area 3B – Survey Unit 1, 4th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-10 – Study Area 3B – Survey Unit 2, 4th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-11 – Study Area 3B – Survey Unit 1, 5th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-12 – Study Area 3B – Survey Unit 2, 5th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-13 – Study Area 3B – Survey Unit 1, 6th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-14 – Study Area 3B – Survey Unit 1, 7th Lift of Acceptable Backfill Material, Final Status Survey Results
Table 6.3-15 – Study Area 3B – Survey Unit 3, Final Status Survey Results
Table 6.3-16 – Study Area 3B – Survey Unit 4, Final Status Survey Results
Table 6.3-17 – Study Area 3A – Survey Unit 5, Final Status Survey Results
Table 6.3-18 – Study Area 3B – Survey Unit 6, (Former ABM Soil Stockpile Area), Final Status Survey Results
Table 6.3-19 – Study Area 3B – Survey Unit 7, Final Status Survey Results
Table 7.4-1 – Quality Control Data, Background Soil Samples
Table 7.4-2 – Quality Control Data, Spike Samples
Table 7.4-3 – Quality Control Data, Soil Replicates
Table 7.5 – Observed Surrogate Radionuclide Scaling Functions (SFs)
Table 8-1 – Summary of Final Status Survey ($DCGL_T$) Results for Waltz Mill Site Study Areas 1, 2, and 3

Table of Contents
(Continued)

Figures

Figure 1.2-1 – Location of Study Area (Dwg 5018235)
Figure 5-1 – Study Area 1, Planned Survey Unit Boundaries (Dwg 5018090)
Figure 5-2 – Study Area 1, Actual Survey Unit Boundaries (Dwg 5018027)
Figure 5-3 – Study Area 2, Planned Survey Unit Boundaries (Dwg 5018030)
Figure 5-4 – Study Area 2, Actual Survey Unit Boundaries (Dwg 5018057)
Figure 5-5 – Study Area 3, Planned Survey Unit Boundaries (Dwg 5018023)
Figure 5-6 – Study Area 3, Actual Survey Unit Boundaries (Dwg 5018059)
Figure 6.1-1 – Study Area 1B – Survey Unit 1R, Gross Gamma Scanning Grids (Dwg 5018S113)
Figure 6.1-2 – Study Area 1 – Survey Unit 1R, Average Gamma Scan Isopleths (kcpm)
Figure 6.1-3 – Study Area 1 – Survey Unit 1R, Background Isopleths (kcpm)
Figure 6.1-4 – Study Area 1B – Survey Unit 1R, Final Status Survey Sampling Locations (Dwg 5018112)
Figure 6.1-5 – Study Area 1B – Survey Unit 1, Gross Gamma Scanning Grids (Dwg 5018S48A)
Figure 6.1-6 – Study Area 1B – Survey Unit 1, Average Gamma Scan Isopleths (kcpm)
Figure 6.1-7 – Study Area 1B – Survey Unit 1, Background Isopleths (kcpm)
Figure 6.1-8 – Study Area 1B – Survey Unit 1, Final Status Survey Sampling Locations (Dwg 5018114)
Figure 6.1-9 – Study Area 1B – Survey Unit 4, Gross Gamma Scanning Grids (Dwg 5018S49)
Figure 6.1-10 – Study Area 1B – Survey Unit 4, Average and Background Isopleths (kcpm)
Figure 6.1-11 – Study Area 1B – Survey Unit 4, Final Status Survey Sampling Locations (Dwg 5018077)
Figure 6.1-12 – Study Area 1B – Survey Unit 5, Excavation Bottom, Gross Gamma Scanning Grids (Dwg 5018S50A)
Figure 6.1-13 – Study Area 1 – Survey Unit 5 – Excavation Bottom, Average and Background Isopleths (kcpm and cpm)
Figure 6.1-14 – Study Area 1B – Survey Unit 5, Excavation Bottom, Final Status Survey Sampling Locations (Dwg 5018080)
Figure 6.1-15 – Study Area 1B – Survey Unit 5, 1st Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S51A)
Figure 6.1-16 – Study Area 1B – Survey Unit 5 – 1st Lift of ABM, Average and Background Isopleths (kcpm and cpm)
Figure 6.1-17 – Study Area 1B – Survey Unit 5, 1st Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018079)
Figure 6.1-18 – Study Area 1B – Survey Unit 5, 2nd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S52A)
Figure 6.1-19 – Study Area 1B – Survey Unit 5 – 2nd Lift of ABM, Average and Background Isopleths (kcpm and cpm)
Figure 6.1-20 – Study Area 1B – Survey Unit 5, 2nd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018078)
Figure 6.1-21 – Study Area 1B – Survey Unit 7, 1995 Gross Gamma Survey Data, Total Spectrum Isopleths (counts per 10 seconds)
Figure 6.1-22 – Study Area 1B – Survey Unit 7, 1995 Gross Gamma Survey Data, Cesium Isopleths (counts per 10 seconds)
Figure 6.1-23 – Study Area 1B – Survey Unit 7, 1995 Gross Gamma Survey Data, Uranium Isopleths (counts per 10 seconds)

Table of Contents
(Continued)

Figure 6.1-24 – Study Area 1B – Survey Unit 7, 1995 Gross Gamma Survey Data, Cobalt Isopleths (counts per 10 seconds)
Figure 6.1-25 – Study Area 1, Location of Gravel Area (Dwg 5018116)
Figure 6.1-26 – Study Area 1B – Survey Unit 7, Gross Gamma Scanning Grids (Dwg 5018S55A)
Figure 6.1-27 – Study Area 1B – Survey Unit 7, Average Gamma Scan Isopleths (kcpm)
Figure 6.1-28 – Study Area 1B – Survey Unit 7, Background Isopleths (kcpm)
Figure 6.1-29 – Study Area 1B – Survey Unit 7, Final Status Survey Sampling Locations (Dwg 5018120)
Figure 6.1-30 – Study Area 1B – Survey Unit 8, 1995 Gross Gamma Survey Data, Total Spectrum Isopleths (counts per 10 seconds)
Figure 6.1-31 – Study Area 1B – Survey Unit 8, 1995 Gross Gamma Survey Data, Cesium Isopleths (counts per 10 seconds)
Figure 6.1-32 – Study Area 1B – Survey Unit 8, 1995 Gross Gamma Survey Data, Uranium Isopleths (counts per 10 seconds)
Figure 6.1-33 – Study Area 1B – Survey Unit 8, 1995 Gross Gamma Survey Data, Cobalt Isopleths (counts per 10 seconds)
Figure 6.1-34 – Study Area 1B – Survey Unit 8, Final Status Survey Sampling Locations (Dwg 5018117)
Figure 6.1-35 – Study Area 1A – Survey Unit 9, 1995 Gross Gamma Survey Data, Total Spectrum Isopleths (counts per 10 seconds)
Figure 6.1-36 – Study Area 1A – Survey Unit 9, 1995 Gross Gamma Survey Data, Cesium Isopleths (counts per 10 seconds)
Figure 6.1-37 – Study Area 1A – Survey Unit 9, 1995 Gross Gamma Survey Data, Uranium Isopleths (counts per 10 seconds)
Figure 6.1-38 – Study Area 1A – Survey Unit 9, 1995 Gross Gamma Survey Data, Cobalt Isopleths (counts per 10 seconds)
Figure 6.1-39 – Study Area 1A – Survey Unit 9, Gross Gamma Scanning Grids (Dwg 5018S53A)
Figure 6.1-40 – Study Area 1A – Survey Unit 9, Average Gamma Scan Isopleths (kcpm)
Figure 6.1-41 – Study Area 1A – Survey Unit 9, Background Isopleths (kcpm)
Figure 6.1-42 – Study Area 1A – Survey Unit 9, Final Status Survey Sampling Locations (Dwg 5018119)
Figure 6.1-43 – Study Area 1A – Survey Unit 10, 1995 Gross Gamma Survey Data, Total Spectrum Isopleths (counts per 10 seconds)
Figure 6.1-44 – Study Area 1A – Survey Unit 10, 1995 Gross Gamma Survey Data, Cesium Isopleths (counts per 10 seconds)
Figure 6.1-45 – Study Area 1A – Survey Unit 10, 1995 Gross Gamma Survey Data, Uranium Isopleths (counts per 10 seconds)
Figure 6.1-46 – Study Area 1A – Survey Unit 10, 1995 Gross Gamma Survey Data, Cobalt Isopleths (counts per 10 seconds)
Figure 6.1-47 – Study Area 1A – Survey Unit 10, Gross Gamma Scanning Grids (Dwg 5018S54)
Figure 6.1-48 – Study Area 1A – Survey Unit 10, Gross Gamma Survey
Figure 6.1-49 – Study Area 1A – Survey Unit 10, Final Status Survey Sampling Locations (Dwg 5018118)
Figure 6.2-1 – Study Area 2 – Survey Unit 1B, LWRB Excavation Bottom, Gross Gamma Scanning Grids (Dwg 5018S19A)
Figure 6.2-2 – Study Area 2 – Survey Unit 1 – Bottom, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-3 – Study Area 2 – Survey Unit 1 – Bottom, Background Isopleths (cpm)

Table of Contents
(Continued)

Figure 6.2-4 – Study Area 2 – Survey Unit 1B, LWRB Excavation Bottom, Final Status Survey Sampling Locations (Dwg 5018073)
Figure 6.2-5 – Study Area 2 – Survey Unit 1W, LWRB Excavation Walls, Gross Gamma Scanning Grids (Dwg 5018S20A)
Figure 6.2-6 – Study Area 2 – Survey Unit 1 (LWRB) North Wall, Average and Background Gamma Isopleths (kcpm)
Figure 6.2-7 – Study Area 2 – Survey Unit 1 (LWRB) South Wall, Average and Background Gamma Isopleths (kcpm)
Figure 6.2-8 – Study Area 2 – Survey Unit 1 (LWRB) East Wall, Average and Background Gamma Isopleths (kcpm)
Figure 6.2-9 – Study Area 2 – Survey Unit 1 (LWRB) West Wall, Average and Background Gamma Isopleths (kcpm)
Figure 6.2-10 – Study Area 2 – Survey Unit 1W, LWRB Excavation Walls, Final Status Survey Sampling Locations (Dwg 5018066)
Figure 6.2-11 – Study Area 2 – Survey Unit 1, 1st Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S13)
Figure 6.2-12 – Study Area 2 – Survey Unit 1 – 1st Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-13 – Study Area 2 – Survey Unit 1, 1st Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018067)
Figure 6.2-14 – Study Area 2 – Survey Unit 1, 2nd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S14A)
Figure 6.2-15 – Study Area 2 – Survey Unit 1 – 2nd Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-16 – Study Area 2 – Survey Unit 1 – 2nd Lift of ABM, Background Isopleths (cpm)
Figure 6.2-17 – Study Area 2 – Survey Unit 1, 2nd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018068)
Figure 6.2-18 – Study Area 2 – Survey Unit 1, 3rd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S15A)
Figure 6.2-19 – Study Area 2 – Survey Unit 1 – 3rd Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-20 – Study Area 2 – Survey Unit 1 – 3rd Lift of ABM, Background Isopleths (cpm)
Figure 6.2-21 – Study Area 2 – Survey Unit, 3rd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018069)
Figure 6.2-22 – Study Area 2 – Survey Unit 1 – 4th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S16A)
Figure 6.2-23 – Study Area 2 – Survey Unit 1 – 4th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-24 – Study Area 2 – Survey Unit 1 – 4th Lift of ABM, Background Isopleths (cpm)
Figure 6.2-25 – Study Area 2 – Survey Unit 1, 4th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 501870)
Figure 6.2-26 – Study Area 2 – Survey Unit 1, 5th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S17A)
Figure 6.2-27 – Study Area 2 – Survey Unit 1 – 5th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-28 – Study Area 2 – Survey Unit 1 – 5th Lift of ABM, Background Isopleths (cpm)

Table of Contents
(Continued)

Figure 6.2-29 – Study Area 2 – Survey Unit 1, 5th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018071)
Figure 6.2-30 – Study Area 2 – Survey Unit 1, 6th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S18A)
Figure 6.2-31 – Study Area 2 – Survey Unit 1 – 6th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-32 – Study Area 2 – Survey Unit 1 – 6th Lift of ABM, Background Isopleths (cpm)
Figure 6.2-33 – Study Area 2 – Survey Unit 1, 6th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018072)
Figure 6.2-34 – Study Area 2 – Survey Unit 2, Bottom of Trench Excavation, Gross Gamma Scanning Grids (Dwg 5018S21A)
Figure 6.2-35 – Study Area 2 – Survey Unit 2 – Trench Excavation Bottom, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-36 – Study Area 2 – Survey Unit 2, Bottom of Trench Excavation, Final Status Survey Sampling Locations (Dwg 5018091)
Figure 6.2-37 – Study Area 2 – Survey Unit 2, 1st Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids, (Dwg 5018S22A)
Figure 6.2-38 – Study Area 2 – Survey Unit 2 – 1st Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-39 – Study Area 2 – Survey Unit 2, 1st Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018092)
Figure 6.2-40 – Study Area 2 – Survey Unit 2, 2nd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S23A)
Figure 6.2-41 – Study Area 2 – Survey Unit 2 – 2nd Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-42 – Study Area 2 – Survey Unit 2 – 2nd Lift of ABM, Background Isopleths (cpm)
Figure 6.2-43 – Study Area 2 – Survey Unit 2, 2nd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018093)
Figure 6.2-44 – Study Area 2 – Survey Unit 2, 3rd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg (5018S24A)
Figure 6.2-45 – Study Area 2 – Survey Unit 2 – 3rd Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-46 – Study Area 2 – Survey Unit 2 – 3rd Lift of ABM, Background Isopleths (cpm)
Figure 6.2-47 – Study Area 2 – Survey Unit 2, 3rd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018094)
Figure 6.2-48 – Study Area 2 – Survey Unit 2, 4th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S25A)
Figure 6.2-49 – Study Area 2 – Survey Unit 2 – 4th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-50 – Study Area 2 – Survey Unit 2 – 4th Lift of ABM, Background Isopleths (cpm)
Figure 6.2-51 – Study Area 2 – Survey Unit 2, 4th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018095)
Figure 6.2-52 – Study Area 2 – Survey Unit 3, WTR Basins 2 and 3 – Excavation Bottom, Gross Gamma Scanning Grids (Dwg 5018S26A)
Figure 6.2-53 – Study Area 2 – Survey Unit 3 – Bottom, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-54 – Study Area 2 – Survey Unit 3 – Bottom, Background Isopleths (cpm)

Table of Contents
(Continued)

Figure 6.2-55 – Study Area 2 – Survey Unit 3, WTR Basins 2 & 3 Excavation Bottom, Final Status Survey Sampling Locations (Dwg 5018061)
Figure 6.2-56 – Study Area 2 – Survey Unit 3, 1st Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S27A)
Figure 6.2-57 – Study Area 2 – Survey Unit 3 – 1st Lift ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-58 – Study Area 2 – Survey Unit 3 – 1st Lift of ABM, Background Isopleths (cpm)
Figure 6.2-59 – Study Area 2 – Survey Unit 3, 1st Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018062)
Figure 6.2-60 – Study Area 2 – Survey Unit 3, 2nd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S28A)
Figure 6.2-61 – Study Area 2 – Survey Unit 3 – 2nd Lift ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-62 – Study Area 2 – Survey Unit 3 – 2nd Lift of ABM, Background Isopleths (cpm)
Figure 6.2-63 – Study Area 2 – Survey Unit 3, 2nd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018063)
Figure 6.2-64 – Study Area 2 – Survey Unit 3, 3rd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S29A)
Figure 6.2-65 – Study Area 2 – Survey Unit 3 – 3rd Lift ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-66 – Study Area 2 – Survey Unit 3 – 3rd Lift of ABM, Background Isopleths (cpm)
Figure 6.2-67 – Study Area 2 – Survey Unit 3, 3rd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018064)
Figure 6.2-68 – Study Area 2 – Survey Unit 3, 4th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S30A)
Figure 6.2-69 – Study Area 2 – Survey Unit 3 – 4th Lift ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-70 – Study Area 2 – Survey Unit 3 – 4th Lift of ABM, Background Isopleths (cpm)
Figure 6.2-71 – Study Area 2 – Survey Unit 3, 4th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018065)
Figure 6.2-72 – Study Area 2 – Survey Unit 4, Gross Gamma Scanning Grids (Dwg 5018S31A)
Figure 6.2-73 – Study Area 2 – Survey Unit 4, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-74 – Study Area 2 – Survey Unit 4, Background Isopleths (kcpm)
Figure 6.2-75 – Study Area 2 – Survey Unit 4, Final Status Survey Sampling Locations (Dwg 5018096)
Figure 6.2-76 – Study Area 2 – Survey Unit 5, Gross Gamma Scanning Grids (Dwg 5018S32A)
Figure 6.2-77 – Study Area 2 – Survey Unit 5, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-78 – Study Area 2 – Survey Unit 5, Background Isopleths (kcpm)
Figure 6.2-79 – Study Area 2 – Survey Unit 5, Final Status Survey Sampling Locations (Dwg 5018097)
Figure 6.2-80 – Study Area 2 – Survey Unit 6, Gross Gamma Scanning Grids (Dwg 5018S33A)
Figure 6.2-81 – Study Area 2 – Survey Unit 6, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-82 – Study Area 2 – Survey Unit 6, Background Isopleths (cpm)
Figure 6.2-83 – Study Area 2 – Survey Unit 6, Final Status Survey Sampling Locations (Dwg 5018098)
Figure 6.2-84 – Study Area 2 – Survey Unit 7, Gross Gamma Scanning Grids (Dwg 5018S34A)
Figure 6.2-85 – Study Area 2 – Survey Unit 7, Average Gamma Scan Isopleths (kcpm)

Table of Contents
(Continued)

Figure 6.2-86 – Study Area 2 – Survey Unit 7, Background Isopleths (kcpm)
Figure 6.2-87 – Study Area 2 – Survey Unit 7, Final Status Survey Sampling Locations (Dwg 5018099)
Figure 6.2-88 – Study Area 2 – Survey Unit 8, Gross Gamma Scanning Grids (Dwg 5018S36A)
Figure 6.2-89 – Study Area 2 – Survey Unit 8, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-90 – Study Area 2 – Survey Unit 8, Background Isopleths (kcpm)
Figure 6.2-91 – Study Area 2 – Survey Unit 8, Final Status Survey Sampling Locations (Dwg 5018101)
Figure 6.2-92 – Study Area 2 – Survey Unit 11, Gross Gamma Scanning Grids (Dwg 5018S35A)
Figure 6.2-93 – Study Area 2 – Survey Unit 11, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-94 – Study Area 2 – Survey Unit 11, Background Isopleths (kcpm)
Figure 6.2-95 – Study Area 2 – Survey Unit 11, Final Status Survey Sampling Locations (Dwg 5018100)
Figure 6.2-96 – Study Area 2 – Survey Unit 12, Gross Gamma Scanning Grids (Dwg 5018S37A)
Figure 6.2-97 – Study Area 2 – Survey Unit 12, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-98 – Study Area 2 – Survey Unit 12, Background Isopleths (cpm)
Figure 6.2-99 – Study Area 2 – Survey Unit 12, Final Status Survey Sampling Locations (Dwg 5018045)
Figure 6.2-100 – Study Area 2 – Survey Unit 13, Gross Gamma Scanning Grids (Dwg 5018S40A)
Figure 6.2-101 – Study Area 2 – Survey Unit 13, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-102 – Study Area 2 – Survey Unit 13, Background Isopleths (cpm)
Figure 6.2-103 – Study Area 2 – Survey Unit 13, Final Status Survey Sampling Locations (Dwg 5018102)
Figure 6.2-104 – Study Area 2, Location of Bag Farm North and South (Dwg 5018103)
Figure 6.2-105 – Study Area 2, Bag Farm North and South, Gross Gamma Scanning Grids (Dwg 5018S41A)
Figure 6.2-106 – Study Area 2 – Bag Farm North and South, Average Gamma Scan Isopleths (kcpm)
Figure 6.2-107 – Study Area 2 – Bag Farm North and South, Background Isopleths (cpm)
Figure 6.2-108 – Study Area 2 – Bag Farm North and South, Final Status Survey Sampling Locations (Dwg 5018104)
Figure 6.2-109 – Study Area 2, Location of ABM-West (1), Center, and East (Dwg 5018105)
Figure 6.2-110 – Study Area 2 – ABM West (1), Gross Gamma Scanning Grids (Dwg 5018S42A)
Figure 6.2-111 – Study Area 2 – ABM Center, Gross Gamma Scanning Grids (Dwg 5018S43A)
Figure 6.2-112 – Study Area 2 – ABM East, Gross Gamma Scanning Grids (Dwg 5018S44A)
Figure 6.2-113 – Study Area 2 – ABM West (1), Average and Background Isopleths (kcpm)
Figure 6.2-114 – Study Area 2 – ABM Center, Average and Background Isopleths (kcpm)
Figure 6.2-115 – Study Area 2 – ABM East, Average and Background Isopleths (kcpm)
Figure 6.2-116 – Study Area 2 – ABM West (1), Final Status Survey Sampling Locations (Dwg 5018106)
Figure 6.2-117 – Study Area 2 – ABM Center, Final Status Survey Sampling Locations (Dwg 5018107)
Figure 6.2-118 – Study Area 2 – ABM East, Final Status Survey Sampling Locations (Dwg 5018108)
Figure 6.2-119 – Study Area 2, Location of ABM-North, South, and West (2) (Dwg 5018109)

Table of Contents
(Continued)

Figure 6.2-120 – Study Area 2-ABM North, Gross Gamma Scanning Grids (Dwg 5018S45A)
Figure 6.2-121 – Study Area 2-ABM South, Gross Gamma Scanning Grids (Dwg 5018S46A)
Figure 6.2-122 – Study Area 2-ABM West (2), Gross Gamma Scanning Grids (Dwg 5018S47A)
Figure 6.2-123 – Study Area2 – ABM North, Average and Background Isopleths (kcpm)
Figure 6.2-124 – Study Area 2 – ABM South, Average and Background Isopleths (kcpm)
Figure 6.2-125 – Study Area 2 – ABM West (2), Average and Background Isopleths (kcpm)
Figure 6.2-126 – Study Area 2-ABM North, Final Status Survey Sampling Locations (Dwg 5018110)
Figure 6.2-127 – Study Area 2-ABM South, Final Status Survey Sampling Locations (Dwg 5018115)
Figure 6.2-128 – Study Area 2-ABM West (2), Final Status Survey Sampling Locations (Dwg 5018111)
Figure 6.3-1 – Study Area 3B – Survey Units 1 and 2, WTR Basin 1 Excavation Bottom, Gross Gamma Scanning Grids (Dwg 5018S01A)
Figure 6.3-2 – WTR Basin 1 Bottom, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-3 – WTR Basin 1 Bottom, Background Isopleths (cpm)
Figure 6.3-4 – Study Area 3B – Survey Units 1 and 2, WTR Basin 1 Excavation Bottom, Final Status Survey Sampling Locations (Dwg 5018037)
Figure 6.3-5 – Study Area 3B – Survey Units 1 and 2, 1st Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S02A)
Figure 6.3-6 – WTR Basin 1 – 1st Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-7 – WTR Basin 1 – 1st Lift of ABM, Background Isopleths (cpm)
Figure 6.3-8 – Study Area 3B – Survey Units 1 and 2, 1st Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018038)
Figure 6.3-9 – Study Area 3B – Survey Units 1 and 2, 2nd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S03A)
Figure 6.3-10 – WTR Basin 1 – 2nd Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-11 – WTR Basin 1 – 2nd Lift of ABM, Background Isopleths (cpm)
Figure 6.3-12 – Study Area 3B – Survey Units 1 and 2, 2nd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018039)
Figure 6.3-13 – Study Area 3B – Survey Units 1 and 2, 3rd Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S04A)
Figure 6.3-14 – WTR Basin 1 – 3rd Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-15 – WTR Basin 1 – 3rd Lift of ABM, Background Isopleths (cpm)
Figure 6.3-16 – Study Area 3B – Survey Units 1 and 2, 3rd Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018040)
Figure 6.3-17 – Study Area 3B – Survey Units 1 and 2, 4th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S05A)
Figure 6.3-18 – WTR Basin 1 – 4th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-19 – WTR Basin 1 – 4th Lift of ABM, Background Isopleths (cpm)
Figure 6.3-20 – Study Area 3B – Survey Units 1 and 2, 4th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018041)
Figure 6.3-21– Study Area 3B – Survey Units 1 and 2, 5th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S06A)
Figure 6.3-22 – WTR Basin 1 – 5th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-23 – WTR Basin 1 – 5th Lift of ABM, Background Isopleths (cpm)

Table of Contents
(Continued)

Figure 6.3-24 – Study Area 3B – Survey Units 1 and 2, 5th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018042)
Figure 6.3-25 – Study Area 3B – Survey Unit 1, 6th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S07A)
Figure 6.3-26 – WTR Basin 1 – 6th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-27 – WTR Basin 1 – 6th Lift of ABM, Background Isopleths (cpm)
Figure 6.3-28 – Study Area 3B – Survey Unit 1, 6th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018043)
Figure 6.3-29 – Study Area 3B – Survey Unit 1, 7th Lift of Acceptable Backfill Material, Gross Gamma Scanning Grids (Dwg 5018S08S)
Figure 6.3-30 – WTR Basin 1 – 7th Lift of ABM, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-31 – WTR Basin 1 – 7th Lift of ABM, Background Isopleths (cpm)
Figure 6.3-32 – Study Area 3B – Survey Unit 1, 7th Lift of Acceptable Backfill Material, Final Status Survey Sampling Locations (Dwg 5018044)
Figure 6.3-33 – Study Area 3B – Survey Unit 3, Gross Gamma Scanning Grid (Dwg 5018S09A)
Figure 6.3-34 – Study Area 3B – Survey Unit 3, Location of Background Readings (Dwg 5018231)
Figure 6.3-35 – Study Area 3, Background Gamma Isopleths (cpm)
Figure 6.3-36 – Study Area 3B – Survey Unit 3, Final Status Survey Sampling Locations (Dwg 5018085)
Figure 6.3-37 – Study Area 3B – Survey Unit 4, Gross Gamma Scanning Grids (Dwg 5018S10A)
Figure 6.3-38 – Study Area 3B – Survey Unit 4, Location of Background Readings (Dwg 5018232)
Figure 6.3-39 – Study Area 3B – Survey Unit 4, Final Status Survey Sampling Locations (Dwg 5018086)
Figure 6.3-40 – Study Area 3A – Survey Unit 5, Location of Background Readings (Dwg 5018230)
Figure 6.3-41 – Study Area 3A – Survey Unit 5, Biased Sample Locations (Dwg 5018089)
Figure 6.3-42 – Study Area 3B – Survey Unit 6, Gross Gamma Scanning Grids (Dwg 5018S11A)
Figure 6.3-43 – Study Area 3B – Survey Unit 6, Average Gamma Scan Isopleths (kcpm)
Figure 6.3-44 – Study Area 3B – Survey Unit 6, Background Isopleths (cpm)
Figure 6.3-45 – Study Area 3B – Survey Unit 6, Final Status Survey Sampling Locations (Dwg 5018087)
Figure 6.3-46 – Study Area 3B – Survey Unit 7, Gross Gamma Scanning Grids (Dwg 5018S12A)
Figure 6.3-47 – Study Area 3B – Survey Unit 7, Average and Background Gamma Isopleths (kcpm)
Figure 6.3-48 – Study Area 3B – Survey Unit 7, Final Status Survey Sampling Locations (Dwg 5018088)

Table of Contents
(Continued)

Volume 2 of 2

Appendices

Appendix A – Gamma Scan Data
Appendix B – 1995 Gross Gamma Survey Data for Study Area 1
Appendix C – Instrument Quality Control Data
Appendix D – Analytical Results
Appendix E – Evaluation of the "As-Collected" Sample Analysis Protocol

Final Status Survey Report
Westinghouse Electric Company, LLC
Waltz Mill Facility

1.0 Introduction

Earth Sciences Consultants, Inc. (Earth Sciences) was retained by Viacom Inc. to provide technical assistance relative to the remediation and final status survey of specific soil remediation activities performed at the Westinghouse Electric Company, LLC (Westinghouse) Waltz Mill site located in Madison, Pennsylvania (Figure 1). The U.S. Nuclear Regulatory Commission (NRC) identified the Waltz Mill site as a Site Decommissioning Management Plan (SDMP) site. In response to listing the Waltz Mill site in the SDMP, Westinghouse prepared and executed a revised soil plan (Reference 1) specifically addressing licensed radioactive material in soil within three specific study areas to meet the objectives presented in Section 1.4. The implementation and results of the final status survey conducted from June 2000 through October 2001 at the Waltz Mill site are presented in this report.

1.1 Site Description

The Westinghouse Waltz Mill site is located approximately 3 miles west of New Stanton, Pennsylvania along Interstate 70 between the towns of Yukon and Madison, Pennsylvania. Property at the site consists of about 850 acres within a sparsely populated area used primarily for farming. Westinghouse's historical and current operations are located on approximately 85 acres. Soil final status survey activities described in this report were implemented in the three specific study areas identified in the Revised Soil Plan.

1.2 Background

The NRC has listed the Westinghouse Waltz Mill site as an SDMP site. In response to NRC concerns and the SDMP requirements in NUREG-1444 (Reference 2), Westinghouse developed a Remediation Plan (Reference 3) to address remediation of soils and retired facilities of the site covered by the SNM-770 license (Reference 4). The site radiological areas had been extensively characterized and controlled by Westinghouse so that they did not pose an unacceptable risk to the health and safety of Waltz Mill site workers or the general public. The principal objective of the Remediation Plan was to remediate the soils and retired facilities to the extent considered prudent for the continued licensed operations at the Waltz Mill site and, therefore, complete those actions necessary to remove the site from the SDMP list. The Remediation Plan was submitted to the NRC for approval on November 27, 1996.

Following technical discussions with the NRC, Westinghouse submitted a Revised Soil Plan (Reference 1) to the NRC in August 1999. The intent of the Revised Soil Plan was to revise the approach used in establishing the level of residual radioactivity in soils on a portion of the site which would permit the removal of the site from the SDMP list and could permit the eventual unrestricted release of the soil areas addressed by the revised plan (Chapter 5.0). The NRC approved the Revised Soil Plan (Reference 1) as part of SNM-770 License Amendment No. 21 dated January 19, 2000.

To support soil remediation activities outlined in the August 1999 Revised Soil Plan, a Soil Remediation Action Support Survey Plan (Reference 5) was prepared and submitted to the NRC in May 2000. The purpose of the support survey plan was to (1) define the radiological survey actions that were to be taken to guide soil remediation activities and (2) define the radiological survey measurements that were to be made in order to document the postremediation radiological status of the areas.

1.3 Description of Study Areas

As shown in Figure 1.2-1, three study areas (1, 2, and 3) were delineated in the Waltz Mill Site by physical boundaries and historical characterization study results (radiological, hydrological, and geological; Reference 1). The postremediation final status surveys were performed in these study areas as follows:

- Area 1 – open area east of Buildings A, B, C, and D
- Area 2 – areas around the former four 20,000-gallon aboveground storage tanks (AST), 500,000-gallon AST, Westinghouse Test Reactor (WTR) Basin Nos. 2 and 3, Liquid Waste Retention Basin (LWRB), and the Low-Level Radioactive Waste Storage Pad (Solid and Liquid Processing Area)
- Area 3 – open area and the former WTR Basin No. 1

Area 1 is an open grass covered area east of Buildings A, B, C, and D and west of the open drainage ditch. This area is bounded by a fence along its western, southern, and southeastern sides. The operational roadway through the middle of the Waltz Mill Site bounds the northern perimeter of this area. Based on characterization data from previous investigations, a majority of the affected soils were in the northern portion of this area. This factor led to subdividing Area 1 into Areas 1A (southern) and Area 1B (northern). The actual final status survey of Area 1 addressed less land area than was anticipated in the Soil Remediation Action Support Survey Plan. The final status survey of a portion of Area 1B is

described in a separate report prepared by Westinghouse. The purpose of this change is discussed more thoroughly in Chapter 5.0.

Area 2 is a portion of the former Solid and Liquid Waste Processing Area that included the LWRB, Evaporator Building, and WTR Basin Nos. 2 and 3. Area 2 is bounded by an open drainage ditch to the west, Calley's Run to the east and south, and the roadway to the north. Area 2 does not include the operational Waltz Mill Site Sanitary Sewage Treatment Plant.

Area 3 lies north of the roadway and extends to the fence line in the west, north, and east directions as shown in Figure 1.2-1. The characterization survey of this area indicated that the majority of the radioactivity occurs near the basin with minimal radioactivity in the area to the north of the basin; therefore, this area was subdivided into Areas 3A and 3B for efficient implementation of remediation work.

1.4 Soil Remediation Objectives

The objective of the Waltz Mill SNM-770 Remediation Plan (Reference 3) has been the remediation of the retired facilities and the soil areas, to the extent considered prudent for the continued licensed operations of the site and, therefore, complete those actions necessary to remove the Waltz Mill facility from the SDMP list. The objective of the soil final status survey was to verify survey unit classification and to demonstrate that the criteria of the Revised Soil Plan (Reference 1) were achieved. The Revised Soil Plan criteria are as follows:

- Soil remediation will be based on reducing the concentration of radionuclides distinguishable from background to levels that are As Low As Reasonable Achievable (ALARA) and that would result in a Total Effective Dose Equivalent (TEDE) to an average member of the critical group of less than 25 millirems per year (mrem/year) in the year 2024, from applicable exposure pathways in the residential farmer scenario. The anticipated dose contribution from the groundwater in the years 2020 to 2024 is estimated to be approximately 5 to 10 mrem/year based on existing and projected conditions; therefore, the soil concentration levels are targeted not to exceed 15 mrem/year in the year 2024 for those areas where groundwater is currently impacted and 25 mrem/year in the year 2024 for all other impacted areas.

- To assure adequate protection of a hypothetical site worker during the interim period over the next 25 years, a dose criterion of 100 mrem/year has been utilized.

- Remediation of the impacted soils will be to levels not to exceed a set of Derived Concentration Guideline Level (DCGL) activity concentrations for the general area. Small areas of elevated activity will be evaluated using the approach presented in the Multi-

Agency Radiation Survey and Site Investigation Manual (MARSSIM) using derived Area Factors and the Elevated Measurement Comparison ($DCGL_{EMC}$).

1.5 Report Organization

The remaining chapters of this report contain detailed information about the design, implementation, and results of the final status survey. Chapter 2.0 describes the survey design used during the implementation of the soil remediation activities, and Chapter 3.0 presents the initial land area classification scheme and revisions made during the implementation. Chapter 4.0 contains the protocols for soil surveys and changes made to the final survey plan are presented in Chapter 5.0. Chapter 6.0 is a summary compilation of final status survey narrative results for each study area. Quality assurance activities that occurred throughout the project are presented in Chapter 7.0, and Chapter 8.0 presents a summary of the final status survey results and conclusions.

Information supporting final status survey activities is included in five (A through E) appendices (Volume 2 of this report). Appendix A is a compilation of all soil gamma scan data produced during the final status survey. Appendix B presents the soil gamma scan data produced during the 1995 radiological survey of Study Area 1 that was confirmed and incorporated for use in the final status survey. Appendix C resents instrument quality control data for the final status survey and Appendix D contains the analytical results reported by the on-site laboratory for the final status survey soil samples. Finally, Appendix E presents an evaluation of the "as-collected" soil sample analysis protocol.

2.0 Final Status Survey Design

The final status survey of specific land areas at the Waltz Mill site was designed and implemented in accordance with professional health physics practice and formal MARSSIM protocols, Reference 6. A final survey plan (Reference 5) was prepared and submitted to the NRC, elaborating the application of the MARSSIM approach to the Waltz Mill site including site-specific performance objectives. The primary focus of the survey plan was the identification of the key radionuclides of remediation concern and associated soil concentrations derived to conform to the Waltz Mill site limiting dose objectives. By conducting the special radiological survey, soil sample analysis, and decision techniques prescribed by the final survey plan, data were generated demonstrating that the dose-based performance objectives for the site study areas were satisfied. This chapter describes the major final survey plan elements and how these elements were used to control and document the remediation process.

2.1 Soil Remediation Criteria

Dose modeling was used to estimate the TEDE to an average member of the critical group from residual radioactivity. The critical group means the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances. Consistent with Subpart E of Title 10 Code of Federal Regulations (CRF) Part 20 (Reference 7) and the NRC Draft Regulatory Guide DG-4006 (Reference 8), soil remediation criteria had been established and were implemented during soil remediation. The criteria support the regulatory requirement for unrestricted release of 25 mrem/year from all pathways following an alternate schedule.

The soil remediation criteria consisted of a set of radionuclide-specific DCGL activity concentrations corresponding to the release criteria after 25 years. The set of DCGLs which made up the soil remediation criteria were developed by selecting the most conservative values from the various RESRAD (Reference 9) analysis scenarios as described below.

2.1.1 DCGL for Soil Remediation

The residual levels of radioactive material that correspond to allowable radiation dose standards were calculated (derived) by analysis of the various pathways and scenarios through which exposures could occur (Revised Soil Plan, Reference 1). These derived levels or DCGLs are presented below in terms of mass activity concentrations in picocuries per gram (pCi/g). The DCGLs were derived by:

(1) Establishing the soil concentrations (pCi/g) in Study Areas 1 and 3 that would correspond to meeting the release criteria of 25 mrem/year in 25 years (2024) from all pathways using RESRAD in a conservative residential farmer scenario. For Study Area 2, the release criteria was 15 mrem/year to accommodate an existing potential groundwater ingestion dose component of 10 mrem/year.

(2) Establishing the soil concentration which would limit the exposure to a Waltz Mill site industrial worker to less than 100 mrem/year for the next 25 years using RESRAD and the industrial worker scenario.

If more than one nuclide was present in the soil, the sum-of-fractions rule was applied to assure that the total radionuclide mixture yielded a combined fractional concentration limit that was less than or equal to one.

Based on the above, and using the most restrictive values, the derived DCGLs (Reference 1) were:

Principal Radionuclide	**Study Area 2 $DCGL_w$ 15 mrem/yr (pCi/g)**	**Study Areas 1 and 3 $DCGL_w$ 25 mrem/yr (pCi/g)**
Am-241	144.7	241.2
C-14	26,682.0	44,470.0
Cm-243/244	81.9	136.5
Co-60	27.2*	27.2*
Cs-137	18.0	30.1
Fe-55	2.99×10^7*	2.99×10^7*
H-3	6.25×10^6*	6.25×10^6*
Ni-63	39,396.0	65,650.0
Pu-238	241.0	401.6
Pu-239/240	179.2	298.6
Pu-241	5,030.4	8,364.0
Sr-90	103.3	172.2
Tc-99	2.5×10^6*	2.5×10^6*
U-234	151.2	252.0
U-235	101.6	169.3
U-238	158.9	264.9
*Limited by industrial use scenario.		

The $DCGL_w$ values in the second column reflect the potential reduction in annual dose needed to accommodate existing groundwater contamination in Study Area 2.

2.1.2 Elevated Measurement Criteria - $DCGL_{EMC}$

Using the approach suggested in MARSSIM, area factors had been calculated using RESRAD for both the Residential and Industrial Use scenarios. These area factors were used to establish DCGLs for elevated measurement comparisons and for the evaluation of scan sensitivities to provide a reasonable level of assurance that any small area of elevated residual activity is not significant. The $DCGL_{EMC}$ was established as:

$$DCGL_{EMC} = \text{Area Factor} * DCGL$$

Area Factors									
Isotope	**1 m^2 (11 ft^2)**	**3 m^2 (32 ft^2)**	**10 m^2 (108 ft^2)**	**30 m^2 (323 ft^2)**	**100 m^2 (1,076 ft^2)**	**300 m^2 (3,229 ft^2)**	**1,000 m^2 (10,764 ft^2)**	**3,000 m^2 (32,292 ft^2)**	**10,000 m^2 (107,639 ft^2)**
Am-241	3.3	2.9	2.4	2.2	1.9	1.6	1.0	1.0	1.0
C-14	33.6	11.2	3.4	1.1	1.0	1.0	1.0	1.0	1.0
Cm-244	7.2	4.1	2.3	1.6	1.3	1.2	1.0	1.0	1.0
Co-60	11.8*	5.0*	2.4*	1.6*	1.2*	1.1*	1.0*	1.0*	1.0*
Cs-137	9.3	4.6	2.3	1.6	1.2	1.1	1.0	1.0	1.0
Fe-55	5.3	5.3	5.3	5.3	5.2	5.2	1.0*	1.0*	1.0*
H-3	101.9*	58.7*	32.1*	18.4*	10.0*	5.7*	3.0*	1.8*	1.0*
Ni-63	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Pu-238	2.8	2.7	2.6	2.4	2.2	1.7	1.0	1.0	1.0
Pu-239	2.8	2.7	2.6	2.4	2.2	1.7	1.0	1.0	1.0
Pu-241	3.2	2.9	2.5	2.2	1.9	1.6	1.0	1.0	1.0
Sr-90	1.6	1.6	1.4	1.0	1.0	1.0	1.0	1.0	1.0
Tc-99	11.3*	5.1*	2.5*	1.8*	1.4*	1.2*	1.0*	1.0*	1.0*
U-234	23.9	10.8	3.4	1.1	1.0	1.0	1.0	1.0	1.0
U-235	14.2	6.4	2.7	1.3	1.1	1.0	1.0	1.0	1.0
U-238	19.3	8.6	3.1	1.1	1.0	1.0	1.0	1.0	1.0
*Limited by industrial use scenario.									

During the evaluation of measurement data for each survey unit, any measurement from the unit that was equal to or greater than the DCGL were investigated by comparison with the $DCGL_{EMC}$ using the elevated measurement approach of Section 8.5.1 of MARSSIM to determine if the elevated measurement is acceptable. As with the DCGL, the $DCGL_{EMC}$ was subject to the sum-of-fractions rule.

2.1.3 MARSSIM's Sign Test

The final status survey included soil sampling (Section 2.2) to determine the average radionuclide concentration in a survey unit coupled with gross gamma scans using sodium iodide (NaI) detectors to identify areas of elevated radionuclide concentrations. Since the radionuclides of interest (see previous table) either did not occur in Waltz Mill site native "background" soils or the Waltz Mill site background

levels were a very small fraction of the $DCGL_W$ (e.g., <10 percent), the survey unit radiological conditions were compared directly to the specified DCGLs using the MARSSIM Sign Test.

The one-sample Sign Test described in MARSSIM Section 8.3.2 was applied to determine whether the concentrations of residual activity in each survey unit were statistically greater than the $DCGL_W$ (i.e., the Null Hypothesis test discussed in Section 2.3) and, if so, required further remediation. The Sign Test calculation results are shown in the Volume 1 data table for each survey unit. The number of positive Sign Test values (S+) was compared to the critical value from Table I.3 of MARSSIM. If S+ was less than the critical value, the survey unit passed the Sign Test.

2.2 Soil Sampling

Soil sampling with laboratory searches for the radionuclides of remediation concern was conducted throughout the project work cycle to verify that the average soil activity concentrations were less than $DCGL_W$ criterion values, satisfying that principal remediation objective. Regardless of the survey unit classification (Class 1, Class 2, or Class 3; refer to Section 3.1), a predetermined minimum number of samples were collected in each survey unit. When a systematic sampling protocol was required (Class 1 or Class 2 land areas) to map sample locations, a computer generated, random-start, triangular grid pattern was normally specified.

2.3 Null and Alternative Hypothesis

A null (H_O) and alternative (H_A) hypothesis was statistically tested when interpreting the average survey unit radiological data. The null hypothesis posed that the measured residual contamination in the survey unit *exceeded* the remedial objective (i.e., $DCGL_W$) activity concentration value. Conversely, the alternative hypothesis presumed that the measured contamination was at or below the $DCGL_W$ activity concentration value. The outcome of this hypothesis testing was used to ascribe a statistically based level of confidence (using the decision error rates discussed in Section 2.4) to the decision made regarding the "true" as-left condition of the survey unit.

2.4 Survey Unit Decisions and Decision Errors

As presented above, survey unit radiological measurement data were studied to objectively determine the success or failure of the remediation work, i.e., whether the "true" as-left radiological condition was below ("success") or above ("failure") the remedial objective ($DCGL_W$ value). "Success" meant that the null hypothesis (H_O) could be rejected and, therefore, the alternative hypothesis (H_A) was accepted at a

decision error confidence interval of (1 - α). The rejection of H_O also meant there was a very small likelihood (equal to the interval α) that the success decision was incorrect. Similarly, "failure" meant that H_O was accepted (and H_A rejected) at a decision error confidence interval of (1 - β), with again a somewhat higher but still small likelihood (equal to β) that the failure decision was incorrect. The framework of these decision relationships is depicted in the following table:

Hypothesis Testing Matrix for Survey Unit Measurement Decisions

	Hypothesis	Survey Unit Decision: *"Success"* (Reject H_O)	Survey Unit Decision: *"Failure"* (Accept H_O)
"True" Condition of the Survey Unit	**H_A** Meets remedial objective (at or below $DCGL_W$ value)	No decision error (probability = 1 - α)	Incorrectly fail to release survey unit (Type II error with probability = β)
	H_O Exceeds remedial objective (exceeds $DCGL_W$ value)	Incorrectly release survey unit (Type I error with probability = α)	No decision error (probability = 1 - β)

Each decision regarding the "true" as-left condition of a Waltz Mill site survey unit was predicated on the error control data quality objective (DQO) confidence interval predetermined for the remediation project. Because decisions regarding the success of remediation efforts directly affect the sustained protection of human health and environmental resources, a primary DQO was established to control the occurrence of the Type I error described in the above table. The Type I decision error control DQO was established by project personnel at the α = 0.05 confidence interval. A secondary DQO limiting the occurrence of Type II decision errors was set at the β = 0.10 or 0.25 confidence interval, depending on survey unit size. Limiting the occurrence of conservative Type II decision errors was also important to project personnel, but for reasons largely unrelated to the protection of human health or environmental resources at the Waltz Mill site. (Selection of a larger β error results in a greater chance of unnecessary remediation.)

2.5 Surrogate Radionuclides

Historical soil characterization activities identified a wide range of radionuclides, activity concentrations, and potential dose consequences. Not all the radionuclides could be identified by in-situ gamma surveys or by gamma spectroscopy of soil samples (the most efficient and cost-effective measurements) or were

otherwise difficult to measure. In addition, at the anticipated concentrations, each of the radionuclides identified contributed to the total dose by varying degrees of magnitude.

As a practical solution, therefore, it was opted to conduct an evaluation identifying four radionuclides as surrogates that would be used to infer the activity concentration of related (correlated) radionuclides. When properly combined ($DCGL_{Total}$ discussed in Section 2.5.3), the surrogate and inferred radionuclide activity concentrations were later used to demonstrate compliance with Waltz Mill site remediation criteria. The technical approach and data used to evaluate the appropriate surrogate-correlated radionuclide relationships in Study Areas 1, 2, and 3 is documented elsewhere (References 5, 10, and 11). A summary of this evaluation is presented in the following section.

2.5.1 Determination of the Appropriate Surrogate-Correlated Radionuclide Relationships

To validate the surrogate concept relating the multiple radionuclides of remediation concern at the Waltz Mill site, it was initially necessary to demonstrate that the surrogate-to-inferred radionuclide activity concentration ratios were constant (or nearly so) at the survey unit level. After careful consideration, cesium-137 (Cs-137) was selected as the most desirable surrogate radionuclide because (1) it was the most prevalent radionuclide identified during Waltz Mill site characterization, (2) it had the most limiting (smallest) DCGL value, and (3) its decay emissions would be readily detectable using instrumentation planned for deployment in the field.

In accordance with Appendix I, Page I.11 of MARSSIM, the correlation coefficient, r, was computed for the observed relationship between the activity concentration of Cs-137 to each additional radionuclide identified by the Waltz Mill site characterization results. As expected, the r-values proved that some of the inferred radionuclide activity concentrations were strongly correlated to that of Cs-137, but others were not. Since the correlation analysis did not identify a simple ratio relating each inferred radionuclide activity concentration to a common surrogate radionuclide like Cs-137, a combination of suggested methods for related and unrelated radionuclides (described in Appendix I of MARSSIM) was applied. These methods were used to successfully segregate the Waltz Mill site characterization radionuclides into one of four correlation "families" offering the best fit (i.e., by genetics and r-value) for the surrogate-correlated radionuclide relationships, as shown in the following table:

Correlation Family	Surrogate Radionuclide	Correlated Radionuclides
Fission Fragment	Cs-137	Sr-90, Tc-99
Activation Product	Co-60	Fe-55, Ni-63, H-3, C-14
Uranium	U-235	U-234, U-238
Transuranic	Am-241	Pu-238, Pu-239/240, Cm-243/244, Pu-241

The recalculated correlation coefficients proved that the correlated radionuclides for the fission fragment and transuranic correlation families were better related to their respective surrogate radionuclides Cs-137 and americium-241 (Am-241). The activation product correlation family relationships were also correlated with cobalt-60 (Co-60) where there was sufficient data. The Waltz Mill site characterization data for the uranium correlation family did not prove that a correlation existed between U-235 and the isotopes U-234 and U-238. Therefore, the uranium correlation family relationships were derived considering the uranium enrichments of licensed material used at the Waltz Mill site and the known mathematical isotope relationships for these uranium enrichments (Reference 5).

2.5.2 Scaling Factors for Correlated Radionuclides

To properly infer a correlated radionuclide activity concentration from a surrogate radionuclide activity concentration measurement, conservative scaling factor (SF) values were developed (Reference 5) for each correlated radionuclide as recommended by MARSSIM. As defined by MARSSIM, the SF is the activity concentration ratio of a correlated radionuclide to its surrogate, adjusted to include a positive margin for ratio uncertainty at the 0.95 confidence interval. Accordingly, the activity concentration ratio values for each correlated radionuclide was calculated and compiled, with the resulting ratio distribution summarized using standard statistical estimators. Finally, the average (best estimate) ratio for each correlation distribution was normalized at the 0.95 confidence interval using Equation 1 for SF, with the results shown in the following table:

$$SF_i = R_i + 1.96\sigma_i \qquad \text{(Equation 1)}$$

where:

SF_i = scaling factor of correlated radionuclide i to the surrogate radionuclide
R_i = average activity concentration ratio of correlated radionuclide i to the surrogate radionuclide
σ_i = standard deviation of the average activity concentration ratio

Radionuclide Scaling Factors for Waltz Mill Site Soil

Surrogate Radionuclide (Correlation Family)	Correlated Radionuclide(s)	Average Soil SF
Am-241	Pu-238	0.936
(Transuranic)	Pu-239/240	0.534
	Pu-241	6.85
	Cm-243/244	0.168
Cs-137	Sr-90	3.16
(Fission Fragment)	Tc-99	2.06
Co-60	Fe-55	3.40
(Activation Product)	Ni-63	1.23
	H-3	0.269
U-235	U-234	20.0
(Uranium)	U-238	5.0

During the remedial action support and final status survey phases, the soil scaling factors, calculated during the planning phase of the project, were periodically validated by project personnel (refer to Section 7.5 for further information).

2.5.3 Interpretation of Final Status Survey Soil Sample Results Using the Unity Rule

To account for the presence of multiple related radionuclides (e.g., Cs-137 and its correlated radionuclides strontium-90 [Sr-90] and technicium-99 [Tc-99]), the Unity Rule test was adopted as the final status survey compliance demonstration. Performing this test for related radionuclides was an important demonstration that the final status survey results were below the acceptance criterion for each survey unit and were therefore acceptable. Remediation was not considered complete or successful in any given survey unit without the Unity Rule test inequalities being satisfied.

When multiple radionuclides were present and the activity concentration was measured for each radionuclide, the sum of the ratios of the concentration of each radionuclide to its respective DCGL could not exceed unity (1.0) as shown in the following unity rule test equation:

$$\sum_{i=1}^{n} \frac{C_i}{DCGL_i} \leq 1.0 \qquad \text{(Equation 2)}$$

where:

C_i = activity concentration of each radionuclide i for i = 1, 2... n (pCi/g)
$DCGL_i$ = guideline value ($DCGL_w$) for each radionuclide i (pCi/g)

$DCGL_{Total}$

At the Waltz Mill site, a routine measurement of the activity concentration of each radionuclide of remediation concern in each final status survey soil sample was not practical or necessary. Instead, the activity concentration of correlated radionuclides not routinely measured was inferred using surrogate radionuclide average scaling factors developed during the planning phase for the final status survey (see Section 2.5.2). This approach required the calculation of $DCGL_{Total}$ values for each of the four surrogate radionuclides (Am-241, Cs-137, Co-60, U-235) that accounted for the inferred activity concentration of the associated correlated radionuclides (see Section 2.5.2 and Appendix I, Page I-32, of MARSSIM). The $DCGL_{Total}$ calculation was performed using the following equation:

$$DCGL_{total,j} = \left\{ \sum_{i=1}^{n} \frac{SF_{i,j}}{DCGL_{w,j}} \right\}^{-1} \qquad \text{(Equation 3)}$$

where:

$SF_{i,j}$ = average soil scaling factor for correlated radionuclide i to its corresponding surrogate radionuclide j
$DCGL_{w,j}$ = surrogate radionuclide j limiting activity concentration taken from the following table:

Surrogate Radionuclide	$DCGL_w$ Values (pCi/g) Study Areas 1 and 3	$DCGL_w$ Values (pCi/g) Study Area 2	$DCGL_{Total}$ Values (pCi/g) Study Areas 1 and 3	$DCGL_{Total}$ Values (pCi/g) Study Area 2
Am-241	241.2	144.7	96.9	58.2
Cs-137	30.1	18.0	19.4	11.6
Co-60	27.2	27.2	27.2	27.2
U-235	169.3	101.6	9.6	5.8

$DCGL_{Total}$ Unity

When the activity concentration of each key surrogate radionuclide was measured but the activity concentrations of the correlated radionuclides were not measured, compliance was demonstrated using the following unity rule test equation:

$$\frac{Conc_{Cs-137}}{DGCL_{total}^{Cs-137}} + \frac{Conc_{Co-60}}{DGCL_{total}^{Co-60}} + \frac{Conc_{U-235}}{DGCL_{total}^{U-235}} + \frac{Conc_{Am-241}}{DGCL_{total}^{Am-241}} \leq 1 \qquad \text{(Equation 4)}$$

Hybrid Unity

When the activity concentration of each key surrogate radionuclide was measured and the activity concentrations for some, but not all, of the correlated radionuclides were also measured, compliance was demonstrated using the Hybrid Unity calculation. For example, when the Cs-137 and correlated Sr-90 activity concentrations were measured, the compliance demonstration used the following unity rule test equation:

$$\frac{Conc_{Cs-137}}{DGCL_{Cs-137}} + \frac{Conc_{Co-60}}{DGCL_{total}^{Co-60}} + \frac{Conc_{U-235}}{DGCL_{total}^{U-235}} + \frac{Conc_{Am-241}}{DGCL_{total}^{Am-241}} + \frac{Conc_{Sr-90}}{DGCL_{Sr-90}} \leq 1 \qquad \text{(Equation 5)}$$

Elevated Measurement Comparison

Similarly, small areas of elevated activity concentration remaining in a survey unit were evaluated using the Elevated Measurement Comparison (EMC) evaluation approach with a Unity Rule constraint. Like the $DCGL_{Total}$ value calculation using Equation 2, a $DCGL_{EMC,t}$ parameter was first calculated using Equation 4 to adjust the $DCGL_W$ value by the appropriate correlated radionuclide scaling factors:

$$DCGL_{EMCi,t} = \left\{ \sum_{i=1}^{n} \frac{SF_i}{DCGL_{EMC,i}} \right\}^{-1} \qquad \text{(Equation 6)}$$

where:

$DCGL_{EMCi,t}$ = soil total $DCGL_{EMC}$ value for radionuclide i, selected from the tables below for the Study Area and soil area factors needed

SF_i = scaling factor for radionuclide i to its surrogate

The acceptance test for EMC evaluations was then performed using the Equation 6 result and the Unity Rule inequality shown in Equation 7:

$$\sum_{i=1}^{n} \frac{C_i}{DCGL_{EMCi,t}} \leq 1.0 \qquad \text{(Equation 7)}$$

The calculated $DCGL_{EMC}$ values for surrogate radionuclides present in various affected soil surface areas (Reference 5) are shown in the following tables.

Study Areas 1 and 3 Surrogate Radionuclide $DCGL_{EMC}$ Values for Waltz Mill Site Soil (pCi/g)

Radio-Nuclide	Affected Soil Surface Area								
	1 m^2 (11 ft^2)	3 m^2 (32 ft^2)	10 m^2 (108 ft^2)	30 m^2 (323 ft^2)	100 m^2 (1,076 ft^2)	300 m^2 (3,229 ft^2)	1,000 m^2 (10,764 ft^2)	3,000 m^2 (32,292 ft^2)	10,000 m^2 (107,639 ft^2)
Am-241	317.0	282.7	239.6	210.9	184.1	152.6	96.9	96.9	96.9
U-235	212.1	95.5	31.6	10.7	9.7	9.6	9.6	9.6	9.6
Co-60	319.0	135.7	65.2	43.5	32.6	29.9	27.2	27.2	27.2
Cs-137	66.5	53.5	36.3	25.6	21.7	20.6	19.4	19.4	19.4

Study Area 2 Surrogate Radionuclide $DCGL_{EMC}$ Values for Waltz Mill Site Soil (pCi/g)

Radio-Nuclide	Affected Soil Surface Area								
	1 m^2 (11 ft^2)	3 m^2 (32 ft^2)	10 m^2 (108 ft^2)	30 m^2 (323 ft^2)	100 m^2 (1,076 ft^2)	300 m^2 (3,229 ft^2)	1,000 m^2 (10,764 ft^2)	3,000 m^2 (32,292 ft^2)	10,000 m^2 (107,639 ft^2)
Am-241	190.3	169.6	143.8	126.5	110.5	91.6	58.2	58.2	58.2
U-235	127.3	57.3	19.0	6.4	5.8	5.8	5.8	5.8	5.8
Co-60	317.8	135.4	65.1	43.5	32.6	29.9	27.2	27.2	27.2
Cs-137	39.9	32.1	21.7	15.3	13.0	12.3	11.6	11.6	11.6

2.6 Method to Determine Sample Collection Density

To determine the number of final status survey soil samples needed in each survey unit, guidance from Chapter 5 and Appendix D of MARSSIM were used to calculate the measurement resolution, i.e., relative shift (Δ/σ). Sigma was calculated from Equation 8:

$$\sigma = \sqrt{[\sigma(C_1)/D_1]^2 + [\sigma(C_2)/D_2]^2 + [\sigma(C_3)/D_3]^2 + \ldots + [\sigma(C_n)/D_n]^2} \qquad \text{(Equation 8)}$$

where, $\sigma(C_i)$ was the expected standard deviation in activity concentration of surrogate radionuclide i and D_i was the calculated $DCGL_{Total}$ value for surrogate radionuclide i. The expected standard deviations for the surrogate radionuclides were derived from the Waltz Mill site characterization data (References 10 and 11) and are shown in the following table.

Expected Standard Deviation (σ) Values Used for the Relative Shift Calculation

Surrogate Radionuclide	Soil σ (pCi/g)
Co-60	1.23
Cs-137	2.51
U-235	0.42
Am-241	1.01

Using Equation 8, a weighted soil σ estimate of 0.23, and a delta value of 0.5, the relative shift value 2.17 (truncated at 2) was calculated. This relative shift value was used to determine the number of final status survey soil samples (N) that were collected in each survey unit using Equation 9 or taken from Table 5.5 of MARSSIM.

$$N = \left[\frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(SignP - 0.5)^2} \right] CF$$

(Equation 9)

where:

N = number of final status survey soil samples
$Z_{1-\alpha}$ = percentile corresponding to the Type I error control DQO (α = 0.05) interval (MARSSIM Table 5.2)
$Z_{1-\beta}$ = percentile corresponding to the Type II error control DQO (β = 0.25) interval (MARSSIM Table 5.2)
SignP = value obtained from Table 5.4 of MARSSIM, corresponding to $\Delta/\sigma = 2$
CF = correction factor for potentially lost or otherwise unusable data (nominally 1.2)

Based on a relative shift value of 2, the number of samples (N) that were required to meet the project error control DQOs was calculated for each Waltz Mill site land area classification, as shown in the following table:

Waltz Mill Site Minimum Soil Sample Collection Density

Survey Unit Area (m^2)	Land Area Classification	Project Data Quality Objective: Type I Error (α) Control	Project Data Quality Objective: Type II Error (β) Control	Sample Locations (N)
10 to 2,000	1	0.05	0.25	8
2,000 to 10,000	2	0.05	0.10	12
10,000 and above	3	0.05	0.10	12

The number of samples shown in Table 5.5 of MARSSIM, as well as in the above table, reflects a compensating margin of 20 percent for lost or otherwise unusable data. When greater statistical power was desired to evaluate final status survey conditions, the number of required samples could be increased.

2.7 Method for Locating Sample Collection Points

A systematic triangular sampling pattern with a random starting point was used to establish the soil sampling points (nodes) within each Class 1 or Class 2 survey unit. (Consistent with MARSSIM protocol, soil samples within a Class 3 survey unit were not taken at locations identified using a systematic grid system.) The random starting point and locations of soil samples were determined using the methodology outlined in Section 5.5.2.5 of MARSSIM. This sampling pattern, or grid, proved to be an efficient approach to identify small areas of elevated activity. The distance between each sample node (L) in a given grid area (A) for the required number of soil samples (N) was determined by Equation 10:

$$L = [A/(0.866N)]^{1/2} \qquad \text{(Equation 10)}$$

The following table lists the maximum distance between sample nodes (node length) and the associated smallest area of soil containing elevated radionuclide concentrations that could be identified using that sampling grid.

Waltz Mill Site Soil Sample Locator Data for a Triangular Grid Design

Survey Unit Area (m^2)	Sample Locations (N)	Maximum Node Length (m)	Smallest Elevated Activity Area Identified (m^2)
10	8	1.2	1.13
100	8	3.8	11.3
500	8	8.5	56.7
1,000	8	12.0	113
1,500	8	14.7	170
2,000	12	13.9	151
5,000	12	21.9	378
10,000	12	31.0	756

2.8 Alternate Method for Locating Sample Collection Points

The methods described in Sections 2.6 and 2.7 presume that the actual scan minimum detectable concentration (MDC) is less than the required scan MDC, i.e., there was sufficient scan sensitivity available to detect small areas of elevated activity. For the infrequent cases where the actual scan MDC exceeded the required MDC, an alternative method to calculate the required number of samples was used. This alternate method is described in Section 5.5.2.4 of MARSSIM and Section 4.6 of Appendix A to the Revised Soil Plan, and involved the calculation of an area factor corresponding to the actual scan MDC as follows:

$$AreaFactor = \frac{ScanMDC(actual)}{DCGL_w} \qquad \text{(Equation 11)}$$

The size of an area of elevated activity corresponding to this area factor was obtained form Section 3.2.3 of Appendix A to the Revised Soil Plan and divided into the area of the survey unit (2,000 m^2 maximum) to determine the number of survey locations, n_{EA}. The value calculated for n_{EA} in conjunction with the survey unit size, A, was then used to determine a revised spacing, L, of the systematic sampling grid using Equation 12:

$$L = \sqrt{\frac{A}{0.866 n_{EA}}} \qquad \text{(Equation 12)}$$

If the number of data points required to identify areas of elevated activity (n_{EA}) was greater than the number calculated using Equation 9, then Equation 12 was used to specify the distance between each sample node in a given grid area.

3.0 Land Area Classifications

To properly implement the final status survey design described in Chapter 2.0, each study area was subdivided into survey units consistent with the MARSSIM (Chapter 4.0) classification/land area scheme. This chapter presents the classification scheme for the study areas and the final status surveys required for each classification.

3.1 Study Area/Survey Unit Classifications

Each study area underwent a characterization study and/or historical assessment to determine the initial land area classification (i.e., Class 1, 2, or 3) for purposes of completing a statistically valid final status survey. Conservatively, all study areas were designated "impacted" (versus nonimpacted) based on historical assessment. Impacted areas were further classified in accordance with potential activity concentration levels. The following tables define the final status survey land area classification design used to develop the initial land area classifications for the project.

Waltz Mill Site Final Status Survey Land Area Classification Design

Land Area Class	Classification Criteria	Land Area Size Constraint (m^2)
1	Areas known or expected to have radionuclide activity concentrations in soil above $DCGL_W$ values.	10 to 2,000
2	Areas known or expected to have radionuclide activity concentrations in soil above normal Waltz Mill site background concentrations but below corresponding $DCGL_W$ values.	2,000 to 10,000
3	Areas that were not expected to have radionuclide activity concentrations in soil detectable above normal Waltz Mill site background concentrations.	10,000 and above

Waltz Mill Site Final Status Survey Initial Land Area Classifications

Study Area	Description	Land Area Class
1A 1B	Specific areas that require remediation based on the characterization data, including a surrounding 3-meter buffer zone.	1
1A 1B	Remaining areas that would not require remediation based on the characterization data.	2
2	Historical and characterization data indicate that potentially the entire area has been affected.	1
3A	No historical record of being used or affected, but is adjacent to the affected Study Area 3B.	3
3B	Area to be disturbed by the excavation of the WTR 1 Basin, including a surrounding 3-meter buffer zone.	1
3B	Remaining area in Study Area 3B that would not be disturbed by the excavation of the WTR 1 Basin.	2

3.2 Final Status Survey Land Area Classification Changes

The final status survey land area initial classifications were based on a combination of Waltz Mill site characterization data and historical assessment information. As the remediation project progressed (with increased radiological measurement data being compiled for land areas), it became apparent that the initial classification, and thus the final status survey protocol tiered to that classification, was inappropriate for some land areas. This situation was anticipated by project personnel during the project planning phase and was resolved by implementing a formal process for changing land area classification designations. It may be noted that one of the chief objectives of the final status survey was to verify that the initial land area classifications were indeed appropriate.

During the project work cycle, a total of three land area final status survey classification changes were approved. Specific field directives were issued following change approval to assure that the proper final status survey protocols were implemented in the redesignated land areas. All of the classification changes approved by project personnel were to a more conservative class designation (from Class 3 to Class 2, or Class 2 to Class 1), prompting an increased level of radiological surveillance in the redesignated areas. For additional information on the land area classification changes made, as well as other survey plan changes, refer to Chapter 5.0.

3.3 Scanning Surveys and Effective Land Area Views

Scanning surveys by qualified surveyor personnel were conducted in each survey unit to identify isolated areas of elevated activity and to record the direct radiological profile of the survey unit. A description of the field instrumentation deployed is provided in Section 4.1. Surveyor technique, i.e., the pace and pattern of surveyor and detector motion as well as the surveyor's professional judgment, controlled the fraction of the survey unit soil surface that was effectively viewed or "covered" by the field instrumentation. The surveyor technique employed a detector face-to-soil surface clearance of no more than 2 inches, with a half-meter per second serpentine motion. To permit the surveyor to focus on maintaining clearance and motion constraints, the surveyor relied on the audio response signal from the survey instrument.

The effective land area views implemented for the project surveys are summarized in the following table:

Scanning Survey Effective Land Area Views

Survey Unit Classification	Gamma Scan View (percent of land area surface)
Class 1	100
	Systematic
Class 2	10 to 100
	Systematic and Judgmental
Class 3	*Judgmental*

Surveyor technique in Class 1 land areas was relatively straightforward because the entire land area surface was to be viewed, requiring a completely systematic surveyor technique. In contrast, the approach to conducting Class 2 and Class 3 land area surveys included frequent, if not constant, adjustment in surveyor technique because project personnel assumed that the likelihood of not identifying a localized elevated activity area was greater in Class 2 and Class 3 land areas. Because of this misidentification concern, the actual gamma scan view fractions in Class 2 land areas were always higher than the minimum shown above, with additional allowances for the hybrid nature of Class 2 land area surveys (both systematic and judgmental components to the surveyor's technique). In some instances, the actual gamma scan view in Class 2 and 3 land areas approached 100 percent due to surveyor judgment, the results of which sometimes prompted a land area reclassification.

In addition to the scanning techniques employed to conduct final status surveys, qualified surveyors also performed operational scanning surveys to direct the crews operating excavation and packaging equip-

ment. An important feature of the design of these operational surveys was the derivation and use of action levels to identify some excavation locations, segregate excavated affected material for reuse as acceptable backfill material (ABM) or disposal in appropriate packaging, and initially determine when excavation was complete. While use of these "precision excavation" action levels was vital to the efficient completion of the remediation project (including the minimization of quantities of affected material requiring disposal, one of the project's performance objectives), they were not used to document final status conditions and, accordingly, are not discussed further in this report.

3.4 Final Status Scan Survey Minimum Detectable Concentration

NaI detector scan surveys were performed to guide remediation activities and document final status survey conditions. The performance capability of these surveys was controlled during the project to assure the required sensitivity (minimum detectable activity concentration) was achieved, using the calculational approach approved in Section 5.2 of Appendix A to the Revised Soil Plan. The achieved scan MDC calculations, based on radiological conditions observed within each survey unit, are shown in Table 6.0. As a routine quality control practice, the achieved MDC performance was subject to the investigations levels discussed in Section 8.2 of Appendix A of the Revised Soil Plan. Any investigations initiated by this practice are discussed in Section 6.0 of this report.

4.0 Surveying and Sampling

This chapter describes the radiological and positioning instrumentation, soil sampling techniques, and laboratory analyses used during the final status survey.

4.1 Field Instrumentation

Qualified surveyors used digital instruments (Ludlum Model 2350-1) equipped with a 2-inch-by-2-inch (40.8-square-centimeter area) NaI detector (Ludlum Model 44-10) to perform operational and final status surveys during the project work cycle. Project personnel chose this scintillation detector because the radionuclides of remediation concern at the Waltz Mill site were the surrogates Cs-137 and Co-60. These surrogate radionuclides decay with emission of abundant high-energy gamma photons that are detected with good efficiency in the large sensitive volume of the NaI detector.

The Ludlum Model 2350-1 instrument was selected for use because it is stable field-proven gear with sophisticated data acquisition and storage capabilities. These important instrument attributes provided additional assurance to project personnel that all the needed radiometric data was acquired accurately, preserved without corruption, and would be easily recovered for final status survey and quality control evaluation purposes. Although the instrument could be configured to acquire data in specific energy regions of interest (ROI), this configuration was never used to acquire final status survey data. (Project personnel concluded that the ROI mode was an operational convenience unjustified by the extra setup and validation work needed.)

The Ludlum's response sensitivity to surrogate radionuclide emissions under various background radiation conditions was periodically assessed during the course of the project. The results of these assessments (refer to Table 6.0) confirmed that the necessary detection sensitivity existed for each field application (scan or scalar) of the instrument.

The location of all final status survey work (survey unit boundaries and soil sample nodes) was mapped in three dimensions using a Trimble® Total Station 4800 Global Positioning System (GPS). The GPS consisted of a fixed base station and portable rover unit with TCS1 data controller. The base station included a radio transceiver and antenna placed at a known location north of the former WTR Basin 1 in Study Area 3 of the Waltz Mill site. The base station position was fixed at this location to assure unobstructed radio communication with the satellite and rover unit receivers and to assure accurate mapping of points (northing, easting, and elevation) throughout the project. The GPS base station received non-

simultaneous signals from a constellation of 24 satellites, but communication with only four satellites was needed to map a point with centimeter precision. Each day the GPS was used for final status survey work, the mapped points stored in the rover unit's TCS1 data controller were checked for accuracy by the land surveyor and downloaded to the Trimble® Office desktop computer application for use in evaluating and reporting final status survey results.

4.2 Soil Sampling and Associated Radiological Surveys

Extensive soil sampling with laboratory spectral and/or field gross (screening) analysis was performed during the project in two categories: (1) as an adjunct to the operational gamma radiation surveys and, (2) to document the final radiological status of land areas using the random-start triangular grid mapping system. Each of these sampling and analysis event categories is discussed below. The soil sampling techniques used by project personnel are discussed in Sections 4.2.1 (surface soil) and 4.2.2 (ABM). Imported backfill material (off-site borrow soil, excluding aggregate) was sampled and submitted to the on-site laboratory for analysis under the project's quality control program (refer to Section 7.4.2).

Under the first category, the sampling results obtained during remediation operations were used primarily to confirm the status of what project personnel referred to as "suspect" soil. The presence of suspect soil was indicated by its ambiguous gamma radiation survey results, being either close to the threshold for disposal or masked by confounding radiation sources in the study area itself or Waltz Mill site operational areas. After the suspect soil analytical results were available and reviewed by project personnel, one of four disposition alternatives (leave as is, remediate the area further, stockpile as ABM, or dispose in packaging) was chosen to appropriately manage the suspect soil. Soil sample results in this adjunct category were also used to periodically confirm that the expected surrogate radionuclide relationships in the study area were indeed as expected.

For second (final status survey) category purposes, a contact (soil surface) gamma radiation measurement was recorded at each randomly mapped soil sample node prior to sampling. The purpose of these measurements was to provide additional assurance to project personnel that the collected soil sample, although randomly located, would be representative of the local soil conditions and thus qualify as a final status measurement. In some instances, another gamma radiation measurement was acquired within the hole left by sampling to further assure representative conditions. Using the Ludlum Model 2350-1/44-10 configuration, each scalar measurement was typically acquired over a 2-minute period, but was adjusted if the chest-level gamma measurement was high, prompting an increase in the count time to provide the

required sensitivity (counts per minute [cpm] per pCi/g soil). In all instances, the actual background counting time used in the field assured that the required sensitivity for surrogate radionuclide detection was available.

After the background gamma radiation measurements were documented and reviewed by project personnel, the soil at each final status survey location was sampled. If the surface of a mapped soil sample location was monolithic rock (typical of the excavation floors at WTR Basin 1 and the LWRB), the location was exempted (without replacement) from sampling.

4.2.1 Surface Soil Sampling Technique

Surface soil samples were collected as a composite of the first 15-centimeter (6-inch) depth of soil removed from the surface either directly into the sample container (suspect and imported soil only) or by using an auger or shovel. This soil sample depth was conservatively chosen by project personnel to correspond to the soil mixing or plow depth (root) zone featured in the RESRAD environmental exposure pathway model for the plant uptake and erosion compartments. The entrance diameter of the sample hole needed to obtain the required sample mass for analysis and archival purposes was normally less than 1 foot. The only composite sample preparation steps used in the field were removal of nonsoil objects (primarily rocks) and periodic decanting of water to the extent practical. If there was reason to believe that nonsoil objects were affected by radionuclides of remediation concern, they were retained for possible further evaluation as a separate sample. All composite samples were mixed in the field before being split into the required number (normally three) of Nalgene® sample jars and placed under sample chain of custody controls for analytical processing. Project personnel transferred sample custody directly to the on-site radioanalytical laboratory, normally on the same day the sample was obtained.

4.2.2 ABM Sampling Technique

Whenever ABM instead of imported backfill material was installed in an excavation, the final status survey soil samples were collected as surface soil samples except that the sampling depth was extended through the entire thickness of the ABM layer, or "lift." ABM lifts were installed in excavations to a full (2-foot) or partial (less than 2-foot) thickness, depending on the eventual surface contour needed when final grade was achieved. The initial ABM lift was not installed in a survey unit until the surface soil sample results for the floor and leading walls of the excavation were reviewed and approved. To demonstrate compliance with final status survey acceptance criteria and obtain the information needed to

approve placement of subsequent ABM lifts, every full or partial lift of ABM was designated and sampled as a separate survey unit.

4.3 Laboratory Analysis

Each final status survey soil sample collected was analyzed by gamma spectrometry in the on-site Waltz Mill laboratory. Consistent with the revised soil plan, the samples were analyzed by the laboratory on an "as-collected" basis with no preparation steps for gamma spectrometry. Information regarding analytical result differences between the "as-collected" and "prepared" (i.e., dried and ground) methods is provided in Section 7.4.3. Specific searches for the four Waltz Mill site surrogate radionuclides (Co-60, Cs-137, Am-241, U-235) were completed within a nominal 20-minute counting time and the results (pCi/g) reported for entry into a spreadsheet for comparison with the respective $DCGL_{Total}$ values. To exclude the bias introduced when grouping results containing "less than" values, the laboratory used observed counting data when reporting results that were below the critical level (thus not detected) established for each analysis. Invoking the unity summation (Equation 3), the surrogate radionuclide results were then combined and compared with the Waltz Mill site remediation acceptance criteria (i.e., "unity" or 1.0).

The *a priori* MDC measurement criteria specified to the on-site laboratory by project personnel was 25 percent of the Area 2 $DCGL_{Total}$ values for the surrogate radionuclides and 25 percent of the Area 2 $DCGL_W$ values (refer to Section 2.1.1) for the correlated radionuclides. These basic final status survey performance criteria for soil measurements, including the typical performance achieved and reported by the laboratory, are shown in the following table.

Analytical Laboratory Basic Performance Criteria for Soil Measurements

		Minimum Detectable Concentration (pCi/g soil)	
Radionuclide Search	Spectrometric Method	Specified to Laboratory	Achieved by Laboratory
Am-241	Gamma	14.6	1
Cm-243/244	Alpha	20.5	1
Co-60	Gamma	6.8	0.1
Cs-137	Gamma	2.9	0.1
Pu-238	Alpha	60.3	1
Pu-239/240	Alpha	44.8	1
Pu-241	Beta	1260	20
Sr-90	Beta	25.8	1
U-234	Alpha	37.8	1
U-235	Gamma	1.45	1
U-238	Alpha	39.7	1

As shown in the above table, the configuration and control of the laboratory's counting equipment and environment resulted in each project soil MDC being routinely achieved with excellent margin.

5.0 Changes to the Survey Plan

During the planning phase of the remediation project, it was anticipated that unforeseen events or circumstances would occur affecting the final status survey design or execution documented in the survey plan (Reference 1). For each event, project personnel promptly reviewed the circumstances and determined if a survey plan deviation existed. For each identified deviation, action resolving the event or circumstance was formulated and approved for implementation. The resolutions required a survey unit land area classification change or a survey unit addition, deletion, or reconfiguration.

The following table summarizes the deviations that were resolved during the project work cycle. Refer to Figures 5-1 through 5-6 for depictions of the planned and actual land areas involved. None of the resolutions compromised the technical efficacy of the final status survey performed.

Deviations From the Waltz Mill Site Final Status Survey Plan

Study Area	Survey Unit	Deviation	Resolution
1	SU1	Excavated affected soil volume exceeded 50 m^3	SU1R was added with a Class 1 land area final status survey protocol.
1	SU2	Westinghouse S-5 Building construction interfered with survey plans.	Westinghouse personnel performed a final status survey as part of preparation for construction. A separate final status survey report addresses this area.
1	SU3	Westinghouse S-5 Building construction interfered with survey plans.	Westinghouse personnel performed a final status survey as part of preparation for construction. A separate final status survey report addresses this area.
1	SU6	Westinghouse S-5 Building construction produced an interfering soil stockpile.	SU6 was eliminated. Westinghouse personnel performed final status survey of the land area beneath the soil stockpile as part of preparation for construction. A separate final status survey report addresses this area.
1	SU7	Butler Building incorrectly identified as a nonoperational soils area.	Excavation of contaminated soil in the adjacent SU1 was terminated near the Butler Building foundation.
1	SU7	Westinghouse S-5 Building construction produced an interfering soil stockpile.	SU7 was reconfigured to exclude the soil stockpile. A separate final status survey report addresses this area.
1	SU8	Westinghouse S-5 Building construction installed a new storm water retention basin.	SU8 was reconfigured to exclude the storm water retention basin. A separate final status survey report addresses this area.

Deviations From the Waltz Mill Site Final Status Survey Plan

Study Area	Survey Unit	Deviation	Resolution
1	SU9	Westinghouse S-5 Building construction produced an interfering soil stockpile.	SU9 was reconfigured to exclude the soil stockpile. A separate final status survey report addresses this area.
2	SU2	Radiological measurements and re-review of historical site photographs indicated that the southern perimeter of WTR Basin 2 was further north.	SU2 was reconfigured to include a portion of SU10 along Calley's Run proceeding to the access road. The portion of SU2 that included the WTR Basin 2 excavation starting point was designated as the "trench area" and the portion of SU2 that used to be in SU10 along Calley's Run was designated "nontrench" area.
2	SU3	Field radiological measurements and re-review of historical Waltz Mill site drawings and photographs indicated that the southern perimeter of WTR Basin 3 was further north.	SU3 was reconfigured to include the entire land area occupied by WTR Basins 2 and 3.
2	SU13	Re-examination of historical Waltz Mill site assessment documentation indicated that the southern reach of SU13 did not extend into the desired land area.	SU13 (adjacent to Calley's Run) was extended approximately 8 feet in the southernmost portion to include the surface water drainage ditch.
2	SU1	Extent of soil contamination was greater than anticipated due to surface-contaminated objects (SCO) excavated (water storage tank foundations, LWRB north valve pit, and LWRB loading dock).	SU1 land area was increased to reflect the actual area excavated. Due to the resizing of the LWRB excavation, the soil walls and bedrock floor of the former LWRB were surveyed separately as SU1W and SU1B.
2	SU4	Extent of soil contamination in, and size of, SU1 was greater than anticipated due to SCOs excavated (water storage tank foundations, LWRB north valve pit, and LWRB loading dock).	SU4 was reconfigured to accommodate the increased land area of SU1.
2	SU5	Portions of the land area were inadvertently used to stockpile ABM prior to completion of the final status survey.	Stockpiled ABM was removed and the land area restored to a near-undisturbed configuration prior to final status survey.
2	SU8	Extent of soil contamination in, and size of, SU1 was greater than anticipated due to SCOs excavated (water storage tank foundations, LWRB north valve pit, and LWRB loading dock).	SU8 was reconfigured to accommodate the increased land area of SU1.

Deviations From the Waltz Mill Site Final Status Survey Plan

Study Area	Survey Unit	Deviation	Resolution
2	SU9	Extent of soil contamination in, and size of, SU1 was greater than anticipated due to SCOs excavated (water storage tank foundations, LWRB north valve pit, and LWRB loading dock).	SU9 was eliminated to accommodate the increased land area of SU1.
2	SU10	Extent of soil contamination in, and size of, SU1 was greater than anticipated due to SCOs excavated (water storage tank foundations, LWRB north valve pit, and LWRB loading dock).	SU10 was eliminated to accommodate the increased land area of SU1.
2	SU11	Extent of soil contamination in, and size of, SU1 was greater than anticipated due to SCOs excavated (water storage tank foundations, LWRB north valve pit, and LWRB loading dock).	SU11 was reconfigured to accommodate the increased land area of SU1.
2	SU1	ABM that was stockpiled in Study Area 3B was used to contour the grade in portions of SU1 in June and September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 4, 5, 7, and 8 exceeded the Class 1 land area limit.	SU1 land area was redesignated to include portions of the three new survey units ABM-West, ABM-Center, and ABM-East.
2	SU1	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU1 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU1 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.
2	SU2	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU2 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU2 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.

Deviations From the Waltz Mill Site Final Status Survey Plan

Study Area	Survey Unit	Deviation	Resolution
2	SU3	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU3 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU3 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.
2	SU4	ABM that was stockpiled in Study Area 3B was used to contour the grade in portions of SU4 in June and September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 4, 5, 7, and 8 exceeded the Class 1 land area limit.	SU4 land area was redesignated to include portions of the three new survey units ABM-West, ABM-Center, and ABM-East.
2	SU5	ABM that was stockpiled in Study Area 3B was used to contour the grade in portions of SU5 in June and September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 4, 5, 7, and 8 exceeded the Class 1 land area limit.	SU5 land area was redesignated to include portions of the three new survey units ABM-West, ABM-Center, and ABM-East.
2	SU5	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU5 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU5 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.
2	SU7	ABM that was stockpiled in Study Area 3B was used to contour the grade in portions of SU7 in June 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 4, 5, 7, and 8 exceeded the Class 1 land area limit.	SU7 land area was redesignated to include portions of the three new survey units ABM-West, ABM-Center, and ABM-East.

Deviations From the Waltz Mill Site Final Status Survey Plan

Study Area	Survey Unit	Deviation	Resolution
2	SU8	ABM that was stockpiled in Study Area 3B was used to contour the grade in portions of SU8 in June and September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 4, 5, 7, and 8 exceeded the Class 1 land area limit.	SU8 land area was redesignated to include portions of the three new survey units ABM-West, ABM-Center, and ABM-East.
2	SU8	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU8 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU8 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.
2	SU11	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU11 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU11 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.
2	SU12	ABM that was stockpiled in Study Area 2 was used to contour the grade in portions of SU12 in September 2001. The total area (over 4,000 m^2) over which ABM was placed in Survey Units 1, 2, 3, 5, 8, 11, and 12 exceeded the Class 1 land area limit.	SU12 land area was redesignated to include portions of the three new survey units ABM-North, ABM-South, and ABM-West.
3	SU1	The east-west orientation of SU1 in WTR Basin 1 interfered with construction equipment traffic.	SU1 was reconfigured with a north-south orientation.
3	SU2	The east-west orientation of SU2 in WTR Basin 1 interfered with construction equipment traffic.	SU2 was reconfigured with a north-south orientation.

Deviations From the Waltz Mill Site Final Status Survey Plan

Study Area	Survey Unit	Deviation	Resolution
3A	n.a.	The area west of WTR Basin 1 was initially classified as a Class 2 Area based on Waltz Mill site history and characterization data. However, ABM accumulated during excavation activities was stockpiled in this area. The last of the stockpiled ABM was placed in Study Area 2 so that the soil surface beneath the stockpile could be surveyed. During initial scanning activities, elevated activity areas were found indicating that the land area classification (Class 2) was incorrect.	SU6 was added with a Class 1 land area final status survey protocol.
3A	n.a.	The area south of WTR Basin 1 was initially classified as a Class 2 Area based on Waltz Mill site history and characterization data. However, during initial scanning activities, elevated activity areas were found indicating that the land area classification (Class 2) was incorrect.	SU7 was added with a Class 1 land area final status survey protocol.

6.0 Final Status Survey Results

The following sections summarize the final (as left) status of each survey unit within Study Areas 1, 2, and 3. This information is based on the detailed observations and data shown in Volume 2 of this report (primarily Appendices A, B, and D), as well as on the data tables included in the Tables section of Volume 1. In some instances, performance of gamma scans or collection of soil samples occurred over extended and/or segmented durations. This was necessary to accommodate construction priorities or to wait for the effect of confounding radiation sources beyond the survey unit to diminish. Such delays in no way affected the efficacy of the final status survey results. As noted in Sections 3.3 and 3.4, the performance capability of the final status scan surveys was routinely evaluated for each survey unit. The results of this sensitivity evaluation are shown in Table 6.0.

6.1 Study Area 1

Study Area 1 included the 10 survey units shown in Figure 5-2. Survey Units 1R, 1, 4, and 5 were Class 1 Areas and Survey Units 7, 8, 9, and 10 were Class 2 Areas. As presented earlier (Chapter 5.0), remediation and final status survey of Survey Units 2, 3, and 6 and portions of Survey Units 7, 8, and 9 was completed by Westinghouse personnel.

6.1.1 Survey Unit 1 R

As described in Chapter 5.0, Survey Unit 1R was added within Survey Unit 1 when an affected soil volume exceeded 50 cubic meters (m^3). The final status survey (100 percent gamma survey) was performed on June 15 and June 20, 2001 using a 5-meter-by-5-meter grid labeled west to east with the letters "A" through "G" and south to north with the numbers 1 through 6 (Figure 6.1-1). Due to varying wall dimensions and elevations, the wall scans were included with the adjacent floor scan. However, the northern walls in Grids A6 and B6 were located beyond the approved study area boundary in an operational area and were excluded from scanning for final status survey purposes. The area of Survey Unit 1R was approximately 6,092 square feet (ft^2) (566 square meters [m^2]).

The following table and Figures 6.1-2 and 6.1-3 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 1R:

Statistical Parameter	Gamma Scan (cpm)
Average	35,600
Standard Deviation	4,100
Minimum Value	31,000
Maximum Value	50,000
Median Value	34,000

Due to the elevated background readings resulting from shine from nearby operational buildings (greater than 35,000 cpm) and radioactive material embedded in soil beyond the approved study area boundary, the scan MDC exceeded the DCGL and the sample density was increased accordingly, using the method discussed in Section 2.8. Therefore, 37 samples were collected using the random-start, triangular sampling grid (Sample Nos. 1184 through 1220). The results are summarized in Table 6.1-1 and the sample locations are shown in Figure 6.1-4. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 1R passed all relevant statistical tests.

6.1.2 Survey Unit 1

The final status survey (100 percent gamma survey) was performed on September 12, September 13, and September 14, 2001 using 5-meter-by-5-meter grids labeled west to east with the letters "A" through "I" and south to north with the numbers 1 through 6 (Figure 6.1-5). The area of Survey Unit 1 was approximately 16,359 ft^2 (1,520 m^2).

The following table and Figures 6.1-6 and 6.1-7 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 1:

Statistical Parameter	Gamma Scan (cpm)
Average	32,800
Standard Deviation	11,300
Minimum Value	17,000
Maximum Value	71,000
Median Value	28,000

Due to the elevated background readings resulting from radioactive material embedded in adjacent operational area soil or in stored components, the scan MDC exceeded the DCGL and the sample density was increased accordingly, using the method discussed in Section 2.8. Therefore, 20 sample locations were located using the random-start, triangular sampling grid (Sample Nos. 1245 through 1264). However, eight sample locations (Sample Nos. 1245 through 1248, 1251, 1252, 1258, and 1259) were located in areas previously backfilled with off-site material; therefore, these samples were not collected.

Two additional biased samples (1265 and 1266) were collected in high background areas of Grids C-5 and D-5. Data for Samples 1265 and 1266 were not included in the summary statistics because they were not obtained in a random-start fashion. The results are summarized in Table 6.1-2 and the sample locations are shown in Figure 6.1-8. All analytical results are less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 1 passed all relevant statistical tests.

6.1.3 Survey Unit 4

The final status survey (100 percent gamma survey) was performed in Survey Unit 4 on November 8 and November 16, 2000 using a 2-meter-by-2-meter grid on the floor of the excavation. The grid was labeled west to east with the letters "A" through "H" and south to north with the numbers 1 through 9 (Figure 6.1-9). The area of Survey Unit 4 was approximately 2,222 ft^2 (206 m^2).

The following table and Figure 6.1-10 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 4:

Statistical Parameter	Gamma Scan (cpm)
Average	36,500
Standard Deviation	2,100
Minimum Value	28,000
Maximum Value	39,000
Median Value	37,000

Eight soil samples were collected in Survey Unit 4 using the random-start, triangular sampling grid (Sample Nos. 1123 through 1130). The results are summarized in Table 6.1-3 and the sample locations are shown in Figure 6.1-11. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 4 passed all relevant statistical tests.

6.1.4 Survey Unit 5

After a thin layer of limestone dust was placed, Survey Unit 5 was backfilled in 2-foot lifts to assure adequate soil compaction. A total of two 2-foot lifts of ABM were placed. A final status survey was conducted on the bottom of Survey Unit 5 prior to placing limestone dust and after placement of each lift of ABM. The results of the final status survey for the bottom of the excavation and each lift is described below.

6.1.4.1 Survey Unit 5 – Bottom of Excavation

The final status survey (100 percent gamma survey) was performed on November 4, 2000 using 2-meter-by-2-meter grids labeled west to east with the letters "A" through "J" and south to north with the numbers 1 through 3 (Figure 6.1-12). The walls of the excavation (up to 1.5 meters high and 2 meters wide) were labeled "A" through "Z" clockwise starting in the southwest corner. The area of the bottom of Survey Unit 5 was approximately 2,031 ft^2 (189 m^2).

The following table and Figure 6.1-13 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls of Survey Unit 5:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	40,300	40,000
Standard Deviation	3,200	3,200
Minimum Value	34,000	35,000
Maximum Value	46,000	46,000
Median Value	40,500	40,500

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 1113 through 1120). The results are summarized in Table 6.1-4 and the sample locations are shown in Figure 6.1-14. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the bottom of Survey Unit 5 passed all relevant statistical tests.

6.1.4.2 Survey Unit 5 – First Lift of ABM

The final status survey (100 percent gamma survey) was performed on the first lift of ABM on November 10, 2000 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "J" and south to north with the numbers 1 through 3 (Figure 6.1-15). The walls of the excavation (up to 0.6 meter high and 2 meters wide) were labeled "A" through "Z" clockwise starting in the southwest corner. The area of the first lift of ABM was approximately 1,687 ft^2 (157 m^2).

The following table and Figure 6.1-16 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls above the first lift of ABM:

Statistical Parameter	Floor (cpm)	Wall (cpm)
Average	47,500	45,900
Standard Deviation	3,000	4,100
Minimum Value	41,000	37,000
Maximum Value	53,000	52,000
Median Value	49,000	46,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 1131 through 1138). The results are summarized in Table 6.1-5 and the sample locations are shown in Figure 6.1-17. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the first lift of ABM passed all relevant statistical tests.

6.1.4.3 Survey Unit 5 – Second Lift of ABM

A final status survey (100 percent gamma survey) was performed on the second lift of ABM on November 16, 2000 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "J" and south to north with the numbers 1 through 3 (Figure 6.1-18). The area of the second lift of ABM was approximately 1,343 ft^2 (125 m^2).

The following table and Figure 6.1-19 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings above the second lift of ABM:

Statistical Parameter	Gamma Scan (cpm)
Average	53,700
Standard Deviation	4,200
Minimum Value	47,000
Maximum Value	61,000
Median Value	53,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 1139 through 1146). The results are summarized in Table 6.1-6 and the sample locations are shown in Figure 6.1-20. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the second lift of ABM passed all relevant statistical tests.

6.1.5 Survey Units 7, 8, 9, and 10

Survey Units 7, 8, 9, and 10 were Class 2 Areas extensively characterized using a systematic survey and sample methodology. The characterization surveys were previously conducted by Westinghouse in 1995. The fixed-point characterization survey data are contained in the Waltz Mill Additional Site Characteri-

zation Report (1995), Reference 11 and in Appendix B. The results of these surveys and sample analyses constitute final status survey data where the data met the quality objectives and requirements of the Soil Remediation Action Support Survey Plan, Reference 5.

The 1995 gross gamma surveys were conducted by taking fixed 10-second counts at every 2-meter intersect using an Exploranium Model GR-256 (GR-256). The GR-256 is a portable multi-channel analyzer with data-logging capabilities, coupled with a 3-inch-by-3-inch NaI detector in an aluminum housing designed for uranium exploration. The GR-256 is capable of storing 2,500 data points consisting of four user-designated ROI. The ROI setup used for this survey provided a channel width of ~12 KeV and were selected based upon the known and suspected history of the site (Reference 11).

ROI	Channels	Isotope	KeV Range
1	10-255	Total Spectrum	120-3060
2	51-59	Cesium	612-708
3	12-20	Uranium	144-240
4	106-118	Cobalt	1272-1416

Survey locations were notated using a standard Cartesian grid (x,y). Data was collected for 10 seconds at every 2-meter intersect unless otherwise indicated by the "Survey Locations Map" (Reference 11). Surveys were not performed in weather conditions where standing water was evident as detector attenuation could affect data collected. Survey and sampling results for Survey Units 7, 8, 9, and 10 are described below.

6.1.5.1 Survey Unit 7

The gross gamma data collected in 1995 (see Section 6.1.5) for this survey was sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). The 10- to 100-percent coverage required for a Class 2 survey unit was achieved by the 78-percent coverage 2-meter-by-2-meter intersect fixed-point measurements. The increased sensitivity of a 3-inch-by-3-inch NaI detector relative to the standard 2-inch-by-2-inch NaI detectors used to perform final status surveys ensured a scanning minimum detectable concentration less than the acceptance criteria, when the background gross gamma count rate approached normal background. The background gross gamma count rate in Survey Unit 7 approached normal background at the time of the survey. Therefore, the characterization gross gamma survey data was used as the final status survey in Survey Unit 7. The results are presented in Appendix B (adapted from Appendix F of the 1995 Characterization Report) and Figures 6.1-21, 6.1-22, 6.1-23, and

6.1-24. The results reveal no substantially elevated areas. The total area of this survey unit was approximately 91,390 ft^2 (8,490 m^2).

Since the fixed-point characterization surveys were performed (1994 and 1995), some of the area had been covered with gravel (Figure 6.1-25). Due to the additional gravel layer, a 100 percent gamma scan coverage was performed in grids (or portions of grids) containing gravel. The final status survey of the gravel-covered areas was performed on September 25, September 26, and September 27, 2001. The survey was performed by using 20-meter-by-20-meter grids labeled west to east with the letters "A" through "G" and south to north with the numbers 1 through 7 (Figure 6.1-26). The following table and Figures 6.1-27 and 6.1-28 (trend of average and background measurements) summarize the results of the gamma scan readings:

Statistical Parameter	Gamma Scan (cpm)
Average	18,100
Standard Deviation	7,800
Minimum Value	9,500
Maximum Value	45,000
Median Value	17,000

In 1995, soil samples were taken on an approximate 20-meter-by-20-meter grid system and analyzed by gamma spectrometry. Although the sampling was systematic and exceeded the minimum number of sample points required, the MDCs reported were not sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). Therefore, 12 soil samples were collected using the random-start, triangular sampling grid in Survey Unit 7 (Sample Nos. 1267 through 1278). In addition, two biased samples were collected on the west and east sides of the Butler Building (Sample Nos. 1291 and 1292). Some of the samples were collected beneath 2 to 3 feet of gravel. The results are summarized in Table 6.1-7 and the sample locations are shown in Figure 6.1-29. Data for samples 1291 and 1292 were not included in the summary statistics because they were not obtained in a random-start fashion. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 7 passed all relevant statistical tests.

6.1.5.2 Survey Unit 8

The gross gamma data collected in 1995 (see Section 6.1.5) in Survey Unit 8 was sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). The 10- to 100-percent coverage required for a Class 2 survey unit was achieved by the 78-percent coverage 2-meter-by-2-meter

intersect fixed-point measurements. The increased sensitivity of a 3-inch-by-3-inch NaI detector relative to the standard 2-inch-by-2-inch NaI detectors used to perform final status surveys ensured a scanning minimum detectable concentration less than the acceptance criteria, when the background gross gamma count rate approached normal background. The background gross gamma count rate in Survey Unit 8 approached normal background at the time of the survey. Therefore, the characterization gross gamma survey data was used as the final status survey in Survey Unit 8. The results are presented in Appendix B (adapted from Appendix F of 1995 Characterization Report) and Figures 6.1-30, 6.1-31, 6.1-32, and 6.1-33. The results reveal one elevated area (186K counts/10 seconds) that was not located by additional gamma scans. The area of Survey Unit 8 was approximately 93,162 ft^2 (8,655 m^2).

In 1995, soil samples were taken on an approximate 20-meter-by-20-meter grid system and analyzed by gamma spectrometry. Although the sampling was systematic and exceeded the minimum number of sample points required, the MDCs reported were not sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). Therefore, 12 soil samples were collected using the random-start, triangular sampling grid in Survey Unit 8 (Sample Nos. 1221 through 1232). The results are summarized in Table 6.1-8 and the sample locations are shown in Figure 6.1-34. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 8 passed all relevant statistical tests.

6.1.5.3 Survey Unit 9

The gross gamma data collected in 1995 (see Section 6.1.5) in Survey Unit 9 was sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). The 10- to 100-percent coverage required for a Class 2 survey unit was achieved by the 78-percent 2-meter-by-2-meter intersect fixed-point measurements. The increased sensitivity of a 3-inch-by-3-inch NaI detector relative to the standard 2-inch-by-2-inch NaI detectors used to perform final status surveys ensured a scanning minimum detectable concentration less than the acceptance criteria, when the background gross gamma count rate approached normal background. The background gross gamma count rate in Survey Unit 9 approached normal background at the time of the survey. Therefore, the characterization gross gamma survey data was used as the final status survey in Survey Unit 9. The results are presented in Appendix B (adapted from Appendix F of the 1995 Characterization Report) and Figures 6.1-35, 6.1-36, 6.1-37, and 6.1-38. The results reveal no elevated areas. The total area of Survey Unit 9 was approximately 95,153 ft^2 (8,840 m^2).

Since the fixed-point characterization surveys were performed (1995), a radioactive waste shipping container staging area (F Lot) was built in Survey Unit 9. The F Lot area was a gravel pad for storage of shipping containers. Due to the additional gravel layer, 100 percent gamma scan coverage was performed in grids (or portions of grids) containing gravel (Figure 6.1-25). The final status survey of the F Lot area was performed on September 27, 2001. The survey was performed using 20-meter-by-20-meter grids labeled west to east with the letters "A" through "F" and south to north with the numbers 1 through 4 (Figure 6.1-39). The following table and Figures 6.1-40 and 6.1-41 (trend of average and background measurements) summarize the results of the F Lot area gamma scan readings:

Statistical Parameter	Gamma Scan (cpm)
Average	10,000
Standard Deviation	1,000
Minimum Value	8,000
Maximum Value	12,500
Median Value	9,800

In 1995, soil samples were taken on an approximate 20-meter-by-20-meter grid system and analyzed by gamma spectrometry. Although the sampling was systematic and exceeded the minimum number of sample points required, the MDCs reported were not sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). Therefore, 12 soil samples were collected using the random-start, triangular sampling grid in Survey Unit 9 (Sample Nos. 1279 through 1290). Some of the samples were collected beneath 2 to 3 feet of gravel. The results are summarized in Table 6.1-9 and the sample locations are shown in Figure 6.1-42. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 9 passed all relevant statistical tests.

6.1.5.4 Survey Unit 10

The gross gamma data collected in 1995 (see Section 6.1.5) in Survey Unit 10 was sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). The 10- to 100-percent coverage required for a Class 2 survey unit was achieved by the 78-percent coverage 2-meter-by-2-meter intersect fixed-point measurements. The increased sensitivity of a 3-inch-by-3-inch NaI detector relative to the standard 2-inch-by-2-inch NaI detectors used to perform final status surveys ensured a scanning minimum detectable concentration less than the acceptance criteria, when the background gross gamma count rate approached normal background. The background gross gamma count rate in Survey Unit 10 approached normal background at the time of the survey. Therefore, the characterization gross gamma survey data was used as the final status survey in Survey Unit 10. The results are presented in

Appendix B (adapted from Appendix F of the 1995 Characterization Report) and Figures 6.1-43, 6.1-44, 6.1-45, and 6.1-46. The results reveal no elevated areas.

The area of Survey Unit 10 was approximately 78,780 ft^2 (7,319 m^2). All but a small area south of the retention pond was surveyed in 1995. The area that was not surveyed in 1995 was surveyed in October 2001 using a standard 2-inch-by-2-inch NaI detector at 100-percent coverage. The results are presented in Figure 6.1-47. Also in October 2001, a series of 1-minute fixed counts of gross gamma activity using a 2-inch-by-2-inch NaI detector were performed at 58 of the original (1994 and 1995) locations to validate the original data. The results are presented in Table 6.1-10 and Figure 6.1-48. A correlation coefficient (r value) was calculated to evaluate the agreement between the two sets of data. The calculated r value (0.705) is more than double the 95-percent confidence level r value (0.316) for 57 degrees of freedom. Thus, historical gross gamma survey data are representative of current (2001) soil conditions.

In 1995, soil samples were taken on an approximate 20-meter-by-20-meter grid system and analyzed by gamma spectrometry. Although the sampling was systematic and exceeded the minimum number of sample points required, the MDCs reported were not sufficient to meet the requirements of the Soil Remediation Action Support Survey Plan (Reference 5). Therefore, 12 soil samples were collected using the random-start, triangular sampling grid in Survey Unit 10 (Sample Nos. 1233 through 1244). The results are summarized in Table 6.1-11 and the sample locations are shown in Figure 6.1-49. All analytical results are less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 10 passed all relevant statistical tests.

6.2 Study Area 2

Study Area 2 included the 12 survey units shown in Figure 5-4. All the survey units within Study Area 2 were Class 1 Areas.

6.2.1 Survey Unit 1

Survey Unit 1 is located within the solid and liquid waste processing area and contained the former concrete LWRB. Due to the size of the excavation, the bottom and walls of the excavation were considered separate survey units (Survey Unit 1B and Survey Unit 1W). The LWRB excavation was backfilled in 2-foot lifts to assure adequate soil compaction. After placing 4 feet of gravel, 2 feet of off-site fill material was placed in the excavation; subsequent lifts placed ABM. A final status survey was conducted

on the bottom of the basin (prior to gravel placement) and after placement of each lift of ABM. A total of six 2-foot lifts of ABM were placed. The results of each final status survey are described below.

6.2.1.1 Survey Unit 1B – Bottom of LWRB

After removal of the concrete walls and floor of the LWRB, the final status survey (100 percent gamma survey) and soil sampling was performed on April 20 and 21, 2001. The survey was performed using a 2-meter-by-2-meter grid on the floor of the excavation. The grids were labeled west to east with the letters "A" through "I" and south to north with the numbers 1 through 12 (Figure 6.2-1). The walls of the excavation are considered a separate survey unit (SU1W). The area of the bottom of the excavation was approximately 6,355 ft^2 (590m^2).

The following table and Figures 6.2-2 and 6.2-3 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings on the floor of the bottom of the excavation:

Statistical Parameter	Floor (cpm)
Average	25,300
Standard Deviation	1,500
Minimum Value	22,000
Maximum Value	29,000
Median Value	25,000

Eight sample locations were located using the random-start, triangular sampling grid. However, due to the bedrock surface, only five samples were obtainable. Earth Sciences' sample numbers for these samples are 2496, 2497, 2501, 2502, and 2503. The results are summarized in Table 6.2-1 and the sample locations are shown in Figure 6.2-4. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the bottom of the excavation passed all relevant statistical tests. Approval to place the gravel and first lift (2 feet of off-site material followed by a layer of ABM) in Survey Unit 1 was given on April 25, 2001. The first lift of ABM was complete on April 28, 2001.

6.2.1.2 Survey Unit 1W – Walls of LWRB

The final status survey (100 percent gamma survey) was performed on the walls of the LWRB in conjunction with each "lift" survey of ABM in April and May 2001. The survey was performed using a 2-meter-by-2-meter grid on the walls of the excavation. The grids were labeled "A" through "CI" clockwise starting in the southwest corner and bottom to top with the numbers 1 through 8 (Figure 6.2-5). The area of the walls was approximately 20,024 ft^2 (1,860 m^2).

The following table and Figures 6.2-6, 6.2-7, 6.2-8, and 6.2-9 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the walls of the excavation:

Statistical Parameter	Walls (cpm)
Average	22,000
Standard Deviation	3,000
Minimum Value	16,500
Maximum Value	37,000
Median Value	22,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2504 through 2511). The results are summarized in Table 6.2-2 and the sample locations are shown in Figure 6.2-10. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the walls of the LWRB excavation passed all relevant statistical tests.

6.2.1.3 Survey Unit 1 – First Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the first lift of ABM on April 27, 2001 and April 28, 2001 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "K" and south to north with the numbers 1 through 13 (Figure 6.2-11). The area of the first lift of ABM was approximately 7,553 ft^2 (702 m^2).

The following table and Figure 6.2-12 (trend of average readings; insufficient number of data points to show background trend plot) summarize the results of the 100 percent gamma scan readings from the floor above of the first lift of ABM:

Statistical Parameter	Floor (cpm)
Average	22,900
Standard Deviation	700
Minimum Value	22,000
Maximum Value	24,000
Median Value	23,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2524 through 2531). The results are summarized in Table 6.2-3 and the sample locations are shown in Figure 6.2-13. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the

first lift of ABM passed all relevant statistical tests. Approval to place the second lift of ABM was given on May 1, 2001. The backfill was completed on May 2, 2001.

6.2.1.4 Survey Unit 1 – Second Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the second lift of ABM on May 2, 2001 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "M" and south to north with the numbers 1 through 16 (Figure 6.2-14). The area of the second lift of ABM was approximately 9,270 ft^2 ($861m^2$).

The following table and Figures 6.2-15 and 6.2-16 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor above the second lift of ABM:

Statistical Parameter	Floor (cpm)
Average	21,400
Standard Deviation	1,300
Minimum Value	19,000
Maximum Value	25,000
Median Value	22,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2540 through 2547). The results are summarized in Table 6.2-4 and the sample locations are shown in Figure 6.2-17. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the second lift of ABM passed all relevant statistical tests. Approval to place the third lift of ABM was given on May 4, 2001. The backfill was completed on May 5, 2001.

6.2.1.5 Survey Unit 1 – Third Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the third lift of ABM on May 5 and May 7, 2001 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "N" and south to north with the numbers 1 through 20 (Figure 6.2-18). The area of the third lift of ABM was approximately 12,517 ft^2 (1,163 m^2).

The following table and Figures 6.2-19 and 6.2-20 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor above the third lift of ABM:

Statistical Parameter	Floor (cpm)
Average	23,800
Standard Deviation	1,300
Minimum Value	22,000
Maximum Value	27,000
Median Value	23,500

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2561 through 2568). The results are summarized in Table 6.2-5 and the sample locations are shown in Figure 6.2-21. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the third lift of ABM passed all relevant statistical tests. Approval to place the fourth lift of ABM was given on May 9, 2001. The backfill was completed on May 10, 2001.

6.2.1.6 Survey Unit 1 – Fourth Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the fourth lift of ABM on May 10 and May 11, 2001 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "T" and south to north with the numbers 1 through 18 (Figure 6.2-22). The area of the fourth lift of ABM was approximately 17,705 ft^2 (1,645 m^2).

The following table and Figures 6.2-23 and 6.2-24 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor above the fourth lift of ABM:

Statistical Parameter	Floor (cpm)
Average	23,600
Standard Deviation	1,300
Minimum Value	19,000
Maximum Value	28,000
Median Value	23,500

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2581 through 2588). The results are summarized in Table 6.2-6 and the sample locations are shown in Figure 6.2-25. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the fourth lift of ABM passed all relevant statistical tests. Approval to place the fifth lift of ABM was given on May 11, 2001. The backfill was completed on May 14, 2001.

6.2.1.7 Survey Unit 1 – Fifth Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the fifth lift of ABM on May 14, May 15, and May 16, 2001 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "T" and south to north with the numbers 1 through 20 (Figure 6.2-26). The area of the fifth lift of ABM was approximately 19,472 ft^2 (1,809 m^2).

The following table and Figures 6.2-27 and 6.2-28 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor above the fifth lift of ABM:

Statistical Parameter	Floor (cpm)
Average	22,700
Standard Deviation	1,700
Minimum Value	18,000
Maximum Value	26,000
Median Value	23,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2591 through 2598). The analytical results for Sample No. 2593 failed unity (>1.0) for both $DCGL_{Total}$ and $DCGL_W$ (upon receipt of Sr-90 results). Therefore, another sample was collected (Sample No. 2601) beneath the location of Sample No. 2593 to verify that no contamination existed. (Apparently, the sample location was remediated by collection of Sample No. 2601.) This sample passed all relevant statistical tests and is used in place of Sample No. 2593 for the final status survey. Regardless, due to the 20 percent safety factor inherent in the sample density calculation, the results for Sample No. 2601 were not required to be considered in assessing survey unit conditions. The results are summarized in Table 6.2-7 and the sample locations are shown in Figure 6.2-29. Approval to place the sixth lift of ABM was given on May 17, 2001. The backfill was completed on May 21, 2001.

6.2.1.8 Survey Unit 1 – Sixth Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the sixth lift of ABM on May 21, 2001 using a 2-meter-by-2-meter grid. The grids were labeled west to east with the letters "A" through "T" and south to north with the numbers 1 through 21 (Figure 6.2-30). The area of the sixth lift of ABM was approximately 20,090 ft^2 (1,866 m^2).

The following table and Figures 6.2-31 and 6.2-32 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor above the sixth lift of ABM:

Statistical Parameter	Floor (cpm)
Average	20,400
Standard Deviation	1,400
Minimum Value	17,000
Maximum Value	26,000
Median Value	20,000

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2624 through 2631). The results are summarized in Table 6.2-8 and the sample locations are shown in Figure 6.2-33. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the sixth lift of ABM passed all relevant statistical tests.

6.2.2 Survey Unit 2

As described in Chapter 5.0, Survey Unit 2 was reconfigured due to a re-examination of historical site assessment documentation indicating the WTR Basins 2 and 3 ending further north (within Survey Unit 3). Therefore, the northern portion of Survey Unit 2 (containing overburden material) was excavated in conjunction with the remediation of Survey Unit 3. This portion of Survey Unit 2 was designated as the "trench" area. The southern portion of Survey Unit 2 was designated as the "nontrench" area. The trench area was backfilled in 2-foot lifts to assure adequate soil compaction. After placing 2 feet of off-site fill material in the excavation, subsequent lifts contained ABM. A final status survey was conducted on the bottom of the trench (prior to off-site material placement) and after each lift of ABM. A total of four 2-foot lifts of ABM were placed in the trench area. The results of each final status survey are described below.

6.2.2.1 Survey Unit 2 – Trench Excavation Bottom

A final status survey (100 percent gamma survey) of the trench excavation bottom and walls of Survey Unit 2 was performed on November 15, 2000. The survey was performed using 10-meter-by-10-meter grids on the floor of the excavation and relevant portions of the walls. The grids were labeled west to east with the letters "A" through "C" and south to north with the numbers 1 through 2 (Figure 6.2-34). The walls of the excavation (up to 1.3 meters high and 10 meters wide) were labeled "A" to "J" clockwise starting in the southwest corner. The area of the bottom of the trench excavation was approximately 10,530 ft^2 (978 m^2) and the total area (trench and nontrench areas) of Survey Unit 2 was approximately 20,948 ft^2 (1,946 m^2).

The following table and Figure 6.2-35 (trend of average readings; insufficient number of measurements were taken to effectively display the background isopleth) summarize the results of the 100 percent gamma scan readings from the floor and walls of the trench area of Survey Unit 2:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	26,200	24,900
Standard Deviation	2,600	2,000
Minimum Value	23,000	23,000
Maximum Value	29,000	28,000
Median Value	27,000	25,000

Due to an increase in background readings, a higher sample density was used to compensate for an increase in uncertainty brought about by the higher scan MDC (refer to method discussed in Section 2.8). Based on the ratio of the calculated scan MDC for the increased background, the minimum number of samples (N) was increased to 12. Therefore, 12 soil samples were collected throughout the entire survey unit using the random-start, triangular sampling grid (2249 through 2260). The results are summarized in Table 6.2-9 and the sample locations are shown in Figure 6.2-36. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the bottom of the excavation passed all relevant statistical tests. However, it was noted the calculated weighted standard deviation (0.29) exceeded the estimated standard deviation. This finding was inconsequential because the calculated standard deviation (0.29) would require seven samples, which is less than the 12 samples collected (refer to Section 6.2.10 for an example recalculation of N. Therefore, no additional sampling was required. Approval to place the first two lifts of soil (one layer of off-site borrow followed by a layer of ABM) in the trench portion of Survey Unit 2 was given on November 17, 2000. The backfill was completed on November 21, 2000.

6.2.2.2 Survey Unit 2 – Trench – 1st Lift of ABM

A final status survey (100 percent gamma survey) of the trench area of Survey Unit 2 was performed on the first lift of ABM on November 21, 2000 using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "C" and south to north with the numbers 1 through 2 (Figure 6.2-37). The walls of the excavation (up to 1.3 meters high and 10 meters wide) were labeled "A" to "J" clockwise starting in the southwest corner. The area of the trench excavation was approximately 11,205 ft^2 (1,041 m^2) and the area of Survey Unit 2 was approximately 20,948 ft^2 (1,946 m^2).

The following table and Figure 6.2-38 (trend of average readings; insufficient number of measurements were taken to effectively display the background isopleth) summarize the results of the 100 percent gamma scan readings from the floor and walls of the trench area above the first lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	19,800	19,000
Standard Deviation	400	600
Minimum Value	19,000	18,000
Maximum Value	20,000	20,000
Median Value	20,000	19,000

Due to an increase in background levels, a higher sample density (12 samples) was used to compensate for an increase in uncertainty brought about by the higher scan MDC (refer to method discussed in Section 2.8). However, only seven of the samples were located in the "trench" area that was backfilled with a 2-foot layer of ABM. Therefore, seven soil samples were collected from the first lift of ABM in Survey Unit 2 using the random-start, triangular sampling grid (2280 through 2286). The results are summarized in Table 6.2-10 and the sample locations are shown in Figure 6.2-39. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the first lift of ABM passed all relevant statistical tests. Approval to place the second layer of ABM in the trench portion of Survey Unit 2 was given on November 28, 2000. The backfill was completed on December 2, 2000.

6.2.2.3 Survey Unit 2 – Trench – 2nd Lift of ABM

A final status survey (100 percent gamma survey) of the trench area of Survey Unit 2 was performed on the second lift of ABM on December 2, 2000 using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "C" and south to north with the numbers 1 through 2 (Figure 6.2-40). The walls of the excavation (up to 1.3 meters high and 10 meters wide) were labeled "A" to "J" clockwise starting in the southwest corner. The area of the trench excavation was approximately 6,402 ft^2 (595 m^2) and the area of Survey Unit 2 was approximately 16,560 ft^2 (1,538 m^2).

The following table and Figures 6.2-41 and 6.2-42 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the floor and walls of the trench area above the second lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	18,500	17,000
Standard Deviation	500	1,000
Minimum Value	18,000	16,000
Maximum Value	19,000	18,000
Median Value	18,500	17,000

Due to an increase in background levels, a higher sample density (12 samples) was used to compensate for an increase in uncertainty brought about by the higher scan MDC (refer to method discussed in Section 2.8). However, only five of the samples were located in the "trench" area that was backfilled with a 2-foot layer of ABM. Therefore, five soil samples were collected from the second lift of ABM in Survey Unit 2 using the random-start, triangular sampling grid (Sample Nos. 2302 through 2306). The results are summarized in Table 6.2-11 and the sample locations are shown in Figure 6.2-43. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the second lift of ABM passed all relevant statistical tests. Approval to place the third lift of ABM was given on December 8, 2000. The backfill was completed on December 11, 2000.

6.2.2.4 Survey Unit 2 – Trench – 3rd Lift of ABM

A final status survey (100 percent gamma survey) of the trench area of Survey Unit 2 was performed on the third lift of ABM on December 11, 2000 using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "C" and south to north with the numbers 1 through 2 (Figure 6.2-44). The walls of the excavation (up to 0.66 meter high and 10 meters wide) were labeled "A" to "J" clockwise starting in the southwest corner. The area of the bottom of the trench excavation was approximately 6,732 ft^2 (625 m^2) and the area of Survey Unit 2 was approximately 16,856 ft^2 (1,566 m^2).

The following table and Figures 6.2-45 and 6.2-46 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the floor and walls of the trench above the third lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	18,800	19,500
Standard Deviation	400	2,100
Minimum Value	18,000	18,000
Maximum Value	19,000	21,000
Median Value	19,000	19,500

Due to an increase in background levels, a higher sample density (12 samples) was used to compensate for an increase in uncertainty bought about by the higher scan MDC (refer to method discussed in Section 2.8). However, only five of the samples were located in the "trench" area that was backfilled with a 2-foot layer of ABM. Therefore, five soil samples were collected from the third lift of ABM in Survey Unit 2 using the random-start, triangular sampling grid (Sample Nos. 2327 through 2331). The results are summarized in Table 6.2-12 and the sample locations are shown in Figure 6.2-47. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the third lift of ABM passed all relevant statistical tests. Approval to place the fourth lift of ABM was given on December 13, 2000. The backfill was completed on December 15, 2000.

6.2.2.5 Survey Unit 2 – Trench – 4th Lift of ABM

A final status survey (100 percent gamma survey) of the nontrench area and trench area of Survey Unit 2 was performed on December 5, 2000 and December 15, 2000 respectively. The survey was performed using 10-meter-by-10-meter grids on the floor of the Survey Unit 2. The grid was labeled west to east with the letters "A" through "D" and south to north with the numbers 1 to 5 (Figure 6.2-48). The area of Survey Unit 2 was approximately 16,856 ft^2 (1,566 m^2).

The following table and Figures 6.2-49 and 6.2-50 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the trench area and nontrench area of Survey Unit 2:

Statistical Parameter	Floor (cpm)
Average	18,900
Standard Deviation	2,000
Minimum Value	16,000
Maximum Value	23,000
Median Value	18,300

Eight soil samples were collected using the random-start, triangular sampling grid (Sample Nos. 2346 to 2353). The results are summarized in Table 6.2-13 and the sample locations are shown in Figure 6.2-51. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values.

6.2.3 Survey Unit 3

As described in Chapter 5.0, Survey Unit 3 was reconfigured due to a re-examination of historical site assessment documentation indicating the WTR Basins 2 and 3 ended further north. Therefore, Survey

Unit 3 was reconfigured to include both WTR Basins 2 and 3. Survey Unit 3 was backfilled in 2-foot lifts to assure adequate soil compaction. After placing 2 feet of off-site fill material in the excavation, subsequent lifts placed ABM. A final status survey was conducted on the bottom of the excavation (prior to off-site material placement) and after each lift of ABM. A total of four 2-foot lifts of ABM were placed in Survey Unit 3. The results of each final status survey are described below.

6.2.3.1 Survey Unit 3 – Excavation Bottom

A final status survey (100 percent gamma survey) of Survey Unit 3 was performed on November 15, 2000 using 2-meter-by-2-meter grids on the floor of the excavation. The grids were labeled west to east with the letters "A" through "L" and south to north with the numbers 1 through 13 (Figure 6.2-52). The walls of the excavation (up to 1.3 meters high and 2 meters wide) were labeled "A" through "AX" clockwise starting in the southwest corner. The area of the bottom of Survey Unit 3 was approximately 7,300 ft^2 (678 m^2).

The following table and Figures 6.2-53 and 6.2-54 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls of the excavation bottom:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	24,100	23,300
Standard Deviation	2,100	2,500
Minimum Value	20,000	19,000
Maximum Value	31,000	30,000
Median Value	24,000	23,000

Eight soil samples were collected throughout the survey unit using the random-start, triangular sampling grid (Sample Nos. 2241 through 2248). The results are summarized in Table 6.2-14 and the sample locations are shown in Figure 6.2-55. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the bottom of the excavation passed all relevant statistical tests. Approval to place the first two lifts (one layer of off-site borrow followed by a layer of ABM) was given on November 17, 2000. The backfill was completed on November 20, 2000.

6.2.3.2 Survey Unit 3 – 1st Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the first lift of ABM on November 20 and November 21, 2000 using 2-meter-by-2-meter grids. The grids were labeled

west to east with the letters "A" through "M" and south to north with the numbers 1 through 14 (Figure 6.2-56). The walls of the excavation (up to 1.3 meters high and 2 meters wide) were labeled "A" through "AO" clockwise starting in the southwest corner. The area of the bottom of the excavation was approximately 9,300 ft^2 (864 m^2).

The following table and Figures 6.2-57 and 6.2-58 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls above the first lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	19,300	18,800
Standard Deviation	1,000	1,200
Minimum Value	17,000	17,000
Maximum Value	23,000	22,000
Median Value	19,000	18,000

Eight soil samples were collected throughout the survey unit using the random-start, triangular sampling grid (Sample Nos. 2272 through 2279). The results are summarized in Table 6.2-15 and the sample locations are shown in Figure 6.2-59. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the first lift of ABM passed all relevant statistical tests. Approval to place the second lift of ABM was given on November 28, 2000. The backfill was completed on December 1, 2000.

6.2.3.3 Survey Unit 3 – 2nd Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the second lift of ABM on December 1 and 2, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "M" and south to north with the numbers 1 through 14 (Figure 6.2-60). The walls of the excavation (up to 1.3 meters high and 2 meters wide) were labeled "A" through "AO" clockwise starting in the southwest corner. The area of the bottom of the excavation was approximately 10,400 ft^2 (966 m^2).

The following table and Figures 6.2-61 and 6.2-62 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls above the second lift of ABM in Survey Unit 3:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	18,000	17,300
Standard Deviation	600	1,000
Minimum Value	16,000	15,000
Maximum Value	22,000	19,000
Median Value	18,000	17,000

Eight soil samples were collected throughout Survey Unit 3 using the random-start, triangular sampling grid (Sample Nos. 2294 through 2301). The results are summarized in Table 6.2-16 and the sample locations are shown in Figure 6.2-63. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the second lift of ABM passed all relevant statistical tests. Approval to place the third lift of ABM was given on December 8, 2000. The backfill was completed on December 11, 2000.

6.2.3.4 Survey Unit 3 – 3rd Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the third lift of ABM on December 11, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "N" and south to north with the numbers 1 through 15 (Figure 6.2-64). The walls of the excavation (up to 1.3 meters high and 2 meters wide) were labeled "A" through "AR" clockwise starting in the southwest corner. The area of the bottom of the excavation was approximately 10,490 ft^2 (975 m^2).

The following table and Figure 6.2-65 and 6.2-66 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls above the third lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	18,500	18,100
Standard Deviation	700	1,600
Minimum Value	17,000	14,000
Maximum Value	20,000	21,500
Median Value	19,000	18,000

Eight soil samples were collected throughout Survey Unit 3 using the random-start, triangular sampling grid (Sample Nos. 2318 through 2325). The results are summarized in Table 6.2-17 and the sample locations are shown in Figure 6.2-67. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the third lift of ABM passed all relevant statistical tests. Approval to place the fourth lift of ABM was given on December 13, 2000. The backfill was completed on December 15, 2000.

6.2.3.5 Survey Unit 3 – 4th Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the fourth lift of ABM on December 15, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "R" and south to north with the numbers 1 through 18 (Figure 6.2-68). The walls of the excavation (up to 1.3 meters high and 2 meters wide) were labeled A1 through B3 above the southwest corner. The area of the bottom of the excavation was approximately 14,600 ft^2 (1,356 m^2).

The following table and Figures 6.2-69 and 6.2-70 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from the floor and walls above the fourth lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	16,900	19,200
Standard Deviation	1,600	800
Minimum Value	10,000	18,000
Maximum Value	20,000	20,000
Median Value	17,000	19,000

Eight soil samples were collected throughout the survey unit using the random-start, triangular sampling grid (Sample Nos. 2333 through 2340). The results are shown in Table 6.2-18 and the sample locations are shown in Figure 6.2-71. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the fourth lift passed all relevant statistical tests.

6.2.4 Survey Unit 4

Survey Unit 4 was located in the northwest corner of Study Area 2. The final status survey (100 percent gamma survey) was performed on May 18, May 23, June 4, June 5, July 31, and August 1, 2001 using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "G" and south to north with the numbers 1 through 5 (Figure 6.2-72). The area of this survey unit was approximately 20,290 ft^2 (1,885 m^2).

The following table and Figures 6.2-73 and 6.2-74 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 4:

Statistical Parameter	Gamma Scans (cpm)
Average	21,000
Standard Deviation	3,200
Minimum Value	14,000
Maximum Value	27,000
Median Value	21,000

Eight soil samples were collected using the random-start, triangular sampling grid in Survey Unit 4 (Sample Nos. 2635 through 2642). The results are summarized in Table 6.2-19 and the sample locations are shown in Figure 6.2-75. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 4 passed all relevant statistical tests.

6.2.5 Survey Unit 5

Survey Unit 5 was located in the north-central portion of Study Area 2. The final status survey (100 percent gamma survey) was performed on May 9, May 24, May 30, May 31, June 1, and June 4, using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "D" and south to north with the numbers 1 through 9 (Figure 6.2-76). The area of this survey unit was approximately 21,528 ft^2 (2,000 m^2).

The following table and Figures 6.2-77 and 6.2-78 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 5:

Statistical Parameter	Gamma Scan (cpm)
Average	19,800
Standard Deviation	2,600
Minimum Value	14,000
Maximum Value	24,000
Median Value	20,000

Eight soil samples were collected using the random-start, triangular sampling grid in Survey Unit 5 (Sample Nos. 2571 through 2578). The results are summarized in Table 6.2-20 and the sample locations are shown in Figure 6.2-79. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 5 passed all relevant statistical tests.

6.2.6 Survey Unit 6

Survey Unit 6 was located along the eastern border of Study Area 2. The final status survey (100 percent gamma survey) was performed in Survey Unit 6 on March 12 and March 13, 2001 using 10-meter-by-

10-meter grids. The grids were labeled west to east with the letters "A" and "B" and south to north with the numbers 1 through 6 (Figure 6.2-80). The area of Survey Unit 6 was approximately 9,257 ft^2 (860 m^2).

The following table and Figures 6.2-81 and 6.2-82 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 6:

Statistical Parameter	Gamma Scan (cpm)
Average	14,900
Standard Deviation	1,300
Minimum Value	13,000
Maximum Value	17,000
Median Value	15,000

Eight soil samples were collected in Survey Unit 6 using the random-start, triangular sampling grid (Sample Nos. 2422 through 2429). Sample No. 2429 fell along the eastern border of Survey Unit 6, which contained off-site backfill material placed to control soil erosion. Therefore, Sample No. 2429 was off-site borrow, whereas Sample No. 2420 (composite sample collected underneath location of Sample No. 2429 prior to backfilling) represented the final exposed condition in that area of Survey Unit 6. The results are summarized in Table 6.2-21 and the sample locations are shown in Figure 6.2-83. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 6 passed all relevant statistical tests.

6.2.7 Survey Unit 7

The final status survey (100 percent gamma survey) was performed on August 22, August 24, August 27, and August 30, 2001. The survey was performed using 10-meter-by-10-meter grids labeled west to east with the letters "A" through "D" and south to north with the numbers 1 through 12 (Figure 6.2-84). The area of Survey Unit 7 was approximately 20,451 ft^2 (1,900 m^2).

The following table and Figures 6.2-85 and 6.2-86 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 7:

Statistical Parameter	Gamma Scan (cpm)
Average	19,700
Standard Deviation	2,100
Minimum Value	16,000
Maximum Value	24,000
Median Value	20,000

Eight soil samples were collected using the random-start, triangular sampling grid in Survey Unit 7 (Sample Nos. 2408 through 2415). The results are summarized in Table 6.2-22 and the sample locations are shown in Figure 6.2-87. The analytical results for the eight samples are less than unity (<1.0) using the $DCGL_{Total}$ values.

6.2.8 Survey Unit 8

The final status survey (100 percent gamma survey) was performed on May 16, May 18, May 21, August 15, September 4, September 5, September 6, and September 7, 2001. The survey was performed using 10-meter-by-10 meter grids labeled west to east with the letters "A" through "D" and south to north with the numbers 1 through 7 (Figure 6.2-88). The area of Survey Unit 8 was approximately 20,615 ft^2 (1,915 m^2).

The following table and Figures 6.2-89 and 6.2-90 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 8:

Statistical Parameter	Gamma Scan (cpm)
Average	20,400
Standard Deviation	2,600
Minimum Value	15,000
Maximum Value	24,500
Median Value	21,000

Eight soil sample locations were located using the random-start, triangular sampling grid in Survey Unit 8 (Sample Nos. 2603 through 2610). However, only seven of the eight samples were collected due to bed-rock surface encountered at Sample No. 2606 (located near Monitoring Well MW-40). The results are summarized in Table 6.2-23 and the sample locations are shown in Figure 6.2-91. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 8 passed all relevant statistical tests.

6.2.9 Survey Unit 11

The final status survey (100 percent gamma survey) was performed on July 20, July 23, July 24, September 5, September 6, and September 7, 2001. The survey was performed using 10-meter-by-10-meter grids labeled west to east with the letters "A" through "J" and south to north with the numbers 1 through 6 (Figure 6.2-92). The area of Survey Unit 11 was approximately 18,514 ft^2 (1,720 m^2).

The following table and Figures 6.2-93 and 6.2-94 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 11:

Statistical Parameter	Gamma Scan (cpm)
Average	15,800
Standard Deviation	1,500
Minimum Value	13,000
Maximum Value	19,000
Median Value	16,000

Eight soil samples were collected using the random-start, triangular sampling grid in Survey Unit 11 (Sample Nos. 2657 through 2664). The results are summarized in Table 6.2-24 and the sample locations are shown in Figure 6.2-95. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 11 passed all relevant statistical tests.

6.2.10 Survey Unit 12

The 100 percent gamma survey was performed in Survey Unit 12 on October 3, October 4, and October 10, 2000 using 10-meter-by-10-meter grids. The grids were labeled north to south with the letters "A" through "E" and west to east with the numbers 1 through 6 (Figure 6.2-96). The area of Survey Unit 12 was approximately 20,118 ft^2 (1,869 m^2).

The following table and Figures 6.2-97 and 6.2-98 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 12:

Statistical Parameter	Gamma Scan (cpm)
Average	25,000
Standard Deviation	3,900
Minimum Value	17,000
Maximum Value	31,000
Median Value	25,500

Eight soil samples were collected in Survey Unit 12 using the random-start, triangular sampling grid (Sample Nos. 2061 through 2068). The results are summarized in Table 6.2-25 and the sample locations are shown in Figure 6.2-99. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 12 passed all relevant statistical tests. However, it was noted that the calculated weighted standard deviation (0.30) exceeded the estimated standard deviation of 0.23. Consequently, a new relative shift value was calculated ($\Delta/\sigma = 1.7$) and the corresponding SignP (MARISSIM Table 5.4) was 0.955435. Substituting these values into Equation 9 (with CF=1.0) resulted in the new required number of samples, N = 7. Since the recalculated number of samples was less than the eight samples collected, no additional sampling was required.

6.2.11 Survey Unit 13

The 100 percent gamma survey was performed in Survey Unit 13 on September 22, September 29, October 2, October 5, and October 7, 2000. As described in Chapter 5.0, Survey Unit 13 was extended approximately 8 feet in the southernmost portion to include the drainage ditch. The gross gamma survey was performed using 10-meter-by-10-meter grids labeled north to south with the letters "A" through "C" and west to east with the numbers 1 through 7 (Figure 6.2-100). The area of Survey Unit 13 was approximately 19,537 ft^2 (1,815 m^2).

The following table and Figures 6.2-101 and 6.2-102 (trend of average and background measurements) summarize the results of the 100 percent gross gamma scan readings:

Statistical Parameter	Gamma Scan (cpm)
Average	23,100
Standard Deviation	4,000
Minimum Value	18,000
Maximum Value	33,000
Median Value	23,500

An elevated area was identified in Grid C-5 and an EMC calculation was performed based on the remaining elevated activity area in Grid C-5 (Table 6.2-26). As shown in Table 6.2-26, Survey Unit 13 passed the EMC calculation.

Eight soil samples were collected in Survey Unit 13 using the random-start, triangular sampling grid (Sample Nos. 2036 through 2043). In addition, three samples were collected in the southernmost portion to include the drainage ditch described above (Sample Nos. 2115 through 2117). However, during

installation of a surface water discharge structure in October 2001, the soil area surrounding Sample No. 2043 was excavated and another sample was collected at the base of the excavation below the location of Sample No. 2043 (Sample No. 2837). Therefore, Sample No. 2837 replaced Sample No. 2043 in the statistical evaluation. The results are summarized in Table 6.2-27 and the random-start sample locations are shown in Figure 6.2-103. All analytical results for the final survey samples were less than unity (<1.0) using the $DCGL_{Total}$ values. Data for Samples 2115 through 2117 were not included in the summary statistics because they were not obtained in a random-start fashion.

6.2.12 Bag Farm – North and South

During remediation of Survey Unit 1 (LWRB), ground and surface water accumulated in the excavation was pumped into cylindrical reinforced polyethylene bags prior to being processed for off-site disposal. These bags were placed on sections of Survey Units 1, 2, 3, 5, and 6 as shown in Figure 6.2-104. Because the surface area covered by the bags was greater than 2,000 m^2 and minor bag leakage was observed, two survey units were required. These survey units were designated as "Bag Farm North" and "Bag Farm South". The final status survey (100 percent gamma survey) was performed on June 18, 2001. The survey was performed using 10-meter-by-10-meter grids labeled west to east with the letters "A" through "H" for both survey units and south to north with the numbers 1 and 2 for Bag Farm North and 1 through 3 for Bag Farm South (Figure 6.2-105). The area of Bag Farm North was approximately 11,086 ft^2 (1,030 m^2) and the area of Bag Farm South was approximately 17,319 ft^2 (1,609 m^2).

The following table and Figures 6.2-106 and 6.2-107 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Bag Farm North and Bag Farm South:

Statistical Parameter	Bag Farm North (cpm)	Bag Farm South (cpm)
Average	15,700	16,000
Standard Deviation	930	800
Minimum Value	15,000	15,000
Maximum Value	18,000	17,000
Median Value	15,500	16,000

Eight soil samples were collected using the random-start, triangular sampling grid in each survey unit (Sample Nos. 2672 through 2687). The results are summarized in Tables 6.2-28 and 6.2-29 and the sample locations are shown in Figure 6.2-108. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, both survey units passed all relevant statistical tests.

6.2.13 ABM West (1), Center, and East

ABM that was stockpiled in Study Area 3B was used as fill in portions of Study Area 2 (i.e., Survey Units 1, 4, 5, 7, and 8). The placement area of the ABM was greater than 4,000 m^2; therefore, three survey units were required. These survey units were designated as ABM-West (1), ABM-Center, and ABM-East (Figure 6.2-109). The final status survey (100 percent gamma survey) was performed on June 21, June 22, June 25, June 26, and June 27, 2001. The survey was performed using 10-meter-by-10-meter grids in each survey unit and labeled west to east with letter designations and south to north with number designations as shown in Figures 6.2-110, 6.2-111, and 6.2-112. The area of survey unit ABM-West was approximately 14,003 ft^2 (1,300 m^2); the area of survey unit ABM-Center was approximately 15,778 ft^2 (1,466 m^2); and the area of survey unit ABM-East was approximately 18,356 ft^2 (1,705 m^2).

The following table and Figures 6.2-113, 6.2-114, and 6.2-115 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from each ABM survey unit:

Statistical Parameter	ABM-West (cpm)	ABM-Center (cpm)	ABM-East (cpm)
Average	22,800	19,200	18,100
Standard Deviation	1,400	1,600	700
Minimum Value	19,000	16,000	17,000
Maximum Value	26,000	22,000	20,000
Median Value	23,000	20,000	18,000

Eight soil samples were collected in each ABM survey unit using the random-start, triangular sampling grid (Sample Nos. 2696 through 2719). The results are summarized in Tables 6.2-30, 6.2-31, and 6.2-32 and the sample locations are shown in Figures 6.2-116, 6.2-117, and 6.2-118. All analytical results are less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, each ABM survey unit passed all relevant statistical tests.

6.2.14 ABM North, South, and West (2)

ABM that was stockpiled in Study Area 3B was used as fill in portions of Study Area 2 (i.e., Survey Units 1, 2, 3, 5, 8, 11, and 12). The placement area of the ABM was greater than 4,000 m^2; therefore, three survey units were required. These survey units were designated as ABM-North, ABM-South, and ABM-West (2) (Figure 6.2-119). The final status survey (100 percent gamma survey) was performed on September 18, September 19, and September 20, 2001. The survey was performed using 10-meter-by-10-meter grids in each survey unit and labeled west to east with letter designations and south to north

with number designations as shown in Figures 6.2-120, 6.2-121, and 6.2-122. The area of survey unit ABM-North was approximately 12,160 ft^2 (1,130 m^2); the area of survey unit ABM-South was approximately 12,443 ft^2 (1,156 m^2); and the area of survey unit ABM-West (2) was approximately 17,896 ft^2 (1,663 m^2).

The following table and Figures 6.2-123, 6.2-124, and 6.2-125 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from each ABM survey unit:

Statistical Parameter	ABM-North (cpm)	ABM-South (cpm)	ABM-West (2) (cpm)
Average	15,600	14,700	14,600
Standard Deviation	900	900	900
Minimum Value	14,500	12,500	13,000
Maximum Value	17,000	16,000	16,000
Median Value	15,000	15,000	15,000

Eight soil samples were collected in each ABM survey unit using the random-start, triangular sampling grid (Sample Nos. 2809 through 2832). The results are summarized in Tables 6.2-33, 6.2-34, and 6.2-35 and the sample locations are shown in Figures 6.2-126, 6.2-127, and 6.2-128. All analytical results are less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, each ABM survey unit passed all relevant statistical tests.

6.3 Study Area 3

Study Area 3 included the seven survey units shown in Figure 5-6. Survey Units 1, 2, 6, and 7 were Class 1 Areas; Survey Units 3 and 4 were Class 2 Areas; and Survey Unit 5 was a Class 3 Area.

6.3.1 Survey Units 1 and 2

The footprint of the excavated WTR Basin 1 was greater than 2,000 m^2; therefore, two survey units were delineated (Survey Units 1 and 2) for purposes of surveying a Class 1 Area. The WTR Basin 1 required backfilling in 2-foot lifts to assure adequate soil compaction. After placing a thin marker layer of limestone dust, 2 feet of off-site fill material was placed on the bottom of the basin excavation, subsequent lifts placed ABM. A final status survey was conducted on the bottom of the basin (prior to marker placement) and each subsequent lift of ABM. A total of five 2-foot lifts and two partial (i.e., less than 2 feet thick) lifts of ABM were placed. The results of the final status survey for each lift are described below.

6.3.1.1 Survey Units 1 and 2 – Bottom of WTR Basin 1

After removal of the radiologically impacted soil in WTR Basin 1, the final status survey (100 percent gamma survey) and soil sampling was performed on August 24, 2000. The survey was performed in 2-meter-by-2-meter grids on the floor of the excavation. The grids were labeled west to east with the letters "A" through "T" and south to north with the numbers 1 through 10 (see Figure 6.3-1). The walls of the excavation (up to 1.2 meters high and 2 meters wide) were labeled "A" to "BH" clockwise starting in the southwest corner. The area of the bottom of the excavation was approximately 16,696 ft^2 (1,551 m^2). Approximately 10 centimeters (4 inches) of soil remained above bedrock.

The following table and Figures 6.3-2 and 6.3-3 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings on the floor and walls of the bottom of the excavation:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	21,500	23,200
Standard Deviation	1,600	1,800
Minimum Value	18,000	19,000
Maximum Value	27,000	28,000
Median Value	22,000	23,000

Ten soil samples were collected in each survey unit using the random-start, triangular sampling grid (Sample Nos. 97 through 116). The results are summarized in Tables 6.3-1 and 6.3-2 and the sample locations are shown in Figure 6.3-4. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the bottom of the excavation passed all relevant statistical tests. Approval to place the first two lifts of soil (one lift of off-site borrow followed by a lift of ABM) in Survey Units 1 and 2 was given on August 25, 2000. The first lift of ABM was completed on August 28, 2000.

6.3.1.2 Survey Units 1 and 2 – First Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the first lift of ABM on August 28, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "W" and south to north with the numbers 1 through 11 (see Figure 6.3-5). The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled "A" to "BP" clockwise starting in the southwest corner. The area of the first lift of ABM was approximately 15,752 ft^2 (1,463 m^2).

The following table and Figures 6.3-6 and 6.3-7 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings on the floor and walls above the first lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	20,900	20,100
Standard Deviation	1,300	1,300
Minimum Value	19,000	17,500
Maximum Value	25,000	23,000
Median Value	21,000	20,000

Eight soil samples were collected in each survey unit using the random-start, triangular sampling grid (Sample Nos. 123 through 138). The results are summarized in Tables 6.3-3 and 6.3-4 and the sample locations are shown in Figure 6.3-8. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the first lift of ABM passed all relevant statistical tests. Approval to place the second lift of ABM in Survey Units 1 and 2 was given on August 29, 2000. The backfill was completed on August 30, 2000.

6.3.1.3 Survey Units 1 and 2 – Second Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the second lift of ABM on August 30, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "X" and from south to north with the numbers 1 through 12 (see Figure 6.3-9). The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled "A" to "BT" clockwise starting in the southwest corner. The area of the second lift of ABM was approximately 15,800 ft^2 (1,468 m^2).

The following table and Figures 6.3-10 and 6.3-11 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings on the floor and walls above the second lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	22,300	22,300
Standard Deviation	1,200	1,400
Minimum Value	19,000	19,000
Maximum Value	26,000	26,000
Median Value	22,000	22,000

Eight soil samples were collected in each survey unit using the random-start, triangular sampling grid (Sample Nos. 140 through 155). The results are summarized in Tables 6.3-5 and 6.3-6 and the sample locations are shown in Figure 6.3-12. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the second lift of ABM passed all relevant statistical tests. Approval to place

the third lift of ABM in Survey Units 1 and 2 was given on August 31, 2000. The backfill was completed on September 5, 2000.

6.3.1.4 Survey Units 1 and 2 – Third Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the third lift of ABM on September 5, 2000 using 2-meter-by-2-meter grids. The grid was labeled west to east with the letters "A" through "X" and south to north with the numbers 1 through 13 (Figure 6.3-13). The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled "A" to "BV" clockwise starting in the southwest corner. The area of the third lift of ABM was approximately 18,316 ft^2 (1,702 m^2).

The following table and Figures 6.3-14 and 6.3-15 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings on the floor and walls above the third lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	23,600	23,300
Standard Deviation	1,000	1,110
Minimum Value	21,000	20,500
Maximum Value	26,000	26,500
Median Value	23,500	23,000

Eight soil samples were collected in each survey unit using the random-start, triangular sampling grid (Sample Nos. 156 through 171). The results are summarized in Tables 6.3-7 and 6.3-8 and the sample locations are shown in Figure 6.3-16. All analytical results are less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the third lift of ABM passed all relevant statistical tests. Approval to place the fourth lift of ABM in Survey Units 1 and 2 was given on September 6, 2000. The backfill was completed on September 8, 2000.

6.3.1.5 Survey Units 1 and 2 – Fourth Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the fourth lift of ABM on September 8, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "Y" and south to north with the numbers 1 through 14 (see Figure 6.3-17). The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled "A" to "BZ" clockwise starting in the southwest corner. The area of the fourth lift of ABM was approximately 20,740 ft^2 (1,927 m^2).

The following table and Figures 6.3-18 and 6.3-19 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the floor and walls above the fourth lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	22,900	23,300
Standard Deviation	1,200	2,200
Minimum Value	20,000	20,000
Maximum Value	26,500	30,000
Median Value	23,000	23,000

Eight soil samples were collected in each survey unit using the random-start, triangular sampling grid (Sample Nos. 172 through 187). The results are summarized in Tables 6.3-9 and 6.3-10 and the sample locations are shown in Figure 6.3-20. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the fourth lift passed all relevant statistical tests. Approval to place the fifth lift of ABM in Survey Units 1 and 2 was given on September 9, 2000. The backfill was completed on September 11, 2000.

6.3.1.6 Survey Units 1 and 2 – Fifth Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the fifth lift of ABM on September 11, 2000 using 2-meter-by-2-meter grids. The grids were labeled west to east with the letters "A" through "Y" and south to north with the numbers 1 through 14 (Figure 6.3-21). As shown in Figure 6.3-21, the southern end of the excavation was at ground level (no walls) as well as part of the southwestern portion of the excavation. The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled from "A" to "AT" clockwise starting in the southwest corner. The area of the fifth lift of ABM was approximately 22,767 ft^2 (2,115 m^2).

The following table and Figures 6.3-22 and 6.3-23 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the floor and walls above the fifth lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	23,400	22,900
Standard Deviation	1,160	800
Minimum Value	19,500	21,000
Maximum Value	28,500	24,000
Median Value	23,000	23,000

Eight soil samples were collected in each survey unit using the random-start, triangular sampling grid (Sample Nos. 190 through 205). The results are summarized in Tables 6.3-11 and 6.3-12 and the sample locations are shown in Figure 6.3-24. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the fifth lift passed all relevant statistical tests. Approval to place the sixth lift of ABM in Survey Unit 1 was given on September 12, 2000 (the sixth lift is a partial lift encompassing only Survey Unit 1). The backfill was completed on September 13, 2000.

6.3.1.7 Survey Unit 1 – Sixth Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the sixth lift of ABM on September 13, 2000 using 2-meter-by-2-meter grids. The sixth lift consisted of one survey unit (Survey Unit 1). The grids were labeled west to east with the letters "A" through "AA" and south to north with the numbers 1 through 10 (Figure 6.3-25). The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled "A" to "AT" clockwise starting in the southwest corner. As shown in Figure 6.3-25, the southern end of the excavation was at ground level (no walls). The area of the sixth lift of ABM was approximately 14,007 ft^2 (1,301 m^2).

The following table and Figures 6.3-26 and 6.2-27 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the floor and walls above the sixth lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	22,000	20,800
Standard Deviation	1,000	1,500
Minimum Value	19,500	18,000
Maximum Value	24,000	24,000
Median Value	22,000	21,000

Eight soil samples were collected in Survey Unit 1 using the random-start, triangular sampling grid (Sample Nos. 206 through 213). The results are summarized in Table 6.3-13 and the sample locations are shown in Figure 6.3-28. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the sixth lift passed all relevant statistical tests. Approval to place the seventh lift of ABM in Survey Unit 1 was given on September 14, 2000. The backfill was completed on September 14, 2000.

6.3.1.8 Survey Unit 1 – Seventh Lift of ABM

The final status survey (100 percent gamma survey) and soil sampling was performed on the seventh lift of ABM on September 14, 2000 and September 15, 2000, respectively, using 2-meter-by-2 meter grids.

The seventh lift consisted of one survey unit (Survey Unit 1) and was triangular in shape. The grids were labeled west to east with the letters "A" through "S" and south to north with the numbers 1 through 9 (see Figure 6.3-29). As shown in Figure 6.3-29, the southern end of the excavation was at ground level (no walls) as well as part of the eastern portion of the excavation. The walls of the excavation (up to 2 meters wide and 0.6 meter high) were labeled "A" to "AC" clockwise starting in the southwest corner. The area of the seventh lift of ABM was approximately 4,453 ft^2 (414 m^2).

The following table and Figures 6.3-30 and 6.3-31 (trend of average and background readings) summarize the results of the 100 percent gamma scan readings from the floor and walls above the seventh lift of ABM:

Statistical Parameter	Floor (cpm)	Walls (cpm)
Average	21,600	21,300
Standard Deviation	1,100	1,100
Minimum Value	19,000	19,000
Maximum Value	24,500	23,000
Median Value	22,000	22,000

Eight soil samples were collected in Survey Unit 1 using the random-start, triangular sampling grid (Sample Nos. 214 through 221). The results are summarized in Table 6.3-14 and the sample locations are shown in Figure 6.3-32. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, the seventh lift passed all relevant statistical tests. A final lift of off-site borrow material was placed on Survey Unit 1 and Survey Unit 2 on September 18, 2000. Seeding of the final soil surface was completed on November 17, 2000.

6.3.2 Survey Unit 3

Survey Unit 3 was a Class 2 Area located north and west of the former WTR Basin 1 and required 10- to 100-percent scan coverage. The final status survey was performed on June 25, June 26, June 27, July 2, July 3, July 9, July 10, July 16, and July 17, 2001 using 20-meter-by-20-meter grids. The grids were labeled west to east with the letters "A" through "G" and south to north with the numbers 1 through 6 (Figure 6.3-33). The area of Survey Unit 3 was approximately 54,330 ft^2 (5,047 m^2).

The following table summarizes the results of the gamma scan readings in Survey Unit 3:

Statistical Parameter	Gamma Scan (cpm)
Average	23,700
Standard Deviation	5,600
Minimum Value	16,000
Maximum Value	36,000
Median Value	20,500

Fifty-one background readings were taken in Survey Unit 3 and ranged from 14,529 cpm to 41,562 cpm with an average of 26,354 cpm. The location and list of these background readings are shown in Figure 6.3-34. Figure 6.3-35 shows the background measurement trend for Survey Unit 3 and adjacent Survey Units 4 and 5.

Twelve soil samples were collected using the random-start, triangular sampling grid in Survey Unit 3 (Sample Nos. 244 through 255). The results are shown in Table 6.3-15 and the sample locations are shown in Figure 6.3-36. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 3 passed all relevant statistical tests.

6.3.3 Survey Unit 4

Survey Unit 4 was a Class 2 Area located east of the former WTR Basin 1 and required 10- to 100-percent gross gamma scan coverage. The final status survey was performed on June 19, June 27, July 3, July 12, July 16, July 17, July 18, 2001, and October 15, 2001 using 20-meter-by-20-meter grids. The grids were labeled west to east with the letters "A" through "D" and south to north with the numbers 1 through 6 (Figure 6.3-37). The area of Survey Unit 4 was approximately 68,255 ft^2 (6,341 m^2).

The following table summarizes the results of the gamma scan readings from Survey Unit 4:

Statistical Parameter	Gamma Scan (cpm)
Average	16,600
Standard Deviation	1,500
Minimum Value	14,000
Maximum Value	19,000
Median Value	17,000

Thirty-nine background readings were taken in Survey Unit 4 and ranged from 10,517 cpm to 18,998 cpm with an average of 13,935 cpm. The location and list of these readings are shown in Figure 6.3-38. Figure 6.3-35 shows the background measurement trend for Survey Unit 4 and adjacent Survey Units 3 and 5.

Twelve soil samples were collected using the random-start, triangular sampling grid in Survey Unit 4 (Sample Nos. 256 through 267). The results are shown in Table 6.3-16 and the sample locations are shown in Figure 6.3-39. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 4 passed all relevant statistical tests.

6.3.4 Survey Unit 5

Survey Unit 5 was a Class 3 Area located north of the former WTR Basin 1 and required judgmental scan coverage. The final status survey was performed on June 27, 2001 by walking pathways that were cleared. Approximately 15 percent of Survey Unit 5 was scanned as shown in Figure 6.3-40. This figure also shows the results of the gamma scan (range from 13,000 cpm to 30,000 cpm). The area of Survey Unit 5 was approximately 182,200 ft^2 (16,926 m^2).

Thirty background readings were taken in Survey Unit 5 and ranged from 13,750 cpm to 25,225 cpm with an average of 17,332 cpm. The location and list of these readings are shown in Figure 6.3-40. Figure 6.3-35 shows the background measurement trend for Survey Unit 5 and adjacent Survey Units 3 and 4.

Study Area 3, Survey Unit 5 was a Class 3 land area requiring judgmental scanning and random sample locations. A random number generator is recommended by MARSSIM, followed by elimination and replacement of sample locations that cannot be sampled due to site conditions (e.g., physical interference). Since the majority of the survey unit was heavily wooded, the cleared areas of the survey unit that bordered the Class 2 survey unit was selected for sampling. The required number of samples were taken in this area of highest contamination potential, yielding a potentially conservative representation of radiological conditions in the survey unit.

Twelve soil samples were required for an area greater than 10,000 m^2. A total of 14 samples were collected in Survey Unit 5 (Sample Nos. 232 through 234 and 268 through 278). Because this survey unit was a Class 3 Area, soil samples were to be taken at random locations. However, a more conservative approach was used and samples were collected in biased locations (Figure 6.3-41). The post sample contact reading of Sample No. 275 was greater than the presample contact reading; therefore, a second sample (No. 277) was collected at depth (2.5 feet) in the same location. Also, Sample No. 278 was collected at depth (2.5 feet) upgradient of this location to verify no potential contamination exists. Upon receipt of

analytical results, an elevated reading of potassium-40 was shown in Sample Nos. 277 and 278. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 5 passed all relevant statistical tests (Table 6.3-17).

6.3.5 Survey Unit 6

Survey Unit 6 was a Class 1 Area located west of the former WTR Basin 1 and was the location of the former ABM soil stockpile. The final status survey (100 percent gamma survey) was performed on June 28, June 29, and July 9, 2001 using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "H" and south to north with the numbers 1 through 5 (see Figure 6.3-42). The area of Survey Unit 6 was approximately 20,774 ft^2 (1,930 m^2).

The following table and Figures 6.3-43 and 6.3-44 (trend of average background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 6:

Statistical Parameter	Gamma Scan (cpm)
Average	23,200
Standard Deviation	3,100
Minimum Value	18,000
Maximum Value	31,000
Median Value	23,000

Eight soil samples were collected using the random-start, triangular sampling grid in Survey Unit 6 (Sample Nos. 224 through 231). The results are shown in Table 6.3-18 and the sample locations are shown in Figure 6.3-45. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 6 passed all relevant statistical tests.

6.3.6 Survey Unit 7

Survey Unit 7 was a Class 1 Area located south of the former WTR Basin 1. The final status survey (100 percent gamma survey) was performed on July 11 and July 12, 2001 using 10-meter-by-10-meter grids. The grids were labeled west to east with the letters "A" through "L" (Figure 6.3-46). The area of Survey Unit 7 was approximately 8,200 ft^2 (762 m^2).

The following table and Figure 6.3-47 (trend of average and background measurements) summarize the results of the 100 percent gamma scan readings from Survey Unit 7:

Statistical Parameter	Gamma Scan (cpm)
Average	21,800
Standard Deviation	3,800
Minimum Value	17,000
Maximum Value	27,000
Median Value	23,000

Eight soil samples were collected using the random-start, triangular sampling grid in Survey Unit 7 (Sample Nos. 236 through 243). However, due to the narrow rectangular geometry of Survey Unit 7, the sample locations were linear. The results are shown in Table 6.3-19 and the sample locations are shown in Figure 6.3-48. All analytical results were less than unity (<1.0) using the $DCGL_{Total}$ values; therefore, Survey Unit 7 passed all relevant statistical tests.

7.0 Quality Assurance Activities

7.1 Introduction

A full-scope Quality Assurance Plan (QAP) featuring performance assessments, technical basis and data reviews, and task-based analytical quality control was implemented to provide additional controls on the final status survey. The principal QAP objective was established to implement a surveying, sampling, and analytical regime limiting the introduction of unknown error into survey unit decisions. There were five component areas that were the focus of the QAP:

- Performance assessments
- Final status survey data packages
- Laboratory measurements
- Surrogate radionuclide scaling factors
- Field measurements

Conformance with the principal QAP objective was successfully demonstrated in each of these five component areas during the 16-month project work cycle, as discussed below.

7.2 Performance Assessments

Two formal audits of final status survey implementation were performed independently by the Westinghouse Nuclear Services Quality organization during the project. These audits assessed the full scope of activities approved in the Waltz Mill Facility SNM-770 Remediation Plan, the Revised Soil Plan, and implementing procedures. Project personnel maintained the technical efficacy of the final status survey and its results by promptly resolving all applicable recommendations and findings documented by these audits.

Additionally, supervisory project personnel continuously verified that the survey protocol was being properly implemented by conducting "front line" performance assessments of survey implementation. These assessments were also effective in anticipating and resolving deviations in the design of the survey plan.

7.3 Final Status Survey Data Packages

Qualified project personnel reviewed all final status survey data being compiled for approval to ensure that the (1) requirements stated in the survey plan were implemented as prescribed and, (2) results of the data collection activities supported the objectives of the survey (or permitted a determination that these

objectives should be modified.) These data package reviews checked that the appropriate numbers of samples were taken in the correct locations and that the samples were analyzed with measurement systems providing the necessary sensitivity. At the completion of each successful data package review, the estimate of sample data variability (standard deviation) and actual number of valid measurements was used to conclude that the sampling design provided adequate power to determine that the objectives of the survey design were met. With two exceptions, the sample design implemented provided adequate power as evidenced by the estimated sigma exceeding the observed sigma. The two exceptions (refer to Sections 6.2.2.1 and 6.2.10) had no impact on survey unit decisions because the number of samples taken exceeded that required by the Sign Test.

7.4 Laboratory Measurements

7.4.1 Laboratory Performance Evaluation

Radiological analyses performed by the on-site laboratory were conducted within the governing internal QAP, policies, and procedures. The management objectives of the QAP, policies, and procedures were to produce data that are scientifically valid, defensible, and of known and documented quality in accordance with federal, state, and local regulatory programs.

All measuring and test equipment having an effect on the accuracy and validity of measurements were calibrated and/or verified initially and on a continuing basis using National Institute of Standards and Technology-traceable source materials and standards. Additionally, quality control samples that were matrix matched (when possible) were analyzed along side each group of samples to ensure the sample preparation and/or measurement processes were in control on any given day. Quality control samples included laboratory control samples, duplicates, matrix spikes, and method blanks.

Following a formal sample chain of custody protocol, all final status survey soil samples were uniquely identified upon receipt and were stored and handled in a manner that maintained their integrity and prevented cross contamination. Secure access to the laboratory and samples was maintained and restricted to authorized personnel only.

Records for each final status survey soil measurement, as well as other quality assurance records needed to reconstruct the compliance of the laboratory to the QAP, are being stored for a minimum of 5 years. These records are being maintained in a secure facility protected from theft, vandalism, fire, and weather.

7.4.2 Laboratory Field Performance Evaluation

To augment the on-site laboratory's use of standard reference materials for performance evaluation as dictated by their QAP, approximately 5 percent of the total sample load submitted to the on-site laboratory was for field performance evaluation (FPE) purposes. This FPE soil sample load was evenly distributed between blanks (imported off-site borrow), spikes containing a "known" quantity of one or more radionuclides, and duplicates. All FPE samples were submitted "blind" to the laboratory (i.e., they were identified as routine project samples). These three FPE sample categories are discussed below.

Twenty-four soil blanks (off-site borrow) were analyzed by gamma spectrometry during the project. The off-site borrow soil was taken within 10 miles of the Waltz Mill Site near the Westmoreland Sewage Plant. The soil blank activity concentrations measured by the on-site laboratory (refer to Table 7.4-1) were used, in part, to determine if there were any naturally occurring radionuclides that could interfere with the gross gamma scanning thresholds established for the field instrumentation. The MDC achieved for each radionuclide of remediation concern was better than (below) the corresponding design value. Potasium-40 and other naturally occurring radionuclides in the soil blanks showed little variability when compared with the results for soil samples taken from the Waltz Mill site. One soil blank was analyzed for strontium-90 by beta spectrometry and showed that this radionuclide was present at 0.81 pCi/g. However, this Sr-90 result was considered anomalous due to the absence of Cs-137 in the same sample and because the value was 8.6 percent above the method MDC. None of the Waltz Mill Site surrogate radionuclides (Am-241, Co-60, Cs-137, U-235) were identified in any of the soil blank samples, an expected finding.

In the soil spike category, 25 samples (refer to Table 7.4-2) from a batch of affected soil recovered from Study Area 2 of the Waltz Mill site were submitted to the on-site laboratory in a blind manner to assess measurement repeatability. All samples were analyzed by gamma spectrometry, 12 by beta spectrometry (Sr-90), and three by alpha spectrometry (uranium, plutonium, and curium series). For purposes of assessing laboratory performance, the average result for each analytical data set was assumed to represent the known concentration. Due to uncertainties in obtaining representative samples from the batch of affected soil, project personnel concluded that the laboratory's performance would be acceptable if the reported result was within the range defined by two standard deviations above and below the known concentration. (There was no acceptance criteria established for duplicate results review in the Revised

Soil Plan.) This acceptance criteria was met for all of the soil spikes analyzed except a single gamma spectrometry measurement (Earth Sciences' Sample No. 3025).

In the soil duplicate category, 24 samples (refer to Table 7.4-3) were obtained from 24 sample locations to assess error associated with sample technique and analytical procedures. Field duplicates are used when determining total error for critical samples with radionuclide concentrations near the action level (DCGL). The soil duplicates (i.e., split samples) from each location were divided into separate containers and treated as separate samples throughout the remaining handling and analytical processes. Of the 24 duplicate results, five were within 20 percent of the other fraction (the acceptance criteria used by project personnel). Three of the duplicates were near the DCGL threshold, and the unity value ($DCGL_{Total}$) was lower for the duplicate fraction in each instance. A percentage of these 24 soil replicates were analyzed by alpha and beta spectrometry. The results of these alpha and beta spectrometry analyses were used to validate the surrogate radionuclide scaling factors (refer to Section 7.5). Because the soil encountered at the Waltz Mill Site made it difficult to consistently prepare a well-mixed (homogenous) field sample, the observed soil duplicate error was understandable but limited its interpretation to sampling technique only. Nonetheless, to control the sampling bias suggested by the duplicate measurements, sample containers were normally screened for gamma emissions in a low-background counting environment to identify and select the highest for final status survey analysis.

7.4.3 As-Collected Sample Analysis Bias

As discussed in Section 4.3, the final status survey soil samples were submitted to, and analyzed by, the laboratory "as collected" for gamma spectrometry. This protocol was in accordance with the Revised Soil Plan and MARSSIM, Section 7.7.1 that states:

> "There is no special sample preparation required for counting samples using a germanium detector or sodium iodide detector beyond placing the sample in a known geometry for which the detector has been calibrated. The samples can be measured as they arrive at the laboratory, or the sample can be dried, ground to a uniform particle size, and mixed to provide a more homogenous sample if required by the SOPs."

Notwithstanding the above, the project (as a quality control practice) studied the relationship between soil sample moisture content and the associated effect on gamma spectrometry results reported by the laboratory. The quality control practice results are presented in Appendix E and confirm, as expected,

that the as-collected sample results are negatively biased when compared to the paired prepared sample results. The gamma spectrometry average moisture dilution bias was –22 percent with an additional, highly variable average residual bias of –7 percent also being observed. The effect of the observed dilution and residual biases on measurements supporting survey unit decisions was evaluated and found to be inconsequential.

7.5 Surrogate – Correlated Radionuclide Relationships

Project personnel periodically validated the radionuclide relationships used to calculate surrogate DCGL activity concentration values that were the cornerstone of survey unit decisions. This validation work focused on the SFs calculated for Am-241 and Cs-137 during the planning phase of the project by incorporating supplemental analytical data into these prior calculations. The U-235 SFs did not require validation since they were based on mathematical relationships that were independent of field conditions. Cobalt-60 SFs were also not validated because the relative dose contribution of its correlated radionuclides was shown to be negligible. Analysis of the radionuclides correlated to Co-60 (H-3, C-14, Tc-99, Fe-55, Ni-63) was performed exclusively to classify IP-1 and IP-2 package shipments per Title 10, CFR, Part 61 (Reference 12).

The supplemental data were obtained by submitting a subset of the final status survey soil samples collected to the on-site laboratory for alpha and beta spectrometry. The submittal schedule was originally fixed at 25 percent (Sr-90 by beta spectrometry for the Cs-137 SF) and 5 percent (Pu-238, Pu-239/240, Pu-241, and Cm-243/244 by alpha spectrometry for the Am-241 SF) of the final status survey soil sample collection effort. However, the schedule was expanded to include other (e.g., 10 CFR 61 waste profile) final status survey study area soil samples to provide sufficient data for the SF review since many of the initial analytical results did not identify the radionuclides needed for the validation.

The surrogate radionuclide scaling factor validation data is compiled in Table 7.5. A total of 552 spectrometry measurements were completed to validate the scaling factors: 58 by alpha, 247 by beta, and 247 by gamma. While 244 of the measurements yielded calculable scaling factors for the surrogate radionuclide Sr-90, only three measurements for Pu-238 and Pu-239/240, one for Pu-241, and two for Cm-243/244 yielded calculable scaling factors. This limited number of successful measurements was due primarily to the extremely low levels of Am-241 gamma radioactivity present in the validation samples. (An overwhelming majority of the Am-241 measurements were below the critical level for the gamma spectrometry routine.) Consistent with the survey unit final status survey data used for survey unit

decisions, the sample dilution (i.e., moisture) correction was not applied to the scaling factors listed in Table 7.5. If this correction were applied, the observed Cs-137 and Am-241 surrogate scaling factors would be reduced by an additional 22 percent (refer to Appendix E for further information about the dilution factor).

The average observed Cs-137 surrogate scaling factor for Sr-90 (based on 244 co-measurements) was 0.80 with a standard deviation of 1.15, a value that is 75 percent less than that calculated for use in the Revised Soil Plan (3.16). Similarly for the Am-241 surrogate radionuclides Pu-238, Pu-239/240, and Cm-243/244, the observed scaling factors were 0.18, 0.32, and 0.08, respectively. These values are 81 percent, 40 percent, and 54 percent less than the corresponding scaling factors in the Revised Soil Plan (0.936, 0.534, and 0.168, respectively) and are based on substantially fewer successful measurements than was available for the Cs-137 surrogate radionuclide Sr-90. The conservative trend in the observed scaling factors was reversed with the Am-241 surrogate radionuclide's Pu-241 value of 9.47, 38 percent more than the Revised Soil Plan value of 6.85. However, this observed value is based on a single co-measurement of Sample No. 2744 and is, therefore, not considered a useful validation finding. The results of the scaling factor validation demonstrate that the design scaling factors derived for use in the Revised Soil Plan were substantially conservative.

7.6 Field Measurements

There were 14 Ludlum Model 2350-1 instruments and Ludlum Model 44-10 NaI detector elements paired for use during the project including final status surveys. This equipment was maintained operable under an approved instrumentation QAP that included traceable calibrations, response checks, and functional testing. A 6-month calibration frequency, daily response checks, and daily functional testing were observed during the project work cycle. The results of these QAP tasks (including acceptance criteria) are provided in Appendix C, showing that the instrumentation used to acquire final status survey data remained operable at all times.

8.0 Summary and Conclusions

The primary objective of the revised soil remediation plan was to establish the level of residual activity in soils which would permit the removal of the Waltz Mill Site from the SDMP list, and could permit the eventual unrestricted release of the site. Due to existing groundwater contamination, it was predicted that unrestricted release of impacted areas on site would not be practical for the next 25 years. Therefore, the approach consisted of remediating radiologically contaminated soil and groundwater to levels that would allow release for unrestricted use sometime in the future. The objective of the Final Status Survey Report is to establish that the level of residual radioactivity in soil following remediation met the criteria established in the Revised Soil Plan.

The DCGL values (soil radionuclide activity concentrations) were derived to levels that were ALARA and that would result in a TEDE to an average member of the critical group of less than 25 mrem/year in the year 2024 from all applicable pathways in the residential farmer scenario. The anticipated dose from groundwater contamination in Study Area 2 in the year 2024 was estimated to be about 10 mrem. Therefore, soil concentration levels in that area were targeted not to exceed 15 mrem/year in the year 2024. During the 25-year interim period, a dose criterion of 100 mrem/year was used to assure adequate protection of a hypothetical site worker.

A soil remediation action support survey plan (Reference 5) was developed prior to initiating soil remediation activities to ensure the soil remediation criteria discussed above were met. Consequently, if the results of the final status surveys were constrained within DCGL value limits and the proper survey and remediation practices followed, it can be concluded that the primary soil remediation objective would be met.

Soil remediation and final status survey activities were initiated in June 2000 and completed in October 2001. During the remediation phase of the project, a total of about 987,360 cubic feet (55,770 tons) of affected and unaffected material (44 percent of this total was affected material) was processed. The final status survey results were obtained by extensive field and laboratory radiological profiling of "as-left" soil conditions in Study Areas 1, 2, and 3, namely:

- Collection of 1,385 soil samples, 608 of which were used to document the average $DCGL_W$ value for all survey units assessed;

- Completion of 43,168 soil sample radionuclide searches in the laboratory to acquire the emissions spectra for radionuclides that could potentially be present in each soil sample; and

- Viewing ("scanning") 1,007,840 ft^2 (about 20 acres) of soil surfaces with NaI scintillation detectors. As expected, based on preparatory work for the remediation project, nearly half (48.96 percent) of the final status survey viewing effort was expended in Study Area 2, followed by Study Areas 3 (29.71 percent), then Study Area 1 (21.33 percent).

As the extracted (Table 8-1) and compiled (Chapter 6.0) final status survey data show, the average $DCGL_{Total}$ (i.e., Unity Rule) test value recorded for all the survey units examined ranged from –0.01 to 0.36, well below the remediation criterion value (1.0). These results are fundamental evidence that the remediation program objectives have been fully achieved.

In summary, the site final status survey has demonstrated that soil contamination was successfully remediated and therefore reflects the achievement of the primary objective. Accordingly, Westinghouse believes that these facts are material justification to petition the NRC to delist the Waltz Mill site from the SDMP.

References

(1) Westinghouse Electric Company, LLC, August 1999, Revised Soil Plan, Waltz Mill Site, Madison, Pennsylvania.

(2) U.S. Nuclear Regulatory Commission, November 1995, NUREG-1444, Site Decommissioning Management Plan.

(3) NUMEGA, November 27, 1996, Waltz Mill Facility SNM-770 Remediation Plan, Revision 0, Madison, Pennsylvania.

(4) U.S. Nuclear Regulatory Commission License Number SNM-770, Westinghouse Electric Company, LLC, Madison, Pennsylvania.

(5) Westinghouse Electric Company, LLC, May 2000, Soil Remediation Action Support Survey Plan, Waltz Mill Site, Madison, Pennsylvania.

(6) USEPA 402-R-97-016, December 1997, Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), NUREG-1575.

(7) U.S. Code of Federal Regulations, Title 10, Part 20, Standards for protection against radiation.

(8) U.S. Nuclear Regulatory Commission, August 1998, Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination."

(9) Argonne National Laboratory, April 1998, RESRAD Version 5.82.

(10) Earth Sciences Consultants, Inc., August 1994, Soil and Groundwater Characterization, Waltz Mill Site, Madison, Pennsylvania.

(11) Earth Sciences Consultants, Inc., August 1995, Additional Site Characterization, Waltz Mill Site, Madison, Pennsylvania.

(12) US Code of Federal Regulations, Title 10, Part 61, Licensing requirements for land disposal of radioactive waste.

Tables

Table 6.0
Final Status Scan Survey Observed Minimum Detectable Concentrations

Study Area	Survey Unit	B_{ave} (cpm)	i (sec)	p	ε_i (cpm/µR/hr)	d'	s_i (counts)	MDCR (ncpm)	$MDCR_s$ (cpm)	Scan MDA (µR/hr)	CF (pCi/g/µR/hr)	Scan MDC	
												pCi/g	$DCGL_F$
1	SU1	40,532	1	0.5	900	1.380	36	2,152	3,043	3.38	3.83	12.9	58%
1	SU1R	37,372	1	0.5	900	1.380	34	2,066	2,922	3.25	3.83	12.4	56%
1	SU4	39,485	1	0.5	900	1.380	35	2,124	3,004	3.34	3.83	12.8	58%
1	SU5 Bottom	42,911	1	0.5	900	1.380	37	2,214	3,132	3.48	3.83	13.3	60%
1	SU5 Lift 1	49,125	1	0.5	900	1.380	39	2,369	3,351	3.72	3.83	14.2	64%
1	SU5 Lift 2	57,328	1	0.5	900	1.380	43	2,559	3,620	4.02	3.83	15.4	69%
1	SU7	18,318	1	0.5	900	1.380	24	1,447	2,046	2.27	3.83	8.7	39%
1	SU8	39,000	1	0.5	900	1.380	35	2,111	2,985	3.32	3.83	12.7	57%
1	SU9	9,352	1	0.5	900	1.380	17	1,034	1,462	1.62	3.83	6.2	28%
											Study Area 1 Average	**12.1**	**54%**
2	SU1B	25,333	1	0.5	900	1.380	28	1,701	2,406	2.67	3.83	10.2	76%
2	SU1W	24,041	1	0.5	900	1.380	28	1,657	2,344	2.60	3.83	10.0	74%
2	SU1 Lift 1	21,457	1	0.5	900	1.380	26	1,566	2,214	2.46	3.83	9.4	70%
2	SU1 Lift 2	23,966	1	0.5	900	1.380	28	1,655	2,340	2.60	3.83	9.9	74%
2	SU1 Lift 3	24,774	1	0.5	900	1.380	28	1,682	2,379	2.64	3.83	10.1	75%
2	SU1 Lift 4	22,534	1	0.5	900	1.380	27	1,605	2,269	2.52	3.83	9.6	72%
2	SU1 Lift 5	19,651	1	0.5	900	1.380	25	1,498	2,119	2.35	3.83	9.0	67%
2	SU1 Lift 6	21,368	1	0.5	900	1.380	26	1,563	2,210	2.46	3.83	9.4	70%
2	SU2 Bottom	18,850	1	0.5	900	1.380	24	1,468	2,076	2.31	3.83	8.8	66%
2	SU2 Lift 1	18,850	1	0.5	900	1.380	24	1,468	2,076	2.31	3.83	8.8	66%
2	SU2 Lift 2	18,850	1	0.5	900	1.380	24	1,468	2,076	2.31	3.83	8.8	66%
2	SU2 Lift 3	18,850	1	0.5	900	1.380	24	1,468	2,076	2.31	3.83	8.8	66%
2	SU2 Lift 4	18,452	1	0.5	900	1.380	24	1,452	2,053	2.28	3.83	8.7	65%
2	SU3 Bottom	25,173	1	0.5	900	1.380	28	1,696	2,398	2.66	3.83	10.2	76%
2	SU3 Lift 1	18,388	1	0.5	900	1.380	24	1,450	2,050	2.28	3.83	8.7	65%
2	SU3 Lift 2	18,301	1	0.5	900	1.380	24	1,446	2,045	2.27	3.83	8.7	65%
2	SU3 Lift 3	19,193	1	0.5	900	1.380	25	1,481	2,094	2.33	3.83	8.9	66%
2	SU3 Lift 4	16,200	1	0.5	900	1.380	23	1,361	1,924	2.14	3.83	8.2	61%

Table 6.0
Final Status Scan Survey Observed Minimum Detectable Concentrations

Study Area	Survey Unit	B_{ave} (cpm)	i (sec)	p	ε_i (cpm/μR/hr)	d'	s_i (counts)	MDCR (ncpm)	$MDCR_s$ (cpm)	Scan MDA (μR/hr)	CF (pCi/g/μR/hr)	Scan MDC	
												pCi/g	$DCGL_F$
2	SU4	20,760	1	0.5	900	1.380	26	1,540	2,178	2.42	3.83	9.3	69%
2	SU5	17,748	1	0.5	900	1.380	24	1,424	2,014	2.24	3.83	8.6	64%
2	SU6	14,742	1	0.5	900	1.380	22	1,298	1,835	2.04	3.83	7.8	58%
2	SU7	18,250	1	0.5	900	1.380	24	1,444	2,042	2.27	3.83	8.7	65%
2	SU8	19,550	1	0.5	900	1.380	25	1,495	2,114	2.35	3.83	9.0	67%
2	SU11	16,249	1	0.5	900	1.380	23	1,363	1,927	2.14	3.83	8.2	61%
2	SU12	25,115	1	0.5	900	1.380	28	1,694	2,396	2.66	3.83	10.2	76%
2	SU13	21,879	1	0.5	900	1.380	26	1,581	2,236	2.48	3.83	9.5	71%
2	Bag Farm North	16,496	1	0.5	900	1.380	23	1,373	1,942	2.16	3.83	8.3	62%
2	Bag Farm South	16,444	1	0.5	900	1.380	23	1,371	1,939	2.15	3.83	8.2	61%
2	ABM West (1)	20,906	1	0.5	900	1.380	26	1,546	2,186	2.43	3.83	9.3	69%
2	ABM Center	17,577	1	0.5	900	1.380	24	1,417	2,004	2.23	3.83	8.5	64%
2	ABM East	16,896	1	0.5	900	1.380	23	1,389	1,965	2.18	3.83	8.4	62%
2	ABM North	14,806	1	0.5	900	1.380	22	1,301	1,839	2.04	3.83	7.8	58%
2	ABM South	14,178	1	0.5	900	1.380	21	1,273	1,800	2.00	3.83	7.7	57%
2	ABM West (2)	13,265	1	0.5	900	1.380	21	1,231	1,741	1.93	3.83	7.4	55%
											Study Area 2 Average	**8.9**	**67%**
3	SU1 Bottom	22,043	1	0.5	900	1.380	26	1,587	2,244	2.49	3.83	9.5	37%
3	SU1 Lift 1	22,293	1	0.5	900	1.380	27	1,596	2,257	2.51	3.83	9.6	37%
3	SU1 Lift 2	23,772	1	0.5	900	1.380	27	1,648	2,331	2.59	3.83	9.9	38%
3	SU1 Lift 3	23,390	1	0.5	900	1.380	27	1,635	2,312	2.57	3.83	9.8	38%
3	SU1 Lift 4	24,135	1	0.5	900	1.380	28	1,661	2,349	2.61	3.83	10.0	39%
3	SU1 Lift 5	26,462	1	0.5	900	1.380	29	1,739	2,459	2.73	3.83	10.5	41%
3	SU1 Lift 6	22,969	1	0.5	900	1.380	27	1,620	2,291	2.55	3.83	9.7	38%
3	SU1 Lift 7	22,215	1	0.5	900	1.380	27	1,593	2,253	2.50	3.83	9.6	37%
3	SU2 Bottom	22,043	1	0.5	900	1.380	26	1,587	2,244	2.49	3.83	9.5	37%

Table 6.0
Final Status Scan Survey Observed Minimum Detectable Concentrations

Study Area	Survey Unit	B_{ave} (cpm)	i (sec)	p	ε_i (cpm/μR/hr)	d'	s_i (counts)	MDCR (ncpm)	$MDCR_s$ (cpm)	Scan MDA (μR/hr)	CF (pCi/g/μR/hr)	Scan MDC	
												pCi/g	$DCGL_F$
3	SU2 Lift 1	22,293	1	0.5	900	1.380	27	1,596	2,257	2.51	3.83	9.6	37%
3	SU2 Lift 2	23,772	1	0.5	900	1.380	27	1,648	2,331	2.59	3.83	9.9	38%
3	SU2 Lift 3	23,390	1	0.5	900	1.380	27	1,635	2,312	2.57	3.83	9.8	38%
3	SU2 Lift 4	24,135	1	0.5	900	1.380	28	1,661	2,349	2.61	3.83	10.0	39%
3	SU2 Lift 5	26,462	1	0.5	900	1.380	29	1,739	2,459	2.73	3.83	10.5	41%
3	SU3	26,393	1	0.5	900	1.380	29	1,737	2,456	2.73	3.83	10.4	40%
3	SU4	13,935	1	0.5	900	1.380	21	1,262	1,785	1.98	3.83	7.6	29%
3	SU5	17,332	1	0.5	900	1.380	23	1,407	1,990	2.21	3.83	8.5	33%
3	SU6	23,681	1	0.5	900	1.380	27	1,645	2,326	2.58	3.83	9.9	38%
3	SU7	21,177	1	0.5	900	1.380	26	1,556	2,200	2.44	3.83	9.4	36%
											Study Area 3 Average	**9.7**	**37%**

Table Notes

Calculations adopted from section 5.2 of Appendix A to the *Revised Soil Plan* incorporating background radiological conditions observed using a Ludlum model 2350-1 instrument attached to a Ludlum model 44-10 2 x 2 NaI detector.

B_{ave} = average observed background count rate
cpm = counts per minute
i = scan time interval
p = experimental minimum surveyor efficiency
ε_i = instrument detection efficiency for ^{137}Cs photons (Table 6.7 of MARSSIM)
d' = index of sensitivity for a correct detection rate of 95% (MARSSIM Table 6.5)
s_i = minimal number of net source counts
MDCR = minimum detectable count rate

$MDCR_s$ = surveyor minimum detectable count rate
MDA = minimum detectable activity
MDC = minimum detectable (activity) concentration
CF = conversion factor (developed from MARSSIM)
ncpm = net counts per minute
pCi/g = picocuries per gram
μR/h = microRoentgen per hour
$DCGL_F$ - fraction of corresponding study area DCGL

Table 6.1-1
Study Area 1B - Survey Unit 1R
Final Status Survey Results

				Median Value:	1.71	0.12	0.03	0.01	3.07	0.10			31,277		
				Minimum Value:	0.00	-0.33	-0.05	-0.43	0.62	-0.02			23,334		
				Maximum Value:	11.14	0.68	0.68	0.78	6.58	0.66			43,776		
				Average Value (δ):	2.47	0.14	0.06	0.02	3.03	0.13			31,554		
				Actual σ:	2.69	0.22	0.13	0.31	1.75	0.15			3,826		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		39,054		
				Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	N/A						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_w$ & $_{Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1184	6/14/01	1400	992	11.14	0.68	0.68	0.55	1.86	0.66	0.47	0.34	43,776	485	1960
2	1185	6/14/01	1405	810	9.47	0.49	0.10	0.02	4.05	0.50	0.35	0.50	40,660	485	1973
3	1186	6/14/01	1410	459	0.25	0.17	0.10	-0.03	-	0.01	NA	0.99	31,908	485	1986
4	1187	6/14/01	1415	322	0.11	0.01	0.05	-0.25	-	-0.02	NA	1.02	27,824	473	2007
5	1188	6/14/01	1420	327	0.10	-0.06	0.02	-0.19	-	-0.01	NA	1.01	32,426	473	1993
6	1189	6/14/01	1425	2281	1.12	0.11	0.05	0.78	-	0.14	NA	0.86	33,321	473	1980
7	1190	6/14/01	1430	387	0.67	0.04	0.20	-0.02	-	0.04	NA	0.96	30,323	473	1966
8	1191	6/14/01	1435	613	4.23	-0.33	0.30	-0.03	3.42	0.22	0.16	0.78	37,094	462	1973
9	1192	6/14/01	1440	460	1.14	-0.01	-0.01	0.05	-	0.06	NA	0.94	35,277	162	1986
10	1193	6/14/01	1445	402	1.63	0.12	-0.05	-0.41	-	0.04	NA	0.96	32,235	462	2000
11	1194	6/14/01	1450	383	0.00	-0.18	-0.01	0.59	-	0.06	NA	0.94	29,454	462	2013
12	1195	6/14/01	1455	505	0.00	0.12	0.00	0.31	-	0.03	NA	0.97	28,505	462	2026
13	1196	6/14/01	1500	446	1.92	0.02	0.03	0.07	-	0.11	NA	0.89	29,457	462	2040
14	1197	6/14/01	1505	565	0.96	0.34	-0.03	0.44	-	0.10	NA	0.90	29,336	451	2047
15	1198	6/14/01	1510	629	2.90	0.22	0.00	-0.24	-	0.13	NA	0.87	28,872	451	2033
16	1199	6/14/01	1515	536	1.18	0.28	0.02	0.37	-	0.10	NA	0.90	31,801	451	2020
17	1200	6/14/01	1520	507	1.71	0.32	-0.04	-0.15	-	0.07	NA	0.93	32,022	451	2006
18	1201	6/14/01	1525	437	2.34	0.32	0.08	-0.25	-	0.10	NA	0.90	29,204	451	1993
19	1202	6/14/01	1530	260	0.16	-0.07	0.04	-0.27	-	-0.02	NA	1.02	23,334	451	1979
20	1203	6/14/01	1535	421	0.23	0.13	0.04	0.09	-	0.02	NA	0.98	29,067	439	1985
21	1204	6/14/01	1540	422	0.56	0.09	0.01	-0.10	-	0.02	NA	0.98	29,774	439	2000
22	1205	6/14/01	1545	810	2.95	0.04	0.01	0.08	1.07	0.16	0.11	0.84	36,046	439	2013
23	1206	6/14/01	1550	762	4.13	0.22	0.08	-0.43	4.43	0.17	0.12	0.83	33,920	439	2026
24	1207	6/14/01	1555	694	5.37	0.44	0.06	-0.30	2.12	0.25	0.17	0.75	33,645	439	2040
25	1208	6/14/01	1600	780	5.97	0.57	0.06	0.44	2.93	0.36	0.27	0.64	36,271	439	2053

Table 6.1-1
Study Area 1B - Survey Unit 1R
Final Status Survey Results

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_w$ & $_{Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
26	1209	6/14/01	1605	566	0.83	0.13	0.00	-0.34	-	0.01	NA	0.99	33,250	428	2047
27	1210	6/14/01	1610	618	1.90	0.19	0.00	-0.28	-	0.07	NA	0.93	32,191	428	2034
28	1211	6/14/01	1615	696	3.88	-0.08	0.08	0.11	3.20	0.21	0.16	0.79	31,277	428	2020
29	1212	6/14/01	1620	645	3.95	0.11	0.09	-0.24	0.62	0.18	0.11	0.82	27,971	428	2006
30	1213	6/14/01	1625	298	0.03	-0.17	0.00	0.32	-	0.03	NA	0.97	27,757	428	1993
31	1214	6/14/01	1630	395	0.94	0.08	-0.01	0.12	-	0.06	NA	0.94	32,248	416	2000
32	1215	6/14/01	1635	394	1.31	0.16	-0.01	-0.21	-	0.05	NA	0.95	28,653	416	2013
33	1216	6/14/01	1640	564	2.54	-0.15	0.07	-0.42	-	0.09	NA	0.91	29,069	416	2027
34	1217	6/14/01	1645	578	2.59	-0.12	0.00	0.37	-	0.17	NA	0.83	28,288	416	2040
35	1218	6/14/01	1650	527	1.86	0.36	0.04	0.25	-	0.13	NA	0.87	32,204	416	2054
36	1219	6/14/01	1655	951	8.60	0.43	0.15	0.01	6.58	0.45	0.33	0.55	29,590	404	2048
37	1220	6/14/01	1700	437	2.64	0.04	-0.03	0.08	-	0.14	NA	0.86	29,470	404	2034

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 37 (Sign Test)
- Critical value from MARSSIM Table I.3 = 23; 37 > 23 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.14

Table 6.1-2
Study Area 1B - Survey Unit 1
Final Status Survey Results

			Median Value:	0.46	-0.05	0.03	0.13	0.32	0.04			23,668		
			Minimum Value:	0.03	-0.35	-0.04	-0.23	0.18	0.02			14,273		
			Maximum Value:	8.77	0.61	0.55	0.46	11.10	0.45			30,849		
			Average Value:	1.45	0.00	0.07	0.12	2.98	0.09			23,650		
			Actual σ:	2.48	0.29	0.16	0.20	5.41	0.13			5,217		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		33,874		
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{w\ \&\ total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1245	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	475	1924
2	1246	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	475	1955
3	1247	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	475	1985
4	1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	475	2016
5	1249	9/14/01	387	2.88	0.22	0.00	0.16	0.33	0.17	0.12	0.83	25,538	475	2048
6	1250	9/14/01	300	0.04	0.01	0.02	0.22	-	0.03	NA	0.97	21,457	449	2061
7	1251	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	449	2031
8	1252	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	449	2000
9	1253	9/14/01	161	0.36	-0.12	0.03	-0.02	-	0.02	NA	0.98	29,799	449	1969
10	1254	9/14/01	735	8.77	0.61	0.55	-0.23	11.10	0.45	0.36	0.55	27,544	449	1939
11	1255	9/14/01	452	2.16	0.16	0.05	0.30	0.31	0.15	0.11	0.85	30,849	422	1923
12	1256	9/14/01	427	0.20	0.33	0.04	0.14	-	0.03	NA	0.97	29,517	422	1949
13	1257	9/14/01	304	0.16	-0.12	-0.02	0.35	-	0.04	NA	0.96	24,748	422	1984
14	1258	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	422	2015
15	1259	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	422	2046
16	1260	9/14/01	345	0.41	-0.30	0.01	0.12	-	0.03	NA	0.97	19,461	395	2061
17	1261	9/14/01	287	1.40	-0.35	0.13	0.02	0.18	0.08	0.05	0.92	19,691	395	2030
18	1262	9/14/01	198	0.50	-0.30	0.04	-0.06	-	0.02	NA	0.98	22,589	395	2000

Table 6.1-2
Study Area 1B - Survey Unit 1
Final Status Survey Results

MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{w\ \&\ total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
19	1263	9/14/01	220	0.51	-0.10	0.04	-0.07	-	0.02	NA	0.98	18,333	395	1968
20	1264	9/14/01	183	0.03	0.00	-0.04	0.46	-	0.05	NA	0.95	14,273	395	1937

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 14 (Sign Test)
- Critical value from MARSSIM Table I.3 = 10; 14 > 10 therefore SU passes Sign Test criteria.
- NA indicates sample located in previous excavation area, not sampled due to off-site backfill
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.13

Table 6.1-3
Study Area 1B - Survey Unit 4
Final Status Survey Results

			Median Value:	0.25	0.01	-0.01	-0.17		0.00			33,716		
			Minimum Value:	0.02	-0.74	-0.07	-0.46		-0.04			32,129		
			Maximum Value:	1.19	0.68	0.07	0.45		0.07			36,525		
			Average Value:	0.30	0.04	0.00	-0.12	0.40	0.00			34,133		
			Actual σ:	0.38	0.40	0.05	0.30		0.04			1,637		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		37,341		
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_w$ & $_{Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1123	11/13/00	478	1.19	0.34	-0.03	0.04	0.40	0.07	0.05	0.93	35,446	288	2062
2	1124	11/13/00	409	0.23	0.68	0.07	-0.26	-	-0.01	NA	1.01	33,319	288	2080
3	1125	11/13/00	573	0.02	0.03	0.05	-0.46	-	-0.04	NA	1.04	32,129	288	2097
4	1126	11/13/00	513	0.30	-0.09	0.02	-0.40	-	-0.03	NA	1.03	33,662	272	2072
5	1127	11/13/00	389	0.03	-0.74	-0.03	0.06	-	0.00	NA	1.00	32,336	272	2088
6	1128	11/13/00	523	0.32	0.13	-0.02	-0.09	-	0.01	NA	0.99	33,771	272	2106
7	1129	11/13/00	473	0.04	-0.04	0.00	-0.28	-	-0.03	NA	1.03	36,525	257	2062
8	1130	11/13/00	461	0.27	0.00	-0.07	0.45	-	0.06	NA	0.94	35,876	257	2080

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.01

Table 6.1-4
Study Area 1B - Survey Unit 5
Excavation Bottom
Final Status Survey Results

			Median Value:	0.03	0.10	0.01	0.01		0.00			36,892		
			Minimum Value:	-0.07	-0.09	-0.04	-0.37		-0.04			28,846		
			Maximum Value:	0.14	0.34	0.04	0.52		0.06			42,072		
			Average Value:	0.04	0.12	0.01	0.01		0.00			36,303		
			Actual σ:	0.07	0.15	0.03	0.26		0.03			4,668		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		45,452		
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_W$ & $_{Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1113	11/8/00	401	0.06	0.30	0.02	-0.03	-	0.00	NA	1.00	38,028	86	1939
2	1114	11/8/00	516	0.03	0.06	0.03	-0.37	-	-0.04	NA	1.04	42,072	92	1955
3	1115	11/8/00	504	0.01	0.05	0.00	0.05	-	0.01	NA	0.99	41,724	98	1971
4	1116	11/8/00	393	0.14	-0.03	-0.04	0.52	0.32	0.06	0.06	0.94	37,463	104	1987
5	1117	11/8/00	405	-0.07	0.14	0.04	-0.21	-	-0.02	NA	1.02	36,321	75	1952
6	1118	11/8/00	493	-0.01	0.34	-0.01	0.08	-	0.01	NA	0.99	34,970	81	1968
7	1119	11/8/00	394	0.14	0.23	0.02	0.06	-	0.02	NA	0.98	30,997	87	1984
8	1120	11/8/00	421	0.03	-0.09	0.00	-0.05	-	0.00	NA	1.00	28,846	93	2000

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.03

Table 6.1-5
Study Area 1B - Survey Unit 5
1st Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.18	-0.04	-0.02	0.12		0.02			45,488		
			Minimum Value:	0.09	-0.20	-0.06	-0.45		-0.04			39,955		
			Maximum Value:	0.29	0.42	0.03	0.61		0.08			49,553		
			Average Value:	0.18	0.06	-0.01	0.12		0.02			45,426		
			Actual σ:	0.07	0.24	0.03	0.36		0.04			3,060		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		51,423		
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_W$ & $_{Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1131	11/13/00	379	0.22	0.42	0.01	0.04	-	0.02	NA	0.98	49,553	94	1951
2	1132	11/13/00	465	0.29	-0.17	0.01	0.61	-0.03	0.08	0.07	0.92	48,299	99	1966
3	1133	11/13/00	374	0.17	-0.20	-0.03	0.13	-	0.02	NA	0.98	47,070	104	1981
4	1134	11/13/00	475	0.11	0.23	-0.03	0.12	-	0.02	NA	0.98	44,662	109	1996
5	1135	11/13/00	399	0.25	-0.02	-0.04	-0.45	-	-0.04	NA	1.04	46,039	78	1948
6	1136	11/13/00	444	0.09	-0.09	0.00	-0.29	-	-0.03	NA	1.03	44,937	83	1963
7	1137	11/13/00	420	0.19	-0.06	-0.06	0.50	-	0.06	NA	0.94	42,893	88	1978
8	1138	11/13/00	417	0.10	0.35	0.03	0.31	-	0.04	NA	0.96	39,955	93	1993

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.04

Table 6.1-6
Study Area 1B - Survey Unit 5
2nd Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.03	0.01	0.00	0.03		0.00			48,008	
			Minimum Value:	-0.05	-0.48	-0.01	-0.32		-0.04			37,353	
			Maximum Value:	0.15	0.29	0.09	0.32		0.04			52,220	
			Average Value:	0.03	-0.06	0.01	-0.01		0.00			47,617	
			Actual σ:	0.06	0.28	0.03	0.24		0.02			4,763	
			Estimated σ:	2.51	1.01	1.23	0.42						
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		56,952	
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA					
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_W$ & $_{Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1139	11/16/00	365	0.15	-0.45	-0.01	-0.24	0.71	-0.02	-0.02	1.02	51,179	91	1957
2	1140	11/16/00	408	0.06	-0.48	0.01	-0.32	-	-0.04	NA	1.04	47,518	95	1969
3	1141	11/16/00	439	0.00	0.10	0.04	0.17	-	0.02	NA	0.98	48,498	99	1982
4	1142	11/16/00	374	-0.02	0.09	0.00	0.19	-	0.02	NA	0.98	46,715	103	1995
5	1143	11/16/00	352	-0.05	0.29	-0.01	-0.05	-	-0.01	NA	1.01	51,510	78	1954
6	1144	11/16/00	384	0.04	-0.07	0.09	-0.23	-	-0.02	NA	1.02	52,220	82	1966
7	1145	11/16/00	360	0.02	0.17	0.00	0.32	-	0.04	NA	0.96	45,943	86	1979
8	1146	11/16/00	343	0.04	-0.09	-0.01	0.11	-	0.01	NA	0.99	37,353	91	1992

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.03

Table 6.1-7
Study Area 1B - Survey Unit 7
Final Status Survey Results

			Median Value:	0.03	-0.16	-0.01	0.10	0.09	0.01			17,490		
			Minimum Value:	-0.02	-0.53	-0.07	-0.73	0.03	-0.08			10,921		
			Maximum Value:	0.37	0.12	0.02	0.59	0.56	0.06			21,826		
			Average Value:	0.05	-0.16	-0.01	0.03	0.23	0.00			17,002		
			Actual σ:	0.10	0.18	0.03	0.37	0.29	0.04			3,519		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,899		
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_W$ & Total)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1267	9/21/01	423	0.03	-0.27	-0.02	0.24	-	0.02	NA	0.98	18,670	257	1851
2	1268	9/21/01	498	0.03	-0.24	0.02	0.16	-	0.02	NA	0.98	20,777	257	1759
3	1269	9/21/01	462	0.06	-0.06	-0.02	-0.03	0.03	0.00	0.00	1.00	21,826	257	1665
4	1270	9/21/01	447	0.37	-0.13	-0.01	0.10	0.56	0.03	0.02	0.97	21,119	257	1571
5	1271*	9/21/01	302	0.03	0.02	0.00	0.35	-	0.04	NA	0.96	13,757	176	1526
6	1272	9/25/01	387	0.00	-0.18	0.00	0.23	-	0.02	NA	0.98	15,482	93	1479
7	1273	9/25/01	437	-0.02	-0.12	0.01	-0.61	-	-0.07	NA	1.07	17,610	93	1573
8	1274	9/25/01	312	0.00	0.12	0.01	0.10	-	0.01	NA	0.99	17,371	93	1667
9	1275*	9/21/01	331	-0.01	-0.19	-0.07	0.05	-	0.00	NA	1.00	10,921	13	1525
10	1276*	9/25/01	263	0.04	-0.01	-0.06	-0.15	-	-0.02	NA	1.02	11,699	13	1609
11	1277*	9/25/01	394	0.07	-0.36	-0.05	0.59	0.09	0.06	0.06	0.94	17,080	13	1712
12	1278	9/25/01	336	0.03	-0.53	0.02	-0.73	-	-0.08	NA	1.08	17,711	12	1899

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
* Sample located beneath 2-3 feet of gravel.
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.04

Table 6.1-8
Study Area 1B - Survey Unit 8
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)						
Median Value:	0.09	-0.13	0.03	-0.01	0.34	0.01				17,626	
Minimum Value:	-0.02	-0.65	-0.04	-0.66	0.28	-0.07				13,701	
Maximum Value:	0.88	0.30	0.07	0.66	0.59	0.09				20,068	
Average Value:	0.20	-0.13	0.02	0.01	0.40	0.01				17,785	
Actual σ:	0.26	0.28	0.04	0.39	0.16	0.04				1,835	
Estimated σ:	2.51	1.01	1.23	0.42							
Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:			21,382	
Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						

MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1221	8/29/01	543	0.43	0.22	-0.02	0.66	0.28	0.09	0.09	0.91	13,701	340	1964
2	1222	8/29/01	517	0.44	-0.22	0.05	0.17	0.59	0.04	0.04	0.96	18,913	339	2058
3	1223	8/29/01	407	0.09	-0.44	0.01	-0.04	-	0.00	NA	1.00	17,301	258	2105
4	1224	8/29/01	531	0.09	-0.65	0.03	-0.66	-	-0.07	NA	1.07	19,730	257	2010
5	1225	8/29/01	477	0.12	0.30	0.07	-0.25	-	-0.01	NA	1.01	20,068	257	1916
6	1226	8/29/01	416	0.02	-0.24	0.02	0.56	-	0.06	NA	0.94	19,686	175	1962
7	1227	8/29/01	349	0.00	-0.01	0.04	-0.45	-	-0.05	NA	1.05	17,128	175	2058
8	1228	8/29/01	405	0.16	-0.36	0.06	0.01	-	0.01	NA	0.99	16,789	176	2153
9	1229	8/29/01	405	0.88	0.06	0.03	-0.18	0.34	0.03	0.01	0.97	15,945	92	2106
10	1230	8/29/01	413	0.04	0.00	-0.03	0.32	-	0.03	NA	0.97	17,873	92	2011
11	1231	8/29/01	424	-0.02	-0.04	-0.04	-0.13	-	-0.02	NA	1.02	18,912	9	1965
12	1232	8/29/01	451	0.09	-0.22	0.03	0.13	-	0.02	NA	0.98	17,379	10	2059

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Fixed gross gamma counts were taken post-sampling due to high background from adjacent "F-Lot" (storage area)
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.04

Table 6.1-9
Study Area 1A - Survey Unit 9
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.06	-0.07	-0.01	0.14	0.27	0.02			11,720
Minimum Value:	-0.01	-0.43	-0.04	-0.28	0.25	-0.03			9,683
Maximum Value:	0.12	0.15	0.03	0.49	0.30	0.06			17,193
Average Value:	0.06	-0.09	-0.01	0.15	0.27	0.02			12,738
Actual σ:	0.04	0.19	0.02	0.22	0.04	0.02			2,562
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		17,760
Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1279*	9/25/01	323	0.08	0.15	-0.02	0.49	-	0.06	NA	0.94	11,393	-18	1505
2	1280*	9/25/01	271	0.11	-0.43	0.02	0.25	0.30	0.03	0.03	0.97	11,437	-17	1602
3	1281*	9/25/01	323	0.06	0.01	0.00	0.33	-	0.04	NA	0.96	12,004	-16	1700
4	1282	9/25/01	317	0.06	-0.38	-0.02	0.16	-	0.01	NA	0.99	17,193	-16	1797
5	1283	9/25/01	363	0.12	0.11	-0.04	0.12	0.25	0.02	0.02	0.98	15,553	-100	1844
6	1284	9/25/01	299	0.04	0.03	0.00	-0.09	-	-0.01	NA	1.01	14,934	-100	1748
7	1285	9/25/01	374	0.07	-0.16	0.01	-0.28	-	-0.03	NA	1.03	14,409	-100	1651
8	1286	9/25/01	455	0.00	0.02	-0.01	-0.10	-	-0.01	NA	1.01	15,086	-100	1554
9	1287*	9/25/01	386	0.03	0.11	0.03	0.10	-	0.01	NA	0.99	9,869	-185	1506
10	1288*	9/25/01	450	0.03	-0.17	-0.02	0.29	-	0.03	NA	0.97	11,349	-184	1602
11	1289*	9/25/01	379	-0.01	-0.16	-0.01	0.13	-	0.01	NA	0.99	9,947	-185	1699
12	1290*	9/25/01	354	0.08	-0.19	0.00	0.41	-	0.04	NA	0.96	9,683	-185	1795

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
* Sample located beneath 2-3 feet of gravel.
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.02

Table 6.1-10
Study Area 1A - Survey Unit 10
Gross Gamma Survey Data
3" x 3" NaI Detector Versus 2" x 2" NaI Detector

Gross Gamma Data (cpm)		
Survey Data Point	3" x 3" NaI Detector	2" x 2" NaI Detector
1	28,230	13,023
2	27,144	13,297
3	28,146	13,204
4	28,074	13,572
5	27,828	13,387
6	27,528	13,196
7	28,284	12,974
8	28,056	13,581
9	28,842	13,542
10	28,350	13,822
11	28,320	13,225
12	27,456	13,303
13	27,954	13,198
14	27,894	13,272
15	28,494	13,469
16	29,106	13,480
17	28,044	13,022
18	29,184	13,276
19	29,706	13,074
20	28,500	13,356
21	29,172	13,336
22	30,426	13,312
23	28,824	13,318
24	28,320	12,561
25	29,454	13,038
26	28,746	12,622
27	29,208	12,461
28	29,592	12,694
29	28,956	12,913
30	29,082	12,488
31	29,058	12,399
32	28,902	12,944
33	29,430	11,932
34	28,368	12,259
35	28,416	12,630
36	27,456	12,839
37	28,140	12,328
38	28,080	11,196
39	27,960	10,939
40	28,098	11,191

Gross Gamma Data (cpm)		
Survey Data Point	3" x 3" NaI Detector	2" x 2" NaI Detector
41	28,944	9,629
42	30,522	10,042
43	29,316	10,525
44	25,524	9,117
45	28,686	9,157
46	27,300	11,302
47	24,498	9,216
48	26,424	8,944
49	28,524	9,937
50	23,388	8,492
51	24,576	7,878
52	26,304	10,396
53	24,690	8,372
54	23,556	8,379
55	25,284	8,452
56	26,832	8,331
57	23,346	8,454
58	22,482	8,297
Average:	27,776	11,734
Standard Deviation:	1,804	1,897
Minimum:	22,482	7,878
Maximum	30,522	13,822
% Coefficient of Variaton:	6.49	16.17

The calculated r (correlation coefficient) value is equal to 0.705. Acceptance criteria for 57 degrees of freedom at the 95% confidence level is 0.316.

Table 6.1-11
Study Area 1A - Survey Unit 10
Final Status Survey Results

			Median Value:	0.06	0.02	-0.01	0.08	0.56	0.01			17,454		
			Minimum Value:	-0.05	-0.42	-0.07	-0.45	0.10	-0.05			14,717		
			Maximum Value:	0.32	0.62	0.03	0.45	0.81	0.05			20,603		
			Average Value:	0.07	0.03	-0.01	0.01	0.49	0.01			17,454		
			Actual σ:	0.10	0.26	0.03	0.30	0.36	0.03			1,545		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 1/3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		20,483		
			Area 1/3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	1233	8/29/01	506	0.05	0.06	0.00	0.17	-	0.02	NA	0.98	20,603	-10	1877
2	1234	8/29/01	389	-0.05	0.07	0.00	-0.43	-	-0.05	NA	1.05	17,241	-11	1964
3	1235	8/29/01	488	0.06	-0.42	0.02	-0.31	-	-0.03	NA	1.03	17,241	-14	2050
4	1236	8/29/01	463	0.07	0.21	-0.03	0.45	-	0.05	NA	0.95	16,386	-15	2135
5	1237	8/29/01	428	0.32	0.02	-0.01	0.23	0.81	0.04	0.04	0.96	16,677	-17	2221
6	1238	8/29/01	398	0.06	0.13	0.00	0.09	-	0.01	NA	0.99	14,717	-90	2177
7	1239	8/29/01	465	0.03	0.62	-0.01	-0.08	-	0.00	NA	1.00	15,863	-89	2090
8	1240	8/29/01	517	0.06	-0.02	-0.01	-0.45	-	-0.04	NA	1.04	17,696	-87	2004
9	1241	8/29/01	486	0.14	0.03	-0.02	-0.15	0.10	-0.01	-0.01	1.01	19,415	-85	1919
10	1242	8/29/01	392	0.08	0.00	0.01	0.33	0.56	0.04	0.04	0.96	17,946	-162	1959
11	1243	8/29/01	351	0.05	-0.32	0.03	0.06	-	0.01	NA	0.99	18,003	-163	2046
12	1244	8/29/01	171	-0.04	-0.06	-0.07	0.25	-	0.02	NA	0.98	17,667	-238	2000

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Fixed gross gamma counts were taken post-sampling due to high background from adjacent "F-Lot" (storage area)
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.03

Table 6.2-1
Study Area 2 - Survey Unit 1B
Bottom of LWRB Excavation
Final Status Survey Results

			Median Value:	1.91	0.14	0.03	0.39	1.55	0.23			26,410		
			Minimum Value:	0.24	-0.03	-0.04	-0.45	0.27	-0.03			22,207		
			Maximum Value:	3.17	0.29	0.08	0.58	2.69	0.35			27,132		
			Average Value:	1.73	0.11	0.03	0.15	1.43	0.18			25,291		
			Actual σ:	1.32	0.14	0.04	0.45	0.88	0.15			2,103		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		29,411		
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2496	4/21/01	1000	0.52	-0.03	0.08	-0.45	1.55	-0.03	-0.03	1.03	26,871	438	2282
2	2497*	4/21/01	1005	1.91	-0.03	0.03	0.39	1.09	0.23	0.18	0.77	22,627	408	2281
6	2501*	4/21/01	1010	2.81	0.14	0.03	0.58	1.57	0.35	0.28	0.65	23,611	378	2280
7	2502*	4/21/01	1015	3.17	0.15	0.02	-0.20	2.69	0.24	0.17	0.76	22,207	363	2306
8	2503	4/20/01	1600	0.24	0.29	-0.04	0.43	0.27	0.10	0.09	0.90	26,401	378	2333
3	2498	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27,058	423	2307
4	2499	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26,419	408	2333
5	2500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27,132	393	2307

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 5 (Sign Test)
- Critical value from MARSSIM Table I.3 = 4; 5 > 4 therefore SU passes Sign Test criteria.
- Sample Nos. 2498 - 2500 were unattainable due to bedrock surface
- * indicates sample was dried prior to analysis
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure
- Container screens were not taken

Estimated weighted σ = 0.23
Calculated weighted σ = 0.14

Table 6.2-2
Study Area 2 - Survey Unit 1W
LWRB Excavation Walls
Final Status Survey Results

				Median Value:	1.14	0.00	0.05	0.01	1.11	0.14			24,161		
				Minimum Value:	0.34	-0.33	-0.02	-0.55	0.49	0.02			21,538		
				Maximum Value:	5.36	0.13	0.11	0.32	3.82	0.37			26,677		
				Average Value:	1.89	-0.04	0.05	-0.03	1.81	0.16			23,907		
				Actual σ:	1.88	0.14	0.04	0.27	1.77	0.13			1,904		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		27,640		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2504	4/21/01	1025	547	0.34	-0.01	0.05	-0.08	-	0.02	NA	0.98	22,362	342	2272
2	2505	4/21/01	1030	593	0.43	0.01	0.03	0.32	-	0.09	NA	0.91	21,538	390	2247
3	2506	4/21/01	1020	911	3.86	-0.09	0.09	-0.23	-	0.29	NA	0.71	21,794	480	2303
4	2507	4/24/01	1300	570	2.44	0.13	0.05	0.07	-	0.23	NA	0.77	23,354	480	2356
5	2508*	4/20/01	1530	737	0.45	-0.10	0.10	0.12	3.82	0.06	0.08	0.94	25,164	433	2328
6	2509	4/24/01	1310	768	5.36	-0.33	0.11	-0.55	-	0.37	NA	0.63	25,402	433	2382
7	2510*	4/20/01	1540	1245	1.80	0.02	0.02	0.17	1.11	0.18	0.14	0.82	26,677	387	2355
8	2511*	4/20/01	1550	555	0.48	0.03	-0.02	-0.06	0.49	0.03	0.02	0.97	24,968	343	2325

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- * indicates sampled within 6-feet of LWRB bottom
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.17

Table 6.2-3
Study Area 2 - Survey Unit 1
1st Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	3.55	-0.05	0.11	0.02	4.58	0.32			20,920		
				Minimum Value:	1.17	-0.20	0.06	-0.38	3.58	0.09			19,294		
				Maximum Value:	6.17	0.36	0.22	0.43	5.20	0.55			22,040		
				Average Value:	3.81	0.02	0.13	-0.01	4.49	0.33			20,919		
				Actual σ:	1.67	0.18	0.06	0.23	0.67	0.15			874		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		22,631		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2524	4/28/01	1000	779	5.06	-0.04	0.09	0.02	4.59	0.44	0.33	0.56	20,672	429	2314
2	2525	4/28/01	1005	865	6.17	0.36	0.13	0.03	3.58	0.55	0.39	0.45	21,666	432	2280
3	2526	4/28/01	1010	912	3.62	0.03	0.15	-0.38	-	0.25	NA	0.75	20,298	404	2263
4	2527	4/28/01	1015	1030	2.48	-0.20	0.22	0.07	4.57	0.23	0.20	0.77	21,078	402	2296
5	2528	4/28/01	1020	898	1.17	-0.07	0.06	-0.09	-	0.09	NA	0.91	19,294	400	2330
6	2529	4/28/01	1025	691	3.48	-0.06	0.22	0.43	-	0.38	NA	0.62	21,544	372	2311
7	2530	4/28/01	1030	975	5.51	0.18	0.09	-0.15	5.20	0.45	0.34	0.55	20,763	374	2277
8	2531	4/28/01	1035	619	3.00	-0.06	0.08	0.02	-	0.26	NA	0.74	22,040	343	2293

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.15

Table 6.2-4
Study Area 2 - Survey Unit 1
2nd Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	3.73	0.05	0.14	0.08	3.91	0.35			23,517		
				Minimum Value:	2.34	-0.75	0.08	-0.45	2.45	0.16			22,088		
				Maximum Value:	4.55	0.20	0.16	0.38	5.36	0.41			25,200		
				Average Value:	3.57	-0.08	0.12	0.02	3.91	0.31			23,591		
				Actual σ:	0.76	0.32	0.03	0.26	2.06	0.10			1,091		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		25,729		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2540	5/2/01	1000	788	3.42	0.07	0.15	0.38	-	0.37	NA	0.63	24,933	388	2260
2	2541	5/2/01	1005	708	4.55	0.20	0.14	0.07	2.45	0.41	0.30	0.59	22,812	408	2291
3	2542	5/2/01	1010	614	2.34	0.09	0.08	-0.12	-	0.19	NA	0.81	22,679	428	2323
4	2543	5/2/01	1015	631	3.74	-0.08	0.16	0.08	-	0.34	NA	0.66	23,320	391	2324
5	2544	5/2/01	1020	773	3.72	-0.33	0.08	-0.18	-	0.29	NA	0.71	23,983	371	2293
6	2545	5/2/01	1025	741	3.89	0.03	0.15	0.17	-	0.37	NA	0.63	25,200	334	2294
7	2546	5/2/01	1030	708	2.63	0.16	0.11	-0.45	-	0.16	NA	0.84	23,714	354	2325
8	2547	5/2/01	1040	835	4.26	-0.75	0.13	0.17	5.36	0.39	0.31	0.61	22,088	374	2356

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.08

Table 6.2-5
Study Area 2 - Survey Unit 1
3rd Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	2.89	-0.01	0.12	-0.06	3.92	0.25			22,532		
				Minimum Value:	1.99	-0.34	0.02	-0.78	3.33	0.14			21,476		
				Maximum Value:	6.18	0.46	0.34	0.26	4.51	0.53			25,952		
				Average Value:	3.51	0.02	0.13	-0.13	3.92	0.29			22,993		
				Actual σ:	1.38	0.26	0.10	0.35	0.83	0.13			1,657		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		26,241		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2561	5/7/01	1000	1283	2.54	-0.28	0.09	0.18	-	0.25	NA	0.75	23,027	396	2266
2	2562	5/7/01	1005	815	4.49	0.46	0.16	0.10	3.33	0.42	0.31	0.58	25,053	357	2282
3	2563	5/7/01	1010	1442	4.30	-0.34	0.02	-0.78	-	0.23	NA	0.77	25,952	318	2297
4	2564	5/7/01	1015	549	2.78	0.00	0.15	-0.01	-	0.24	NA	0.76	22,680	351	2325
5	2565	5/7/01	1020	800	3.00	-0.02	0.06	-0.45	-	0.18	NA	0.82	21,828	390	2308
6	2566	5/7/01	1025	752	1.99	-0.05	0.09	-0.19	-	0.14	NA	0.86	21,548	429	2292
7	2567	5/7/01	1030	629	2.78	0.22	0.14	0.26	-	0.29	NA	0.71	22,383	423	2335
8	2568	5/7/01	1035	888	6.18	0.13	0.34	-0.12	4.51	0.53	0.38	0.47	21,476	385	2350

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.13

Table 6.2-6
Study Area 2 - Survey Unit 1
4th Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	3.14	0.04	0.07	-0.06	3.88	0.28			22,342		
				Minimum Value:	0.07	-0.16	-0.05	-0.48	2.01	-0.05			20,786		
				Maximum Value:	4.60	0.34	0.17	0.45	5.75	0.40			28,259		
				Average Value:	2.85	0.06	0.08	-0.03	3.88	0.24			23,005		
				Actual σ:	1.54	0.16	0.07	0.31	2.64	0.16			2,376		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		27,663		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2581	5/10/01	1300	713	3.21	-0.10	0.07	0.27	-	0.32	NA	0.68	22,650	407	2271
2	2582	5/10/01	1305	730	2.43	0.14	0.15	0.13	-	0.24	NA	0.76	21,553	435	2312
3	2583	5/10/01	1310	771	3.71	0.00	0.09	0.45	-	0.40	NA	0.60	20,786	413	2357
4	2584	5/10/01	1315	607	3.08	0.34	0.08	-0.48	-	0.19	NA	0.81	21,370	385	2315
5	2585	5/10/01	1320	548	1.28	-0.16	0.05	-0.21	-	0.07	NA	0.93	24,007	357	2275
6	2586	5/10/01	1325	436	0.07	0.08	-0.05	-0.30	-	-0.05	NA	1.05	28,259	307	2278
7	2587	5/10/01	1330	631	4.60	0.00	0.06	-0.02	2.01	0.40	0.27	0.60	23,383	336	2319
8	2588	5/10/01	1335	749	4.39	0.17	0.17	-0.10	5.75	0.37	0.29	0.63	22,034	364	2360

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.14

Table 6.2-7
Study Area 2 - Survey Unit 1
5th Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	3.82	0.06	0.11	0.02	2.83	0.33			20,226		
				Minimum Value:	2.56	-0.13	-0.03	-0.54	1.85	0.25			16,756		
				Maximum Value:	7.50	0.30	0.15	0.36	3.80	0.65			23,542		
				Average Value:	4.10	0.06	0.08	0.00	2.83	0.36			20,062		
				Actual σ:	1.50	0.14	0.07	0.27		0.12			2,053		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		24,085		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2591	5/15/01	800	809	3.62	-0.13	0.11	0.00	-	0.31	NA	0.69	21,080	325	2281
2	2592	5/15/01	805	887	7.50	0.14	0.14	-0.04	3.80	0.65	0.45	0.35	21,261	371	2255
4	2594	5/15/01	815	864	3.83	0.30	0.04	0.25	-	0.38	NA	0.62	20,530	371	2308
5	2595	5/15/01	820	861	2.98	0.12	0.15	-0.09	-	0.25	NA	0.75	18,558	371	2360
6	2596	5/15/01	825	693	2.56	0.05	-0.03	0.36	-	0.28	NA	0.72	18,846	416	2334
7	2597	5/15/01	830	712	4.02	0.01	-0.01	0.03	-	0.35	NA	0.65	19,922	463	2307
8	2598	5/15/01	835	809	3.81	0.07	0.12	0.04	-	0.34	NA	0.66	16,756	416	2388
3	2601	5/15/01	1745	NA	4.45	-0.11	0.12	-0.54	1.85	0.29	NA	0.71	23,542	416	2281

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.14

Table 6.2-8
Study Area 2 - Survey Unit 1
6th Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	1.21	0.05	0.03	-0.24	0.81	0.09			20,562		
				Minimum Value:	0.11	0.00	-0.02	-0.45	0.50	-0.06			18,608		
				Maximum Value:	5.01	0.33	0.12	0.33	1.12	0.40			22,009		
				Average Value:	1.43	0.10	0.04	-0.18	0.81	0.10			20,510		
				Actual σ:	1.58	0.11	0.05	0.25	0.44	0.15			1,064		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		22,596		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2624	5/21/01	1530	553	0.11	0.18	0.01	-0.45	-	-0.06	NA	1.06	22,009	331	2317
2	2625	5/21/01	1450	634	0.44	0.33	0.05	-0.32	-	-0.01	NA	1.01	20,444	378	2289
3	2626	5/21/01	1340	544	1.12	0.00	-0.02	0.33	-	0.15	NA	0.85	21,466	425	2261
4	2627	5/21/01	1430	571	1.40	0.05	0.05	0.03	-	0.13	NA	0.87	21,096	471	2289
5	2628	5/21/01	1420	568	1.88	0.05	0.01	-0.36	1.12	0.10	0.05	0.90	20,681	425	2316
6	2629	5/21/01	1540	976	5.01	0.06	0.10	-0.19	0.50	0.40	0.26	0.60	19,846	378	2344
7	2630	5/21/01	1550	536	0.18	0.04	0.12	-0.29	-	-0.03	NA	1.03	18,608	425	2370
8	2631	5/21/01	1410	510	1.30	0.12	0.00	-0.19	-	0.08	NA	0.92	19,932	471	2343

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.14

Table 6.2-9
Study Area 2 - Survey Unit 2 "Trench and Non-Trench"
Bottom of Excavation
Final Status Survey Results

			Median Value:	1.19	0.12	0.01	-0.15	0.74	0.08			24,664		
			Minimum Value:	-0.05	-0.63	-0.05	-0.52	0.53	-0.04			19,958		
			Maximum Value:	10.11	0.26	0.11	0.21	2.24	0.86			33,639		
			Average Value:	2.74	0.03	0.02	-0.17	1.01	0.21			25,678		
			Actual σ:	3.32	0.26	0.04	0.23	0.66	0.29			4,241		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		33,991		
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2249	11/15/00	498	-0.01	0.26	-0.01	-0.27	-	-0.04	NA	1.04	19,958	452	2465
2	2250	11/15/00	548	0.44	-0.02	-0.05	-0.10	-	0.02	NA	0.98	25,176	473	2503
3	2251	11/15/00	610	0.89	-0.30	0.01	0.13	-	0.09	NA	0.91	21,940	494	2543
4	2252	11/15/00	970	0.92	0.12	-0.03	-0.06	-	0.07	NA	0.93	32,247	408	2463
5	2253	11/15/00	487	-0.05	0.16	0.00	-0.03	-	-0.01	NA	1.01	26,047	428	2503
6	2254	11/15/00	556	0.66	0.23	0.00	-0.41	-	-0.01	NA	1.01	23,126	449	2543
7	2255	11/15/00	787	7.89	0.22	0.06	-0.20	2.24	0.65	0.43	0.35	33,639	383	2502
8	2256	11/15/00	595	1.79	0.13	0.11	-0.37	0.74	0.10	0.05	0.90	24,761	405	2543
9	2257	11/15/00	862	10.11	-0.63	0.02	-0.01	1.28	0.86	0.56	0.14	24,568	426	2581
10	2258	11/15/00	593	5.04	0.08	0.05	0.21	0.55	0.47	0.32	0.53	30,427	338	2502
11	2259	11/15/00	440	1.46	-0.08	0.02	-0.42	0.73	0.05	0.01	0.95	23,358	360	2541
12	2260	11/15/00	462	3.71	0.15	0.05	-0.52	0.53	0.23	0.12	0.77	22,897	381	2580

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.29

Table 6.2-10
Study Area 2 - Survey Unit 2 "Trench"
1st Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.27	-0.04	0.04	0.13	1.41	0.05			18,951
Minimum Value:	0.11	-0.41	-0.03	-0.17	0.77	0.01			17,946
Maximum Value:	1.37	0.15	0.06	0.48	1.56	0.16			20,039
Average Value:	0.55	-0.11	0.02	0.15	1.25	0.07			18,956
Actual σ:	0.50	0.21	0.03	0.23	0.42	0.06			833
Estimated σ:	2.51	1.01	1.23	0.42					
Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		20,588
Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA				

MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2280	11/21/00	451	0.90	-0.41	-0.03	-0.17	0.77	0.04	0.02	0.96	20,039	471	2445
2	2281	11/21/00	534	1.37	-0.31	0.06	0.13	1.56	0.14	0.11	0.86	18,951	486	2472
3	2282	11/21/00	654	0.27	0.15	0.05	0.13	-	0.05	NA	0.95	19,862	442	2477
4	2283	11/21/00	553	0.88	-0.22	-0.01	0.48	1.41	0.16	0.14	0.84	18,675	467	2513
5	2284	11/21/00	489	0.18	0.02	0.00	0.40	-	0.09	NA	0.91	17,967	488	2543
6	2285	11/21/00	519	0.11	0.05	0.04	0.15	-	0.04	NA	0.96	19,254	432	2510
7	2286	11/21/00	498	0.13	-0.04	0.05	-0.04	-	0.01	NA	0.99	17,946	447	2553

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 7 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 7 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.06

Table 6.2-11
Study Area 2 - Survey Unit 2 "Trench"
2nd Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.85	-0.12	0.00	0.05	1.43	0.10			17,796		
			Minimum Value:	-0.01	-0.66	-0.04	-0.43	1.16	-0.03			16,999		
			Maximum Value:	1.53	0.03	0.03	0.40	1.67	0.12			20,904		
			Average Value:	0.79	-0.18	0.00	0.02	1.42	0.07			18,308		
			Actual σ:	0.57	0.28	0.02	0.33	0.26	0.06			1,527		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		21,302		
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2302	12/2/00	540	0.85	0.03	0.00	0.25	1.16	0.12	0.10	0.88	16,999	468	2451
2	2304	12/2/00	724	1.53	-0.66	0.03	-0.43	-	0.05	NA	0.95	17,796	504	2523
3	2305	12/2/00	679	0.55	-0.16	0.00	0.40	1.67	0.11	0.11	0.89	20,904	446	2485
4	2306	12/2/00	670	1.03	0.03	-0.04	0.05	-	0.10	NA	0.90	18,320	465	2521
5	2303	12/2/00	457	-0.01	-0.12	0.00	-0.18	1.43	-0.03	-0.02	1.03	17,523	486	2487

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 5 (Sign Test)
- Critical value from MARSSIM Table I.3 = 4; 5 > 4 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.08

Table 6.2-12
Study Area 2 - Survey Unit 2 "Trench"
3rd Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.86	-0.03	0.02	-0.23		0.04			17,548	
			Minimum Value:	0.56	-0.25	-0.06	-0.38		0.01			17,299	
			Maximum Value:	1.11	0.56	0.05	0.03		0.10			18,543	
			Average Value:	0.86	0.08	0.00	-0.16		0.05			17,787	
			Actual σ:	0.21	0.31	0.04	0.18		0.04			498	
			Estimated σ:	2.51	1.01	1.23	0.42						
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		18,764	
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA					
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2327	12/11/00	527	0.99	-0.25	-0.02	0.03	-	0.09	NA	0.91	17,299	477	2469
2	2328	12/11/00	551	0.86	-0.05	-0.06	-0.38	-	0.01	NA	0.99	17,521	496	2502
3	2329	12/11/00	506	0.79	0.56	0.05	-0.24	-	0.04	NA	0.96	18,543	438	2467
4	2330	12/11/00	509	1.11	-0.03	0.02	0.02	1.14	0.10	0.08	0.90	18,023	456	2502
5	2331	12/11/00	588	0.56	0.17	0.03	-0.23	-	0.01	NA	0.99	17,548	476	2537

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 5 (Sign Test)
- Critical value from MARSSIM Table I.3 = 4; 5 > 4 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.04

Table 6.2-13
Study Area 2 - Survey Unit 2 "Trench and Non-Trench"
4th Lift of Acceptable Backfill Material
Final Status Survey Results

Median Value:	1.74	0.03	-0.01	0.03	1.74	0.18			20,706
Minimum Value:	0.39	-0.19	-0.06	-0.38	1.05	0.02			19,208
Maximum Value:	6.03	0.21	0.10	0.25	2.43	0.54			24,782
Average Value:	2.41	0.01	0.00	-0.01	1.74	0.21			21,305
Actual σ:	1.90	0.15	0.05	0.23	0.69	0.17			1,793
Estimated σ:	2.51	1.01	1.23	0.42					
Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		24,819
Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA				

MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2346	12/21/00	634	0.78	-0.17	0.04	0.17	-	0.10	NA	0.90	20,149	472	2473
2	2347	12/21/00	600	0.39	0.07	-0.06	-0.06	-	0.02	NA	0.98	23,107	423	2476
3	2348	12/21/00	652	1.40	-0.01	0.10	0.25	-	0.17	NA	0.83	20,778	451	2517
4	2349	12/21/00	427	1.44	0.18	0.00	-0.38	-	0.06	NA	0.94	21,321	402	2520
5	2350	12/21/00	604	4.08	0.06	-0.01	-0.25	1.74	0.31	0.20	0.69	20,635	430	2561
6	2351	12/21/00	410	3.17	0.21	0.00	-0.14	2.43	0.25	0.18	0.75	20,462	325	2483
7	2352	12/21/00	662	6.03	-0.05	-0.06	0.17	1.05	0.54	0.37	0.46	24,782	353	2524
8	2353	12/21/00	466	2.04	-0.19	-0.04	0.12	-	0.19	NA	0.81	19,208	382	2565

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.17

Table 6.2-14
Study Area 2 - Survey Unit 3
WTR Basins 2 and 3 Excavation Bottom
Final Status Survey Results

				Median Value:	0.61	-0.02	-0.01	-0.06	3.63	0.04			22,911		
				Minimum Value:	0.09	-0.63	-0.06	-0.42	0.74	-0.02			20,512		
				Maximum Value:	1.81	0.26	0.04	0.48	6.52	0.18			25,136		
				Average Value:	0.70	-0.12	0.00	-0.02	3.63	0.06			22,839		
				Actual σ:	0.55	0.30	0.04	0.30	4.08	0.07			1,836		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		26,438		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2241	11/15/00	1000	646	0.67	-0.51	0.04	0.30	-	0.10	NA	0.90	20,512	561	2474
2	2242	11/15/00	1010	545	0.17	-0.04	0.00	0.07	-	0.03	NA	0.97	22,627	533	2489
3	2243	11/15/00	1020	552	1.81	-0.63	-0.06	-0.20	6.52	0.11	0.12	0.89	24,570	506	2506
4	2244	11/15/00	1030	771	0.69	0.26	-0.01	-0.42	-	-0.01	NA	1.01	25,136	506	2473
5	2245	11/15/00	1040	634	1.10	0.01	-0.02	0.48	0.74	0.18	0.15	0.82	24,615	534	2458
6	2246	11/15/00	1050	518	0.56	0.09	-0.01	-0.25	-	0.01	NA	0.99	20,907	562	2442
7	2247	11/15/00	1100	561	0.09	0.05	0.04	-0.16	-	-0.02	NA	1.02	21,148	534	2426
8	2248	11/15/00	1110	596	0.52	-0.16	0.02	0.05	-	0.05	NA	0.95	23,196	507	2441

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.07

Table 6.2-15
Study Area 2 - Survey Unit 3
1st Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	1.83	0.00	0.07	0.01	2.12	0.18			19,263		
				Minimum Value:	0.61	-0.21	-0.01	-0.37	2.07	0.06			17,388		
				Maximum Value:	4.59	0.52	0.17	0.34	3.09	0.36			21,928		
				Average Value:	2.33	0.04	0.07	0.02	2.43	0.21			19,308		
				Actual σ:	1.39	0.25	0.06	0.23	0.58	0.11			1,340		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		21,935		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2272	11/21/00	1000	471	0.61	0.52	-0.01	0.00	-	0.06	NA	0.94	18,391	584	2477
2	2273	11/21/00	1010	690	1.52	0.14	0.02	0.02	-	0.14	NA	0.86	18,645	551	2492
3	2274	11/21/00	1020	466	1.58	-0.14	0.02	-0.13	-	0.11	NA	0.89	19,248	517	2506
4	2275	11/21/00	1030	517	2.07	0.04	0.12	-0.03	3.09	0.18	0.14	0.82	19,430	555	2456
5	2276	11/21/00	1040	551	4.14	-0.21	0.11	0.04	2.12	0.36	0.26	0.64	17,388	521	2470
6	2277	11/22/00	1050	510	2.74	-0.19	0.05	0.30	-	0.29	NA	0.71	21,928	559	2419
7	2278	11/21/00	1100	716	4.59	0.22	0.17	-0.37	2.07	0.34	0.22	0.66	20,158	526	2434
8	2279	11/21/00	1110	443	1.42	-0.04	0.10	0.34	-	0.18	NA	0.82	19,279	492	2448

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.13

Table 6.2-16
Study Area 2 - Survey Unit 3
2nd Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.96	-0.02	0.03	-0.14	1.22	0.06			17,887		
			Minimum Value:	0.55	-0.40	-0.02	-0.45	0.74	-0.01			17,052		
			Maximum Value:	1.42	0.19	0.12	0.28	2.45	0.12			18,748		
			Average Value:	0.99	-0.11	0.04	-0.14	1.47	0.06			17,919		
			Actual σ:	0.30	0.21	0.04	0.21	0.88	0.04			660		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		19,214		
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2294	12/2/00	561	0.96	-0.33	0.02	-0.13	-	0.05	NA	0.95	17,493	553	2419
2	2295	12/2/00	683	0.89	-0.01	0.06	-0.26	-	0.03	NA	0.97	18,017	567	2455
3	2296	12/2/00	559	1.00	-0.40	0.02	-0.23	2.45	0.04	0.03	0.96	18,748	580	2490
4	2297	12/2/00	703	0.97	0.02	0.00	-0.15	-	0.06	NA	0.94	18,731	529	2449
5	2298	12/2/00	736	0.74	-0.03	-0.02	-0.45	-	-0.01	NA	1.01	17,189	543	2484
6	2299	12/2/00	582	0.55	0.02	0.03	0.28	-	0.10	NA	0.90	18,371	491	2443
7	2300	12/2/00	689	1.42	-0.32	0.12	-0.13	1.22	0.10	0.07	0.90	17,757	505	2479
8	2301	12/2/00	687	1.41	0.19	0.07	-0.03	0.74	0.12	0.09	0.88	17,052	519	2514

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.04

Table 6.2-17
Study Area 2 - Survey Unit 3
3rd Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.58	-0.05	0.03	-0.16	0.83	0.06			18,305		
			Minimum Value:	0.34	-0.32	-0.03	-0.29	0.82	-0.02			16,807		
			Maximum Value:	6.26	0.33	0.05	0.26	0.85	0.49			19,374		
			Average Value:	1.35	-0.04	0.02	-0.07	0.83	0.10			18,292		
			Actual σ:	2.00	0.22	0.03	0.22	0.02	0.16			836		
			Estimated σ:	2.51	1.01	1.23	0.42							
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		19,931		
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2318	12/11/00	542	0.34	-0.23	0.03	0.22	-	0.06	NA	0.94	17,801	559	2410
2	2319	12/11/00	440	1.17	-0.09	0.04	-0.17	0.85	0.07	0.04	0.93	19,374	577	2446
3	2320	12/11/00	610	0.44	0.14	0.05	-0.15	-	0.02	NA	0.98	16,807	595	2481
4	2321	12/11/00	559	0.96	0.10	0.04	-0.29	-	0.04	NA	0.96	18,638	537	2443
5	2322	12/11/00	543	0.62	0.33	0.01	0.26	-	0.10	NA	0.90	17,906	555	2479
6	2323	12/11/00	595	0.44	-0.32	-0.01	-0.28	-	-0.02	NA	1.02	19,200	499	2440
7	2324	12/11/00	544	6.26	-0.25	0.04	-0.24	0.82	0.49	0.31	0.51	18,607	515	2476
8	2325	12/11/00	595	0.54	-0.01	-0.03	0.06	-	0.06	NA	0.94	18,004	533	2512

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.18

Table 6.2-18
Study Area 2 - Survey Unit 3
4th Lift of Acceptable Backfill Material
Final Status Survey Results

			Median Value:	0.81	-0.08	0.01	0.11	0.80	0.07			17,491	
			Minimum Value:	0.49	-0.33	-0.04	-0.34	0.39	0.02			16,943	
			Maximum Value:	1.19	0.09	0.06	0.44	1.21	0.14			18,825	
			Average Value:	0.80	-0.09	0.01	0.03	0.80	0.07			17,727	
			Actual σ:	0.21	0.13	0.03	0.27	0.58	0.04			739	
			Estimated σ:	2.51	1.01	1.23	0.42						
			Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		19,175	
			Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA					
MARSSIM #	ESC Sample Number	Date	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2333	12/18/00	694	0.59	-0.33	0.02	0.20	-	0.08	NA	0.92	18,825	554	2406
2	2334	12/18/00	717	0.90	-0.06	0.02	-0.19	1.21	0.04	0.03	0.96	17,164	573	2448
3	2335	12/18/00	578	0.85	-0.10	-0.04	0.10	-	0.09	NA	0.91	16,943	591	2488
4	2336	12/18/00	600	0.76	-0.04	0.02	0.44	-	0.14	NA	0.86	17,500	527	2443
5	2337	12/18/00	487	0.49	0.09	-0.02	0.15	-	0.07	NA	0.93	17,120	547	2483
6	2338	12/18/00	506	0.79	-0.20	0.00	-0.27	-	0.02	NA	0.98	18,789	483	2438
7	2339	12/18/00	649	1.19	-0.09	0.01	-0.34	0.39	0.04	0.01	0.96	17,996	502	2479
8	2340	12/18/00	522	0.84	-0.02	0.06	0.13	-	0.10	NA	0.90	17,481	521	2520

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.05

Table 6.2-19
Study Area 2 - Survey Unit 4
Final Status Survey Results

				Median Value:	0.24	-0.07	0.02	0.00	0.50	0.04			23,631		
				Minimum Value:	-0.06	-0.27	-0.02	-0.31	0.49	-0.06			14,258		
				Maximum Value:	3.46	0.21	0.15	0.31	0.51	0.27			26,038		
				Average Value:	0.62	-0.04	0.04	-0.02	0.50	0.05			22,536		
				Actual σ:	1.16	0.17	0.05	0.21	0.01	0.10			3,535		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		29,465		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2635	5/29/01	1430	329	0.10	-0.15	0.04	0.00	-	0.01	NA	0.99	23,473	489	2110
2	2636	5/29/01	1435	519	3.46	-0.27	0.01	-0.12	0.49	0.27	0.17	0.73	24,010	489	2166
3	2637	6/4/01	1600	537	0.18	0.11	-0.02	0.31	-	0.07	NA	0.93	14,258	489	2220
4	2638	5/29/01	1440	331	0.05	-0.05	0.02	0.22	-	0.04	NA	0.96	22,605	441	2193
5	2639	5/29/01	1445	169	0.40	0.21	0.01	0.00	-	0.04	NA	0.96	23,927	441	2138
6	2640	7/31/01	1100	635	-0.06	0.14	0.02	-0.31	-	-0.06	NA	1.06	26,038	441	2084
7	2641	7/31/01	1110	412	0.31	-0.09	0.08	-0.23	0.51	-0.01	-0.02	1.01	23,789	394	2111
8	2642	5/23/01	730	644	0.51	-0.19	0.15	-0.01	-	0.05	NA	0.95	22,192	394	2165

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.11

Table 6.2-20
Study Area 2 - Survey Unit 5
Final Status Survey Results

				Median Value:	0.68	0.01	0.02	0.03	1.09	0.11			18,547			
				Minimum Value:	0.06	-0.12	-0.04	-0.17	0.52	0.03			16,546			
				Maximum Value:	4.85	0.28	0.22	0.47	1.65	0.40			20,946			
				Average Value:	1.40	0.02	0.04	0.09	1.09	0.14			18,637			
				Actual σ:	1.68	0.13	0.08	0.22	0.80	0.13			1,404			
				Estimated σ:	2.51	1.01	1.23	0.42								
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		21,388			
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA							
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting	
1	2571	5/23/01	1000	717	3.05	-0.09	0.08	0.07	0.52	0.28	0.19	0.72	20,109	516	2278	
2	2572	5/23/01	1005	537	0.78	0.03	0.03	0.34	-	0.13	NA	0.87	17,747	537	2329	
3	2573	5/23/01	1010	438	0.43	-0.01	0.02	-0.02	-	0.03	NA	0.97	16,546	558	2380	
4	2574	5/23/01	1015	757	0.06	-0.12	0.05	0.14	-	0.03	NA	0.97	17,673	503	2373	
5	2575	5/23/01	1020	503	0.27	0.10	-0.04	0.47	-	0.11	NA	0.89	18,369	470	2417	
6	2576	5/9/01	1100	485	1.22	0.08	-0.02	0.00	-	0.11	NA	0.89	18,724	413	2410	
7	2577	5/16/01	1630	590	0.58	-0.09	0.22	-0.17	-	0.03	NA	0.97	18,983	358	2403	
8	2578	5/23/01	1025	922	4.85	0.28	0.02	-0.13	1.65	0.40	0.27	0.60	20,946	304	2395	

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.15

Table 6.2-21
Study Area 2 - Survey Unit 6
Final Status Survey Results

				Median Value:	0.13	-0.01	0.01	-0.18	1.02	0.01			14,293		
				Minimum Value:	-0.01	-0.53	-0.01	-0.67	0.95	-0.11			13,555		
				Maximum Value:	1.53	0.32	0.05	0.50	1.10	0.09			15,557		
				Average Value:	0.36	-0.04	0.01	-0.17	1.02	0.00			14,318		
				Actual σ:	0.51	0.29	0.02	0.41	0.11	0.08			689		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3			95% Confidence Level:	15,667		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
8	2420	3/10/01	1020	496	0.26	-0.53	-0.01	-0.21	-	-0.02	NA	1.02	NA	NA	NA
1	2422	3/12/01	1300	455	0.05	0.03	0.01	-0.67	-	-0.11	NA	1.11	13,666	628	2502
2	2423	3/12/01	1310	355	-0.01	0.01	0.00	0.50	-	0.09	NA	0.91	13,555	610	2533
3	2424	3/12/01	1320	624	0.66	0.28	-0.01	0.16	0.95	0.09	0.08	0.91	15,557	575	2533
4	2425	3/12/01	1330	458	0.14	0.32	0.03	0.08	-	0.03	NA	0.97	13,947	592	2564
5	2426	3/12/01	1340	464	1.53	-0.03	0.02	-0.38	1.10	0.07	0.03	0.93	14,620	557	2564
6	2427	3/12/01	1350	458	0.11	-0.10	0.00	-0.67	-	-0.11	NA	1.11	14,586	575	2595
7	2428	3/12/01	1360	410	0.13	-0.33	0.05	-0.14	-	-0.02	NA	1.02	14,293	521	2564
8	2429	3/12/01	1370	556	0.09	0.23	0.00	-0.28	-	-0.04	NA	1.04	13,587	539	2595

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure
- Sample No. 2420 was a composite sample collected beneath #2429 and is considered Final Status
- Sample No. 2429 was located on off-site borrow material. This data is not included in statistical tests.

Estimated weighted σ = 0.23
Calculated weighted σ = 0.08

Table 6.2-22
Study Area 2 - Survey Unit 7
Final Status Survey Results

				Median Value:	0.25	0.04	0.04	-0.11	0.62	0.00			18,428		
				Minimum Value:	0.08	-0.20	-0.05	-0.37	0.42	-0.06			16,054		
				Maximum Value:	1.38	0.37	0.05	0.30	0.82	0.16			23,659		
				Average Value:	0.49	0.11	0.03	-0.03	0.62	0.04			18,598		
				Actual σ:	0.48	0.21	0.04	0.23	0.28	0.08			2,324		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		23,153		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2408	8/24/01	800	342	0.69	0.37	0.04	0.09	0.82	0.08	0.07	0.92	18,481	330	2125
2	2409	8/24/01	810	610	0.16	-0.01	0.00	-0.17	-	-0.02	NA	1.02	23,659	328	2179
3	2410	3/8/01	1100	606	1.38	-0.03	0.05	0.25	-	0.16	NA	0.84	16,562	282	2149
4	2411	8/22/01	1330	456	0.20	0.08	0.05	-0.12	-	0.00	NA	1.00	18,375	279	2203
5	2412	3/8/01	1110	449	0.11	-0.20	-0.05	-0.37	-	-0.06	NA	1.06	18,816	232	2173
6	2413	8/22/01	1335	440	0.97	0.37	0.05	0.30	0.42	0.14	0.12	0.86	16,054	230	2228
7	2414	3/8/01	1445	426	0.30	0.00	0.05	-0.13	-	0.01	NA	0.99	19,258	184	2198
8	2415	8/22/01	1340	388	0.08	0.32	0.03	-0.11	-	-0.01	NA	1.01	17,585	135	2223

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.06

Table 6.2-23
Study Area 2 - Survey Unit 8
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.26	-0.12	0.01	0.26	1.25	0.06			18,084
Minimum Value:	0.03	-0.98	-0.02	-0.44	0.50	-0.05			13,680
Maximum Value:	0.72	0.37	0.07	0.35	1.99	0.11			23,827
Average Value:	0.38	-0.17	0.02	0.00	1.25	0.03			18,308
Actual σ:	0.28	0.45	0.03	0.39	1.05	0.06			2,953
Estimated σ:	2.51	1.01	1.23	0.42					
Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		24,095
Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2603	8/21/01	730	197	0.16	0.17	0.01	0.26	-	0.06	NA	0.94	13,680	212	2278
2	2604	8/16/01	1500	584	0.58	0.00	0.07	0.33	-	0.11	NA	0.89	17,588	245	2322
3	2605	8/14/01	1420	413	0.72	-0.51	0.04	-0.35	1.99	-0.01	-0.01	1.01	16,906	276	2365
4	2606	NA	NA	NA	NA	NA	NA	NA	-	NA	NA	NA	23,827	299	2315
5	2607	6/5/01	1130	534	0.03	-0.16	0.02	0.35	-	0.06	NA	0.94	16,703	267	2271
6	2608	5/16/01	1400	444	0.26	0.37	0.01	-0.44	-	-0.05	NA	1.05	18,581	321	2265
7	2609	5/18/01	1120	492	0.22	-0.12	-0.02	0.32	-	0.07	NA	0.93	18,983	289	2220
8	2610	5/16/01	1030	488	0.69	-0.98	-0.01	-0.44	0.50	-0.03	-0.05	1.03	20,197	343	2215

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Sample No. 2606 was unattainable due to bedrock surface (located next to MW-40)
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.07

Table 6.2-24
Study Area 2 - Survey Unit 11
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.70	0.03	0.00	0.03	1.70	0.08			14,987
Minimum Value:	0.16	-0.20	-0.03	-0.20	1.27	-0.02			12,539
Maximum Value:	2.89	0.27	0.07	0.36	2.13	0.23			20,345
Average Value:	0.99	0.03	0.01	0.05	1.70	0.10			16,473
Actual σ:	0.93	0.15	0.04	0.20	0.61	0.08			3,208
Estimated σ:	2.51	1.01	1.23	0.42					
Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		22,761
Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2657	7/19/01	1400	398	0.68	0.16	-0.01	0.02	-	0.07	NA	0.93	20,307	339	2472
2	2658	8/14/01	1400	488	1.86	-0.03	0.05	0.04	1.27	0.17	0.12	0.83	15,009	295	2447
3	2659	6/1/01	1145	850	2.89	0.05	0.07	-0.11	-	0.23	NA	0.77	20,345	295	2396
4	2660	8/21/01	1415	532	0.91	-0.20	0.02	-0.15	2.13	0.05	0.04	0.95	14,044	250	2422
5	2661	9/6/01	900	530	0.71	-0.10	-0.03	0.36	-	0.12	NA	0.88	12,539	207	2448
6	2662	8/30/01	1450	512	0.55	0.27	-0.01	0.29	-	0.10	NA	0.90	20,047	162	2423
7	2663	8/14/01	1405	349	0.17	0.09	-0.01	-0.20	-	-0.02	NA	1.02	14,527	207	2397
8	2664	8/14/01	1410	443	0.16	0.02	0.00	0.15	-	0.04	NA	0.96	14,966	205	2346

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.09

Table 6.2-25
Study Area 2 - Survey Unit 12
Final Status Survey Results

				Median Value:	2.02	-0.15	0.22	-0.08	9.51	0.18			29,841		
				Minimum Value:	0.50	-0.53	0.04	-0.53	4.62	0.04			20,037		
				Maximum Value:	10.10	0.52	0.33	0.31	14.40	0.78			31,480		
				Average Value:	3.56	-0.07	0.19	-0.06	9.51	0.30			27,719		
				Actual σ:	3.49	0.32	0.11	0.26	6.92	0.29			4,327		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		36,199		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2061	10/2/00	1700	620	0.50	0.15	0.11	-0.06	-	0.04	NA	0.96	29,903	296	2499
2	2062	10/2/00	1705	332	1.76	-0.25	0.33	-0.15	-	0.13	NA	0.87	30,527	320	2546
3	2063	10/3/00	910	291	1.34	-0.09	0.04	-0.07	-	0.10	NA	0.90	22,146	344	2597
4	2064	10/2/00	1650	653	10.10	-0.53	0.20	-0.53	4.62	0.78	0.51	0.22	31,480	241	2495
5	2065	10/3/00	900	515	2.27	-0.20	0.25	-0.08	-	0.19	NA	0.81	29,780	266	2543
6	2066	10/3/00	850	249	1.40	0.05	0.05	0.31	-	0.18	NA	0.82	20,037	291	2590
7	2067	10/2/00	1650	533	3.22	0.52	0.27	-0.10	-	0.28	NA	0.72	27,078	187	2491
8	2068	10/3/00	930	658	7.86	-0.24	0.26	0.23	14.40	0.72	0.62	0.28	30,802	212	2540

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.30

Table 6.2-26
Study Area 2 - Survey Unit 13
Elevated Measurement Comparison

$\delta/DCGL_{Total}$	0.12

$DCGL_{Total}$ Evaluation

Elevated Areas	Area (m^2)	δ_{EMC} (Average in Elevated Area)					$DCGL_{EMC}$				$\delta_{EMC}/DCGL_{EMC}$				
		Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	(Cs-137)	(Am-241)	(Co-60)	(U-235)	$\Sigma\ \delta_{EMC}/DCGL_{EMC}$
C-5	2	23.25	0.03	0.06	-0.36	N/A	32.10	169.60	135.40	57.30	0.68	0.00	0.00	-0.01	0.67
											Triple Summation Result:				0.80

$DCGL_W$ Evaluation

$\delta/DCGL_W$	0.09

Elevated Areas	Area (m^2)	δ_{EMC} (Average in Elevated Area)					$DCGL_{EMC}$					$\delta_{EMC}/DCGL_{EMC}$					
		Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	(Cs-137)	(Am-241)	(Co-60)	(U-235)	(Sr-90)	$\Sigma\ \delta_{EMC}/DCGL_{EMC}$
C-5	2	23.25	0.03	0.06	-0.36	4.11	108.0	169.60	135.40	57.30	165.3	0.20	0.00	0.00	-0.01	0.02	0.22
														Triple Summation Result:			0.30

$$\sum \frac{\delta_i}{DCGL_{totali}} + \sum \sum \frac{(\delta_{EMCi} - \delta_i)}{DCGL_{EMC}} < 1$$

Analytical Data from Grid C-5					
Sample No.	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)
2144	15.02	0.08	0.09	-0.35	2.25
2054	35.63	-0.12	0.05	-0.67	2.43
2090	19.09	0.13	0.05	-0.06	7.65
Average:	23.25	0.03	0.06	-0.36	4.11

Notes:
- Shaded values are below MDA values

Table 6.2-27
Study Area 2 - Survey Unit 13
Final Status Survey Results

				Median Value:	0.85	0.04	0.03	0.08	0.49	0.11			22,996	
				Minimum Value:	0.07	-0.10	-0.02	-0.45	0.28	-0.07			19,762	
				Maximum Value:	3.72	0.14	0.08	0.34	2.69	0.28			24,016	
				Average Value (δ):	1.45	0.03	0.03	-0.01	0.93	0.12			22,354	
				Actual σ:	1.34	0.08	0.04	0.29	1.00	0.12			1,543	
				Estimated σ:	2.51	1.01	1.23	0.42						
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		25,379	
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	N/A					
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2036	9/22/00	1520	324	0.68	-0.01	0.06	0.31	0.28	0.11	0.10	0.89	21,447	2333	25
2	2037	9/22/00	1530	366	0.40	0.05	0.08	0.34	-	0.10	NA	0.90	23,202	2369	64
3	2038	9/25/00	1027	407	0.07	0.02	-0.01	-0.45	-	-0.07	NA	1.07	19,762	2442	141
4	2039	9/28/00	800	254	0.53	-0.10	0.00	0.10	0.38	0.06	0.05	0.94	22,996	2306	103
5	2040	9/22/00	1540	367	2.23	0.08	-0.02	0.10	0.49	0.21	0.15	0.79	21,345	2385	13
6	2041	9/28/00	1100	400	2.91	0.09	0.07	0.06	0.79	0.27	0.18	0.73	23,711	2421	51
7	2042	9/23/00	1100	320	1.03	0.14	0.03	-0.33	2.69	0.04	0.03	0.96	24,016	2457	91
8	2837	10/10/01	1410	NA	3.72	-0.05	0.04	-0.24	-	0.28	NA	0.72	NA	NA	NA
8	2043	9/28/00	745	NA	0.85	0.11	0.07	-0.20	1.16	0.04	0.03	0.96	20,919	2493	128
-	2115	10/12/00	1030	NA	0.37	-0.26	0.04	0.19	-	0.06	NA	0.94	21,101	NA	NA
-	2116	10/12/00	1035	NA	0.31	-0.19	0.03	0.63	-	0.13	NA	0.87	19,575	NA	NA
-	2117	10/12/00	1040	NA	0.12	-0.09	-0.03	0.12	-	0.03	NA	0.97	18,270	NA	NA

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- Sample No. 2043 was eliminated during installation of a trench. Sample No. 2837 was collected at base of trench excavation and replaces Sample No. 2043.
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.13

Table 6.2-28
Study Area 2 - Bag Farm North
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.14	0.08	0.03	-0.20	0.49	0.00			14,482
Minimum Value:	-0.13	-0.47	-0.03	-0.64	0.04	-0.10			13,414
Maximum Value:	1.15	0.24	0.08	0.27	0.94	0.05			15,385
Average Value:	0.25	0.00	0.03	-0.18	0.49	-0.01			14,438
Actual σ:	0.39	0.23	0.03	0.33	0.64	0.05			728
Estimated σ:	2.51	1.01	1.23	0.42					
Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		15,865
Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2672	6/4/01	1530	597	0.23	-0.15	0.02	0.19	-	0.05	NA	0.95	15,385	483	2374
2	2673	6/4/01	1535	418	0.05	0.18	-0.03	-0.64	-	-0.10	NA	1.10	14,537	503	2408
3	2674	6/6/01	1330	482	0.06	0.11	0.05	0.01	-	0.01	NA	0.99	14,555	524	2441
4	2675	6/6/01	1335	551	0.31	-0.47	-0.01	-0.21	0.04	-0.02	-0.03	1.02	15,311	545	2475
5	2676	6/6/01	1340	519	-0.13	0.24	0.04	-0.18	-	-0.04	NA	1.04	14,428	566	2508
6	2677	6/6/01	1345	488	1.15	0.10	0.08	-0.55	0.94	0.01	-0.02	0.99	13,414	587	2542
7	2678	6/6/01	1350	522	0.30	0.06	0.03	-0.32	-	-0.03	NA	1.03	14,428	584	2473
8	2679	6/6/01	1355	558	0.03	-0.09	0.03	0.27	-	0.05	NA	0.95	13,448	563	2440

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.07

Table 6.2-29
Study Area 2 - Bag Farm South
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.37	-0.05	0.00	-0.11	0.19	0.01			15,208
Minimum Value:	0.14	-0.21	-0.03	-0.39	0.08	-0.04			13,883
Maximum Value:	0.60	0.18	0.02	0.26	0.30	0.08			17,136
Average Value:	0.36	-0.03	0.00	-0.09	0.19	0.01			15,371
Actual σ:	0.15	0.11	0.02	0.22	0.15	0.04			1,216
Estimated σ:	2.51	1.01	1.23	0.42					
Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		17,754
Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2680	6/4/01	1540	656	0.42	0.18	-0.03	-0.01	-	0.04	NA	0.96	16,583	478	2398
2	2681	6/4/01	1400	469	0.14	-0.08	0.02	-0.27	-	-0.04	NA	1.04	13,883	503	2442
3	2682	6/4/01	1405	485	0.24	-0.03	0.00	0.14	-	0.04	NA	0.96	14,488	529	2485
4	2683	6/4/01	1410	459	0.60	-0.21	0.00	-0.39	0.30	-0.02	-0.03	1.02	14,110	554	2530
5	2684	6/4/01	1415	535	0.26	0.01	-0.02	-0.26	-	-0.02	NA	1.02	14,935	504	2530
6	2685	6/4/01	1420	450	0.32	0.02	0.00	-0.14	-	0.00	NA	1.00	16,357	479	2485
7	2686	6/4/01	1425	522	0.47	-0.09	0.02	0.26	0.08	0.08	0.07	0.92	17,136	453	2442
8	2687	6/4/01	1430	388	0.41	-0.06	-0.01	-0.09	-	0.02	NA	0.98	15,481	429	2486

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.04

Table 6.2-30
Study Area 2 - ABM West (1)
Final Status Survey Results

				Median Value:	2.07	0.04	0.04	0.04	1.94	0.16			21,465		
				Minimum Value:	0.18	-0.31	-0.02	-0.65	1.64	-0.06			20,520		
				Maximum Value:	6.30	0.45	0.38	0.51	2.24	0.65			23,642		
				Average Value:	2.37	0.05	0.08	-0.09	1.94	0.19			21,749		
				Actual σ:	1.87	0.22	0.13	0.40	0.42	0.21			1,303		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		24,302		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2696	6/20/01	1400	498	0.18	0.01	0.04	-0.47	-	-0.06	NA	1.06	20,977	419	2169
2	2697	6/20/01	1405	439	0.70	-0.31	0.01	0.12	-	0.08	NA	0.92	20,522	443	2207
3	2698	6/20/01	1410	592	2.66	0.12	0.00	-0.48	1.64	0.15	0.08	0.85	20,520	466	2246
4	2699	6/20/01	1415	569	1.84	0.08	-0.02	0.10	-	0.18	NA	0.82	20,526	422	2246
5	2700	6/20/01	1420	763	1.75	0.00	0.08	-0.65	-	0.04	NA	0.96	21,954	398	2208
6	2701	6/20/01	1425	595	2.30	-0.09	0.08	0.17	-	0.23	NA	0.77	22,487	375	2171
7	2702	6/20/01	1430	727	3.20	0.45	0.04	-0.02	-	0.28	NA	0.72	23,642	352	2211
8	2703	6/20/01	1435	681	6.30	0.18	0.38	0.51	2.24	0.65	0.48	0.35	23,363	377	2248

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.18

Table 6.2-31
Study Area 2 - ABM Center
Final Status Survey Results

				Median Value:	1.52	-0.04	0.06	-0.08	2.68	0.10			18,086		
				Minimum Value:	0.86	-0.66	0.00	-0.61	2.12	0.05			16,920		
				Maximum Value:	2.42	0.28	0.15	0.38	3.24	0.26			19,867		
				Average Value:	1.58	-0.12	0.07	-0.08	2.68	0.12			18,355		
				Actual σ:	0.59	0.31	0.05	0.28	0.79	0.07			999		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		20,313		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2704	6/20/01	1440	529	1.05	-0.44	0.09	0.09	-	0.10	NA	0.90	17,601	511	2266
2	2705	6/20/01	1445	453	2.22	0.28	0.05	0.38	3.24	0.26	0.23	0.74	19,867	464	2266
3	2706	6/20/01	1450	540	1.81	0.05	0.12	0.02	-	0.17	NA	0.83	18,141	488	2307
4	2707	6/20/01	1455	635	1.88	0.09	0.04	-0.14	-	0.14	NA	0.86	16,920	511	2347
5	2708	6/20/01	1500	574	1.13	-0.15	0.00	-0.24	-	0.05	NA	0.95	18,032	441	2307
6	2709	6/20/01	1505	564	2.42	-0.66	0.07	-0.61	2.12	0.10	0.04	0.90	19,548	417	2266
7	2710	6/20/01	1510	537	0.86	0.04	0.03	-0.06	-	0.07	NA	0.93	18,868	394	2307
8	2711	6/20/01	1515	452	1.22	-0.13	0.15	-0.11	-	0.09	NA	0.91	17,865	347	2307

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.07

Table 6.2-32
Study Area 2 - ABM East
Final Status Survey Results

				Median Value:	1.61	0.09	0.04	-0.04	1.57	0.14			17,343			
				Minimum Value:	0.19	-0.70	0.02	-0.69	1.00	-0.01			14,745			
				Maximum Value:	4.01	0.40	0.07	0.45	2.14	0.33			17,947			
				Average Value:	1.86	0.00	0.04	-0.04	1.57	0.16			16,960			
				Actual σ:	1.15	0.32	0.02	0.34	0.81	0.12			1,097			
				Estimated σ:	2.51	1.01	1.23	0.42								
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		19,110			
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA							
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2712	6/20/01	1520	407	0.19	-0.06	0.02	-0.18	-	-0.01	NA	1.01	14,745	535	2392
2	2713	6/20/01	1525	512	1.22	0.16	0.06	0.25	-	0.15	NA	0.85	16,532	485	2389
3	2714	6/20/01	1530	607	4.01	0.40	0.07	-0.15	2.14	0.33	0.23	0.67	17,947	434	2387
4	2715	6/20/01	1535	614	2.63	-0.09	0.02	0.13	-	0.25	NA	0.75	17,699	410	2342
5	2716	6/20/01	1540	601	1.31	0.09	0.04	0.01	-	0.12	NA	0.88	17,888	360	2340
6	2717	6/20/01	1545	574	1.83	0.11	0.05	-0.69	-	0.04	NA	0.96	17,180	384	2385
7	2718	6/20/01	1550	534	1.39	0.10	0.02	-0.10	-	0.11	NA	0.89	16,180	357	2427
8	2719	6/20/01	1555	530	2.35	-0.70	0.04	0.45	1.00	0.27	0.21	0.73	17,507	306	2424

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.11

Table 6.2-33
Study Area 2 - ABM North
Final Status Survey Results

				Median Value:	1.27	-0.13	0.03	0.06	3.52	0.12			15,776			
				Minimum Value:	0.04	-0.62	-0.01	-0.20	2.71	0.02			12,834			
				Maximum Value:	3.53	0.17	0.14	0.25	4.82	0.28			17,366			
				Average Value:	1.60	-0.15	0.05	0.05	3.68	0.15			15,668			
				Actual σ:	1.28	0.27	0.05	0.17	1.06	0.10			1,513			
				Estimated σ:	2.51	1.01	1.23	0.42								
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		18,634			
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA							
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting	
1	2809	9/17/01	1400	585	0.04	-0.43	0.01	0.12	-	0.02	NA	0.98	17,273	520	2461	
2	2810	9/17/01	1405	596	0.46	-0.20	0.02	0.16	-	0.06	NA	0.94	15,332	519	2505	
3	2811	9/17/01	1410	503	3.53	0.17	0.14	-0.20	4.82	0.28	0.22	0.72	14,839	481	2526	
4	2812	9/17/01	1415	409	1.05	-0.12	0.02	0.25	-	0.13	NA	0.87	12,834	482	2483	
5	2813	9/17/01	1420	569	0.75	0.07	0.04	0.25	-	0.11	NA	0.89	16,584	445	2460	
6	2814	9/17/01	1425	620	3.17	0.04	0.12	0.01	3.52	0.28	0.22	0.72	17,366	444	2504	
7	2815	9/17/01	1430	538	1.50	-0.14	0.06	-0.16	-	0.10	NA	0.90	14,899	407	2525	
8	2816	9/17/01	1435	680	2.28	-0.62	-0.01	0.00	2.71	0.19	0.14	0.81	16,221	408	2481	

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.11

Table 6.2-34
Study Area 2 - ABM South
Final Status Survey Results

				Median Value:	1.32	0.15	0.03	0.05	2.62	0.16			15,137		
				Minimum Value:	0.34	-0.13	-0.04	-0.16	1.83	0.02			11,492		
				Maximum Value:	2.42	0.39	0.08	0.60	3.77	0.23			15,986		
				Average Value:	1.33	0.15	0.03	0.13	2.71	0.14			14,387		
				Actual σ:	0.88	0.18	0.04	0.24	0.83	0.08			1,698		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		17,715		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2817	9/17/01	1440	492	1.90	0.39	0.08	-0.16	2.89	0.15	0.12	0.85	14,446	387	2495
2	2818	9/17/01	1445	471	2.22	0.31	0.03	-0.01	1.83	0.20	0.15	0.80	15,062	389	2537
3	2819	9/17/01	1450	531	2.42	0.14	0.02	0.11	3.77	0.23	0.19	0.77	15,260	350	2519
4	2820	9/17/01	1455	430	0.34	-0.13	-0.04	-0.04	-	0.02	NA	0.98	15,211	348	2477
5	2821	9/17/01	1500	448	2.02	0.17	0.03	0.30	2.35	0.23	0.19	0.77	15,651	313	250
6	2822	9/17/01	1505	327	0.62	-0.03	-0.02	0.22	-	0.09	NA	0.91	11,492	315	2542
7	2823	9/17/01	1510	442	0.74	0.32	0.03	0.60	-	0.17	NA	0.83	11,989	277	2523
8	2824	9/17/01	1515	515	0.41	0.06	0.08	0.00	-	0.04	NA	0.96	15,986	275	2480

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.09

Table 6.2-35
Study Area 2 - ABM West (2)
Final Status Survey Results

				Median Value:	1.01	-0.07	0.02	0.10	2.31	0.12			13,823		
				Minimum Value:	0.65	-0.51	-0.02	-0.29	2.10	0.04			13,507		
				Maximum Value:	1.78	0.10	0.10	0.51	3.05	0.17			15,732		
				Average Value:	1.15	-0.10	0.03	0.09	2.49	0.11			14,132		
				Actual σ:	0.41	0.21	0.04	0.28	0.50	0.05			737		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 2 $DCGL_W$	18.0	144.7	27.2	101.6	103.3		95% Confidence Level:		15,577		
				Area 2 $DCGL_{Total}$	11.6	58.2	27.2	5.8	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 2 $DCGL_{Total}$)	Hybrid Unity (Area 2 $DCGL_{w\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	2825	9/18/01	1120	440	1.72	-0.14	0.00	-0.23	2.31	0.11	0.08	0.89	14,598	340	2344
2	2826	9/18/01	1125	434	0.98	0.10	0.03	0.26	-	0.13	NA	0.87	14,232	310	2383
3	2827	9/18/01	1130	410	1.31	-0.03	0.07	0.33	2.10	0.17	0.15	0.83	13,863	291	2338
4	2828	9/18/01	1135	532	0.65	-0.51	-0.01	0.04	-	0.05	NA	0.95	13,744	271	2292
5	2829	9/18/01	1140	575	1.78	0.09	0.10	-0.09	3.05	0.14	0.12	0.86	13,507	241	2332
6	2830	9/18/01	1145	589	0.87	-0.27	0.00	0.51	-	0.16	NA	0.84	13,603	261	2377
7	2831	9/18/01	1150	670	1.04	-0.11	0.03	-0.29	-	0.04	NA	0.96	15,732	212	2372
8	2832	9/18/01	1155	524	0.86	0.04	-0.02	0.16	-	0.10	NA	0.90	13,782	233	2418

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure

Estimated weighted σ = 0.23
Calculated weighted σ = 0.06

Table 6.3-1
Study Area 3B - Survey Unit 1
WTR Basin 1 Excavation Bottom
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.51	-0.06	0.02	-0.05		0.03			19,809
Minimum Value:	0.01	-0.40	-0.03	-0.51		-0.04			15,250
Maximum Value:	2.26	0.20	0.36	0.53		0.07			22,208
Average Value:	0.61	-0.10	0.06	-0.04		0.03			19,565
Actual σ:	0.65	0.19	0.11	0.32		0.04			1,966
Estimated σ:	2.51	1.01	1.23	0.42		NA			
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2	NA	95% Confidence Level:		23,418
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA	NA			

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	97	8/24/00	1005	425	0.19	-0.24	0.08	-0.12	-	0.00	NA	1.00	20,924	901	2106
2	98	8/24/00	1010	323	0.01	-0.13	0.02	-0.40	-	-0.04	NA	1.04	15,250	895	2134
3	99	8/24/00	1015	423	0.05	0.01	-0.02	0.02	-	0.00	NA	1.00	19,508	889	2163
4	100	8/24/00	1020	531	0.44	0.02	0.01	0.22	-	0.05	NA	0.95	18,533	883	2192
5	101	8/24/00	1025	N/A	0.75	0.20	-0.03	-0.26	-	0.01	NA	0.99	17,937	877	2225
6	102	8/24/00	1030	N/A	0.58	-0.40	0.36	-0.20	-	0.02	NA	0.98	21,165	875	2115
7	103	8/24/00	1035	561	2.26	-0.38	0.09	-0.51	0.55	0.06	0.02	0.94	20,508	868	2143
8	104	8/24/00	1040	453	0.90	-0.01	0.00	0.02	-	0.05	NA	0.95	19,969	860	2172
9	105	8/24/00	1300	545	0.68	-0.11	0.08	0.27	-	0.07	NA	0.93	19,649	853	2204
10	106	8/24/00	1305	429	0.28	0.02	0.02	0.53	-	0.07	NA	0.93	22,208	880	2088

Notes:
- Shaded values are below MDA values
- N/A denotes reading was not taken
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.02

Table 6.3-2
Study Area 3B - Survey Unit 2
WTR Basin 1 Excavation Bottom
Final Status Survey Results

				Median Value:	0.89	0.06	0.04	0.00	1.23	0.06	0.12		19,730		
				Minimum Value:	0.04	-0.25	-0.09	-0.33	1.11	0.03	0.07		17,606		
				Maximum Value:	5.90	0.24	0.17	0.36	1.35	0.28	0.18		22,118		
				Average Value:	1.45	0.06	0.03	0.04	1.23	0.08	0.12		19,793		
				Actual σ:	1.72	0.15	0.07	0.26	0.17	0.07	0.07		1,357		
				Estimated σ:	2.51	1.01	1.23	0.42	NA	NA					
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2	NA	95% Confidence Level:		22,453		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA	NA					
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	107	8/24/00	1310	605	0.58	0.07	-0.09	0.25	-	0.05	NA	0.95	20,843	856	2096
2	108	8/24/00	1330	1339	5.90	0.06	0.17	-0.32	1.11	0.28	0.18	0.72	22,118	848	2124
3	109	8/24/00	1320	574	2.01	0.01	0.04	-0.33	-	0.07	NA	0.93	19,541	842	2155
4	110	8/24/00	1325	490	0.88	-0.25	0.08	-0.13	-	0.03	NA	0.97	19,184	835	2185
5	111	8/24/00	1400	438	0.44	-0.02	0.00	0.04	-	0.03	NA	0.97	18,060	830	2215
6	112	8/24/00	1405	N/A	0.04	0.17	0.05	0.36	-	0.04	NA	0.96	20,971	833	2074
7	113	8/24/00	1410	N/A	0.22	0.24	0.03	0.34	-	0.05	NA	0.95	19,919	826	2104
8	114	8/24/00	1415	577	2.15	-0.04	0.00	-0.05	1.35	0.10	0.07	0.90	20,309	820	2134
9	115	8/24/00	1420	512	0.89	0.22	0.00	0.27	-	0.08	NA	0.92	17,606	813	2164
10	116	8/24/00	1455	514	1.36	0.18	0.07	-0.04	-	0.07	NA	0.93	19,382	806	2194

Notes:
- Shaded values are below MDA values
- N/A denotes reading was not taken
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.09

Table 6.3-3
Study Area 3B - Survey Unit 1
1st Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	0.52	0.18	0.02	0.00	0.85	0.04	0.06		21,353		
				Minimum Value:	0.19	-0.46	-0.05	-0.43	0.54	-0.02	0.03		19,494		
				Maximum Value:	2.75	0.44	0.08	0.24	1.87	0.16	0.12		22,542		
				Average Value:	0.89	0.11	0.01	-0.03	1.09	0.04	0.07		21,149		
				Actual σ:	0.83	0.29	0.04	0.24	0.70	0.06	0.05		922		
				Estimated σ:	2.51	1.01	1.23	0.42	NA						
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		22,957		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	123	8/28/00	1005	542	0.19	0.44	-0.01	0.24	-	0.04	NA	0.96	21,632	885	2176
2	124	8/28/00	1315	556	2.75	0.05	0.04	0.15	1.87	0.16	0.12	0.84	21,441	900	2123
3	125	8/28/00	1330	547	0.47	0.23	0.01	0.20	-	0.05	NA	0.95	19,494	893	2090
4	126	8/28/00	1340	472	1.19	0.37	0.02	0.09	0.85	0.07	0.06	0.93	20,220	876	2144
5	127	8/28/00	1400	516	1.10	-0.13	0.08	-0.13	0.54	0.04	0.03	0.96	21,160	863	2202
6	128	8/28/00	1415	518	0.48	0.24	0.03	-0.08	-	0.02	NA	0.98	21,286	838	2224
7	129	8/28/00	1645	557	0.36	0.13	-0.05	-0.25	-	-0.01	NA	1.01	21,420	853	2169
8	130	8/28/00	1650	523	0.56	-0.46	-0.02	-0.43	-	-0.02	NA	1.02	22,542	868	2112

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.05

Table 6.3-4
Study Area 3B - Survey Unit 2
1st Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
Median Value:	0.80	-0.11	0.03	0.25		0.07			20,596		
Minimum Value:	0.33	-0.46	-0.01	0.11		0.03			19,294		
Maximum Value:	1.62	-0.01	0.12	0.53		0.11			21,780		
Average Value:	0.85	-0.17	0.04	0.27		0.07			20,545		
Actual σ:	0.39	0.17	0.05	0.14		0.03			912		
Estimated σ:	2.51	1.01	1.23	0.42							
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		22,333		
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	131	8/28/00	1720	408	0.91	-0.09	0.01	0.25	-	0.07	NA	0.93	19,294	844	2165
2	132	8/28/00	1710	476	1.62	-0.04	0.06	0.24	0.89	0.11	0.09	0.89	21,136	861	2108
3	133	8/28/00	1730	522	0.33	-0.05	0.06	0.15	-	0.03	NA	0.97	21,780	835	2076
4	134	8/28/00	1740	499	1.04	-0.46	0.12	0.18	-	0.07	NA	0.93	21,474	836	2132
5	135	8/28/00	1750	572	0.97	-0.14	-0.01	0.53	-	0.10	NA	0.90	20,584	820	2189
6	136	8/28/00	1800	556	0.58	-0.01	0.07	0.44	-	0.08	NA	0.92	20,077	794	2210
7	137	8/28/00	1805	410	0.70	-0.38	0.00	0.25	-	0.06	NA	0.94	20,608	811	2155
8	138	8/28/00	1800	394	0.65	-0.23	-0.01	0.11	-	0.04	NA	0.96	19,407	829	2099

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-5
Study Area 3B - Survey Unit 1
2nd Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.73	-0.08	0.02	0.17		0.05			21,758
Minimum Value:	0.05	-0.54	-0.07	0.00		0.00			19,549
Maximum Value:	1.52	0.13	0.04	0.73		0.15			22,628
Average Value:	0.70	-0.13	0.01	0.23		0.06			21,361
Actual σ:	0.47	0.22	0.04	0.24		0.05			1,066
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,450
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	140	8/30/00	1350	540	0.84	-0.15	0.04	0.37	-	0.08	NA	0.92	19,549	884	2197
2	141	8/30/00	1355	703	0.08	-0.01	-0.07	0.15	-	0.02	NA	0.98	20,142	894	2166
3	142	8/30/00	1405	777	0.05	-0.16	-0.02	0.00	-	0.00	NA	1.00	21,638	904	2134
4	143	8/30/00	1415	544	0.72	-0.54	0.00	0.06	-	0.04	NA	0.96	20,910	908	2103
5	144	8/30/00	1425	411	0.74	0.03	0.04	0.18	-	0.06	NA	0.94	22,171	880	2109
6	145	8/30/00	1500	495	0.71	0.13	0.04	0.28	-	0.07	NA	0.93	21,972	871	2141
7	146	8/30/00	1505	463	0.90	-0.01	0.00	0.03	-	0.05	NA	0.95	22,628	861	2172
8	147	8/30/00	1510	531	1.52	-0.35	0.04	0.73	1.68	0.15	0.13	0.85	21,879	852	2204

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-6
Study Area 3B - Survey Unit 2
2nd Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.99	0.01	0.01	0.08	0.51	0.06	0.03		21,390
Minimum Value:	0.60	-0.15	-0.03	-0.26	0.29	0.02	0.02		20,785
Maximum Value:	2.44	0.46	0.09	0.23	0.60	0.14	0.10		23,147
Average Value:	1.13	0.05	0.03	0.03	0.47	0.06	0.05		21,548
Actual σ:	0.57	0.18	0.04	0.19	0.16	0.03	0.04		769
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,055
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	148	8/30/00	1530	533	2.44	0.05	0.02	0.11	0.51	0.14	0.10	0.86	21,656	820	2229
2	149	8/30/00	1540	561	0.79	0.46	0.09	0.19	-	0.07	NA	0.93	21,252	830	2198
3	150	8/30/00	1550	561	1.33	-0.15	0.07	-0.15	0.29	0.05	0.03	0.95	21,528	840	2164
4	151	8/30/00	1555	533	1.02	0.02	0.00	0.05	-	0.06	NA	0.94	21,171	850	2134
5	152	8/30/00	1610	497	0.60	-0.06	0.01	0.21	-	0.05	NA	0.95	23,147	828	2110
6	153	8/30/00	1615	474	1.02	-0.03	0.01	-0.15	0.60	0.04	0.02	0.96	20,785	817	2141
7	154	8/30/00	1630	401	0.97	-0.01	-0.03	0.23	-	0.07	NA	0.93	22,025	807	2172
8	155	8/30/00	1635	476	0.87	0.14	0.07	-0.26	-	0.02	NA	0.98	20,819	798	2204

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.04

Table 6.3-7
Study Area 3B - Survey Unit 1
3rd Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	0.37	-0.04	-0.01	0.10	0.47	0.04	0.04		22,306		
				Minimum Value:	0.26	-0.32	-0.02	-0.14	0.07	0.01	0.00		21,198		
				Maximum Value:	0.90	0.49	0.10	0.46	0.78	0.08	0.07		22,718		
				Average Value:	0.47	0.05	0.01	0.16	0.43	0.04	0.04		22,140		
				Actual σ:	0.23	0.31	0.04	0.23	0.28	0.03	0.03		547		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,211		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	156	9/5/00	1425	464	0.28	-0.30	-0.01	0.14	-	0.03	NA	0.97	21,198	900	2122
2	157	9/5/00	1430	553	0.90	-0.05	-0.01	-0.06	0.07	0.04	0.02	0.96	22,422	890	2156
3	158	9/5/00	1435	404	0.37	0.21	0.00	0.05	-	0.03	NA	0.97	22,191	880	2190
4	159	9/5/00	1445	416	0.49	-0.32	0.04	0.40	0.78	0.07	0.06	0.93	21,788	870	2224
5	160	9/5/00	1500	467	0.26	-0.06	-0.01	0.46	0.14	0.06	0.06	0.94	22,684	876	2093
6	161	9/5/00	1510	416	0.35	-0.02	0.10	-0.14	0.45	0.01	0.00	0.99	21,638	865	2128
7	162	9/5/00	1530	410	0.38	0.49	-0.02	0.07	0.67	0.03	0.03	0.97	22,718	856	2164
8	163	9/5/00	1540	523	0.73	0.44	-0.02	0.40	0.49	0.08	0.07	0.92	22,479	845	2199

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-8
Study Area 3B - Survey Unit 2
3rd Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.21	-0.23	0.00	-0.09		0.00			22,412
Minimum Value:	0.07	-0.48	-0.07	-0.45		-0.05			21,630
Maximum Value:	0.43	0.08	0.03	0.08		0.02			23,797
Average Value:	0.23	-0.18	-0.01	-0.12		0.00			22,549
Actual σ:	0.12	0.21	0.04	0.16		0.02			712
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,943
Area 1 &3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	164	9/5/00	1600	478	0.27	0.01	-0.07	0.08	-	0.02	NA	0.98	22,566	866	2102
2	165	9/5/00	1610	414	0.07	-0.33	0.00	-0.17	-	-0.02	NA	1.02	21,922	856	2136
3	166	9/5/00	1615	450	0.33	-0.29	-0.04	-0.09	-	0.00	NA	1.00	22,136	847	2171
4	167	9/5/00	1620	390	0.18	0.08	-0.01	-0.20	-	-0.01	NA	1.01	22,958	837	2205
5	168	9/5/00	1650	476	0.18	-0.17	-0.05	-0.09	-	0.00	NA	1.00	22,259	832	2110
6	169	9/5/00	1705	430	0.24	0.08	0.03	0.00	-	0.01	NA	0.99	23,122	822	2145
7	170	9/5/00	1715	401	0.43	-0.35	0.02	-0.03	0.40	0.02	0.01	0.98	21,630	813	2179
8	171	9/5/00	1720	393	0.09	-0.48	0.02	-0.45	-	-0.05	NA	1.05	23,797	802	2214

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.02

Table 6.3-9
Study Area 3B - Survey Unit 1
4th Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	0.04	-0.01	0.01	0.16	1.16	0.02	0.01		20,425		
				Minimum Value:	-0.06	-0.30	-0.03	-0.05	0.86	0.00	0.01		19,362		
				Maximum Value:	0.18	0.19	0.03	0.41	1.28	0.05	0.05		22,892		
				Average Value:	0.05	-0.02	0.00	0.16	1.10	0.02	0.02		20,910		
				Actual σ:	0.08	0.14	0.02	0.17	0.22	0.02	0.02		1,211		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,284		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	172	9/8/00	840	570	-0.01	-0.12	-0.02	0.20	-	0.02	NA	0.98	22,892	921	2108
2	173	9/8/00	845	420	0.04	-0.30	-0.01	0.41	-	0.04	NA	0.96	20,445	912	2147
3	174	9/8/00	850	421	0.03	0.08	0.00	0.02	1.28	0.00	0.01	1.00	20,033	904	2184
4	175	9/8/00	855	418	-0.06	0.01	0.01	0.19	-	0.02	NA	0.98	19,362	894	2222
5	176	9/8/00	835	374	0.18	-0.01	0.02	-0.05	1.16	0.00	0.01	1.00	22,398	883	2119
6	177	9/8/00	815	394	0.04	0.19	0.01	0.12	-	0.02	NA	0.98	20,381	873	2157
7	178	9/8/00	805	405	0.07	-0.01	-0.03	0.03	-	0.01	NA	0.99	21,365	864	2195
8	179	9/8/00	750	492	0.13	-0.03	0.03	0.39	0.86	0.05	0.05	0.95	20,404	855	2234

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.02

Table 6.3-10
Study Area 3B - Survey Unit 2
4th Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.15	-0.04	0.03	0.05	1.29	0.01	0.01		22,106
Minimum Value:	0.00	-0.48	-0.03	-0.12	1.27	0.00	0.01		20,285
Maximum Value:	0.30	0.15	0.08	0.55	1.31	0.06	0.02		24,279
Average Value:	0.14	-0.04	0.02	0.12	1.29	0.02	0.01		22,124
Actual σ:	0.11	0.20	0.04	0.23	0.03	0.02	0.01		1,388
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		24,844
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	180	9/8/00	910	431	0.14	0.10	0.03	-0.06	-	0.00	NA	1.00	22,352	862	2086
2	181	9/8/00	915	422	0.18	-0.04	0.02	0.08	-	0.02	NA	0.98	23,187	850	2122
3	182	9/8/00	920	395	0.00	-0.03	-0.03	0.01	-	0.00	NA	1.00	20,286	838	2159
4	183	9/8/00	925	424	0.15	-0.48	0.05	0.41	-	0.05	NA	0.95	20,285	827	2195
5	184	9/8/00	930	475	0.05	0.14	-0.02	0.55	-	0.06	NA	0.94	21,773	817	2233
6	185	9/8/00	935	363	0.05	-0.07	-0.02	0.08	1.27	0.01	0.02	0.99	24,279	523	2094
7	186	9/8/00	940	407	0.28	0.15	0.05	0.03	-	0.02	NA	0.98	21,861	812	2131
8	187	9/8/00	950	463	0.30	-0.12	0.08	-0.12	1.31	0.00	0.01	1.00	22,968	801	2168

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-11
Study Area 3B - Survey Unit 1
5th Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	0.05	0.11	0.00	0.05	0.33	0.01	0.03		22,071		
				Minimum Value:	0.01	-0.39	-0.02	-0.34	0.18	-0.03	0.01		21,047		
				Maximum Value:	0.12	0.41	0.02	0.42	0.48	0.05	0.05		24,165		
				Average Value:	0.06	0.06	0.00	0.03	0.33	0.01	0.03		22,281		
				Actual σ:	0.04	0.25	0.01	0.25	0.21	0.03	0.03		966		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		24,174		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	190	9/11/00	1318	496	0.02	-0.16	0.02	0.09	-	0.01	NA	0.99	22,006	922	2094
2	191	9/11/00	1324	521	0.12	0.14	-0.02	0.42	0.48	0.05	0.05	0.95	22,681	912	2134
3	192	9/11/00	1330	540	0.07	0.14	-0.01	-0.15	-	-0.01	NA	1.01	21,537	902	2173
4	193	9/11/00	1334	450	0.10	0.41	-0.01	-0.16	-	-0.01	NA	1.01	21,047	891	2213
5	194	9/11/00	1337	515	0.01	0.09	0.01	0.04	0.18	0.01	0.01	0.99	24,165	883	2105
6	195	9/11/00	1341	514	0.02	0.25	0.01	0.32	-	0.04	NA	0.96	22,903	873	2144
7	196	9/11/00	1347	424	0.08	-0.39	0.00	-0.34	-	-0.03	NA	1.03	22,136	864	2183
8	197	9/11/00	1353	500	0.02	0.02	0.00	0.05	-	0.01	NA	0.99	21,776	851	2223

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-12
Study Area 3B - Survey Unit 2
5th Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity	Hybrid Unity	Sign Test	Fixed Gross Gamma Count (cpm)
Median Value:	0.08	-0.10	0.00	0.10		0.01			23,716
Minimum Value:	0.03	-0.24	-0.05	-0.29		-0.02			21,864
Maximum Value:	0.16	0.35	0.03	0.64		0.07			25,039
Average Value:	0.08	-0.03	0.00	0.08		0.01			23,616
Actual σ:	0.05	0.23	0.02	0.30		0.03			1,093
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		25,758
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	198	9/11/00	1400	566	0.16	-0.02	0.03	0.00	0.26	0.01	0.01	0.99	24,268	863	2091
2	199	9/11/00	1405	502	0.11	-0.18	-0.01	-0.11	-	-0.01	NA	1.01	23,718	853	2129
3	200	9/11/00	1409	454	0.04	-0.21	0.00	0.64	-	0.07	NA	0.93	23,714	841	2166
4	201	9/11/00	1417	531	0.03	-0.13	-0.05	0.21	-	0.02	NA	0.98	21,864	829	2204
5	202	9/11/00	1422	527	0.14	-0.24	0.02	0.21	-	0.03	NA	0.97	25,039	825	2100
6	203	9/11/00	1428	484	0.04	0.35	0.01	-0.29	-	-0.02	NA	1.02	24,615	814	2138
7	204	9/11/00	1431	452	0.08	-0.08	0.02	-0.20	-	-0.02	NA	1.02	23,428	803	2174
8	205	9/11/00	1439	445	0.08	0.30	0.00	0.20	-	0.03	NA	0.97	22,281	792	2211

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-13
Study Area 3B - Survey Unit 1
6th Lift of Acceptable Backfill Material
Final Status Survey Results

				Median Value:	0.08	0.09	0.00	0.15	0.94	0.01	-0.01		20,296		
				Minimum Value:	0.06	-0.19	-0.26	-0.49	0.34	-0.04	-0.01		18,818		
				Maximum Value:	0.14	0.96	0.06	0.60	0.99	0.07	0.04		22,892		
				Average Value:	0.08	0.16	-0.02	0.06	0.76	0.01	0.01		20,627		
				Actual σ:	0.02	0.36	0.10	0.42	0.36	0.04	0.03		1,521		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,607		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	206	9/13/00	1435	602	0.08	0.96	0.01	-0.49	-	-0.04	NA	1.04	20,894	920	2091
2	207	9/13/00	1440	413	0.08	0.25	0.04	-0.22	0.99	-0.01	-0.01	1.01	19,227	910	2136
3	208	9/13/00	1445	472	0.06	-0.04	-0.03	0.36	-	0.04	NA	0.96	19,698	899	2180
4	209	9/13/00	1450	425	0.08	0.28	-0.05	-0.46	-	-0.04	NA	1.04	19,609	888	2223
5	210	9/13/00	1500	502	0.14	-0.13	0.06	0.35	0.34	0.04	0.04	0.96	22,892	876	2104
6	211	9/13/00	1459	477	0.09	-0.19	0.04	0.60	-	0.07	NA	0.93	22,390	866	2148
7	212	9/13/00	1505	523	0.08	0.13	-0.26	-0.06	0.94	-0.01	-0.01	1.01	21,490	856	2192
8	213	9/13/00	1510	461	0.06	0.04	-0.01	0.36	-	0.04	NA	0.96	18,818	846	2236

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.04

Table 6.3-14
Study Area 3B - Survey Unit 1
7th Lift of Acceptable Backfill Material
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.06	0.04	0.00	0.14		0.02			21,173
Minimum Value:	-0.01	-0.28	-0.08	-0.48		-0.05			19,205
Maximum Value:	0.26	0.20	0.03	0.35		0.04			22,884
Average Value:	0.09	0.03	-0.01	0.04		0.01			21,079
Actual σ:	0.09	0.14	0.03	0.30		0.03			1,355
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		23,735
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	214	9/15/00	710	479	0.02	0.16	0.02	-0.48	-	-0.05	NA	1.05	19,205	931	2091
2	215	9/15/00	715	443	0.09	0.05	-0.01	0.08	-	0.01	NA	0.99	20,795	925	2116
3	216	9/15/00	720	438	0.26	0.02	0.00	-0.20	0.30	-0.01	-0.01	1.01	20,278	918	2140
4	217	9/15/00	725	440	0.05	-0.28	0.00	-0.20	-	-0.02	NA	1.02	19,605	913	2164
5	218	9/15/00	730	461	-0.01	0.20	0.00	0.29	-	0.03	NA	0.97	22,719	913	2073
6	219	9/15/00	735	387	0.06	0.03	-0.04	0.20	-	0.02	NA	0.98	21,552	907	2099
7	220	9/15/00	740	522	0.16	0.05	-0.08	0.28	-	0.04	NA	0.96	21,599	901	2123
8	221	9/15/00	750	485	0.07	-0.02	0.03	0.35	-	0.04	NA	0.96	22,884	888	2081

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-15
Study Area 3B - Survey Unit 3
Final Status Survey Results

				Median Value:	0.46	-0.03	0.02	-0.14	0.37	0.02	0.07		19,485		
				Minimum Value:	-0.04	-0.58	-0.03	-0.76	0.26	-0.05	-0.06		16,413		
				Maximum Value:	2.05	0.29	0.11	0.35	4.05	0.10	0.11		32,359		
				Average Value:	0.59	-0.03	0.03	-0.19	1.56	0.01	0.04		21,407		
				Actual σ:	0.56	0.24	0.04	0.36	2.16	0.05	0.08		4,752		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		30,721		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	244	7/12/01	1000	489	-0.04	-0.06	0.01	0.23	-	0.02	NA	0.98	18,909	980	2223
2	245	7/11/01	1500	413	0.18	-0.07	-0.01	-0.40	-	-0.03	NA	1.03	16,413	980	2304
3	246	7/11/01	1505	533	2.05	-0.26	0.07	-0.02	0.26	0.10	0.07	0.90	18,029	909	2343
4	247	7/11/01	1510	472	1.25	0.10	0.08	0.35	4.05	0.10	0.11	0.90	18,495	910	2262
5	248	7/11/01	1515	473	0.55	0.29	0.03	-0.76	-	-0.05	NA	1.05	18,702	939	2302
6	249	7/12/01	900	286	0.45	-0.04	-0.01	-0.06	-	0.02	NA	0.98	20,130	939	2382
7	250	7/12/01	910	391	0.35	-0.58	0.02	-0.44	-	-0.03	NA	1.03	24,629	769	2342
8	251	7/11/01	1520	360	0.25	0.28	-0.02	0.16	-	0.03	NA	0.97	28,507	770	2261
9	252	7/11/01	1525	327	0.47	-0.02	0.11	-0.11	-	0.02	NA	0.98	32,359	669	2221
10	253	7/11/01	1530	320	0.61	-0.16	-0.03	-0.73	0.37	-0.05	-0.06	1.05	21,742	669	2301
11	254	7/11/01	1535	367	0.32	0.02	0.05	-0.33	-	-0.02	NA	1.02	19,227	669	2383
12	255	7/11/01	1540	330	0.60	0.19	0.05	-0.18	-	0.02	NA	0.98	19,743	669	2463

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.05

Table 6.3-16
Study Area 3B - Survey Unit 4
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.10	0.06	0.01	0.02	0.20	0.02	0.03		13,666
Minimum Value:	-0.01	-0.39	-0.08	-0.39	0.07	-0.03	0.01		8,985
Maximum Value:	2.06	0.31	0.04	0.61	0.42	0.09	0.05		17,373
Average Value:	0.32	-0.02	0.01	0.06	0.23	0.02	0.03		13,562
Actual σ:	0.58	0.27	0.04	0.31	0.18	0.04	0.02		2,805
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		19,060
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	256	7/18/01	1400	758	0.01	-0.26	0.00	0.28	-	0.03	NA	0.97	10,785	980	2223
2	257	7/18/01	1405	577	0.07	0.11	0.02	-0.39	-	-0.03	NA	1.03	12,912	980	2304
3	258	7/18/01	1410	560	0.02	0.14	0.00	-0.27	-	-0.03	NA	1.03	11,745	909	2343
4	259	7/18/01	1415	689	0.01	-0.34	-0.02	0.22	-	0.02	NA	0.98	11,390	914	2266
5	260	7/18/01	1420	624	0.03	0.31	0.04	0.61	-	0.07	NA	0.93	8,985	839	2302
6	261	7/18/01	1425	496	0.13	0.27	0.04	-0.25	-	-0.01	NA	1.01	10,917	839	2382
7	262	7/13/01	1000	381	0.18	-0.39	-0.08	-0.02	-	0.00	NA	1.00	14,421	769	2342
8	263	7/13/01	1005	458	0.42	0.01	0.03	-0.10	0.20	0.01	0.01	0.99	17,373	770	2261
9	264	7/18/01	1430	596	-0.01	0.27	-0.01	0.21	-	0.02	NA	0.98	16,794	669	2221
10	265	7/13/01	1010	274	0.24	0.10	-0.03	0.47	-	0.06	NA	0.94	16,706	669	2301
11	266	7/13/01	1015	325	0.64	-0.39	0.04	0.06	0.42	0.04	0.03	0.96	15,834	669	2383
12	267	7/13/01	1020	379	2.06	-0.03	0.04	-0.15	0.07	0.09	0.05	0.91	14,879	669	2463

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 12 (Sign Test)
- Critical value from MARSSIM Table I.3 = 9; 12 > 9 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.04

Table 6.3-17
Study Area 3A - Survey Unit 5
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.28	0.07	0.00	-0.07	0.26	0.01	0.00		17,060
Minimum Value:	-0.06	-0.44	-0.06	-0.26	0.17	-0.02	0.00		14,842
Maximum Value:	0.41	0.36	0.05	0.58	0.43	0.06	0.04		46,263
Average Value:	0.22	0.07	0.00	0.04	0.29	0.02	0.01		21,651
Actual σ:	0.18	0.22	0.03	0.23	0.13	0.03	0.02		9,572
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		40,413
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	232	7/2/01	1020	503	0.15	0.36	-0.05	-0.26	-	-0.02	NA	1.02	26,063	1152	1610
2	233	7/2/01	1025	601	0.27	0.06	0.00	-0.10	-	0.00	NA	1.00	15,967	1034	2138
3	234	7/2/01	1030	447	0.38	0.13	0.00	0.27	-	0.05	NA	0.95	14,842	1012	2260
4	268	7/23/01	900	384	0.41	-0.44	-0.01	-0.08	0.17	0.01	0.00	0.99	16,843	1076	2165
5	269	7/23/01	905	411	0.31	-0.05	0.03	-0.19	-	0.00	NA	1.00	15,914	1129	2188
6	270	7/23/01	910	402	0.38	-0.08	-0.02	-0.12	0.26	0.01	0.00	0.99	16,654	1022	2189
7	271	7/23/01	915	446	0.41	0.25	-0.01	0.24	0.43	0.05	0.04	0.95	16,844	1011	2318
8	272	7/23/01	920	471	0.15	-0.09	0.03	-0.06	-	0.00	NA	1.00	16,087	1018	2370
9	273	7/23/01	925	589	0.01	0.08	-0.06	-0.12	-	-0.01	NA	1.01	17,276	1063	2363
10	274	7/23/01	930	476	0.36	-0.01	-0.02	0.27	-	0.05	NA	0.95	18,457	1057	2055
11	275	7/23/01	935	635	0.01	0.24	0.05	0.08	-	0.01	NA	0.99	22,028	1063	1911
12	276	7/23/01	940	471	0.29	0.33	0.02	0.16	-	0.04	NA	0.96	20,314	1009	1824
14	277	7/23/01	1500	1192	-0.06	-0.08	0.00	0.58	-	0.06	NA	0.94	46,263	1063	1911
13	278	7/23/01	1505	927	-0.04	0.25	0.01	-0.09	-	-0.01	NA	1.01	39,568	1071	1936

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) =14 (Sign Test)
- Critical value from MARSSIM Table I.3 = 10; 14 > 10 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.03

Table 6.3-18
Study Area 3B - Survey Unit 6
(Former ABM Soil Stockpile Area)
Final Status Survey Results

	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)
Median Value:	0.12	-0.02	0.01	0.19	0.21	0.03	-0.01		22,002
Minimum Value:	0.05	-0.30	-0.04	-0.52	0.12	-0.04	-0.05		18,600
Maximum Value:	0.75	0.23	0.05	0.62	0.30	0.07	0.03		25,297
Average Value:	0.21	-0.04	0.01	0.10	0.21	0.02	-0.01		21,795
Actual σ:	0.23	0.18	0.03	0.36	0.13	0.04	0.05		2,628
Estimated σ:	2.51	1.01	1.23	0.42					
Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		26,945
Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA				

MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	Cs-137 (pCi/g)	Am-241 (pCi/g)	Co-60 (pCi/g)	U-235 (pCi/g)	Sr-90 (pCi/g)	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	224	6/27/01	1430	333	0.05	-0.02	0.02	0.29	-	0.03	NA	0.97	18,600	962	1871
2	225	6/27/01	1435	475	0.75	0.00	0.05	-0.03	0.30	0.04	0.03	0.96	19,382	955	1925
3	226	6/27/01	1440	524	0.14	-0.03	-0.02	0.27	-	0.03	NA	0.97	18,991	949	1979
4	227	6/27/01	1445	527	0.10	0.17	-0.04	0.62	-	0.07	NA	0.93	21,008	943	2033
5	228	6/27/01	1450	570	0.31	-0.26	-0.03	-0.52	0.12	-0.04	-0.05	1.04	22,995	899	2002
6	229	6/27/01	1455	621	0.07	0.23	0.04	0.12	-	0.02	NA	0.98	23,985	905	1946
7	230	6/27/01	1500	522	0.14	-0.30	0.03	-0.23	-	-0.02	NA	1.02	25,297	855	1968
8	231	6/27/01	1505	540	0.09	-0.09	0.00	0.31	-	0.04	NA	0.96	24,101	848	2021

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.04

Table 6.3-19
Study Area 3B - Survey Unit 7
Final Status Survey Results

				Median Value:	0.20	-0.03	0.01	-0.04	-0.04	0.00	0.01		20,373		
				Minimum Value:	0.05	-0.64	-0.03	-0.53	-0.12	-0.04	-0.05		16,391		
				Maximum Value:	0.56	0.13	0.04	0.59	0.03	0.07	0.06		22,389		
				Average Value:	0.23	-0.12	0.01	0.02	-0.04	0.01	0.01		19,811		
				Actual σ:	0.17	0.27	0.02	0.38	0.10	0.04	0.07		2,217		
				Estimated σ:	2.51	1.01	1.23	0.42							
				Area 1 & 3 $DCGL_W$	30.1	241.2	27.2	169.3	172.2		95% Confidence Level:		24,156		
				Area 1 & 3 $DCGL_{Total}$	19.4	96.9	27.2	9.6	NA						
MARSSIM #	ESC Sample Number	Date	Time	Container Screen (ncpm)	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	Unity (Area 1/3 $DCGL_{Total}$)	Hybrid Unity (Area 1/3 $DCGL_{W\ \&\ Total}$)	Sign Test 1 - Unity ($DCGL_{Total}$)	Fixed Gross Gamma Count (cpm)	GPS Coordinates Northing	GPS Coordinates Easting
1	236	7/11/01	1100	318	0.32	0.13	-0.03	0.47	-0.12	0.07	0.06	0.93	21,817	841	1948
2	237	7/11/01	1105	323	0.56	0.06	0.02	0.19	-	0.05	NA	0.95	21,461	831	1981
3	238	7/11/01	1110	456	0.30	0.04	0.04	-0.33	-	-0.02	NA	1.02	22,389	821	2019
4	239	7/11/01	1115	365	0.16	-0.24	0.01	0.02	-	0.01	NA	0.99	21,052	812	2046
5	240	7/11/01	1120	410	0.25	0.10	0.00	-0.53	0.03	-0.04	-0.05	1.04	19,694	802	2079
6	241	7/11/01	1125	288	0.06	-0.36	0.00	-0.13	-	-0.01	NA	1.01	17,865	792	2111
7	242	7/11/01	1130	420	0.16	-0.10	0.03	0.59	-	0.07	NA	0.93	17,819	782	2145
8	243	7/11/01	1135	458	0.05	-0.64	0.02	-0.10	-	-0.01	NA	1.01	16,391	772	2177

Notes:
- Shaded values are below MDA values
- Number of positive values (S+) = 8 (Sign Test)
- Critical value from MARSSIM Table I.3 = 6; 8 > 6 therefore SU passes Sign Test criteria.
- Hybrid Unity applicable only to samples with Sr-90 results
- MARSSIM # references sample number shown on associated Figure.

Estimated weighted σ = 0.23
Actual weighted σ = 0.04

Table 7.4-1
Quality Control Data
Background Soil Samples

	Median Value:	0.00	-0.03	0.01	0.04	NA
	Minimum Value:	-0.08	-0.45	-0.04	-0.67	NA
	Maximum Value:	0.07	0.42	0.09	0.42	NA
	Average Value:	0.00	-0.03	0.00	0.03	NA
	Actual σ:	0.03	0.22	0.03	0.28	NA
ESC Sample Number	**Date**	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**
3001	10/6/00	-0.01	0.15	0.02	0.12	-
3002	10/6/00	0.04	-0.09	-0.04	0.40	-
3003	10/6/00	-0.04	0.24	0.03	0.41	0.81
3004	10/6/00	-0.02	-0.09	0.03	-0.13	-
3011	10/26/00	0.01	0.01	-0.01	0.02	-
3013	11/1/00	-0.03	0.24	-0.04	0.42	-
3018	11/20/00	0.01	0.02	0.02	0.15	-
3022	12/4/00	0.04	0.02	-0.01	0.02	-
3023	12/5/00	0.00	0.11	0.02	-0.30	-
3027	12/8/00	-0.02	-0.14	-0.04	-0.09	-
3031	1/2/01	0.03	0.42	0.03	-0.41	-
3035	1/4/00	-0.05	-0.26	0.01	-0.14	-
3037	3/21/01	0.02	-0.32	0.00	-0.13	-
3041	4/26/01	-0.08	0.11	0.09	-0.25	-
3044	5/30/01	-0.02	-0.06	0.02	-0.02	-
3048	6/18/01	0.07	-0.16	-0.01	-0.67	-
3050	7/9/01	0.00	-0.25	0.02	0.08	-
3053	7/17/01	0.00	0.15	0.04	0.23	-
3056	7/31/01	-0.02	-0.39	-0.01	0.35	-
3059	8/21/01	0.04	-0.45	-0.04	0.20	-
3062	8/30/01	0.01	-0.26	0.00	-0.02	-
3065	9/11/01	0.01	0.29	0.00	0.42	-
3068	9/20/01	0.03	-0.12	0.01	0.12	-
3071	9/25/01	-0.01	0.02	-0.04	0.05	-

Notes:
- Shaded values are below MDA values

Table 7.4-2
Quality Control Data
Spike Samples

Median Value:		84.12	-0.05	0.02	-0.07	2.60	0.67	0.02	0.24	0.03	0.03	7.86	0.00
Minimum Value:		42.42	-1.25	-0.05	-1.71	0.95	0.55	0.00	0.23	-0.01	0.03	-35.40	-0.01
Maximum Value:		121.50	0.81	0.05	1.15	5.01	0.69	0.03	0.36	0.05	0.06	16.50	0.01
Average Value:		87.11	-0.13	0.02	-0.08	2.81	0.63	0.02	0.28	0.02	0.04	-3.68	0.00
Standard Deviaton		20.51	0.50	0.02	0.61	1.13	0.07	0.02	0.07	0.03	0.02	27.81	0.01
ESC Sample Number	**Date**	**Cs-137 (pCi/g)**	**Am-241 (pCi/g)**	**Co-60 (pCi/g)**	**U-235 (pCi/g)**	**Sr-90 (pCi/g)**	**U-234 (pCi/g)**	**U-235 by alpha spec**	**U-238 (pCi/g)**	**Pu-238 (pCi/g)**	**Pu-239/240 (pCi/g)**	**Pu-241 (pCi/g)**	**Cm-243/244 (pCi/g)**
2134	10/19/00	95.71	0.38	0.00	-0.50	4.09							
3010	10/26/00	80.37	-0.15	0.00	-0.77	2.60	-	-	-	-	-	-	-
3012	10/31/00	73.73	0.48	0.02	0.19	-	-	-	-	-	-	-	-
3014	11/1/00	73.96	-0.08	0.01	-0.04	2.75	0.55	0.03	0.23	0.03	0.03	16.50	0.00
3015	11/7/00	72.33	0.51	0.03	0.00	-	-	-	-	-	-	-	-
3016	11/10/00	93.38	-0.65	0.03	-0.67	-	-	-	-	-	-	-	-
3017	11/20/00	74.57	-0.18	0.01	-0.13	-	-	-	-	-	-	-	-
3025	12/5/00	42.42	-0.05	-0.05	0.64	5.01	-	-	-	-	-	-	-
3026	12/6/00	87.41	0.81	0.02	0.01	-	-	-	-	-	-	-	-
3028	12/8/00	79.95	0.12	0.03	-0.05	-	-	-	-	-	-	-	-
3032	1/2/01	103.20	-1.25	-0.01	-0.24	3.74	-	-	-	-	-	-	-
3034	1/4/00	111.10	-0.61	0.01	0.71	2.46	0.69	0.00	0.24	0.05	0.03	-35.40	0.01
3036	2/14/01	89.07	0.26	0.04	-0.55	-	-	-	-	-	-	-	-
3039	4/3/01	77.66	-0.95	0.00	-0.41	1.81	-	-	-	-	-	-	-
3042	4/27/01	91.00	-0.82	0.01	-0.98	-	-	-	-	-	-	-	-
3045	5/30/01	63.05	-0.02	0.02	0.38	0.95	-	-	-	-	-	-	-
3047	6/18/01	69.52	0.08	0.02	-0.35	3.72	-	-	-	-	-	-	-
3049	7/9/01	80.83	-0.14	0.00	1.15	-	-	-	-	-	-	-	-
3054	7/17/01	98.49	-0.23	0.04	-0.29	-	-	-	-	-	-	-	-
3057	7/31/01	117.50	0.03	0.02	-0.15	3.63	0.67	0.02	0.36	-0.01	0.06	7.86	-0.01
3060	8/27/01	121.50	-0.77	0.05	0.62	-	-	-	-	-	-	-	-
3063	8/30/01	100.10	0.00	0.01	0.57	-	-	-	-	-	-	-	-
3066	9/11/01	57.54	-0.05	0.04	0.15	2.04	-	-	-	-	-	-	-
3069	9/20/01	114.30	-0.02	0.03	-0.08	2.19	-	-	-	-	-	-	-
3072	9/25/01	117.60	0.50	0.01	-1.71	-	-	-	-	-	-	-	-

Notes:
- Shaded values are below MDA values
- Sample No. 2134 represents the certified concentration

Table 7.4-3
Quality Control Data
Soil Replicates

Area 2 $DCGL_W$		18.0	144.7	27.2	101.6	103.3	151.2	101.6	158.9	241.0	179.2	5030.4	81.9			
Area 1 &3 $DCGL_W$		30.1	241.2	27.2	169.3	172.2	252.0	169.3	264.9	401.6	298.6	8364.0	136.5			
Area 2 $DCGL_{Total}$		11.6	58.2	27.2	5.8	NA	NA	NA	NA	NA	NA	NA	NA			
Area 1 &3 $DCGL_{Total}$		19.4	96.9	27.2	9.6	NA	NA	NA	NA	NA	NA	NA	NA			
ESC Sample Number[1]	Date	Cs-137 (pCi/g)	Am-241[5] (pCi/g)	Co-60[5] (pCi/g)	U-235[5] (pCi/g)	Sr-90 (pCi/g)	U-234 (pCi/g)	U-235 by alpha spec	U-238 (pCi/g)	Pu-238 (pCi/g)	Pu-239/240 (pCi/g)	Pu-241 (pCi/g)	Cm-243/244 (pCi/g)	Unity $DCGL_{Total}$	Hybrid Unity[4] (Area 2 $DCGL_{W\ \&\ Total}$) or $DCGL_W$	% Error[6]
1[2]	6/26/00	733.30	-0.57	2.22	0.24	143.00	-	-	-	-	-	-	-	37.90	25.29	2.6
3005	10/12/00	724.40	-0.87	2.15	-0.04	-	-	-	-	-	-	-	-	37.41	NA	
73[2]	7/26/00	31.34	-0.35	0.06	0.25	-	-	-	-	-	-	-	-	1.64	NA	101.7
3006	10/12/00	19.75	0.06	0.16	-0.47	-	-	-	-	-	-	-	-	0.98	NA	
84[2]	7/31/00	157.40	0.73	0.63	0.50	20.40	-	-	-	-	-	-	-	8.20	5.43	184.9
3007	10/12/00	54.42	-0.16	0.25	0.95	14.40	-	-	-	-	-	-	-	2.91	2.00	
86[2]	8/1/00	1.46	0.23	-0.01	0.46	-	-	-	-	-	-	-	-	0.13	NA	322.1
3008	10/12/00	0.32	-0.27	-0.04	0.01	-	-	-	-	-	-	-	-	0.01	NA	
89[2]	8/3/00	245.50	0.43	0.75	0.74	1.38	-	-	-	-	-	-	-	12.76	8.27	118.3
3009	10/12/00	133.00	-0.18	0.49	0.63	-	-	-	-	-	-	-	-	6.94	NA	
2001[3]	8/12/00	67.36	-0.09	0.04	0.70	-	-	-	-	-	-	-	-	5.93	NA	232.9
3019	11/28/00	18.12	-0.08	-0.01	0.03	-	-	-	-	-	-	-	-	1.56	NA	
2018[3]	9/6/00	427.20	0.71	10.86	-1.04	-	-	-	-	-	-	-	-	37.06	NA	168.6
3020	11/30/00	174.00	1.45	3.41	-0.41	-	-	-	-	-	-	-	-	15.08	NA	
2025[3]	9/14/00	226.10	0.40	0.53	0.65	-	-	-	-	-	-	-	-	19.63	NA	113.8
3021	12/4/00	125.70	-0.03	0.28	0.51	-	-	-	-	-	-	-	-	10.93	NA	
2047[3]	9/28/00	1628.00	2.42	1.51	-1.29	-	-	-	-	-	-	-	-	140.22	NA	14.8
3024	12/5/00	1757.00	-1.47	1.44	-2.71	-	-	-	-	-	-	-	-	151.03	NA	
2203[3]	10/27/00	517.10	-0.32	0.12	-0.05	18.40	-	-	-	-	-	-	-	44.57	28.90	29.4
3029	12/5/00	441.70	-0.56	0.11	-0.71	54.20	-	-	-	-	-	-	-	37.95	24.94	
2092[3]	10/10/00	30.01	0.30	0.06	0.24	-	-	-	-	-	-	-	-	2.64	NA	56.0
3030	1/2/01	41.82	0.25	0.15	-0.69	-	-	-	-	-	-	-	-	3.50	NA	

Table 7.4-3
Quality Control Data
Soil Replicates

Area 2 $DCGL_W$		18.0	144.7	27.2	101.6	103.3	151.2	101.6	158.9	241.0	179.2	5030.4	81.9			
Area 1 &3 $DCGL_W$		30.1	241.2	27.2	169.3	172.2	252.0	169.3	264.9	401.6	298.6	8364.0	136.5			
Area 2 $DCGL_{Total}$		11.6	58.2	27.2	5.8	NA	NA	NA	NA	NA	NA	NA	NA			
Area 1 &3 $DCGL_{Total}$		19.4	96.9	27.2	9.6	NA	NA	NA	NA	NA	NA	NA	NA			
ESC Sample Number[1]	Date	Cs-137 (pCi/g)	Am-241[5] (pCi/g)	Co-60[5] (pCi/g)	U-235[5] (pCi/g)	Sr-90 (pCi/g)	U-234 (pCi/g)	U-235 by alpha spec	U-238 (pCi/g)	Pu-238[5] (pCi/g)	Pu-239/240[5] (pCi/g)	Pu-241[5] (pCi/g)	Cm-243/244[5] (pCi/g)	Unity $DCGL_{Total}$	Hybrid Unity[4] (Area 2 $DCGL_{W\ \&\ Total}$) or $DCGL_W$	% Error[6]
2126[3]	10/16/00	78.56	-0.20	0.01	-0.36	2.45	-	-	-	-	-	-	-	6.71	4.32	212.9
3033	1/4/00	23.07	0.20	-0.01	0.02	3.26	-	-	-	-	-	-	-	2.00	1.32	
2207[3]	10/31/00	758.60	-0.61	0.05	2.71	21.10	-	-	-	-	-	-	-	65.85	42.81	44.1
3038	3/21/01	952.80	0.89	0.10	0.00	-	-	-	-	-	-	-	-	82.16	NA	
2211[3]	11/3/00	115.10	0.19	0.06	-0.21	-	-	-	-	-	-	-	-	9.89	NA	17.6
3040	4/24/01	106.80	0.16	0.00	-0.88	-	-	-	-	-	-	-	-	9.06	NA	
2233[3]	11/8/00	5.49	-0.08	0.04	-0.30	-	-	-	-	-	-	-	-	0.42	NA	41.4
3043	5/30/01	4.78	-0.30	0.08	-0.39	-	-	-	-	-	-	-	-	0.34	NA	
2196[3]	10/24/00	25.26	-0.07	0.03	-0.34	2.06	-	-	-	-	-	-	-	2.12	1.36	18.1
3046	6/13/01	24.44	-0.22	0.02	0.65	2.78	-	-	-	-	-	-	-	2.22	1.49	
2369[3]	1/12/01	249.60	-0.36	1.74	0.93	24.90	-	-	-	-	-	-	-	21.73	14.33	65.4
3051	7/9/01	185.60	-1.16	1.29	-0.44	3.95	-	-	-	-	-	-	-	15.95	10.30	
2214[3]	11/4/00	82.17	-1.05	0.02	0.53	-	-	-	-	-	-	-	-	7.16	NA	150.2
3052	7/17/01	180.60	2.37	0.08	0.87	-	-	-	-	-	-	-	-	15.76	NA	
2234[3]	11/9/00	124.90	0.04	0.04	0.23	-	-	-	-	-	-	-	-	10.81	NA	32.1
3055	7/31/01	148.80	-0.32	0.01	-0.72	-	-	-	-	-	-	-	-	12.70	NA	
2203[3]	10/27/00	517.10	-0.32	0.12	-0.05	18.40	7.94	0.25	0.25	0.01	0.17	-3.61	0.00	44.57	29.42	0.9
3058	8/21/01	515.40	0.87	0.09	3.00	70.40	1.71	0.03	0.11	0.00	0.03	2.74	-0.01	44.97	29.28	
2466[3]	4/2/01	31.21	1.26	0.35	0.50	-	-	-	-	-	-	-	-	2.81	NA	71.5
3061	8/30/01	23.85	0.84	0.38	-0.73	-	-	-	-	-	-	-	-	1.96	NA	
2551[3]	5/2/01	61.59	0.07	2.13	-0.54	-	-	-	-	-	-	-	-	5.30	NA	274.3
3064	9/11/01	11.63	0.18	0.10	-0.13	-	-	-	-	-	-	-	-	0.99	NA	

Table 7.4-3
Quality Control Data
Soil Replicates

Area 2 $DCGL_W$		18.0	144.7	27.2	101.6	103.3	151.2	101.6	158.9	241.0	179.2	5030.4	81.9			
Area 1 &3 $DCGL_W$		30.1	241.2	27.2	169.3	172.2	252.0	169.3	264.9	401.6	298.6	8364.0	136.5			
Area 2 $DCGL_{Total}$		11.6	58.2	27.2	5.8	NA	NA	NA	NA	NA	NA	NA	NA			
Area 1 &3 $DCGL_{Total}$		19.4	96.9	27.2	9.6	NA	NA	NA	NA	NA	NA	NA	NA			
ESC Sample Number[1]	Date	**Cs-137 (pCi/g)**	**Am-241[5] (pCi/g)**	**Co-60[5] (pCi/g)**	**U-235[5] (pCi/g)**	**Sr-90 (pCi/g)**	**U-234 (pCi/g)**	**U-235 by alpha spec**	**U-238 (pCi/g)**	**Pu-238[5] (pCi/g)**	**Pu-239/240[5] (pCi/g)**	**Pu-241[5] (pCi/g)**	**Cm-243/244[5] (pCi/g)**	Unity $DCGL_{Total}$	Hybrid Unity[4] (Area 2 $DCGL_{W\ \&\ Total}$) or $DCGL_W$	% Error[6]
2386[3]	2/9/01	738.70	3.81	0.23	2.23	72.80	-	-	-	-	-	-	-	64.14	42.20	155.0
3067	9/20/01	523.40	1.21	0.13	-2.38	44.00	-	-	-	-	-	-	-	44.74	29.12	
2464[3]	3/30/01	404.10	0.43	0.96	0.58	7.46	-	-	-	-	-	-	-	34.98	22.66	288.3
3070	9/25/01	91.40	0.30	0.35	0.05	8.07	-	-	-	-	-	-	-	7.91	5.18	

Notes:

[1] Duplicate samples were analyzed from the 3 of 3 sample jar fraction with the exception of Sample No. 2203 (used both 2 of 3 and 3 of 3 fraction)

[2] Samples collected from Study Area 3, therefore, the Study Area 3 DCGL values were used

[3] Samples collected from Study Area 2, therefore, the Study Area 2 DCGL values were used

[4] Hybrid Unity applicable only to samples with Sr-90 results

[5] Shaded values are below MDA values

[6] % Error was calculated using $DCGL_{Total}$ values unless $DCGL_W$ values were available

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

							Number of Calculable SFs	244	3	3	1	2
							Standard Deviation	1.15	0.18	0.39	-	0.08
							Maximum	11.28	0.38	0.77	-	0.14
	SF Sample Load						Minimum	0.002	0.07	0.07	-	0.02
	Total	Alpha	Beta	Gamma			Average	**0.80**	**0.18**	**0.32**	**9.47**	**0.08**
	552	58	247	247			*Observed/Design* Difference	-75%	-81%	-40%	38%	-54%
	Laboratory Analytical Data (pCi/g)							**Observed Surrogate Radionuclide Scaling Factors**				
ESC Sample Number	**Cs-137[a]**	**Am-241[a]**	**Sr-90**	**Pu-238**	**Pu-239/240**	**Pu-241**	**Cm-243/244**	**Cs-137[a]**	**Am-241[a]**			
								Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
1	733.3	-0.57	143.00	0.67	4.90	66.90	0.03	0.20	-	-	-	-
3	19.2	-0.11	4.43	-	-	-	-	0.23	-	-	-	-
52	21.1	0.09	2.2	0.08	0.06	20.1	0.00	0.10	-	-	-	-
62	29.5	0.51	2.35	0.02	0.33	-10.60	0.00	0.08	-	-	-	-
63	1.39	-0.09	1.31	-	-	-	-	0.94	-	-	-	-
69	9.79	-0.21	2.34	-	-	-	-	0.24	-	-	-	-
74	6.04	-0.12	2.35	-	-	-	-	0.39	-	-	-	-
77	3.32	-0.07	2.93	-	-	-	-	0.88	-	-	-	-
78	25.2	0.00	34.20	0.041	0.227	2.930	0.00	1.36	-	-	-	-
81	407.8	-1.15	23.40	0.140	0.428	21.300	0.00	0.06	-	-	-	-
84	157.4	0.73	20.40	-	-	-	-	0.13	-	-	-	-
87	157.6	0.12	5.54	0.06	0.62	3.31	0.00	0.04	-	-	-	-
89	245.5	0.43	1.38	0.08	0.18	7.17	0.00	0.01	-	-	-	-
103	2.26	-0.38	0.55	-	-	-	-	0.24	-	-	-	-
108	5.90	0.06	1.11	0.07	0.07	8.40	0.00	0.19	-	-	-	-
114	2.15	-0.04	1.35	-	-	-	-	0.63	-	-	-	-
117	67.7	-0.35	0.57	-	-	-	-	0.01	-	-	-	-
122	100.2	0.107	5.81	-	-	-	-	0.06	-	-	-	-
124	2.75	0.05	1.87	0.08	0.05	13.90	0.00	0.68	-	-	-	-
126	1.19	0.37	0.85	0.05	0.08	-10.60	0.00	0.71	-	-	-	-
127	1.10	-0.13	0.54	-	-	-	-	0.49	-	-	-	-
132	1.62	-0.04	0.89	-	-	-	-	0.55	-	-	-	-
147	1.52	-0.35	1.68	-	-	-	-	1.10	-	-	-	-
148	2.44	0.05	0.51	0.01	0.01	14.30	0.00	0.21	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
153	1.02	-0.03	0.60	0.01	0.01	18.80	0.00	0.59	-	-	-	-
159	0.49	-0.32	0.78	-	-	-	-	1.59	-	-	-	-
162	0.38	0.49	0.67	-	-	-	-	1.78	-	-	-	-
163	0.73	0.44	0.49	0.03	0.01	-1.52	0.09	0.67	-	-	-	-
170	0.43	-0.35	0.40	-	-	-	-	0.92	-	-	-	-
179	0.13	-0.03	0.86	0.08	0.00	12.30	0.01	6.72	-	-	-	-
247	1.25	0.10	4.05	-	-	-	-	3.25	-	-	-	-
283	6.32	0.26	1.74	-	-	-	-	0.28	-	-	-	-
284	4.39	0.47	3.01	-	-	-	-	0.69	-	-	-	-
1002	15.68	0.10	5.61	-	-	-	-	0.36	-	-	-	-
1004	26.34	0.32	1.83	-	-	-	-	0.07	-	-	-	-
1005	19.46	0.17	2.61	-	-	-	-	0.13	-	-	-	-
1006	20.76	0.22	3.32	-	-	-	-	0.16	-	-	-	-
1008	44.65	0.19	8.56	-	-	-	-	0.19	-	-	-	-
1011	113.70	0.22	37.90	0.19	0.32	31.40	0.03	0.33	-	-	-	-
1012	87.94	1.50	74.80	0.11	0.18	12.80	0.03	0.85	0.08	0.12	-	0.02
1015	0.47	-0.19	0.94	-	-	-	-	2.02	-	-	-	-
1023	2.64	-0.02	0.65	-	-	-	-	0.25	-	-	-	-
1048	61.62	0.94	56.60	-	-	-	-	0.92	-	-	-	-
1054	68.64	-0.56	15.40	0.14	0.19	7.76	0.03	0.22	-	-	-	-
1056	83.23	0.27	91.10	-	-	-	-	1.09	-	-	-	-
1057	53.72	0.32	184.00	-	-	-	-	3.43	-	-	-	-
1076	1.48	0.02	0.35	0.03	0.00	5.05	0.01	0.23	-	-	-	-
1139	0.15	-0.45	0.71	-	-	-	-	-	-	-	-	-
1147	11.06	0.71	2.73	-	-	-	-	0.25	-	-	-	-
1155	60.80	1.30	22.60	-	-	-	-	0.37	-	-	-	-
1156	22.69	2.02	1.34	-	-	-	-	0.06	-	-	-	-
1158	13.09	1.13	4.62	-	-	-	-	0.35	-	-	-	-
1177	40.42	3.91	5.88	-	-	-	-	0.15	-	-	-	-
1178	4953.00	25.93	301.00	-	-	-	-	0.06	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
1181	26.11	2.25	5.18	-	-	-	-	0.20	-	-	-	-
1182	15.88	-0.13	2.81	-	-	-	-	0.18	-	-	-	-
1184	11.14	0.68	1.86	0.08	0.10	3.66	0.08	0.17	-	-	-	-
1185	9.47	0.49	4.05	0.11	0.11	4.47	0.55	0.43	-	-	-	-
1191	4.23	-0.33	3.42	-	-	-	-	0.81	-	-	-	-
1206	4.13	0.22	4.43	-	-	-	-	1.07	-	-	-	-
1207	5.37	0.44	2.12	-	-	-	-	0.39	-	-	-	-
1208	5.97	0.57	2.93	-	-	-	-	0.49	-	-	-	-
1211	3.88	-0.08	3.20	-	-	-	-	0.82	-	-	-	-
1219	8.60	0.43	6.58	0.04	0.02	3.34	0.07	0.77	-	-	-	-
1222	0.44	-0.22	0.59	-	-	-	-	1.32	-	-	-	-
1237	0.32	0.02	0.81	-	-	-	-	2.50	-	-	-	-
1242	0.08	0.00	0.56	-	-	-	-	-	-	-	-	-
1254	8.77	0.61	11.10	-	-	-	-	1.27	-	-	-	-
1265	1.58	0.10	1.46	-	-	-	-	0.92	-	-	-	-
1270	0.37	-0.13	0.56	-	-	-	-	1.52	-	-	-	-
2010	35.02	0.08	9.55	0.05	0.09	6.99	0.00	0.27	-	-	-	-
2011	9.72	0.00	2.18	0.07	0.03	-1.80	0.01	0.22	-	-	-	-
2012	9.82	0.16	7.19	0.05	0.07	3.72	0.00	0.73	-	-	-	-
2020	10.45	-0.36	14.30	-	-	-	-	1.37	-	-	-	-
2022	10.68	-0.12	8.35	-	-	-	-	0.78	-	-	-	-
2028	18.38	0.46	9.16	0.04	0.01	-4.59	0.01	0.50	-	-	-	-
2033	11.51	0.03	5.99	-	-	-	-	0.52	-	-	-	-
2039	0.53	-0.10	0.38	-	-	-	-	0.72	-	-	-	-
2040	2.23	0.08	0.49	-	-	-	-	0.22	-	-	-	-
2041	2.91	0.09	0.79	0.08	0.01	-3.17	0.01	0.27	-	-	-	-
2042	1.03	0.14	2.69	-	-	-	-	2.61	-	-	-	-
2043	0.85	0.11	1.16	-	-	-	-	1.37	-	-	-	-
2053	10.85	0.16	5.16	-	-	-	-	0.48	-	-	-	-
2054	35.63	-0.12	2.43	-	-	-	-	0.07	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
2055	27.50	0.26	4.64	-	-	-	-	0.17	-	-	-	-
2056	13.45	-0.07	6.62	-	-	-	-	0.49	-	-	-	-
2057	25.92	-0.04	7.98	-	-	-	-	0.31	-	-	-	-
2058	20.67	0.23	6.48	-	-	-	-	0.31	-	-	-	-
2059	49.87	0.13	12.30	-	-	-	-	0.25	-	-	-	-
2064	10.10	-0.53	4.62	0.05	0.05	-2.45	0.09	0.46	-	-	-	-
2068	7.86	-0.24	14.40	-	-	-	-	1.83	-	-	-	-
2076	21.87	-0.01	6.07	-	-	-	-	0.28	-	-	-	-
2077	12.54	-0.13	5.88	-	-	-	-	0.47	-	-	-	-
2078	25.10	0.18	8.17	-	-	-	-	0.33	-	-	-	-
2079	27.38	0.55	12.20	-	-	-	-	0.45	-	-	-	-
2089	14.49	-0.59	3.54	-	-	-	-	0.24	-	-	-	-
2090	19.09	0.13	7.65	-	-	-	-	0.40	-	-	-	-
2126	78.56	-0.20	2.45	-	-	-	-	0.03	-	-	-	-
2134	95.71	0.38	4.09	-	-	-	-	0.04	-	-	-	-
2138	18.73	0.29	7.33	-	-	-	-	0.39	-	-	-	-
2141	8.53	0.26	4.82	-	-	-	-	0.57	-	-	-	-
2144	15.02	0.08	2.25	-	-	-	-	0.15	-	-	-	-
2145	13.15	-0.18	5.42	-	-	-	-	0.41	-	-	-	-
2162	3.22	-0.08	8.65	-	-	-	-	2.69	-	-	-	-
2167	10.95	0.11	7.84	-	-	-	-	0.72	-	-	-	-
2168	10.18	-0.34	9.34	-	-	-	-	0.92	-	-	-	-
2178	7.49	-0.56	4.86	-	-	-	-	0.65	-	-	-	-
2185	4.29	-0.08	4.42	-	-	-	-	1.03	-	-	-	-
2192	7.34	-0.04	2.86	-	-	-	-	0.39	-	-	-	-
2196	25.26	-0.07	2.06	0.01	0.01	-0.78	0.17	0.08	-	-	-	-
2203	517.10	-0.32	18.40	0.01	0.17	-3.61	0.00	0.04	-	-	-	-
2207	758.60	-0.61	21.10	0.03	0.06	-6.52	0.00	0.03	-	-	-	-
2212	24.03	0.00	1.70	0.02	0.03	-2.35	0.02	0.07	-	-	-	-
2232	585.10	-1.55	13.70	-	-	-	-	0.02	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
2243	1.81	-0.63	6.52	-	-	-	-	3.59	-	-	-	-
2255	7.89	0.22	2.24	-	-	-	-	0.28	-	-	-	-
2256	1.79	0.13	0.74	-	-	-	-	0.41	-	-	-	-
2257	10.11	-0.63	1.28	-0.02	0.06	17.00	-0.03	0.13	-	-	-	-
2259	1.46	-0.08	0.73	-	-	-	-	0.50	-	-	-	-
2261	75.70	1.16	4.71	-	-	-	-	0.06	-	-	-	-
2262	24.25	0.09	6.25	-	-	-	-	0.26	-	-	-	-
2263	28.97	0.14	1.62	0.09	0.07	3.97	0.00	0.06	-	-	-	-
2270	15.58	-0.09	3.15	-	-	-	-	0.20	-	-	-	-
2275	2.07	0.04	3.09	-	-	-	-	1.49	-	-	-	-
2276	4.14	-0.21	2.12	0.14	0.03	17.90	-0.01	0.51	-	-	-	-
2278	4.59	0.22	2.07	-	-	-	-	0.45	-	-	-	-
2280	0.90	-0.41	0.77	-	-	-	-	0.85	-	-	-	-
2281	1.37	-0.31	1.56	0.06	0.14	44.00	0.02	1.14	-	-	-	-
2283	0.88	-0.22	1.41	-	-	-	-	1.60	-	-	-	-
2288	22.15	-0.16	5.79	0.11	0.11	66.40	0.01	0.26	-	-	-	-
2296	1.00	-0.40	2.45	-	-	-	-	2.45	-	-	-	-
2300	1.42	-0.32	1.22	-	-	-	-	0.86	-	-	-	-
2301	1.41	0.19	0.74	-	-	-	-	0.52	-	-	-	-
2302	0.85	0.03	1.16	-	-	-	-	1.36	-	-	-	-
2304	1.53	-0.66	1.67	-	-	-	-	1.09	-	-	-	-
2306	1.03	0.03	1.43	-	-	-	-	1.40	-	-	-	-
2319	1.17	-0.09	0.85	-	-	-	-	0.72	-	-	-	-
2324	6.26	-0.25	0.82	0.16	0.13	8.41	0.00	0.13	-	-	-	-
2330	1.11	-0.03	1.14	-	-	-	-	1.03	-	-	-	-
2334	0.90	-0.06	1.21	-	-	-	-	1.35	-	-	-	-
2344	0.98	-0.38	1.01	-	-	-	-	1.03	-	-	-	-
2345	10.69	1.71	32.90	-	-	-	-	3.08	-	-	-	-
2350	4.08	0.06	1.74	-	-	-	-	0.43	-	-	-	-
2351	3.17	0.21	2.43	-	-	-	-	0.77	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
2352	6.03	-0.05	1.05	-	-	-	-	0.17	-	-	-	-
2356	583.50	0.17	3.21	0.06	0.04	-23.20	0.01	0.01	-	-	-	-
2369	249.60	-0.36	24.90	-	-	-	-	0.10	-	-	-	-
2373	1629.00	-3.05	14.90	-	-	-	-	0.01	-	-	-	-
2374	1253.00	1.70	2.82	-	-	-	-	0.002	-	-	-	-
2375	310.70	0.40	23.50	-	-	-	-	0.08	-	-	-	-
2381	13.89	0.75	7.51	-	-	-	-	0.54	-	-	-	-
2383	259.10	3.22	1.62	-	-	-	-	0.01	-	-	-	-
2386	738.70	3.81	72.80	-	-	-	-	0.10	-	-	-	-
2389	42.23	1.58	26.70	-	-	-	-	0.63	-	-	-	-
2390	3.73	0.27	4.77	-	-	-	-	1.28	-	-	-	-
2394	3.83	-0.03	1.11	-	-	-	-	0.29	-	-	-	-
2404	637.90	-0.70	59.30	0.30	0.20	-26.40	0.07	0.09	-	-	-	-
2405	417.10	1.48	13.60	-	-	-	-	0.03	-	-	-	-
2408	0.69	0.37	0.82	-	-	-	-	1.18	-	-	-	-
2416[b]	3.72	-0.11	83.20	-	-	-	-	22.34	-	-	-	-
2421	6.43	-0.60	2.28	-	-	-	-	0.35	-	-	-	-
2424	0.66	0.28	0.95	-	-	-	-	1.45	-	-	-	-
2426	1.53	-0.03	1.10	-	-	-	-	0.72	-	-	-	-
2435	6.55	0.38	1.40	0.24	0.08	47.40	0.00	0.21	-	-	-	-
2452	0.17	-0.26	1.87	-	-	-	-	11.28	-	-	-	-
2456	5.62	0.19	3.83	-	-	-	-	0.68	-	-	-	-
2460	63.39	-0.44	7.42	0.11	0.12	-2.84	0.02	0.12	-	-	-	-
2461	31.79	0.25	4.55	-	-	-	-	0.14	-	-	-	-
2463	16.30	0.72	5.15	-	-	-	-	0.32	-	-	-	-
2464	404.10	0.43	7.46	-	-	-	-	0.02	-	-	-	-
2474	15.48	-0.32	7.59	-	-	-	-	0.49	-	-	-	-
2476	88.09	0.38	17.50	-	-	-	-	0.20	-	-	-	-
2478	50.94	0.37	23.10	-	-	-	-	0.45	-	-	-	-
2481	24.02	0.08	10.80	-	-	-	-	0.45	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
2493	36.59	0.45	15.00	-	-	-	-	0.41	-	-	-	-
2494	11.71	-0.43	8.45	-	-	-	-	0.72	-	-	-	-
2495	64.95	0.48	13.00	-	-	-	-	0.20	-	-	-	-
2496	0.52	-0.03	1.55	0.03	0.08	3.29	0.00	3.01	-	-	-	-
2497	1.91	-0.03	1.09	-	-	-	-	0.57	-	-	-	-
2501	2.81	0.14	1.57	-	-	-	-	0.56	-	-	-	-
2502	3.17	0.15	2.69	-	-	-	-	0.85	-	-	-	-
2508	0.45	-0.10	3.82	-	-	-	-	8.58	-	-	-	-
2510	1.80	0.02	1.11	-	-	-	-	0.62	-	-	-	-
2512	20.00	0.43	6.76	-	-	-	-	0.34	-	-	-	-
2514	0.68	0.21	1.21	-	-	-	-	1.78	-	-	-	-
2519	7.04	1.80	2.89	0.13	0.13	1.48	0.00	0.41	0.07	0.07	-	-
2524	5.06	-0.04	4.59	-	-	-	-	0.91	-	-	-	-
2525	6.17	0.36	3.58	0.09	0.18	5.01	0.02	0.58	-	-	-	-
2527	2.48	-0.20	4.57	-	-	-	-	1.84	-	-	-	-
2530	5.51	0.18	5.20	-	-	-	-	0.94	-	-	-	-
2541	4.55	0.20	2.45	-	-	-	-	0.54	-	-	-	-
2547	4.26	-0.75	5.36	-	-	-	-	1.26	-	-	-	-
2558	4.85	-0.21	3.69	-	-	-	-	0.76	-	-	-	-
2562	4.49	0.46	3.33	-	-	-	-	0.74	-	-	-	-
2568	6.18	0.13	4.51	-	-	-	-	0.73	-	-	-	-
2571	3.05	-0.09	0.52	-	-	-	-	0.17	-	-	-	-
2578	4.85	0.28	1.65	0.03	0.05	61.70	0.00	0.34	-	-	-	-
2580	5.93	0.19	0.86	0.08	0.05	87.60	0.00	0.15	-	-	-	-
2587	4.60	0.00	2.01	0.16	0.10	0.00	0.02	0.44	-	-	-	-
2588	4.39	0.17	5.75	-	-	-	-	1.31	-	-	-	-
2592	7.50	0.14	3.80	0.04	0.15	91.10	0.02	0.51	-	-	-	-
2593 1 of 3	4.17	-0.36	5.18	-	-	-	-	1.24	-	-	-	-
2593 3 of 3	68.17	0.60	4.06	-	-	-	-	0.06	-	-	-	-
2601	4.45	-0.11	1.85	0.01	0.05	75.40	0.02	0.42	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
2605	0.72	-0.51	1.99	-	-	-	-	2.76	-	-	-	-
2610	0.69	-0.98	0.50	-	-	-	-	0.73	-	-	-	-
2628	1.88	0.05	1.12	-	-	-	-	0.60	-	-	-	-
2629	5.01	0.06	0.50	1.58	0.12	76.70	0.03	0.10	-	-	-	-
2641	0.31	-0.09	0.51	-	-	-	-	1.67	-	-	-	-
2649	1.81	0.15	0.24	0.03	0.02	54.10	-0.01	0.13	-	-	-	-
2651	1.50	0.08	2.17	-	-	-	-	1.45	-	-	-	-
2658	1.86	-0.03	1.27	-	-	-	-	0.68	-	-	-	-
2660	0.91	-0.20	2.13	-	-	-	-	2.34	-	-	-	-
2665	5.92	0.04	1.48	-	-	-	-	0.25	-	-	-	-
2677	1.15	0.10	0.94	-	-	-	-	0.82	-	-	-	-
2692	17.10	2.12	3.23	-	-	-	-	0.19	-	-	-	-
2698	2.66	0.12	1.64	-	-	-	-	0.62	-	-	-	-
2703	6.30	0.18	2.24	0.08	0.05	3.90	0.24	0.36	-	-	-	-
2705	2.22	0.28	3.24	-	-	-	-	1.46	-	-	-	-
2709	2.42	-0.66	2.12	0.04	0.00	-1.13	0.00	0.87	-	-	-	-
2714	4.01	0.40	2.14	0.07	0.03	0.82	0.10	0.53	-	-	-	-
2719	2.35	-0.70	1.00	-	-	-	-	0.43	-	-	-	-
2723	14.81	0.46	1.60	-	-	-	-	0.11	-	-	-	-
2728	120.80	5.71	6.99	-	-	-	-	0.06	-	-	-	-
2729	0.24	0.09	0.17	-	-	-	-	0.72	-	-	-	-
2730	0.42	0.12	0.42	-	-	-	-	1.00	-	-	-	-
2744	108.40	1.71	7.80	0.65	1.32	16.20	0.23	0.07	0.38	0.77	9.47	0.14
2745	236.20	-0.19	13.50	0.13	0.15	3.13	0.12	0.06	-	-	-	-
2746	155.60	1.05	14.40	-	-	-	-	0.09	-	-	-	-
2747	51.53	-0.47	12.10	-	-	-	-	0.23	-	-	-	-
2748	37.38	-0.39	0.65	-	-	-	-	0.02	-	-	-	-
2771	180.70	0.42	12.20	-	-	-	-	0.07	-	-	-	-
2772	1.14	-0.46	1.92	-	-	-	-	1.69	-	-	-	-
2777	28.69	0.04	6.59	-	-	-	-	0.23	-	-	-	-

Table 7.5
Observed Surrogate Radionuclide Scaling Factors (SFs)

ESC Sample Number	Laboratory Analytical Data (pCi/g)							Observed Surrogate Radionuclide Scaling Factors				
								Cs-137[a]	Am-241[a]			
	Cs-137[a]	Am-241[a]	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244	Sr-90	Pu-238	Pu-239/240	Pu-241	Cm-243/244
2805	1.66	0.01	2.59	-	-	-	-	1.56	-	-	-	-
2811	3.53	0.17	4.82	0.07	0.02	8.32	0.03	1.37	-	-	-	-
2814	3.17	0.04	3.52	-	-	-	-	1.11	-	-	-	-
2816	2.28	-0.62	2.71	-	-	-	-	1.19	-	-	-	-
2817	1.90	0.39	2.89	-	-	-	-	1.52	-	-	-	-
2818	2.22	0.31	1.83	-	-	-	-	0.83	-	-	-	-
2819	2.42	0.14	3.77	-	-	-	-	1.56	-	-	-	-
2821	2.02	0.17	2.35	-	-	-	-	1.17	-	-	-	-
2825	1.72	-0.14	2.31	-	-	-	-	1.35	-	-	-	-
2827	1.31	-0.03	2.10	-	-	-	-	1.60	-	-	-	-
2829	1.78	0.09	3.05	0.02	0.02	-3.18	-0.01	1.71	-	-	-	-
2836	1.98	0.37	2.98	-	-	-	-	1.50	-	-	-	-
2838	5.32	-0.27	11.80	-	-	-	-	2.22	-	-	-	-

Notes:

a. Gamma spectrometry results are reported on an 'as collected' (lab-wet) basis, whereas the alpha- and beta-spectrometry results are reported on a prepared (lab-dry) basis. Accordingly, the observed SF's should be considered conservative values.

b. Sample 2416 contained a large amount of concrete fines from demolition of the LWRB and therefore is not considered representative of soil. Accordingly, ESC Sample Number 2416 was excluded from the dataset statistic calculations.

- Shaded cells contain the *posteriori* lower limit of detection (L_D) value reported by the laboratory corresponding to the non-detect ($<L_C$) decision.
- Scaling factor calculations exclude L_D data.

Table 8-1
Summary of Final Status Survey Unity ($DCGL_T$) Results for
Waltz Mill Site Study Areas 1, 2, and 3

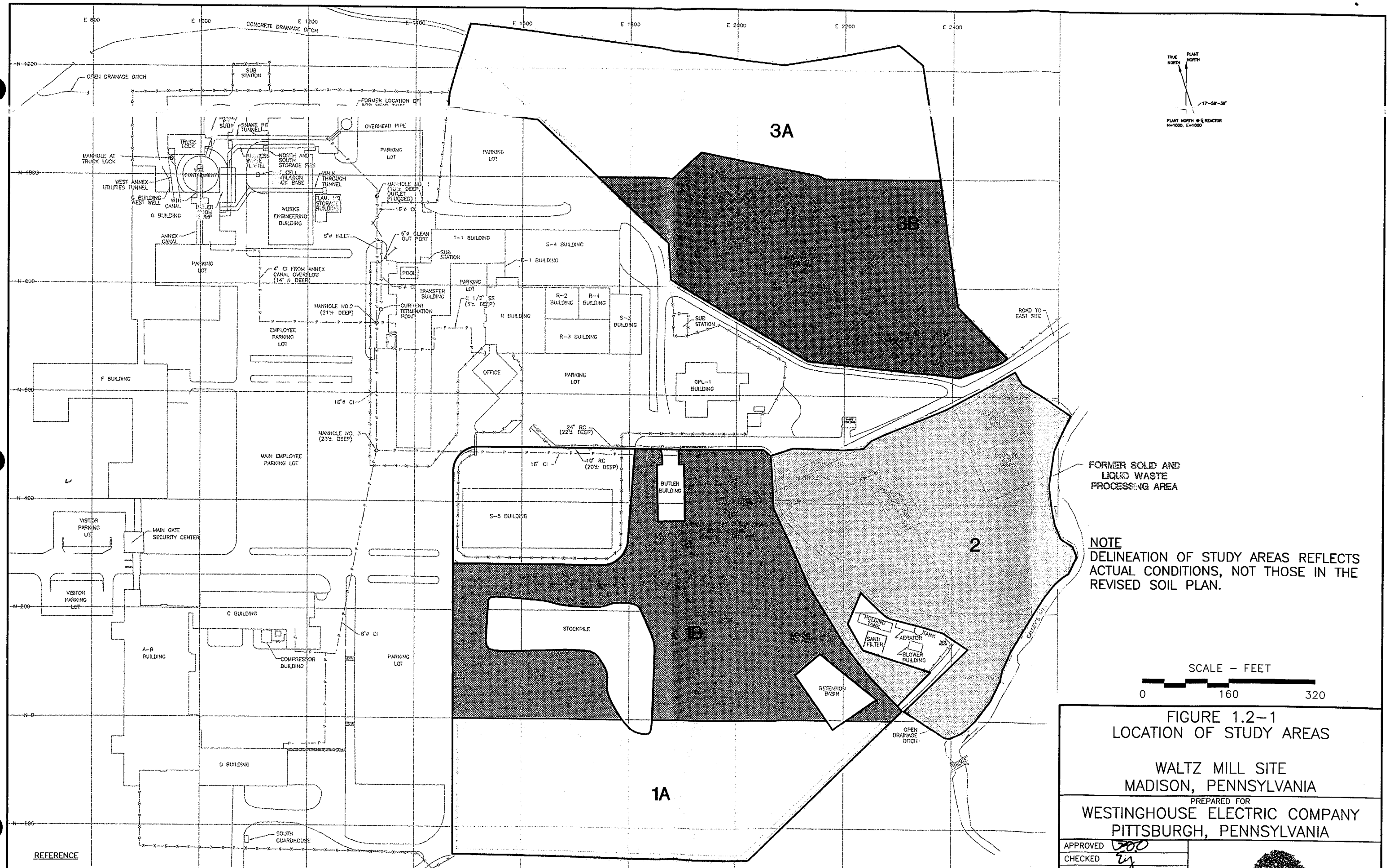
Study Area	Survey Unit	Median	Minimum	Maximum	Average	Std Dev
1B	SU01	0.04	0.02	0.45	0.09	0.13
1B	SU01R	0.10	-0.02	0.66	0.13	0.15
1B	SU04	0.00	-0.04	0.07	0.00	0.04
1B	SU05 Floor	0.00	-0.04	0.06	0.00	0.03
1B	SU05 Lift 1	0.02	-0.04	0.08	0.02	0.04
1B	SU05 Lift 2	0.00	-0.04	0.04	0.00	0.02
1B	SU07	0.01	-0.08	0.06	0.00	0.04
1B	SU08	0.01	-0.07	0.09	0.01	0.04
1A	SU09	0.02	-0.03	0.06	0.02	0.02
1A	SU10	0.01	-0.05	0.05	0.01	0.03
2	SU01 Floor	0.23	-0.03	0.35	0.18	0.15
2	SU01 Walls	0.14	0.02	0.37	0.16	0.13
2	SU01 Lift 1	0.32	0.09	0.55	0.33	0.15
2	SU01 Lift 2	0.35	0.16	0.41	0.31	0.10
2	SU01 Lift 3	0.25	0.14	0.53	0.29	0.13
2	SU01 Lift 4	0.28	-0.05	0.40	0.24	0.16
2	SU01 Lift 5	0.33	0.25	0.65	0.36	0.12
2	SU01 Lift 6	0.09	-0.06	0.40	0.10	0.15
2	SU02 Floor	0.08	-0.04	0.86	0.21	0.29
2	SU02 Lift 1	0.05	0.01	0.16	0.07	0.06
2	SU02 Lift 2	0.10	-0.03	0.12	0.07	0.06
2	SU02 Lift 3	0.04	0.01	0.10	0.05	0.04
2	SU02 Lift 4	0.18	0.02	0.54	0.21	0.17
2	SU03 Floor	0.04	-0.02	0.18	0.06	0.07
2	SU03 Lift 1	0.18	0.06	0.36	0.21	0.11
2	SU03 Lift 2	0.06	-0.01	0.12	0.06	0.04
2	SU03 Lift 3	0.06	-0.02	0.49	0.10	0.16
2	SU03 Lift 4	0.07	0.02	0.14	0.07	0.04
2	SU04	0.04	-0.06	0.27	0.05	0.10
2	SU05	0.11	0.03	0.40	0.14	0.13
2	SU06	0.01	-0.11	0.09	0.00	0.08
2	SU07	0.00	-0.06	0.16	0.04	0.08
2	SU08	0.06	-0.05	0.11	0.03	0.06
2	SU11	0.08	-0.02	0.23	0.10	0.08
2	SU12	0.18	0.04	0.78	0.30	0.29
2	SU13	0.11	-0.07	0.28	0.12	0.12
2	Bag Farm N	0.00	-0.10	0.05	-0.01	0.05
2	Bag Farm S	0.01	-0.04	0.08	0.01	0.04
2	ABM W1	0.16	-0.06	0.65	0.19	0.21
2	ABM Center	0.10	0.05	0.26	0.12	0.07
2	ABM E	0.14	-0.01	0.33	0.16	0.12
2	ABM North	0.12	0.02	0.28	0.15	0.10
2	ABM S	0.16	0.02	0.23	0.14	0.08
2	ABM W2	0.12	0.04	0.17	0.11	0.05
3B	SU01 Floor	0.03	-0.04	0.07	0.03	0.04
3B	SU01 Lift 1	0.04	-0.02	0.16	0.04	0.06
3B	SU01 Lift 2	0.05	0.00	0.15	0.06	0.05
3B	SU01 Lift 3	0.04	0.01	0.08	0.04	0.03
3B	SU01 Lift 4	0.02	0.00	0.05	0.02	0.02

Table 8-1
Summary of Final Status Survey Unity ($DCGL_T$) Results for Waltz Mill Site Study Areas 1, 2, and 3

Study Area	Survey Unit	Median	Minimum	Maximum	Average	Std Dev
3B	SU01 Lift 5	0.01	-0.03	0.05	0.01	0.03
3B	SU01 Lift 6	0.01	-0.04	0.07	0.01	0.04
3B	SU01 Lift 7	0.02	-0.05	0.04	0.01	0.03
3B	SU02 Floor	0.06	0.03	0.28	0.08	0.07
3B	SU02 Lift 1	0.07	0.03	0.11	0.07	0.03
3B	SU02 Lift 2	0.06	0.02	0.14	0.06	0.03
3B	SU02 Lift 3	0.00	-0.05	0.02	0.00	0.02
3B	SU02 Lift 4	0.01	0.00	0.06	0.02	0.02
3B	SU02 Lift 5	0.01	-0.02	0.07	0.01	0.03
3B	SU03	0.02	-0.05	0.10	0.01	0.05
3B	SU04	0.02	-0.03	0.09	0.02	0.04
3A	SU05	0.01	-0.02	0.06	0.02	0.03
3B	SU06	0.03	-0.04	0.07	0.02	0.04
3B	SU07	0.00	-0.04	0.07	0.01	0.04
	Average	0.08	-0.01	0.23	0.09	0.09

Note: Table is based on the unity values from each survey unit. An average sum of fractions < 1 meets the criteria.

Figures



NOTE
DELINEATION OF STUDY AREAS REFLECTS ACTUAL CONDITIONS, NOT THOSE IN THE REVISED SOIL PLAN.

REFERENCE

1. WESTINGHOUSE ELECTRIC CORPORATION DRAWING NO. SP-SK 269, ENTITLED WALTZ MILL MAIN SITE 1975 RADIOACTIVE DRAIN SYSTEM, DATED 4-27-87, REVISED 4-30-92, SCALE 1" = 50'.

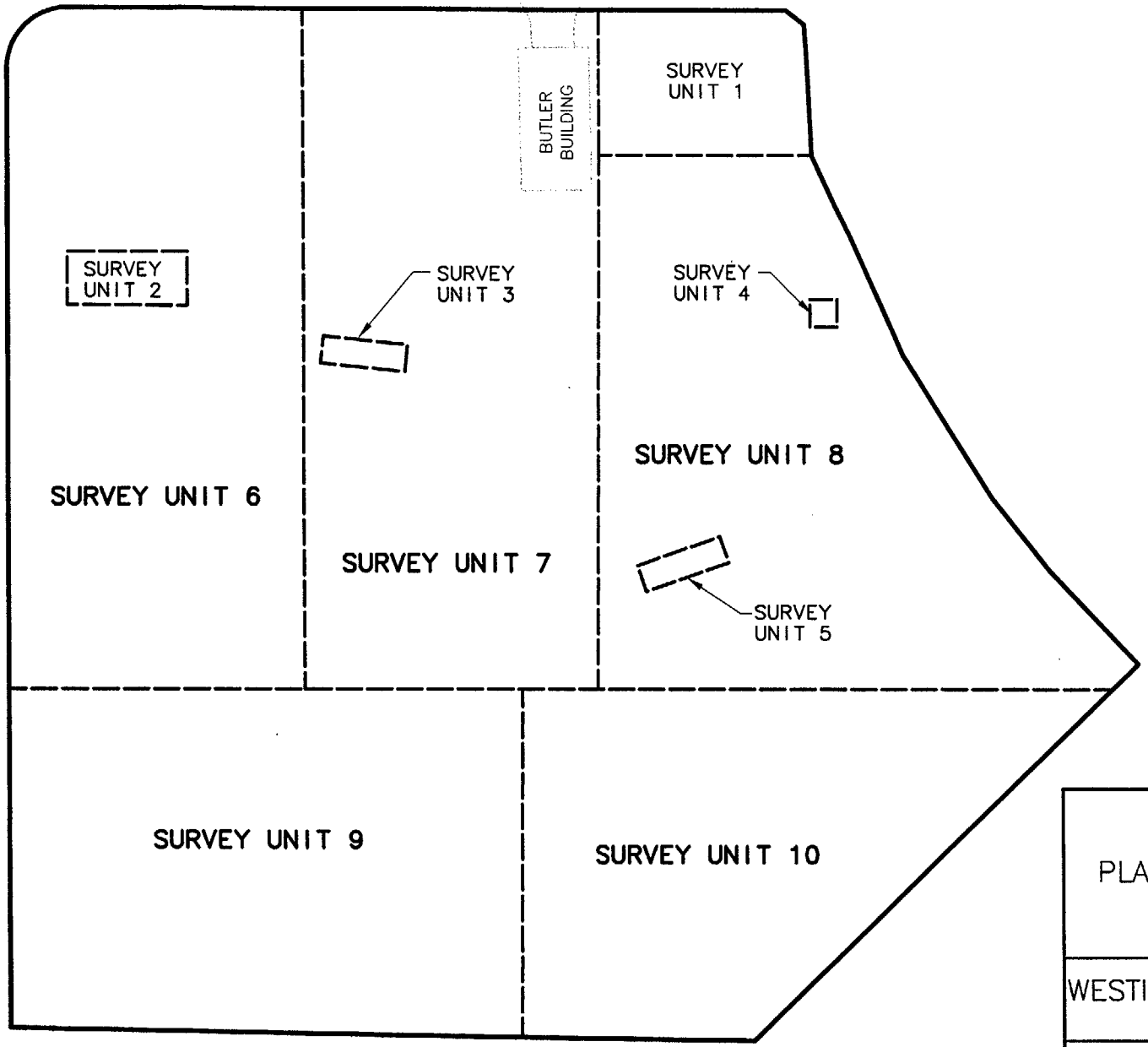
FIGURE 1.2-1
LOCATION OF STUDY AREAS

WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	
DRAWN	GJA 11/28/01
DRAWING NUMBER	5018235

Earth Sciences Consultants, Inc.



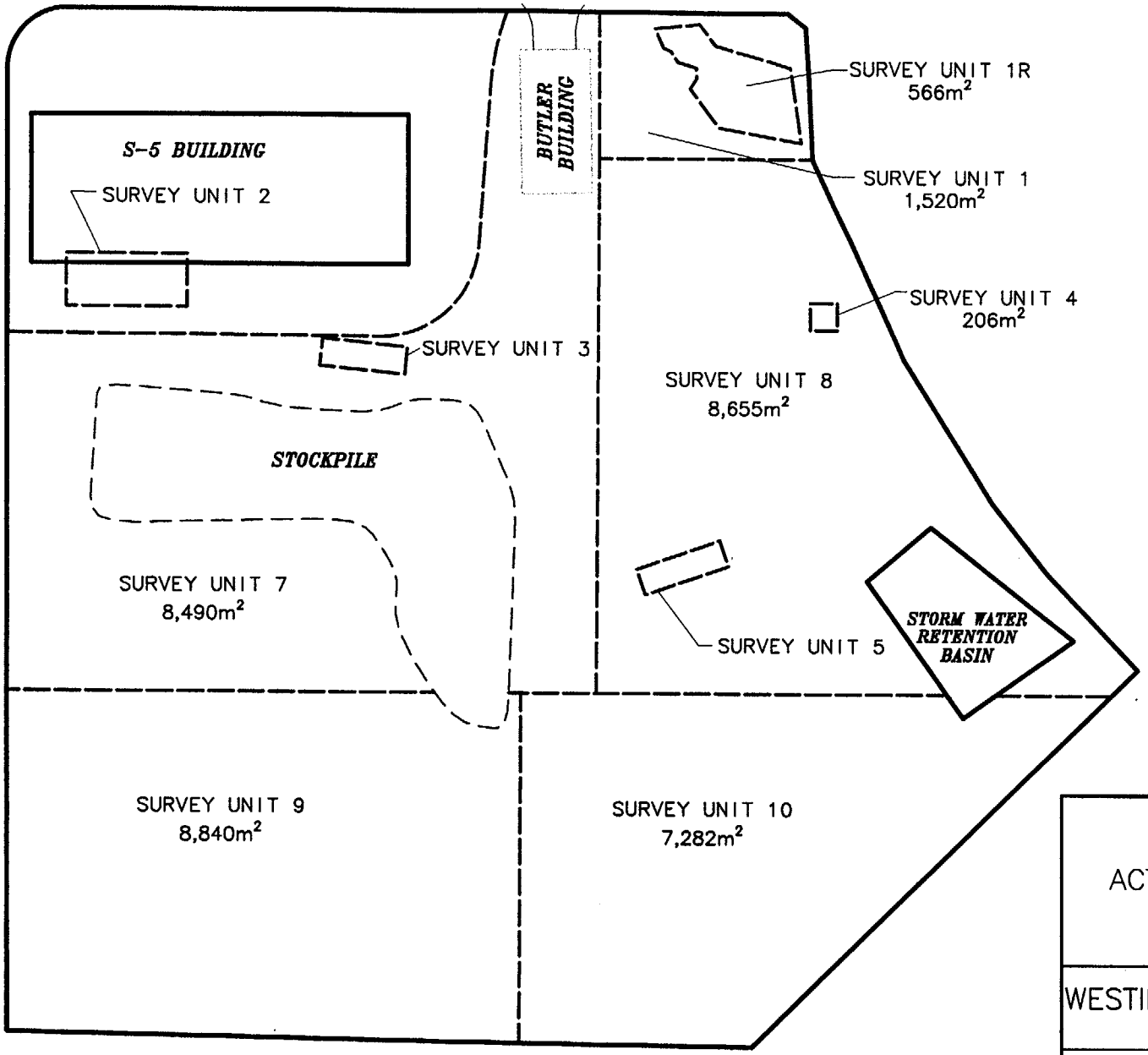
DRAWING NOT TO SCALE

FIGURE 5–1
STUDY AREA 1
PLANNED SURVEY UNIT BOUNDARIES
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	
DRAWN	JA 10/24/01
DRAWING NUMBER	5018090

Earth Sciences Consultants, Inc.



NOTE

1. THE AREA OF SURVEY UNIT 5 VARIED DUE TO BACKFILLING EXCAVATION IN LIFTS.

2. STORM WATER RETENTION BASIN INSTALLED BY WESTINGHOUSE AS PART OF CONSTRUCTION ACTIVITIES FOR NEW BUILDING S-5.

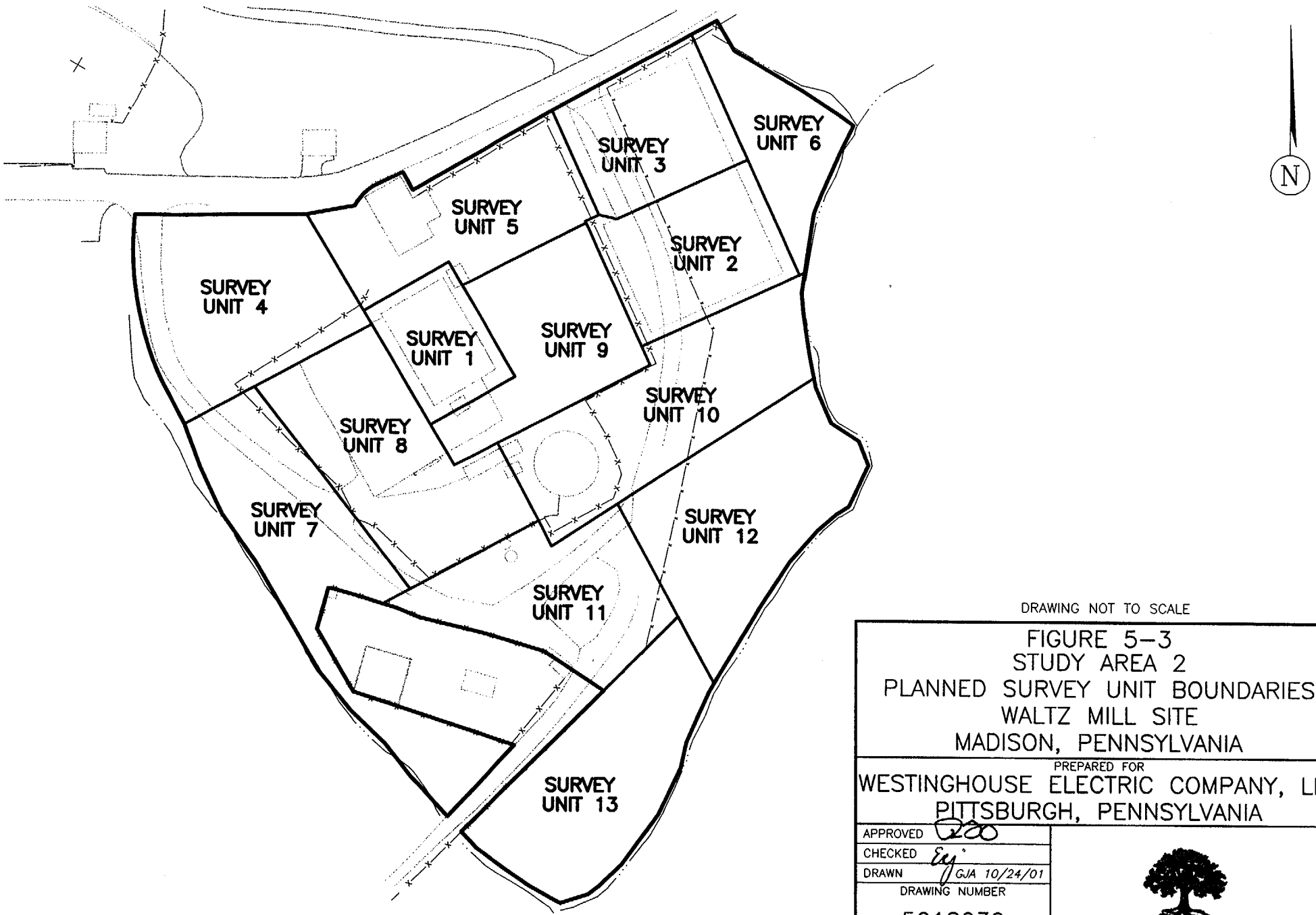
DRAWING NOT TO SCALE

FIGURE 5-2
STUDY AREA 1
ACTUAL SURVEY UNIT BOUNDARIES
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	
DRAWN	GJA 10/24/01
DRAWING NUMBER	5018027

Earth Sciences Consultants, Inc.



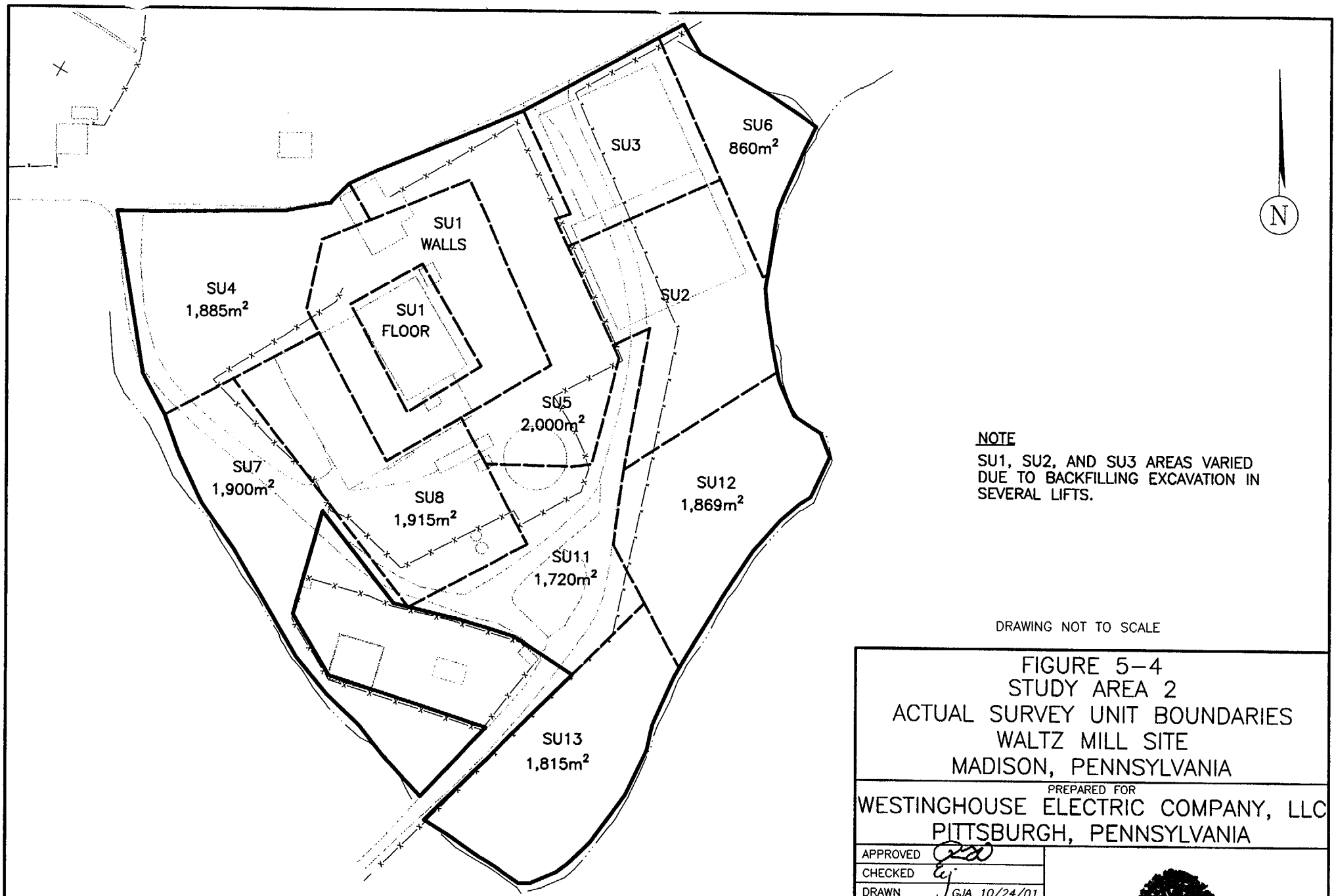
DRAWING NOT TO SCALE

FIGURE 5-3
STUDY AREA 2
PLANNED SURVEY UNIT BOUNDARIES
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	
DRAWN	GJA 10/24/01
DRAWING NUMBER	5018030

Earth Sciences Consultants, Inc.



NOTE

SU1, SU2, AND SU3 AREAS VARIED DUE TO BACKFILLING EXCAVATION IN SEVERAL LIFTS.

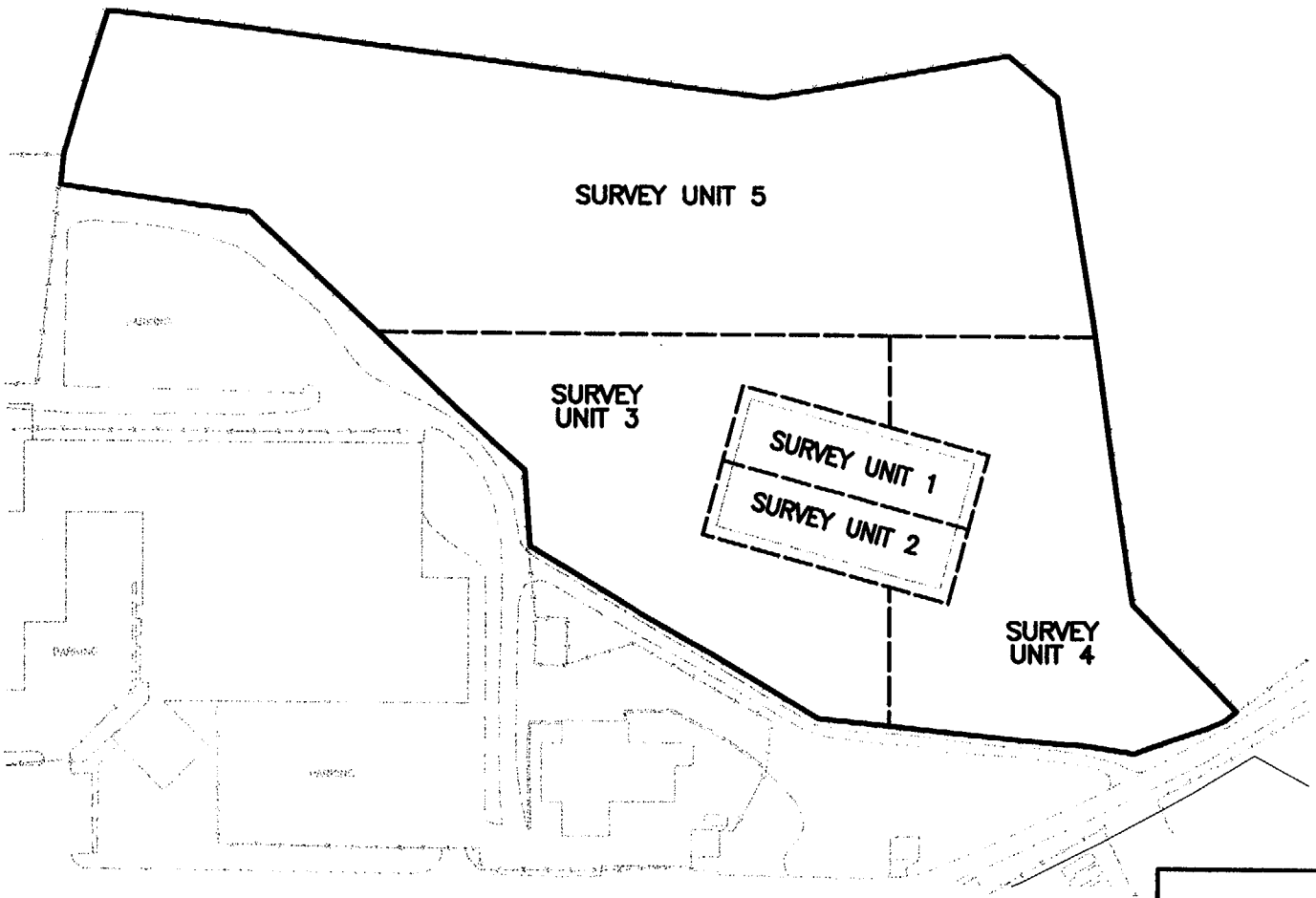
DRAWING NOT TO SCALE

FIGURE 5-4
STUDY AREA 2
ACTUAL SURVEY UNIT BOUNDARIES
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	
DRAWN	GJA 10/24/01
DRAWING NUMBER	5018057

Earth Sciences Consultants, Inc.



DRAWING NOT TO SCALE

FIGURE 5–5
STUDY AREA 3
PLANNED SURVEY UNIT BOUNDARIES
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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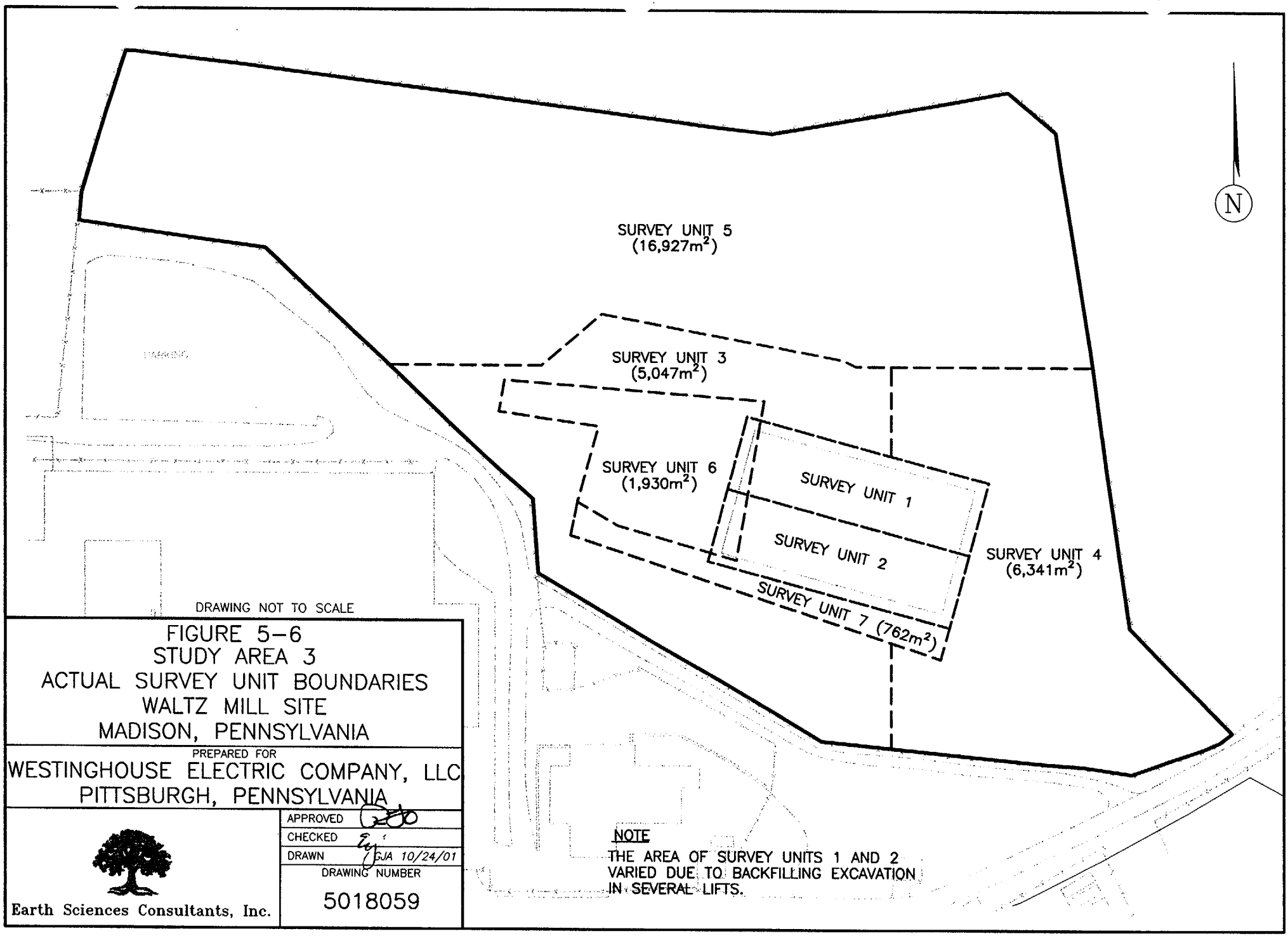

FIGURE 5-6
STUDY AREA 3
ACTUAL SURVEY UNIT BOUNDARIES
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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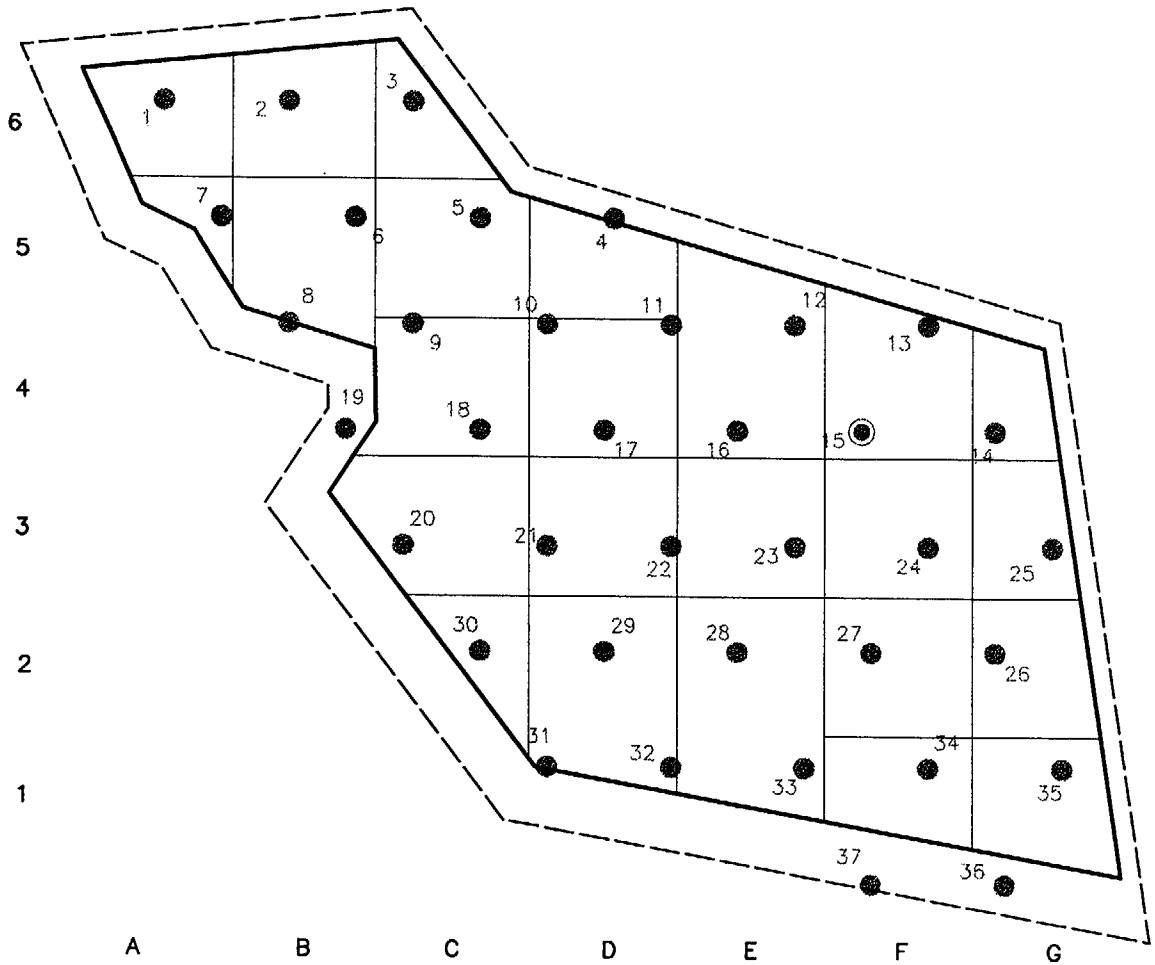

N

NOTES

GRIDS ARE APPROXIMATELY 5m x 5m.

RANDOM START POINT

SAMPLING POINT

DRAWING NOT TO SCALE

FIGURE 6.1–1
STUDY AREA 1B–SURVEY UNIT 1R
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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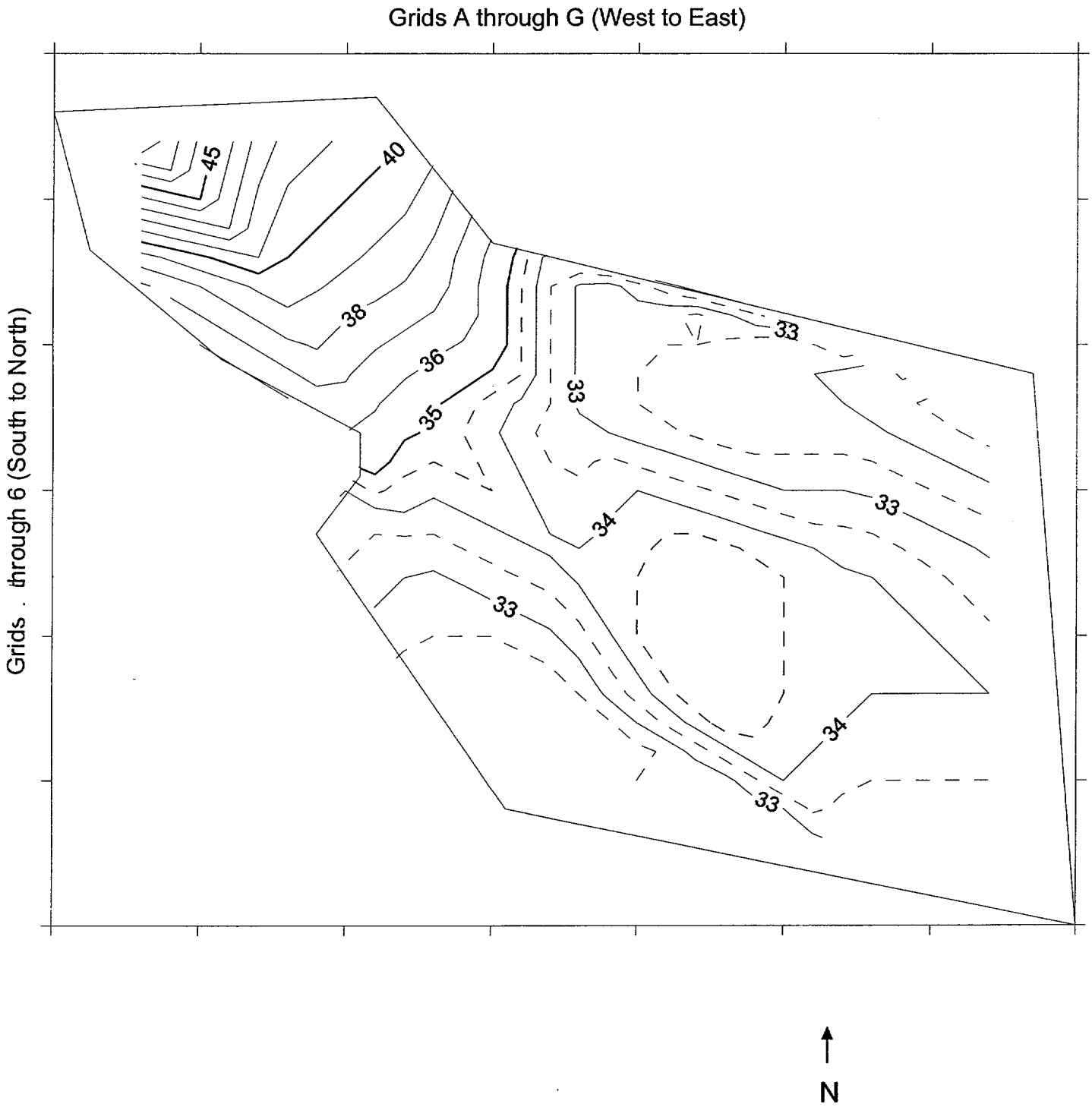

Average Gamma Scan Readings Ranged
From 31 kcpm to 50 kcpm

Figure 6.1-2
Study Area 1 - Survey Unit 1R
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

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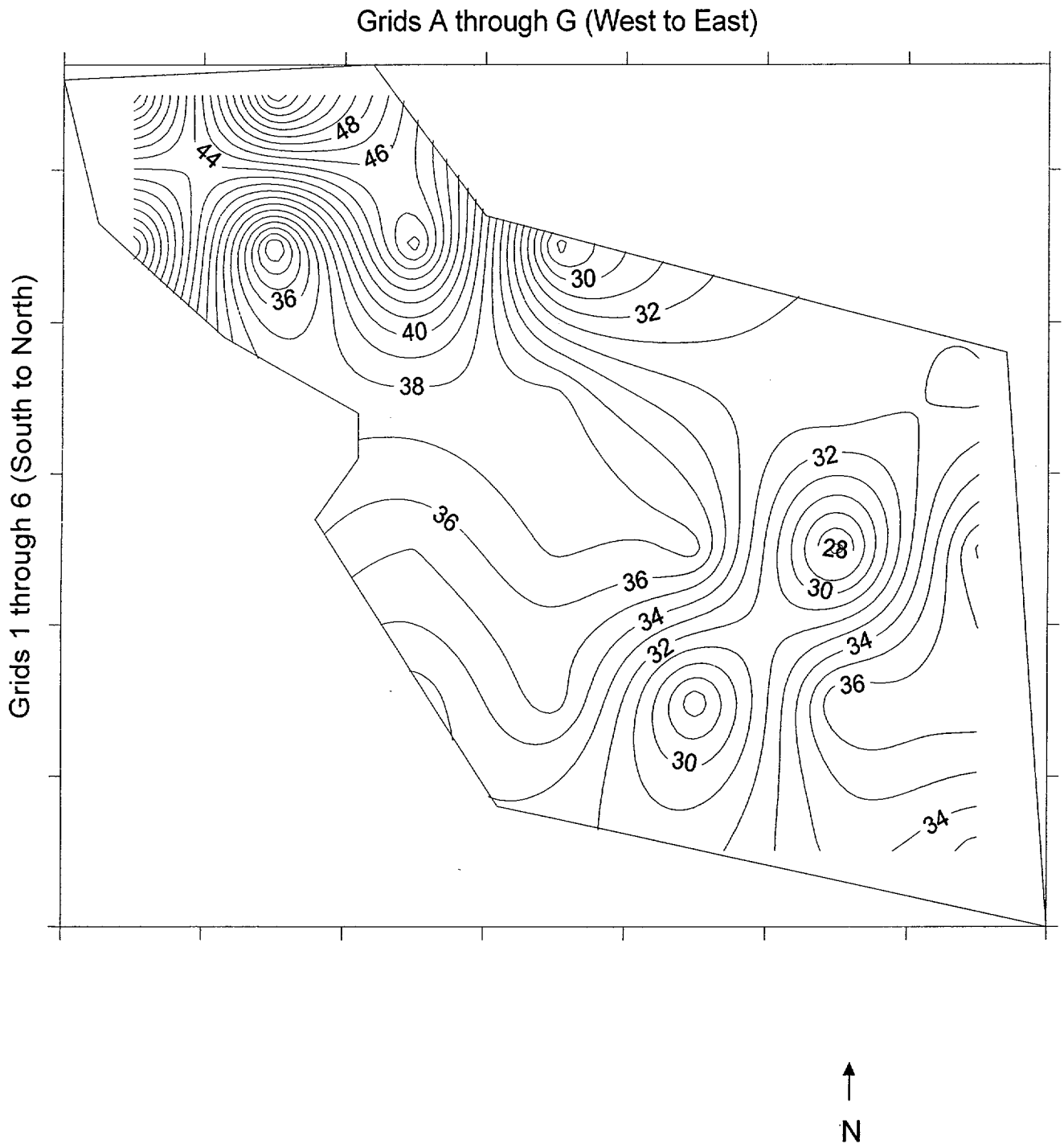
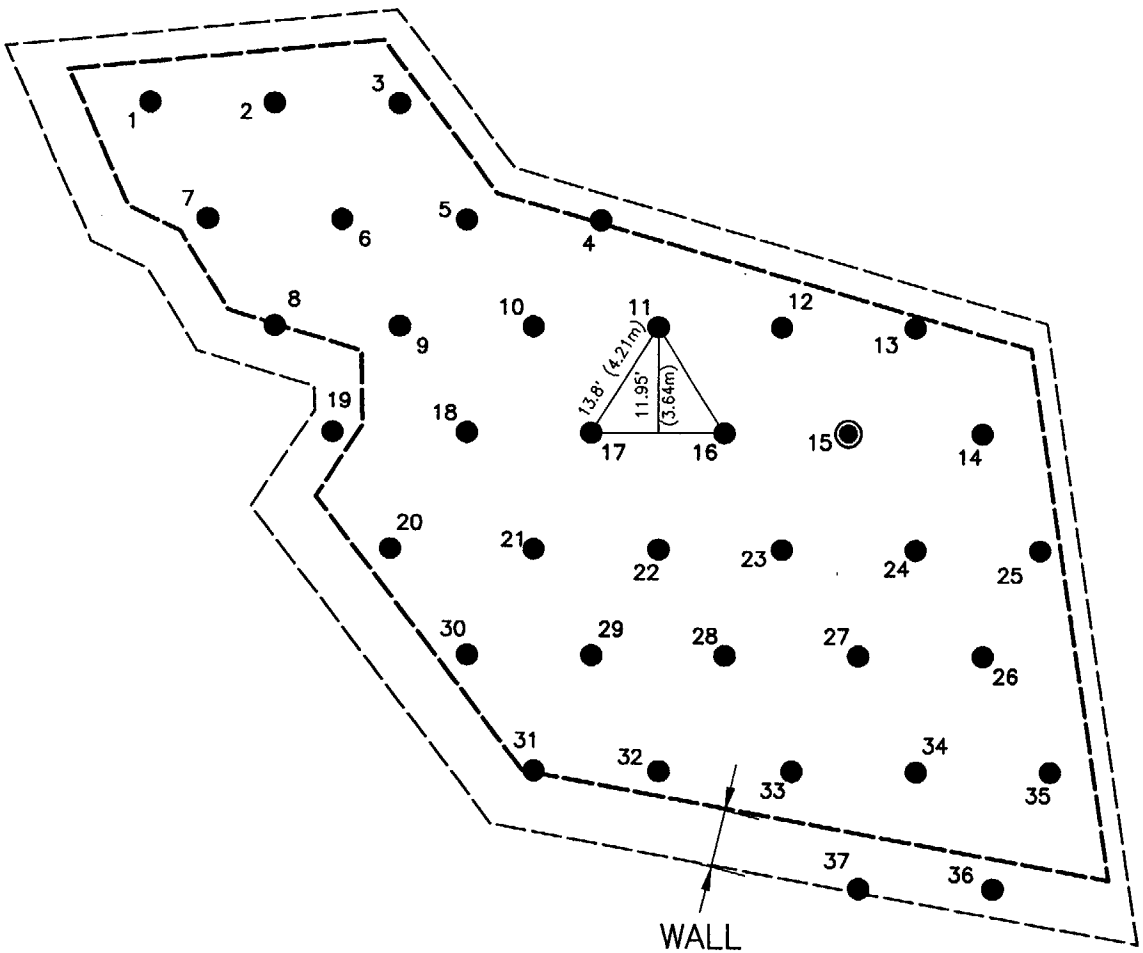


Background Measurements Ranged
From 26.4 kcpm to 55.1 kcpm

Figure 6.1-3
Study Area 1 - Survey Unit 1R
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su01r-b.srf



NOTES

A ≅ 6,092 FT^2 (566m^2)
n = 37
L = 13.8 FEET
◉ RANDOM START POINT
WALL DIMENSIONS ARE APPROXIMATE

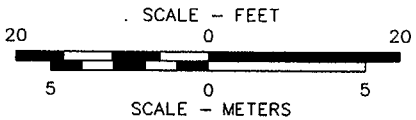


FIGURE 6.1–4
STUDY AREA 1B–SURVEY UNIT 1R
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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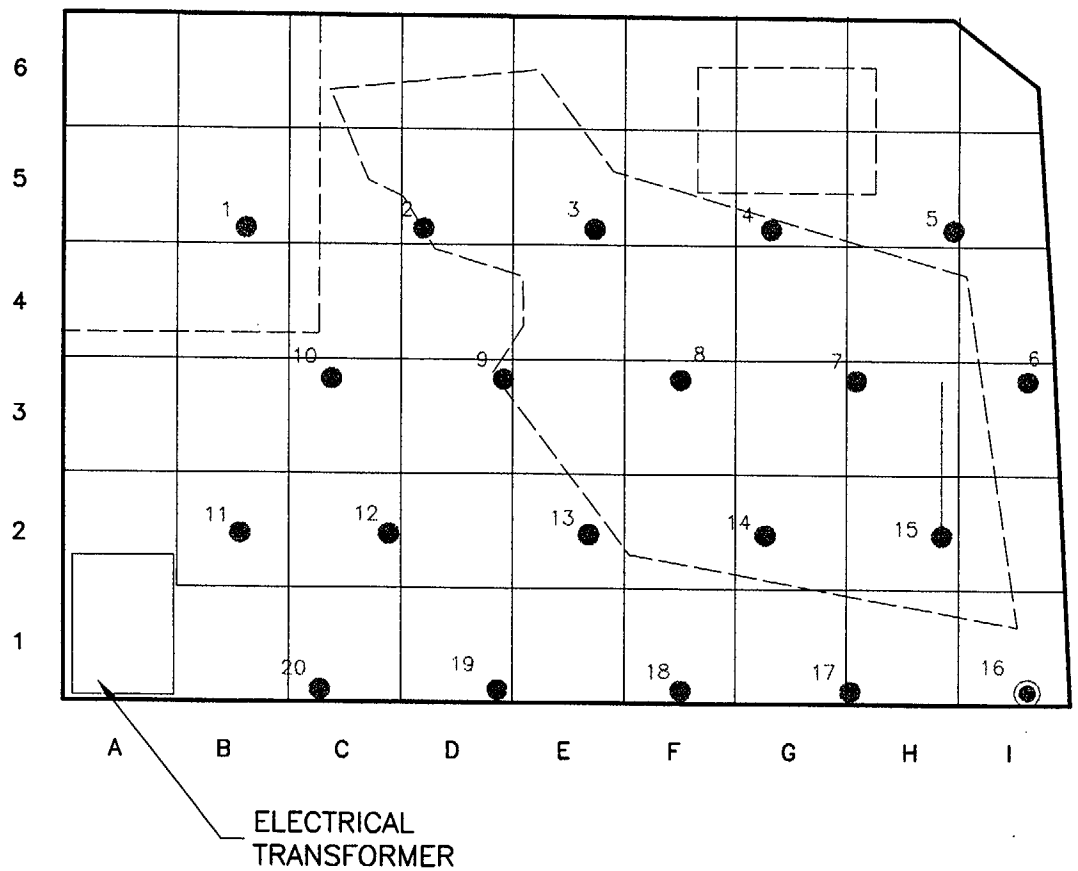

N

NOTES

GRIDS ARE APPROXIMATELY 5m x 5m.

PREVIOUS EXCAVATIONS BACKFILLED WITH OFF SITE MATERIAL.

RANDOM START POINT

SAMPLING POINT

DRAWING NOT TO SCALE

FIGURE 6.1–5
STUDY AREA 1B–SURVEY UNIT 1
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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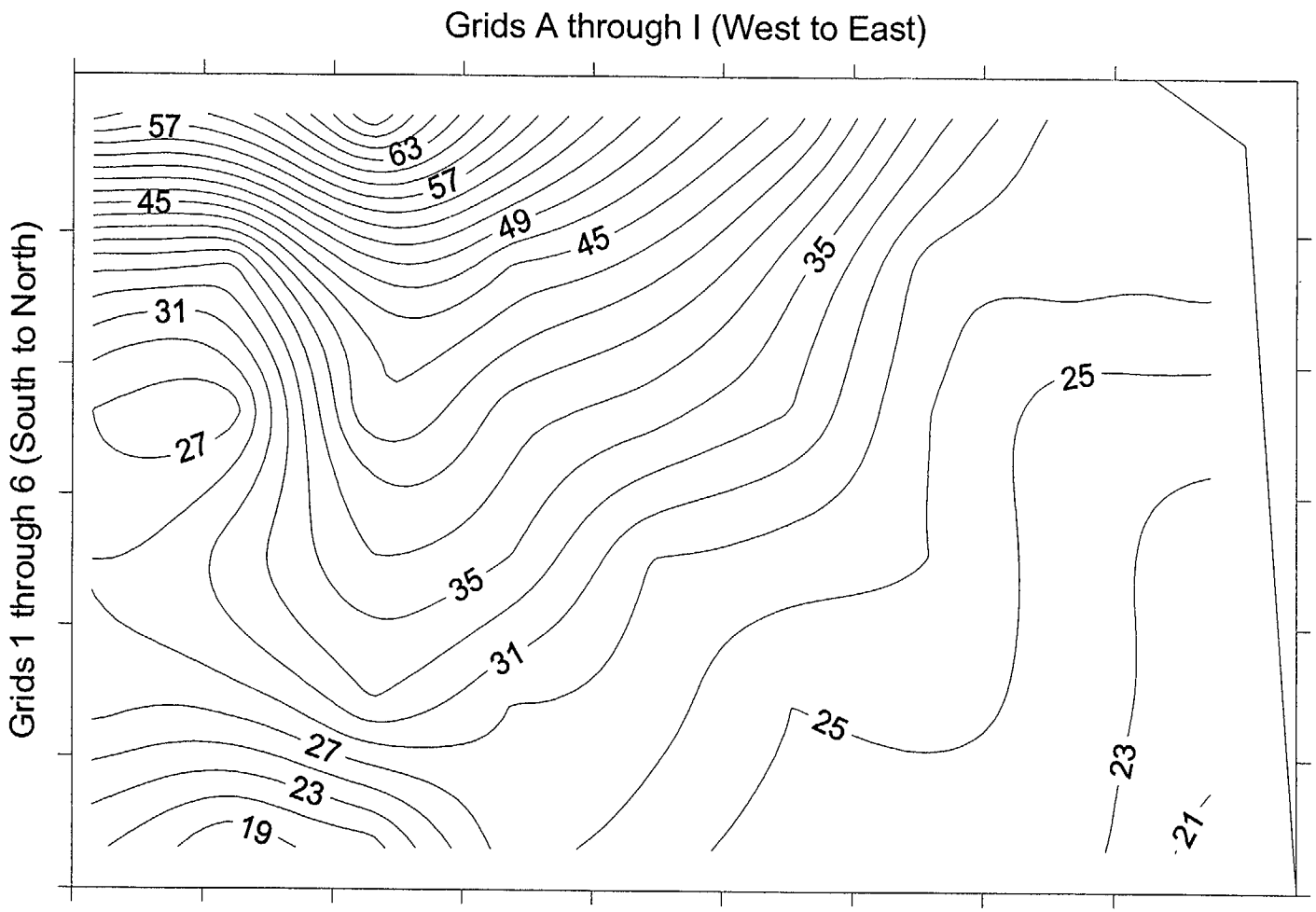

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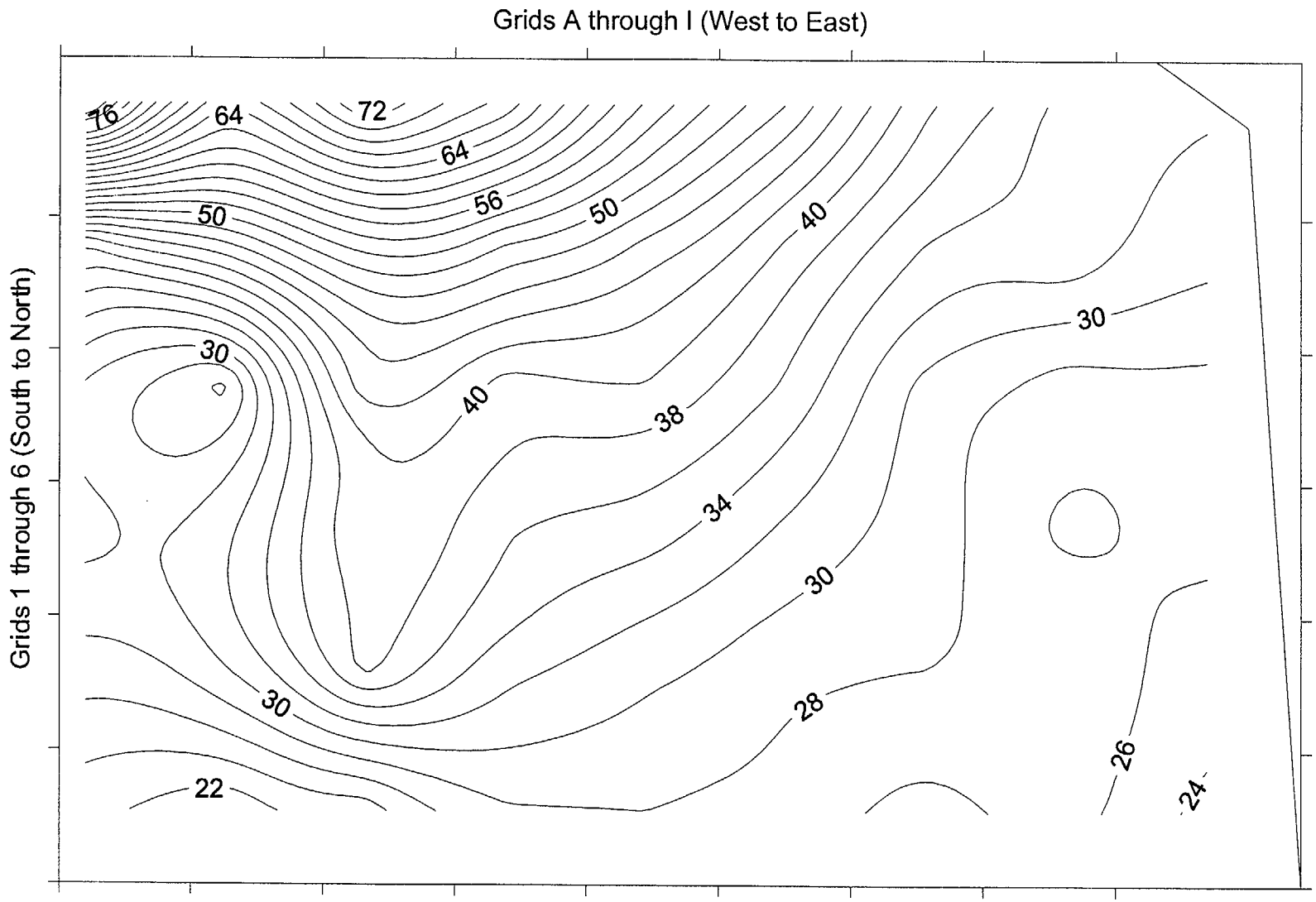
Average Gamma Scan Readings Ranged
from 17 kcpm to 71 kcpm

Figure 6.1-6
Study Area 1B - Survey Unit 1
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Suo1-a.srf



N

Background Measurements Ranged
from 20.4 kcpm to 83.8 kcpm

Figure 6.1-7
Study Area 1B - Survey Unit 1
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

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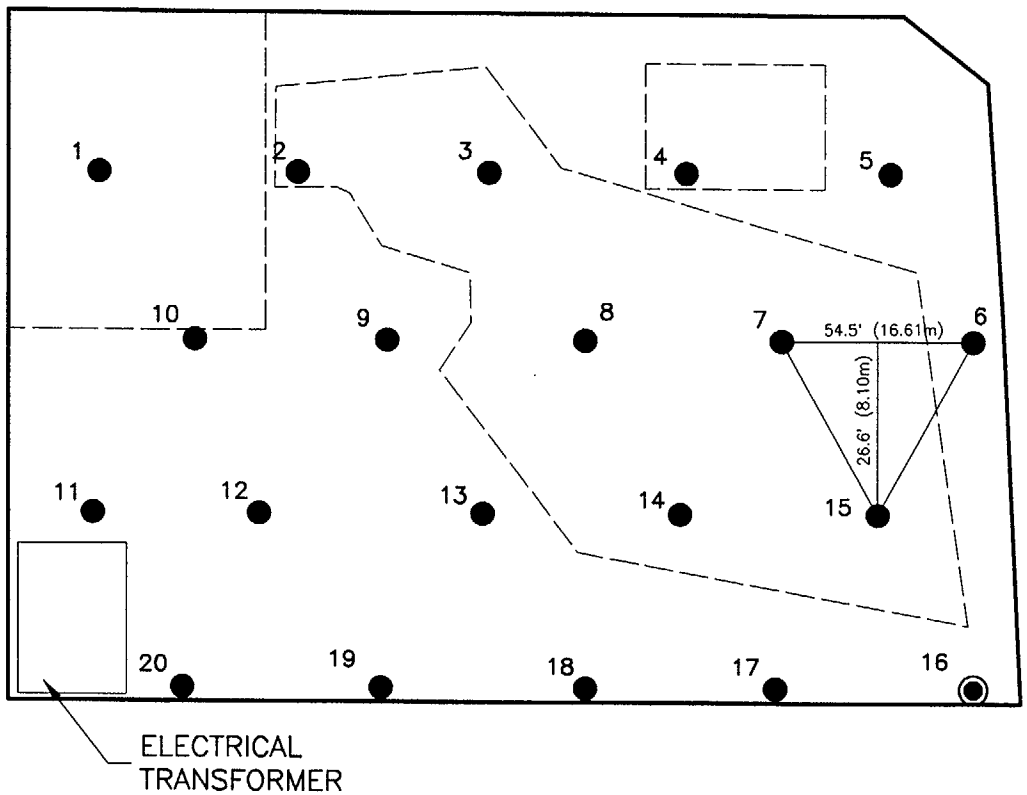

NOTES

A ≅ 16,359 FT^2 (1,520m^2)
n = 8
L = 54.5 FEET
◉ RANDOM START POINT
– – – – – PREVIOUS EXCAVATIONS BACKFILLED WITH OFF–SITE MATERIAL.

SAMPLES 1, 2, 3, 4, 7, 8, 14, AND 15 NOT SAMPLED DUE TO OFF SITE BACKFILL.

N

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.1–8
STUDY AREA 1B–SURVEY UNIT 1
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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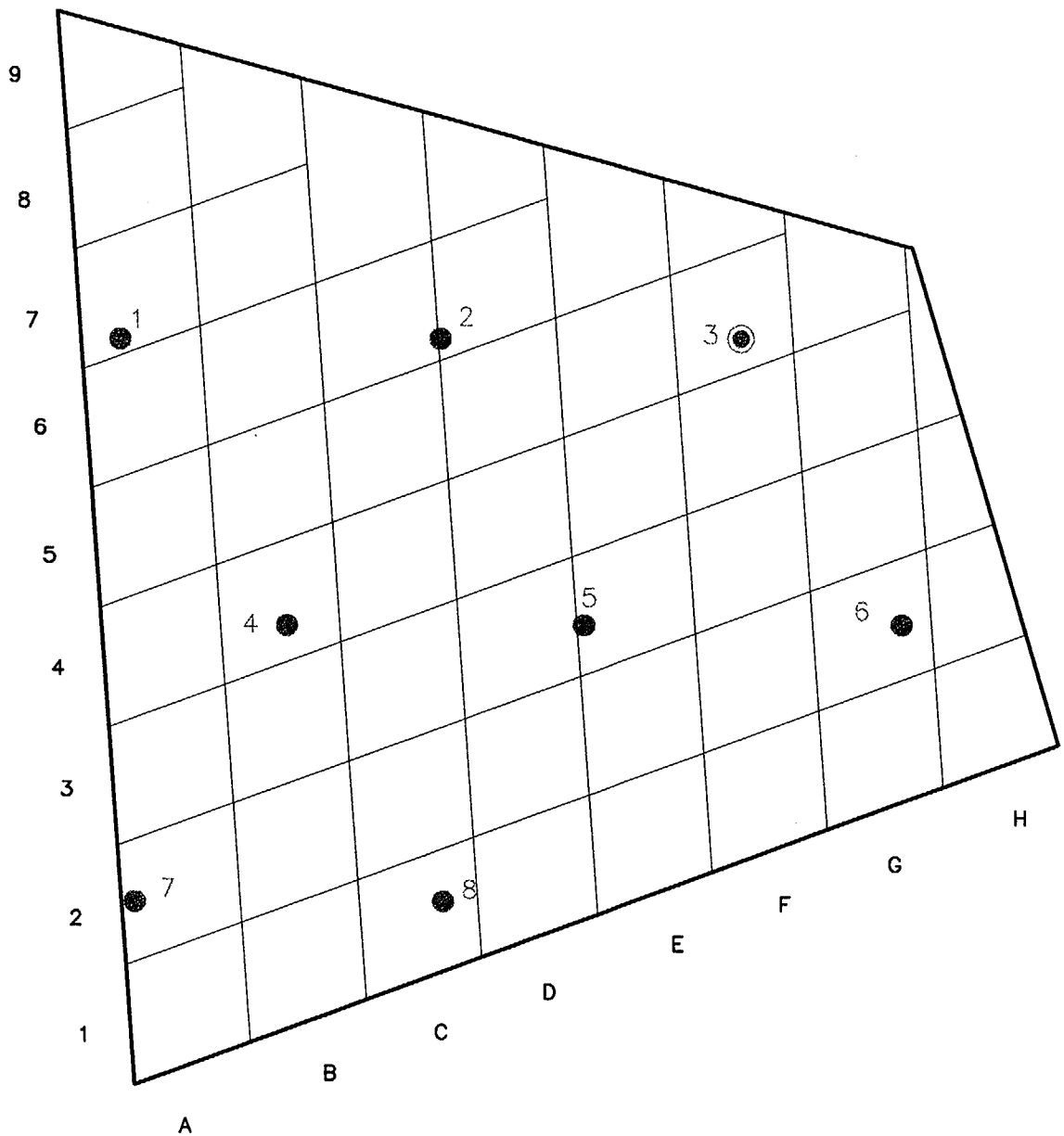

N

NOTES

GRIDS ARE APPROXIMATELY 2m x 2m.

RANDOM START POINT

SAMPLING POINTS

DRAWING NOT TO SCALE

FIGURE 6.1–9
STUDY AREA 1B–SURVEY UNIT 4
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	5018S49

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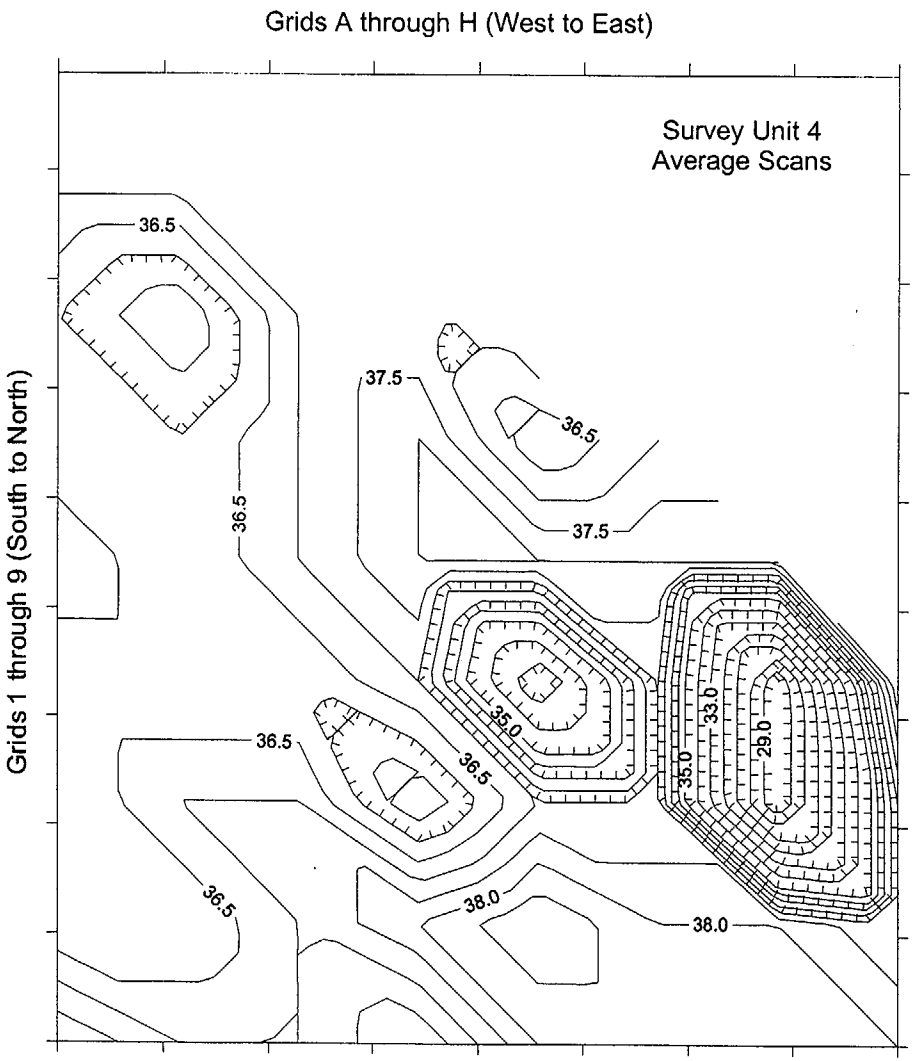

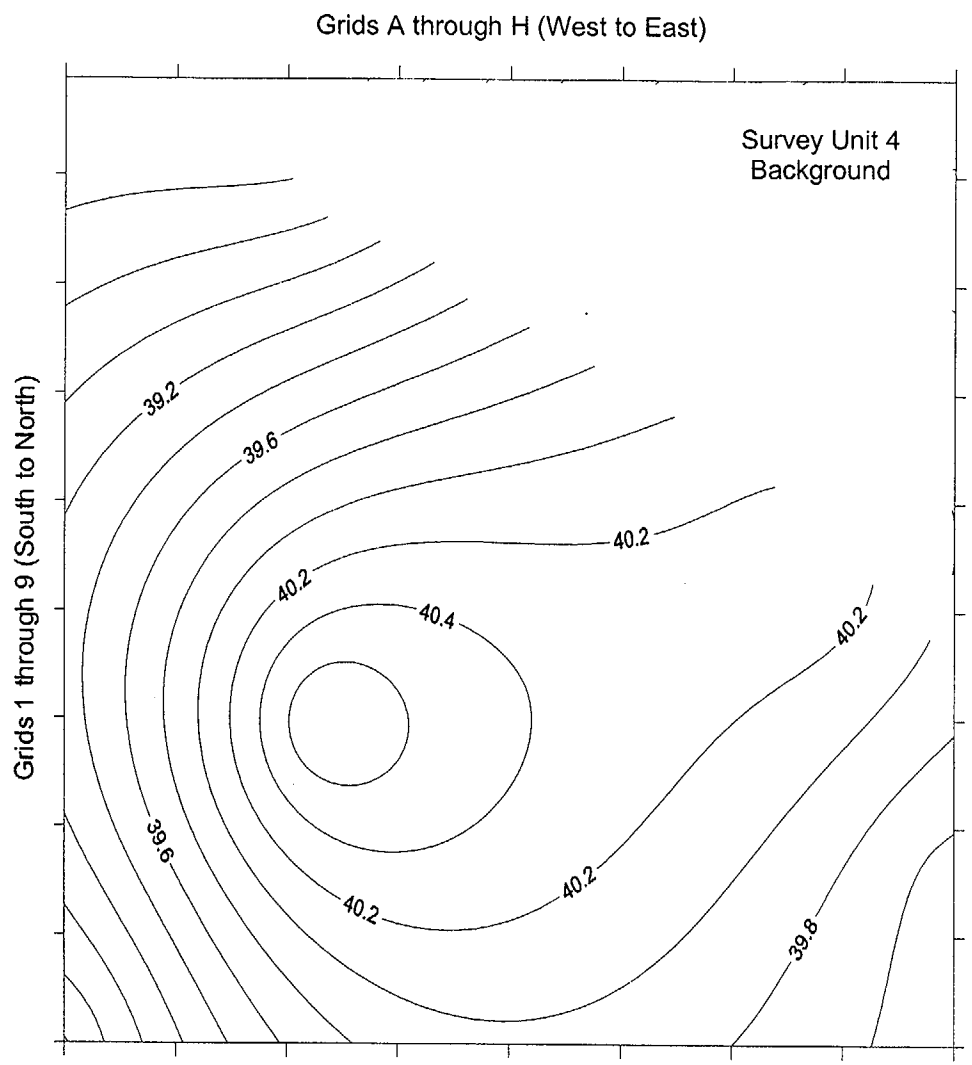

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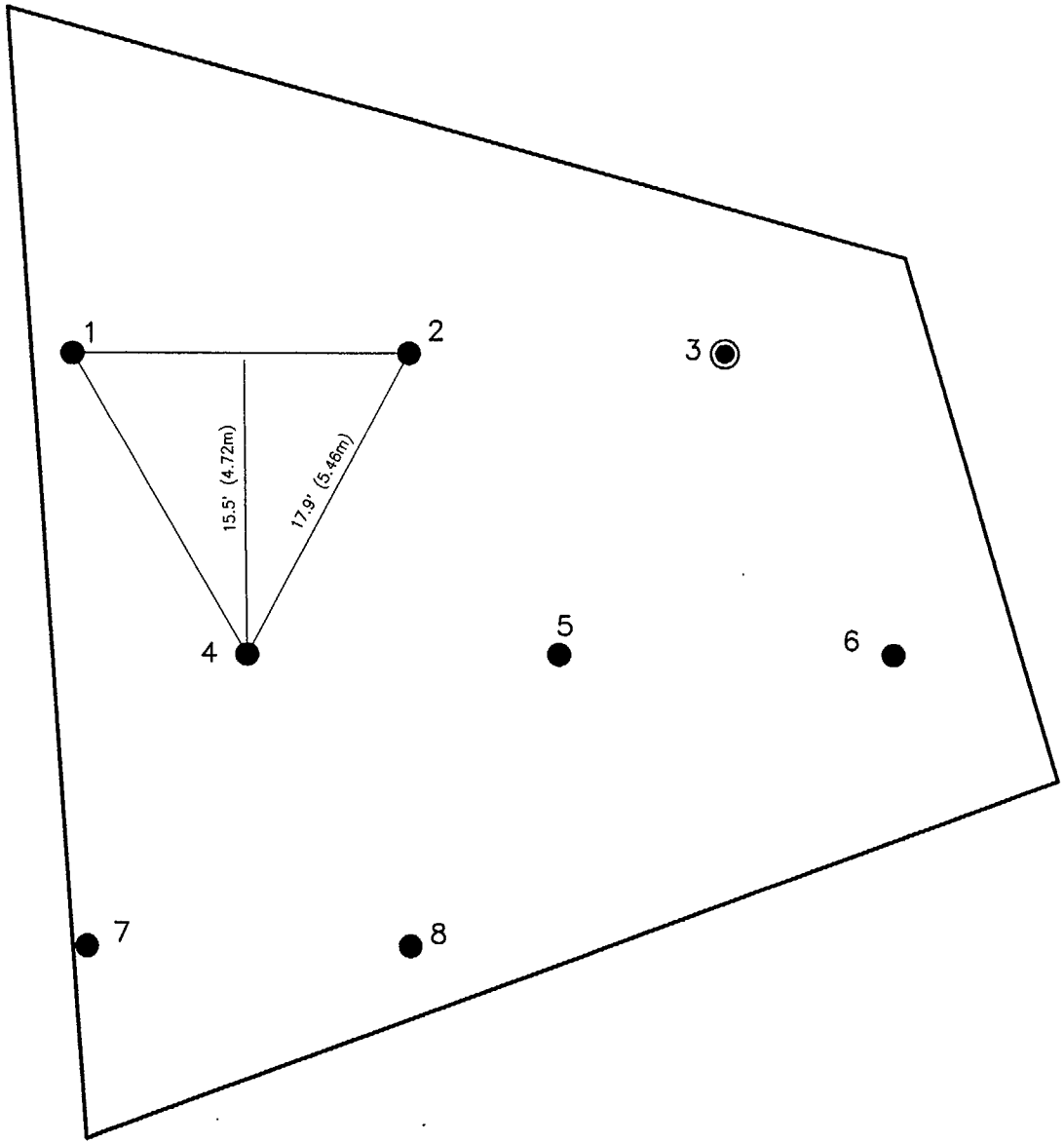
Average Gamma Scan Readings Ranged
from 28 kcpm to 39 kcpm

Background Measurements Ranged
from 38.2 kcpm to 40.8 kcpm

Figure 6.1-10
Study Area 1B - Survey Unit 4
Average and Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su04-a.srf



NOTES

A ≅ 2,222 FT^2 (206m^2)
n = 8
L = 17.9 FEET
◉ RANDOM START POINT

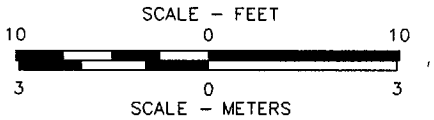


FIGURE 6.1–11
STUDY AREA 1B–SURVEY UNIT 4
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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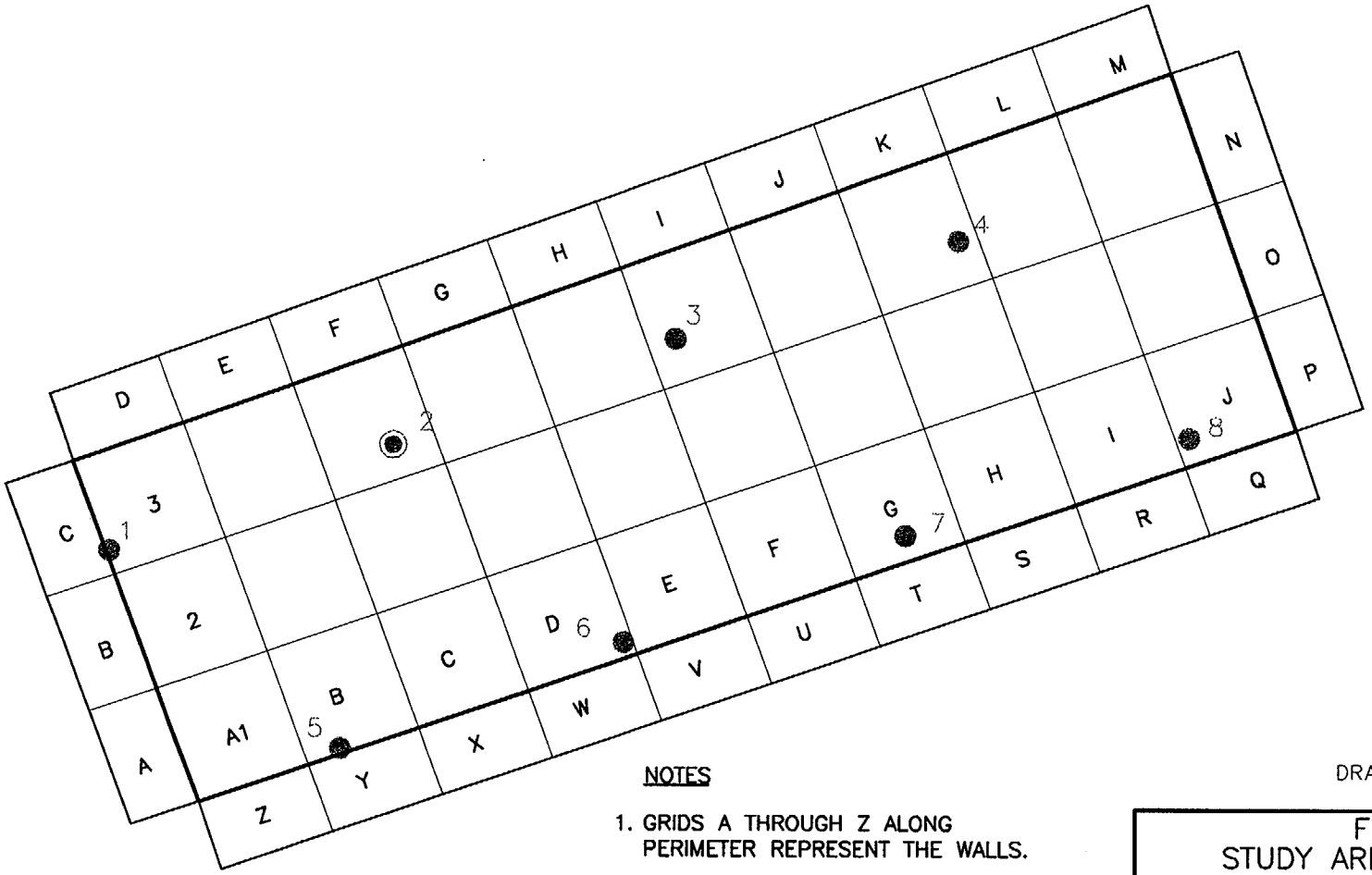

N

DRAWING NOT TO SCALE

NOTES

1. GRIDS A THROUGH Z ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH J3 REPRESENT THE EXCAVATION FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.5m HIGH.

◉ RANDOM START POINT

● SAMPLING LOCATIONS

FIGURE 6.1–12
STUDY AREA 1B–SURVEY UNIT 5
EXCAVATION BOTTOM
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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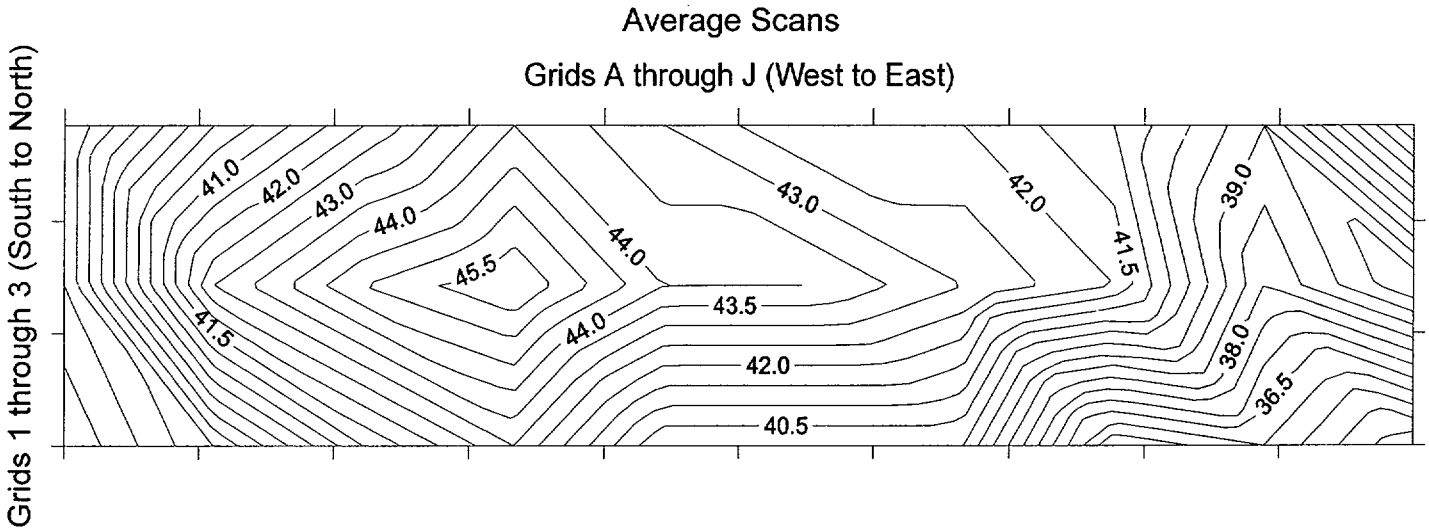

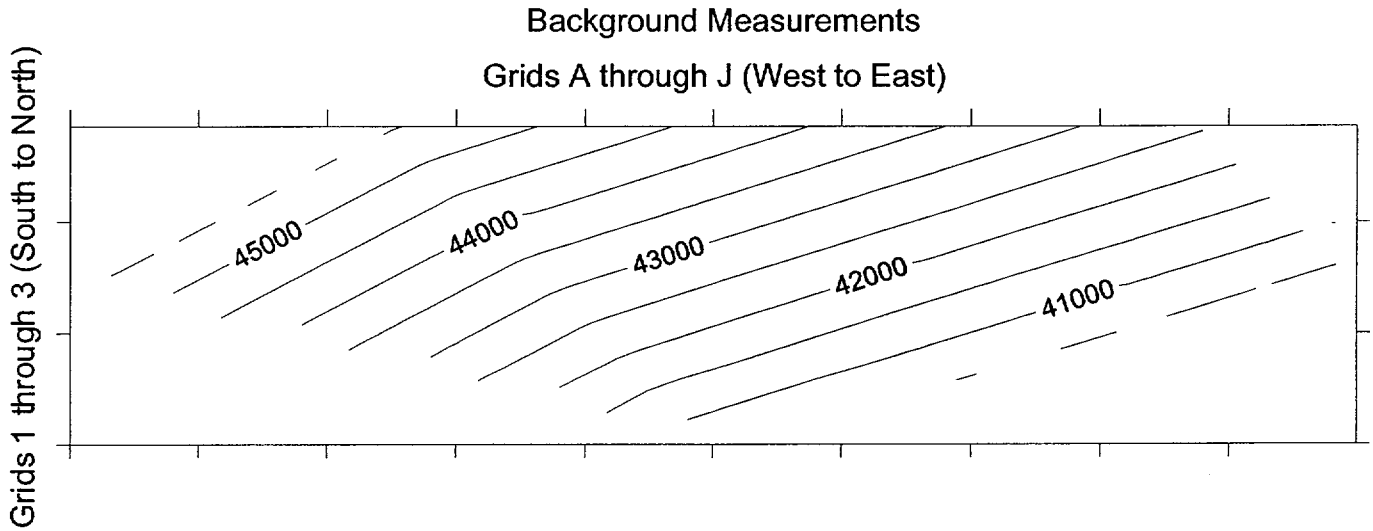

N

Average Gamma Scan Readings Ranged
From 34 kcpm to 46 kcpm

Background Measurements Ranged
From 40,202 cpm to 45,624 cpm

Figure 6.1-13
Study Area 1 - Survey Unit 5 - Excavation Bottom
Average and Background Isopleths (kcpm and cpm)

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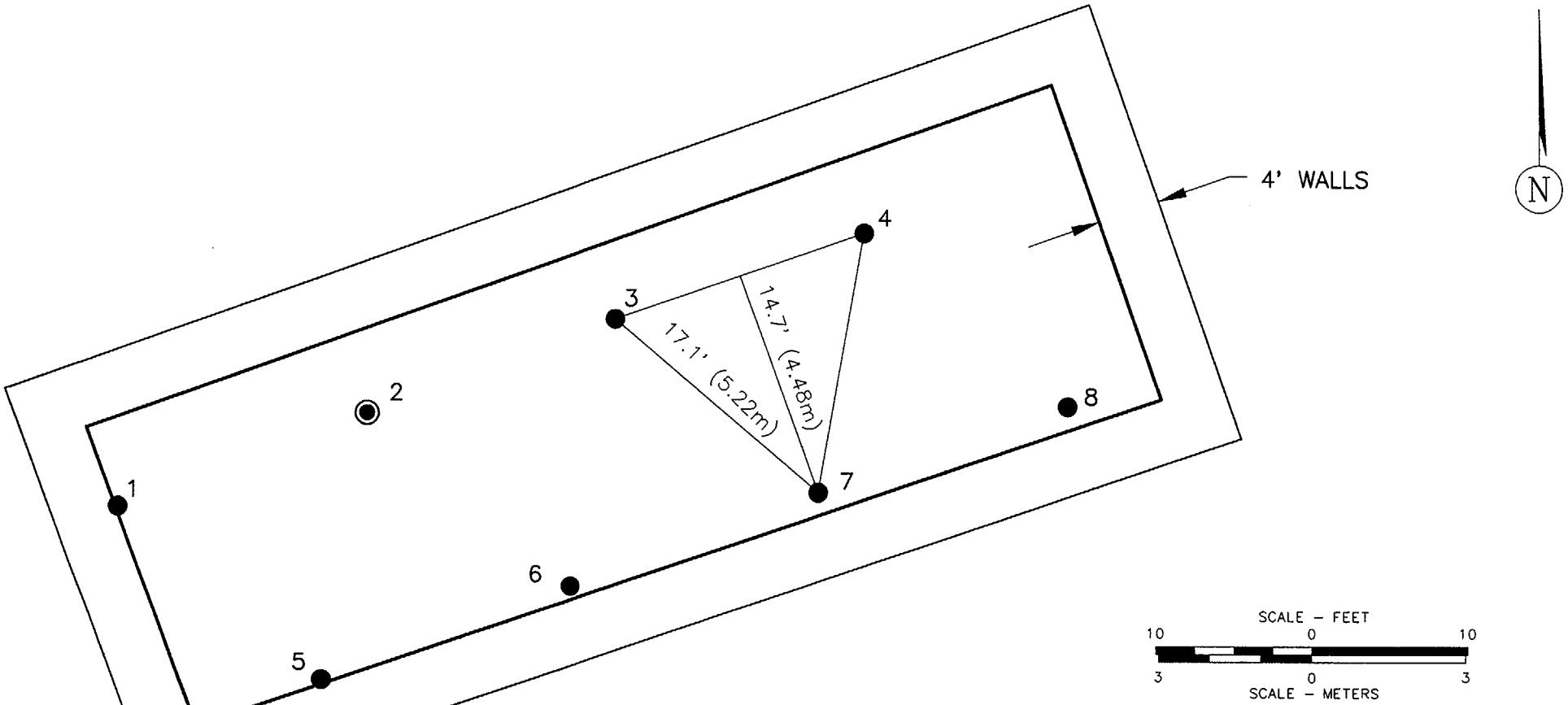
k:/5018/Fssr/Cas/Surfer/Area1/Su05-bot.srf



NOTES

A ≅ 2,031 FT^2 (189m^2)
n = 8
L = 17.1 FEET
◉ RANDOM START POINT

FIGURE 6.1–14
STUDY AREA 1B–SURVEY UNIT 5
EXCAVATION BOTTOM
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	EJA 1/10/02
DRAWING NUMBER	5018080

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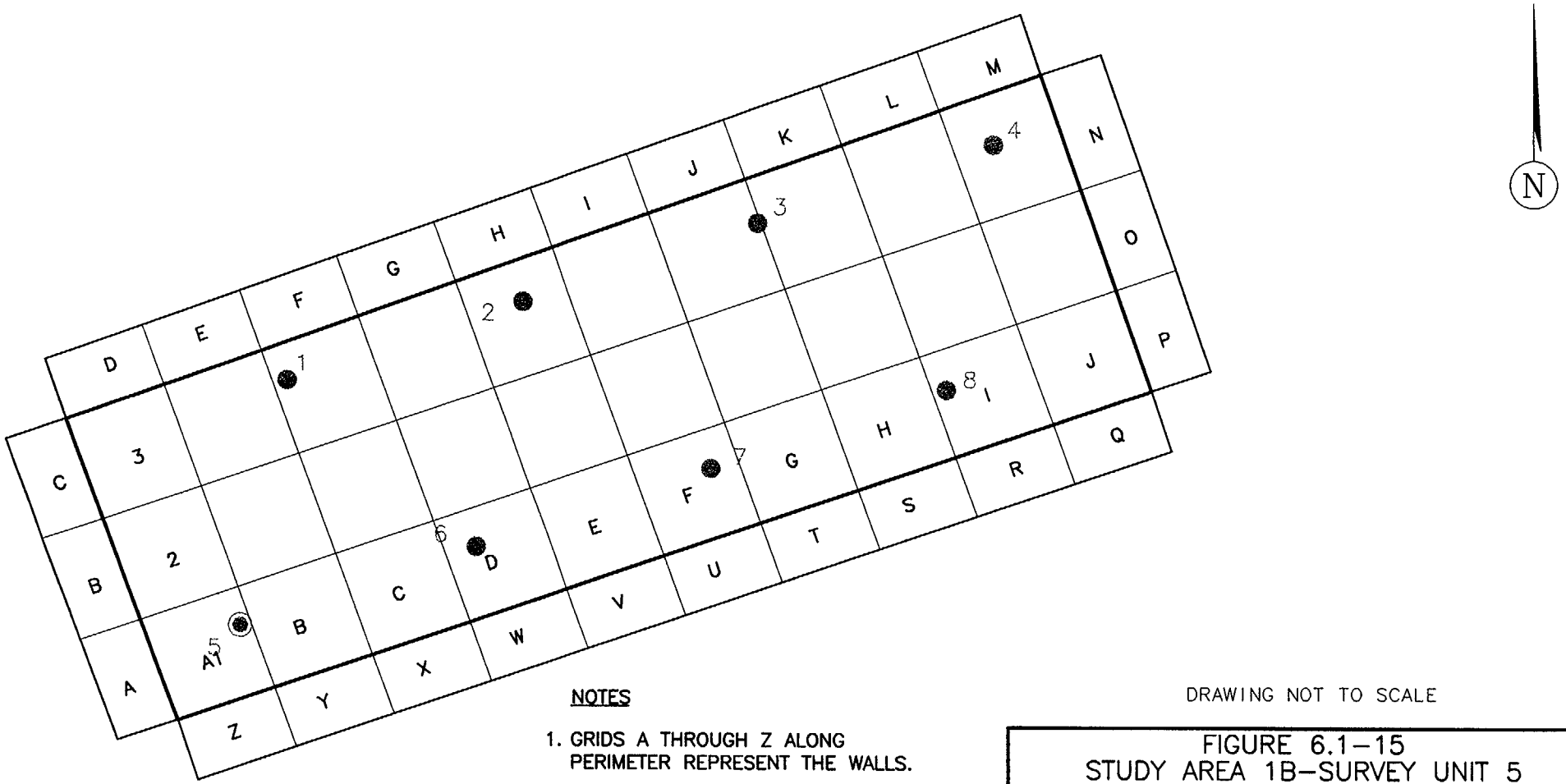

NOTES

1. GRIDS A THROUGH Z ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH J3 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x .6m HIGH.

◉ RANDOM START POINT

● SAMPLING POINTS

DRAWING NOT TO SCALE

FIGURE 6.1–15
STUDY AREA 1B–SURVEY UNIT 5
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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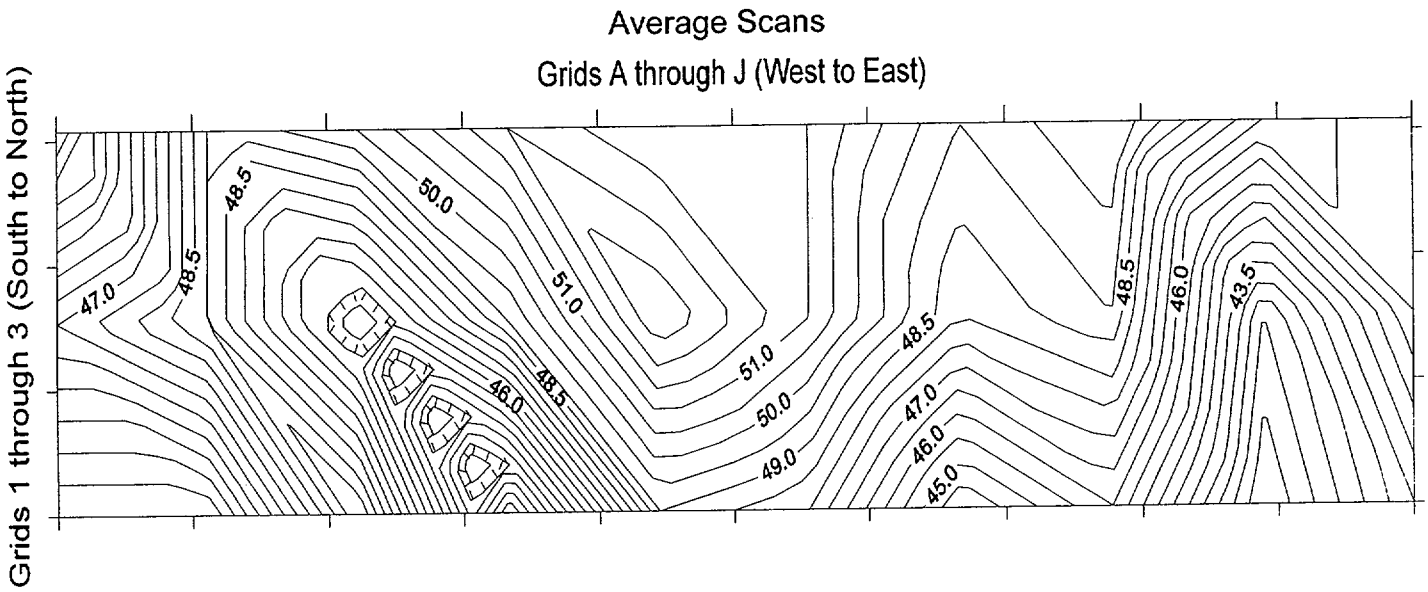

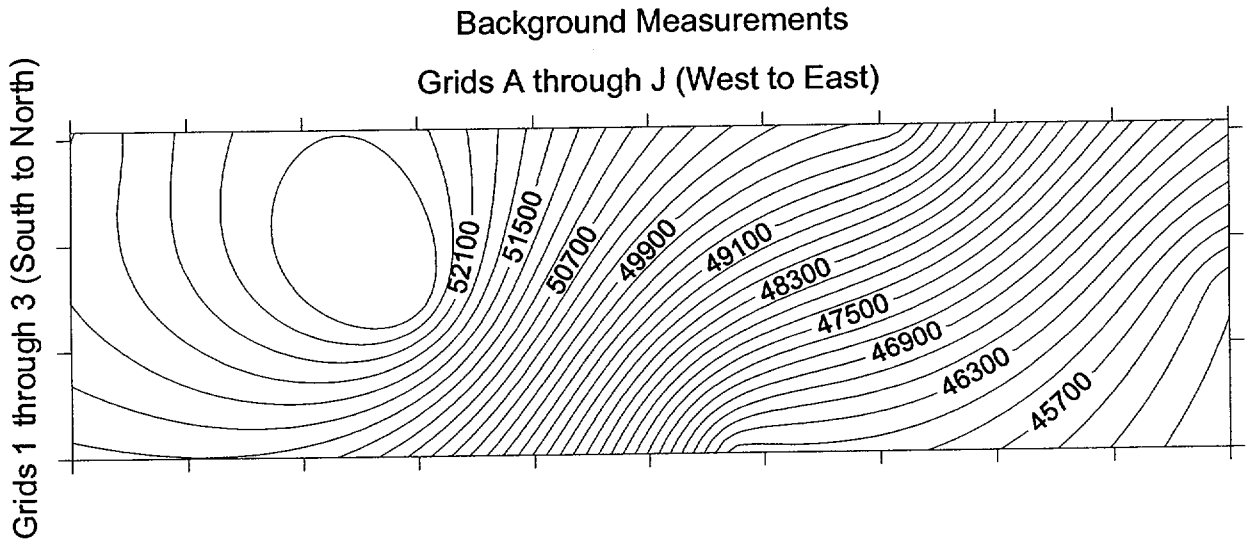

N

Average Gamma Scan Readings Ranged
From 41 kcpm to 53 kcpm

Background Measurements Ranged
From 45,143 cpm to 52,967 cpm

Figure 6.1-16
Study Area 1B - Survey Unit 5 - 1st Lift of ABM
Average and Background Isopleths (kcpm and cpm

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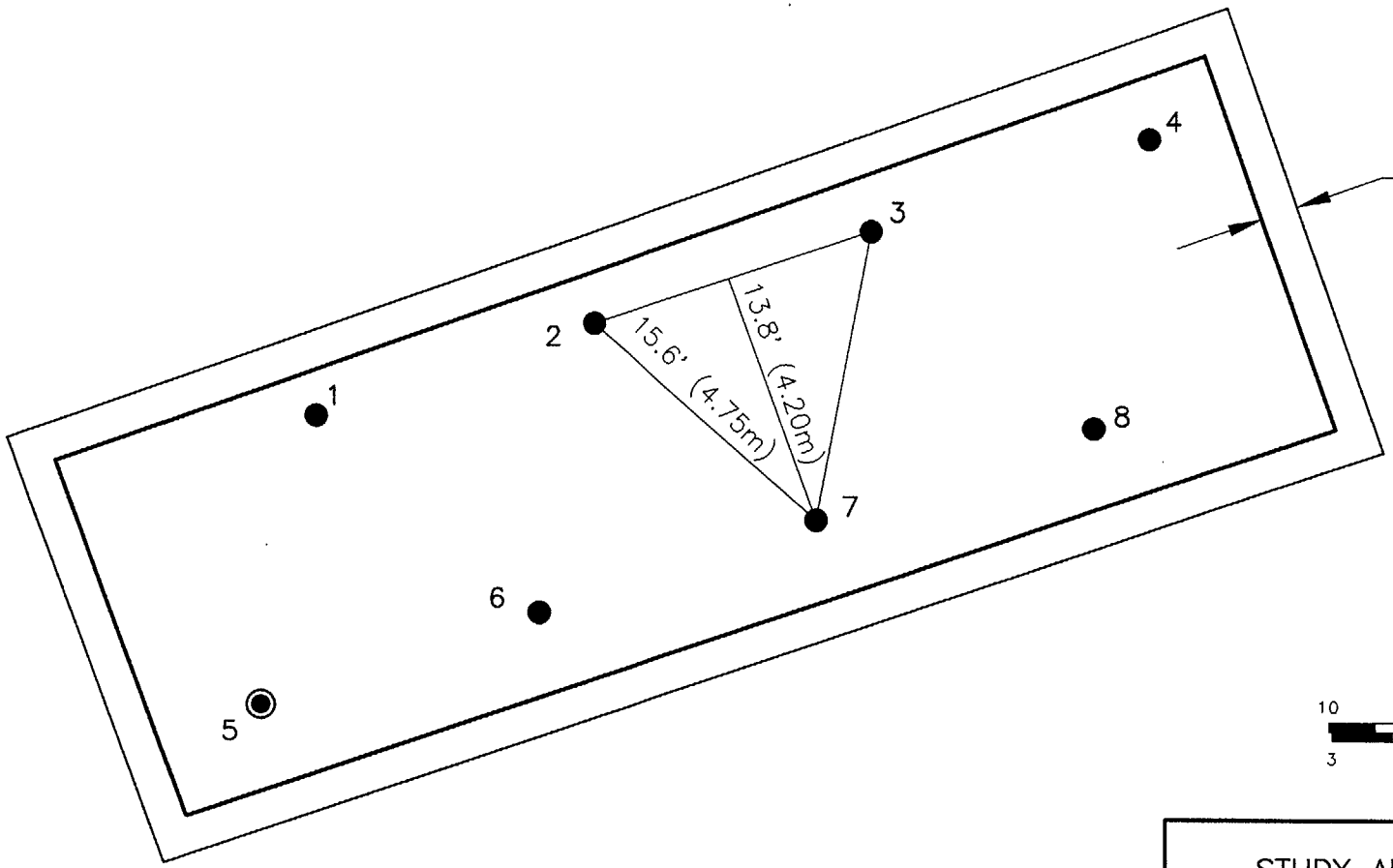

SCALE – FEET
10 0 10
3 0 3
SCALE – METERS

NOTES

A ≅ 1,687 FT^2 (157m^2)
n = 8
L = 15.6 FEET
◉ RANDOM START POINT

FIGURE 6.1–17
STUDY AREA 1B–SURVEY UNIT 5
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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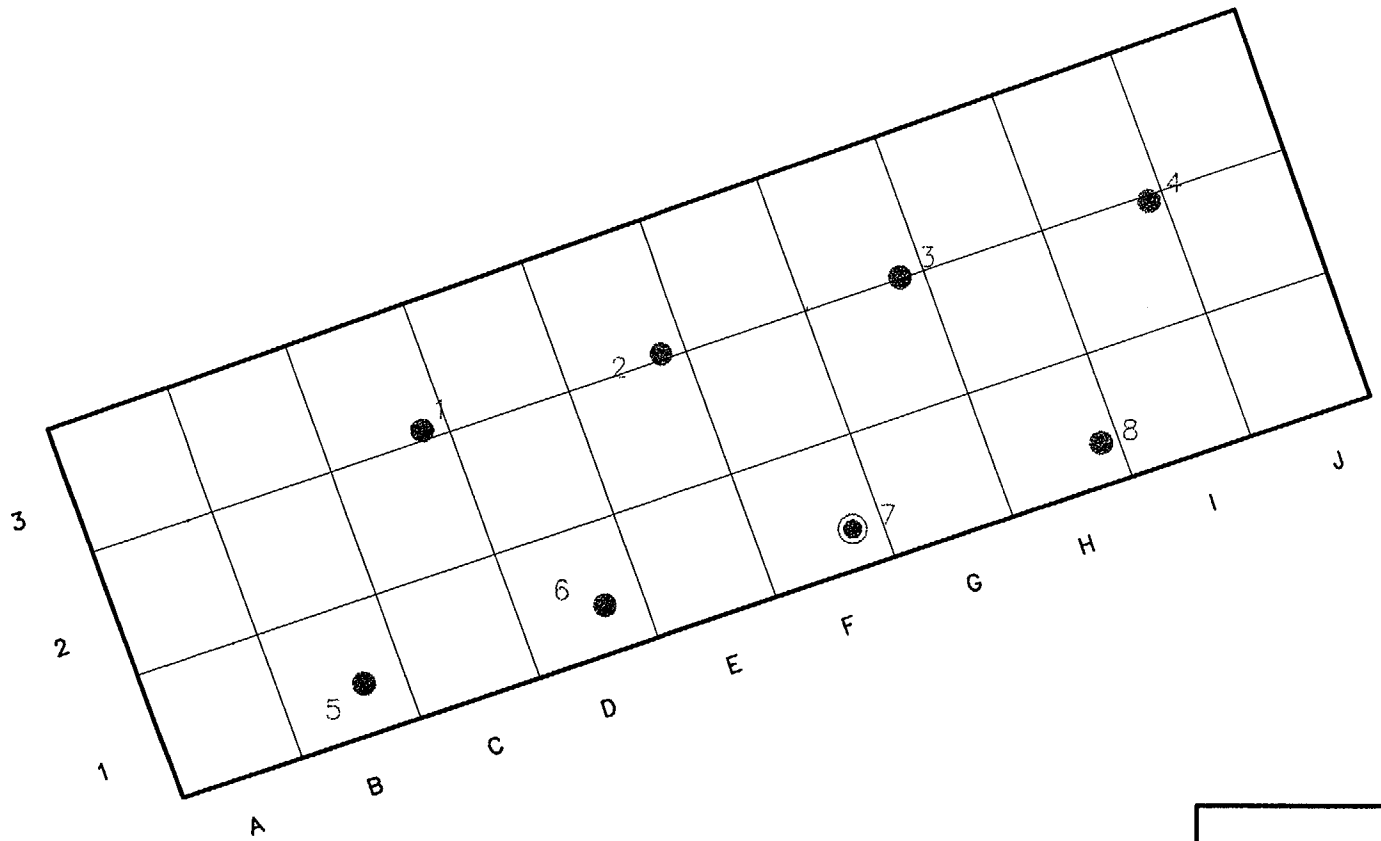

DRAWING NOT TO SCALE

NOTES

1. GRIDS A1 THROUGH J3 REPRESENT THE FLOOR.
2. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.

RANDOM START POINT

SAMPLING POINTS

FIGURE 6.1–18
STUDY AREA 1B–SURVEY UNIT 5
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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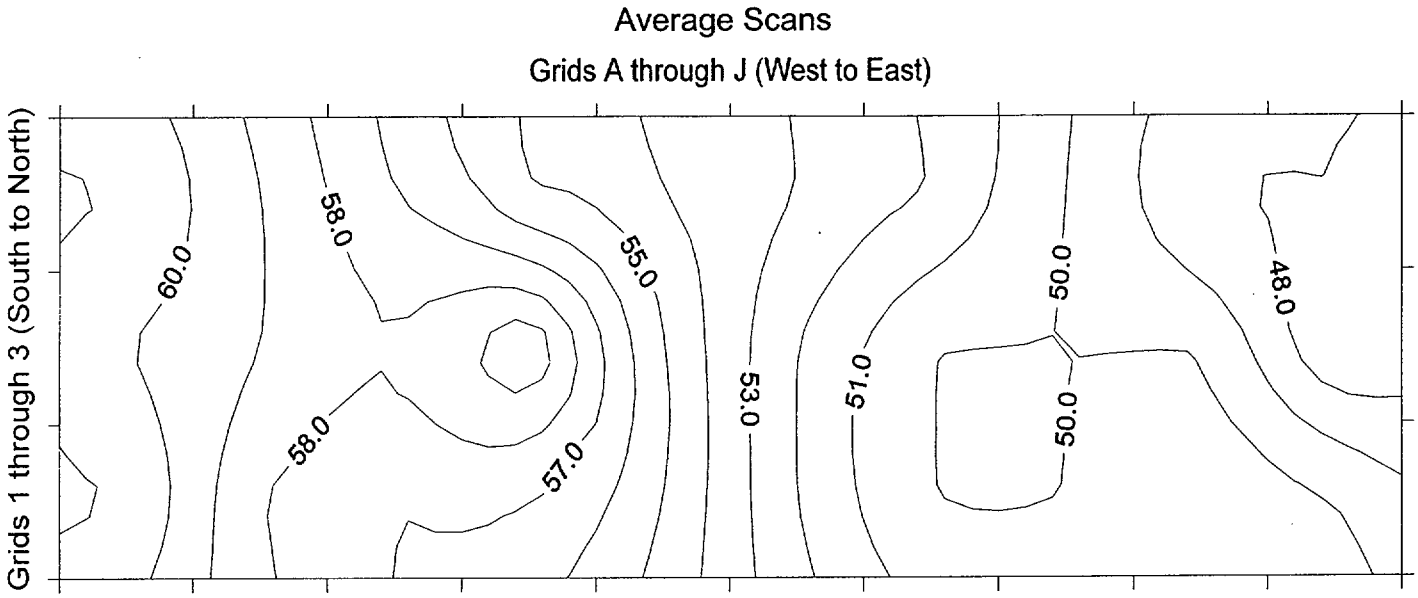

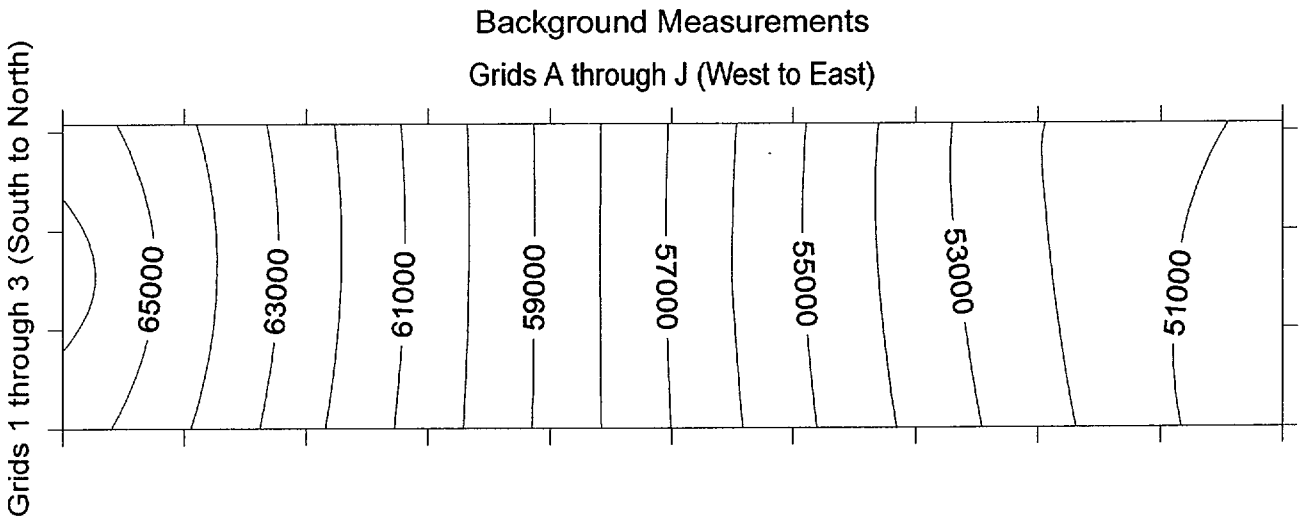

N

Average Gamma Scan Readings Ranged
From 47 kcpm to 61 kcpm

Background Measurements Ranged
From 50,112 cpm to 66,545 cpm

Figure 6.1-19
Study Area 1B - Survey Unit 5 - 2nd Lift of ABM
Average and Background Isopleths (kcpm and cpm)

Earth Sciences Consultants, Inc.

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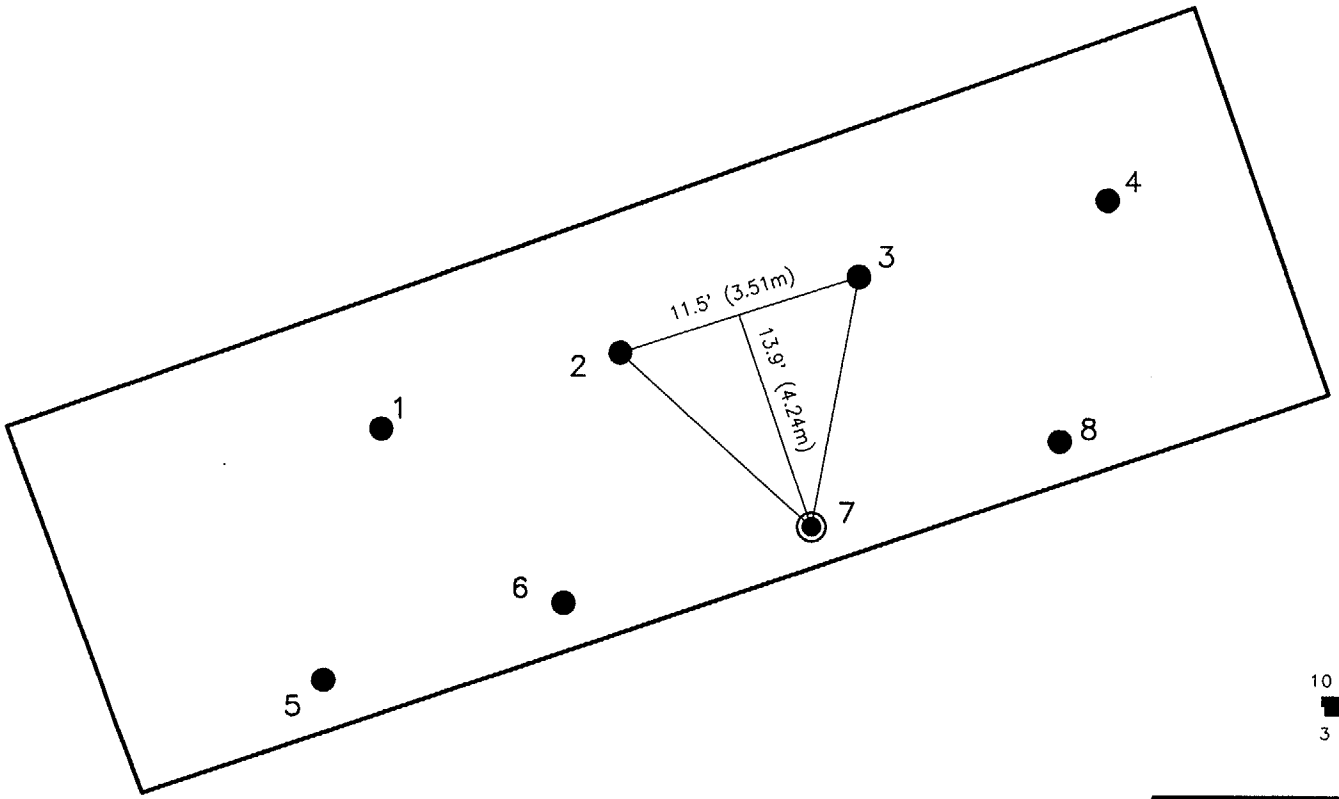

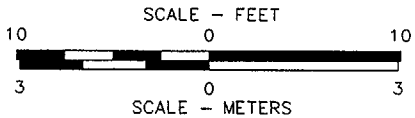

NOTES

A ≅ 1,343 FT^2 (125m^2)
n = 8
L = 13.9 FEET
◉ RANDOM START POINT

FIGURE 6.1–20
STUDY AREA 1B–SURVEY UNIT 5
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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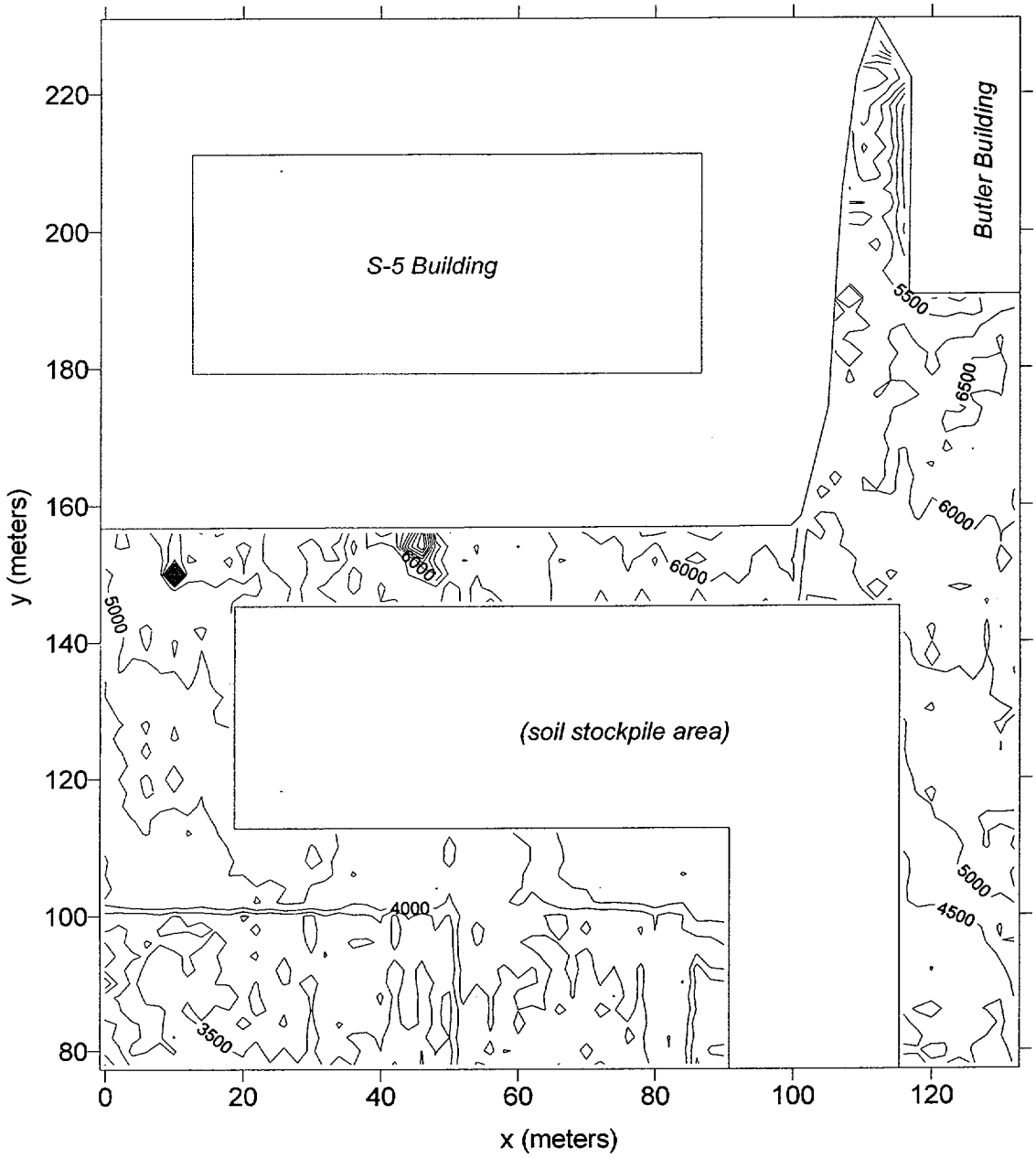
DRAWING NUMBER	5018078

Earth Sciences Consultants, Inc.



N

0 2E+001 4E+001

(note: soil stockpile area is not to scale)

Total Spectrum Measurements Ranged From
2,737 to 16,598 counts per 10 seconds
with an average of 4,923 counts per 10 seconds

Figure 6.1-21
Study Area 1B - Survey Unit 7
1995 Gross Gamma Survey Data
Total Spectrum Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

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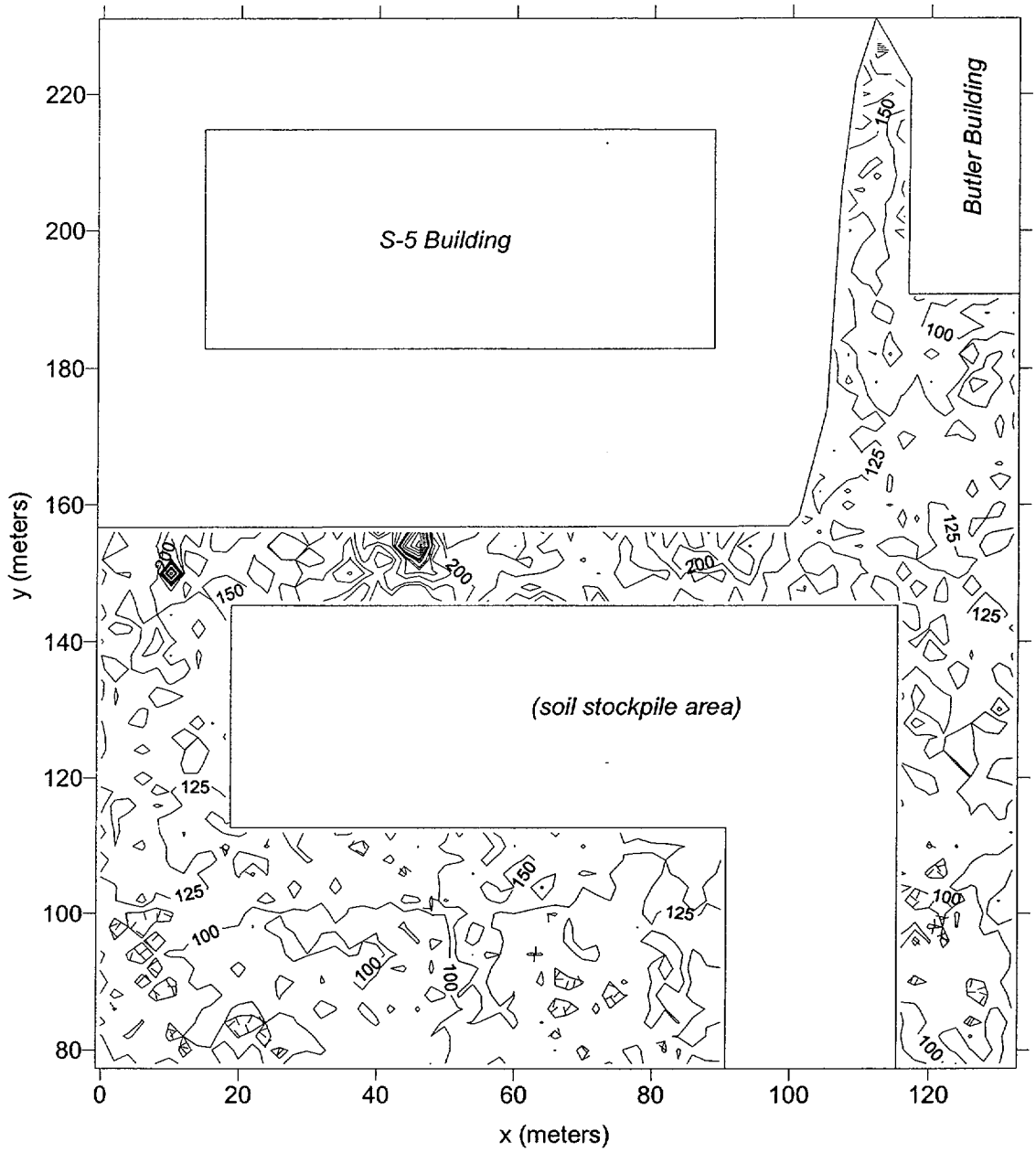


N

0 2E+001 4E+001

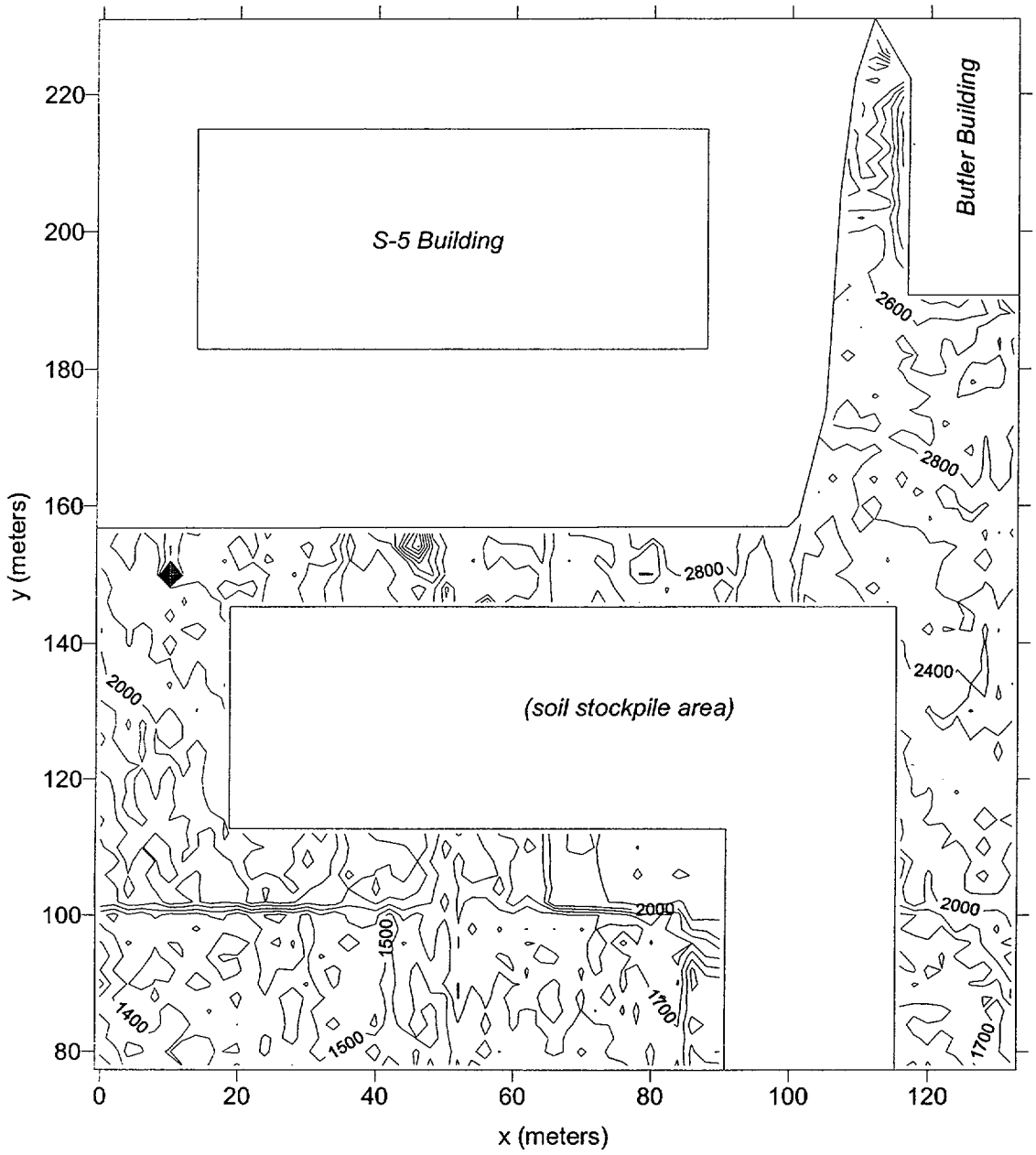
(note: soil stockpile area is not to scale)

Cesium Measurements Ranged From
65 to 2,261 counts per 10 seconds
with an average of 138 counts per 10 seconds

Figure 6.1-22
Study Area 1B - Survey Unit 7
1995 Gross Gamma Survey Data
Cesium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su7-cs.srf



N

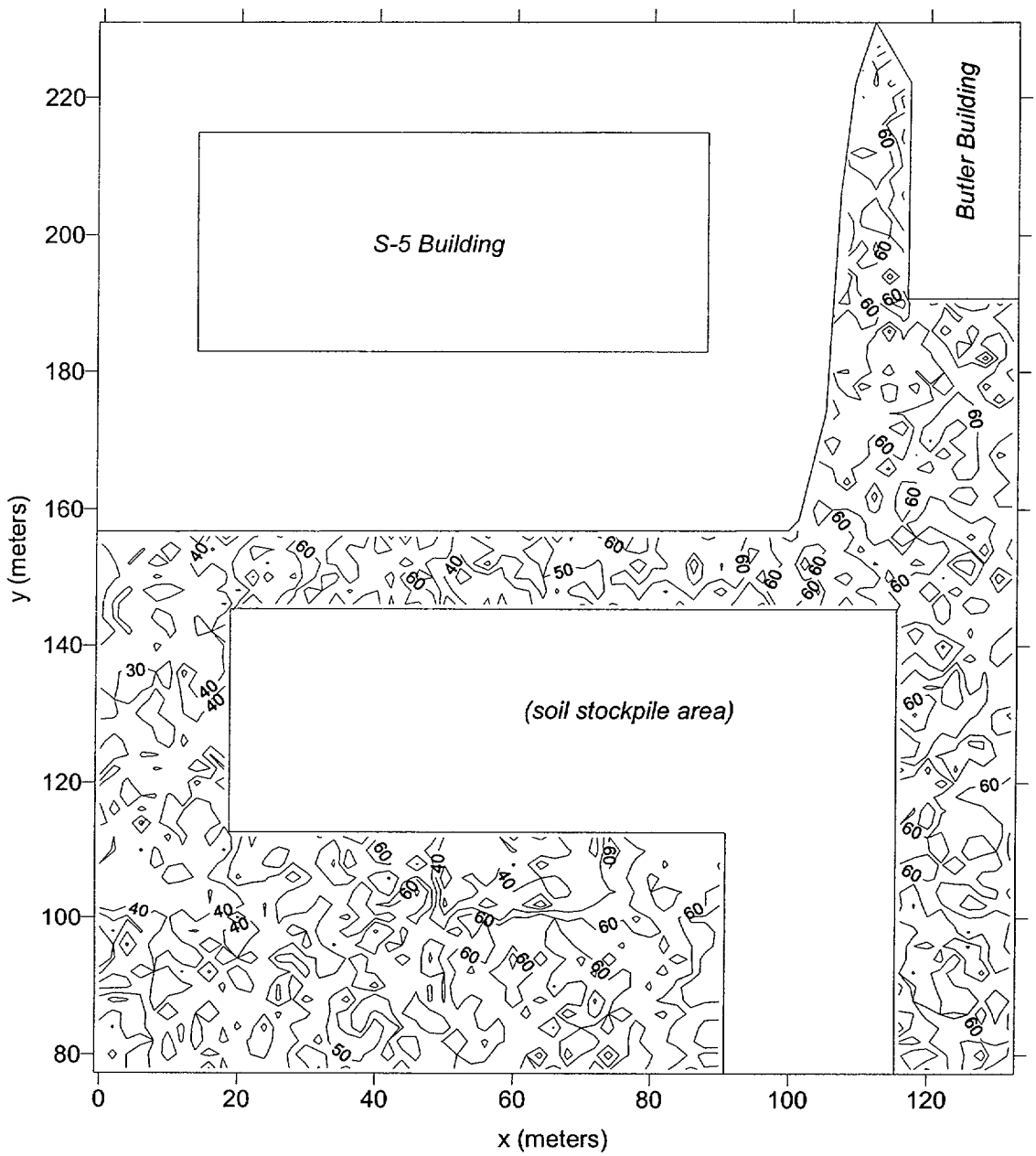
0 2E+001 4E+001
(note: soil stockpile area is not to scale)

Uranium Measurements Ranged From
1,122 to 6,192 counts per 10 seconds
with an average of 2,125 counts per 10 seconds

Figure 6.1-23
Study Area 1B - Survey Unit 7
1995 Gross Gamma Survey Data
Uranium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su7-ur.srf



N

0 2E+001 4E+001

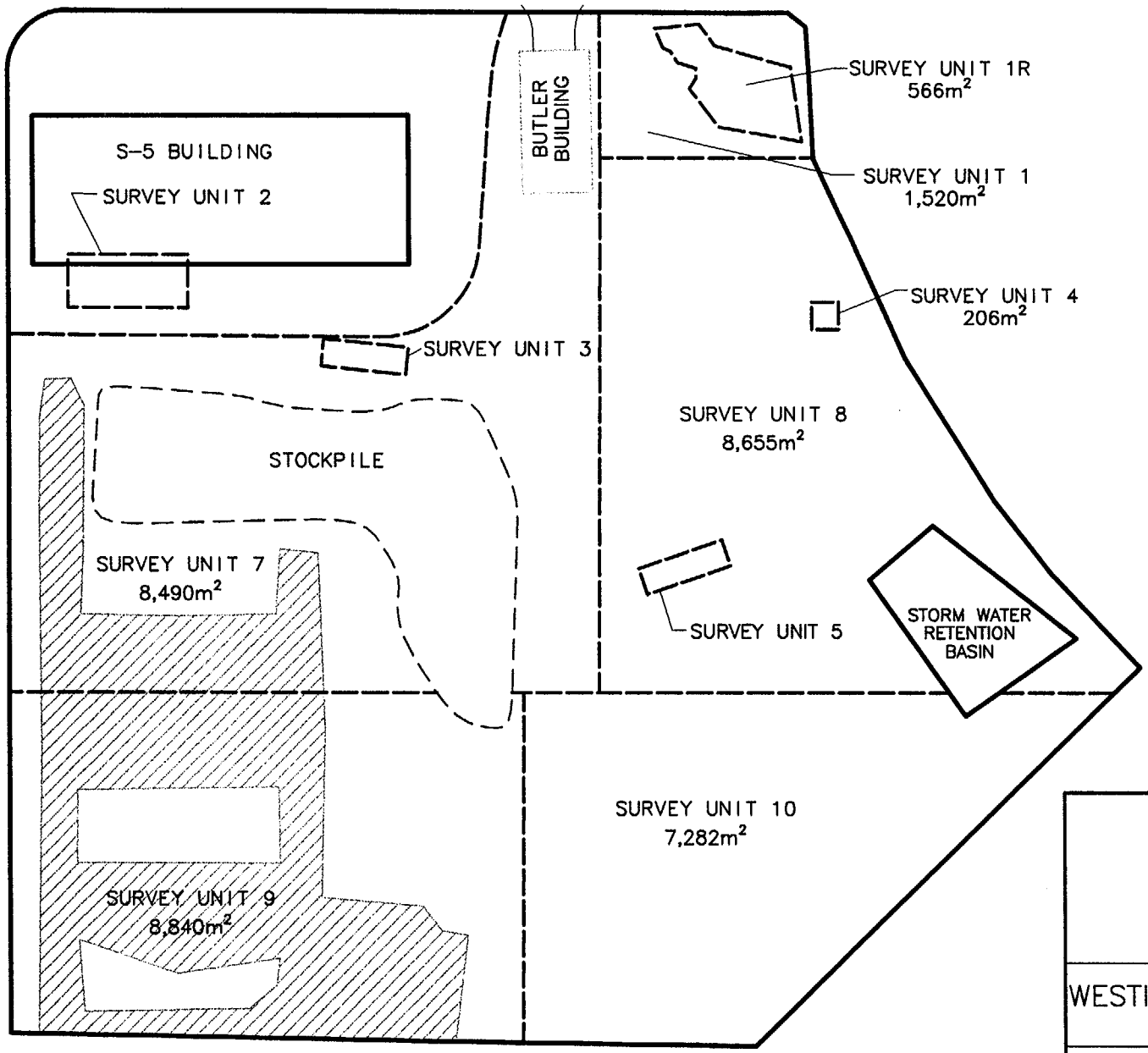
(note: soil stockpile area is not to scale)

Cobalt Measurements Ranged From
16 to 105 counts per 10 seconds
with an average of 52 counts per 10 seconds

Figure 6.1-24
Study Area 1B - Survey Unit 7
1995 Gross Gamma Survey Data
Cobalt Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su7-co.srf



DRAWING NOT TO SCALE

FIGURE 6.1-25
STUDY AREA 1
LOCATION OF GRAVEL AREA
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	Eg
DRAWN	JBJA 1/10/02
DRAWING NUMBER	5018116

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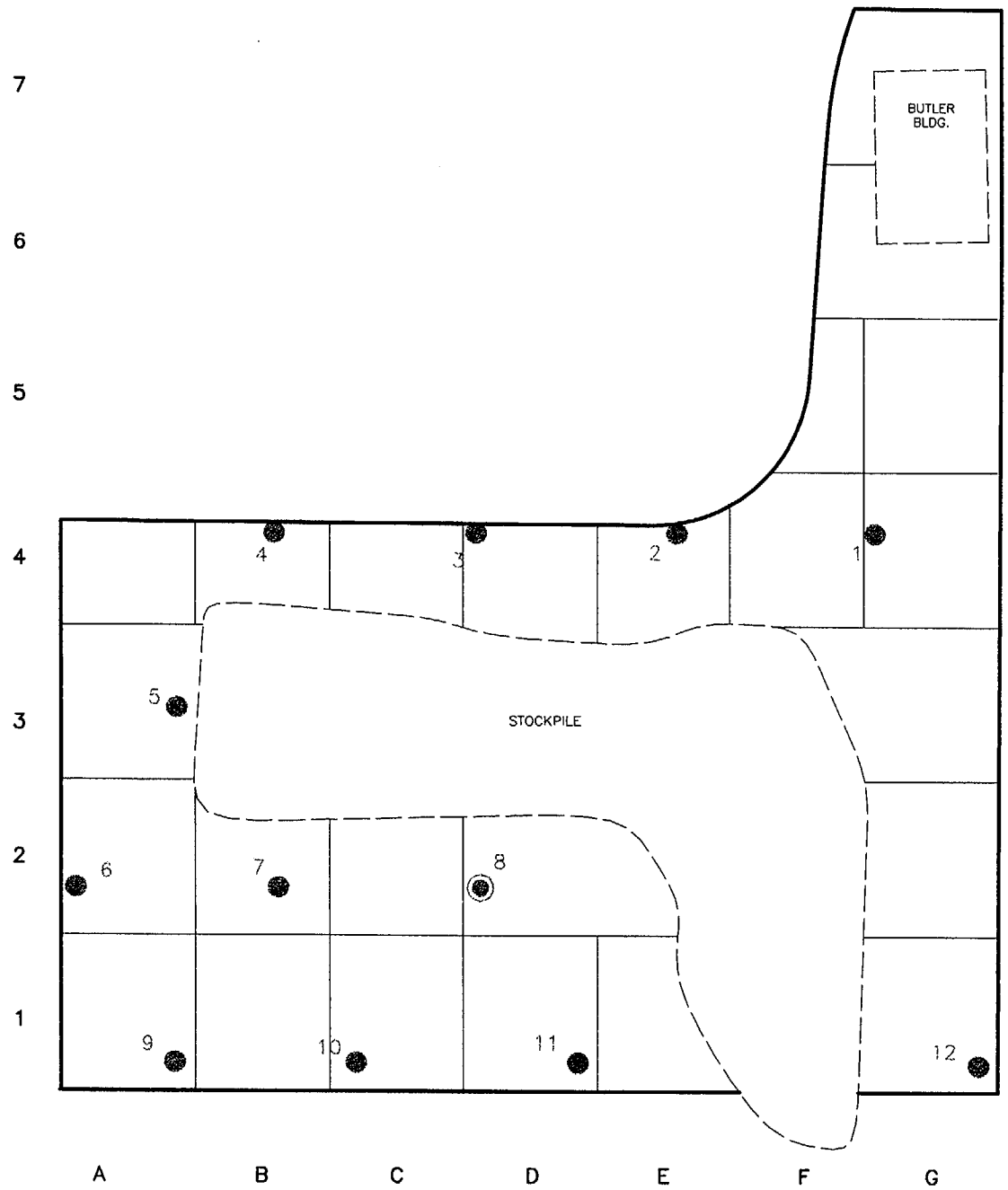

NOTES

GRIDS ARE APPROXIMATELY 20m x 20m.

RANDOM START POINT

SAMPLING POINTS

DRAWING NOT TO SCALE

FIGURE 6.1–26
STUDY AREA 1B–SURVEY UNIT 7
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	
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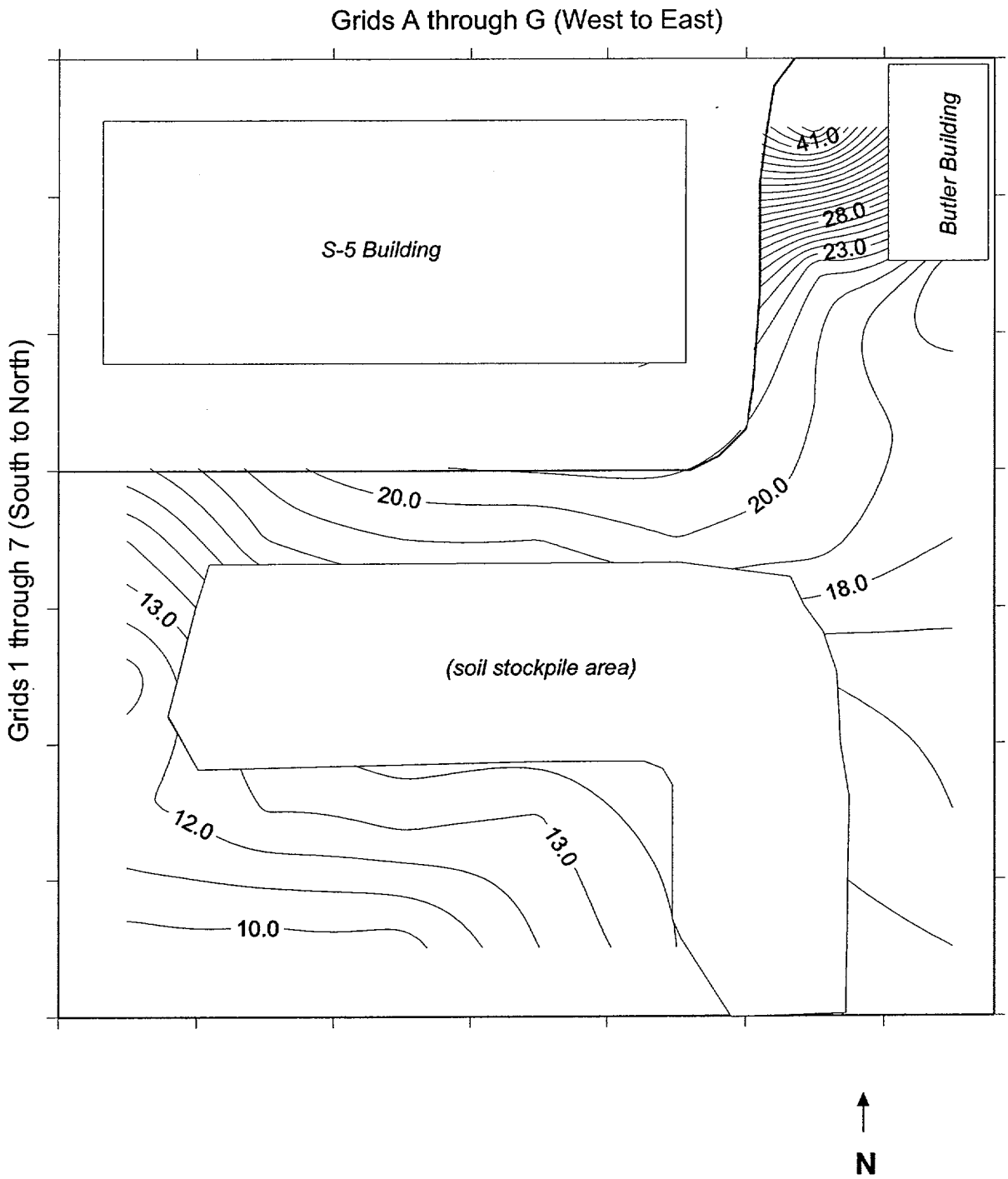
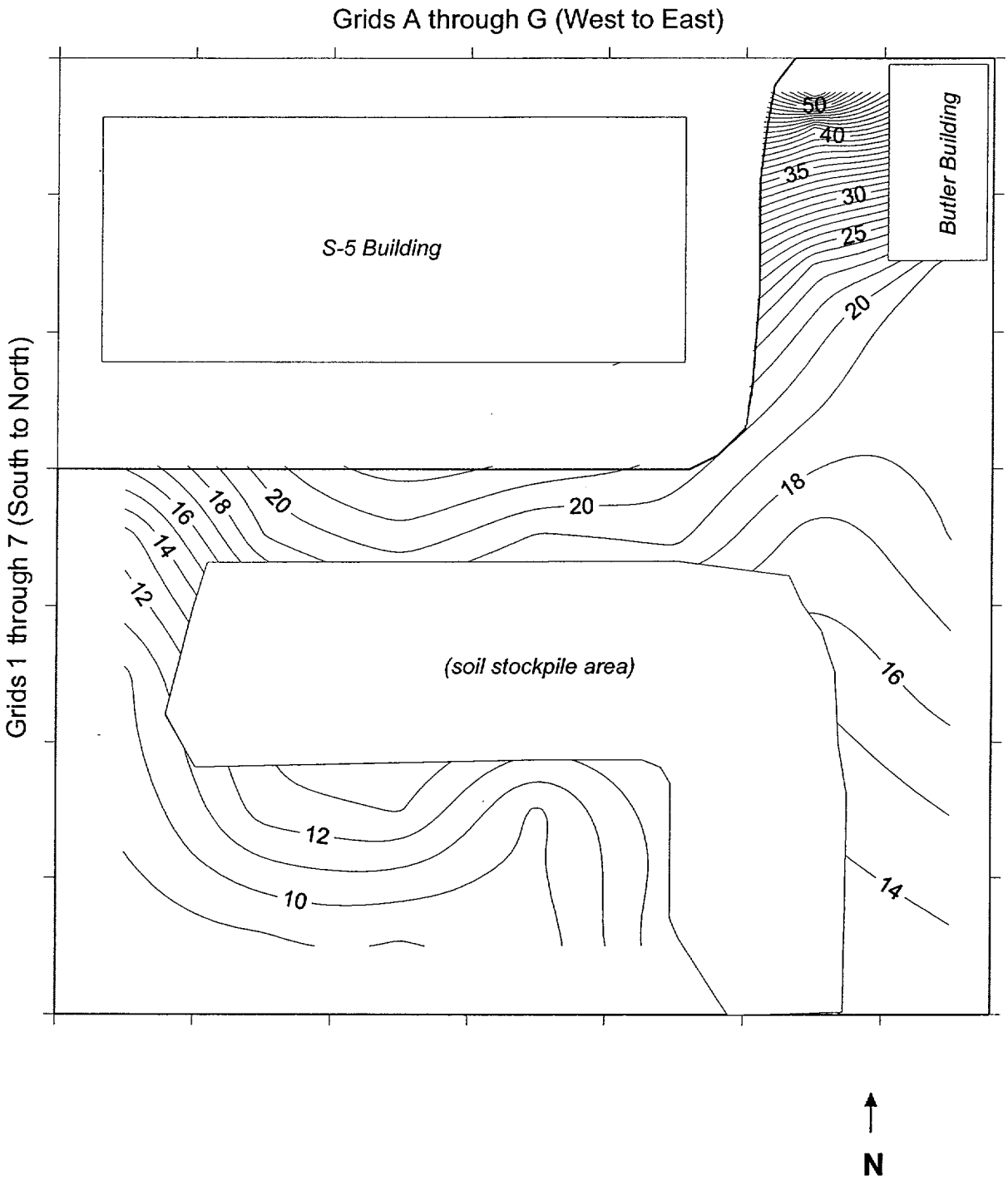


Average Gamma Scans Ranged From
9.5 kcpm to 45 kcpm

Figure 6.1-27
Study Area 1B - Survey Unit 7
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su7-avg.srf

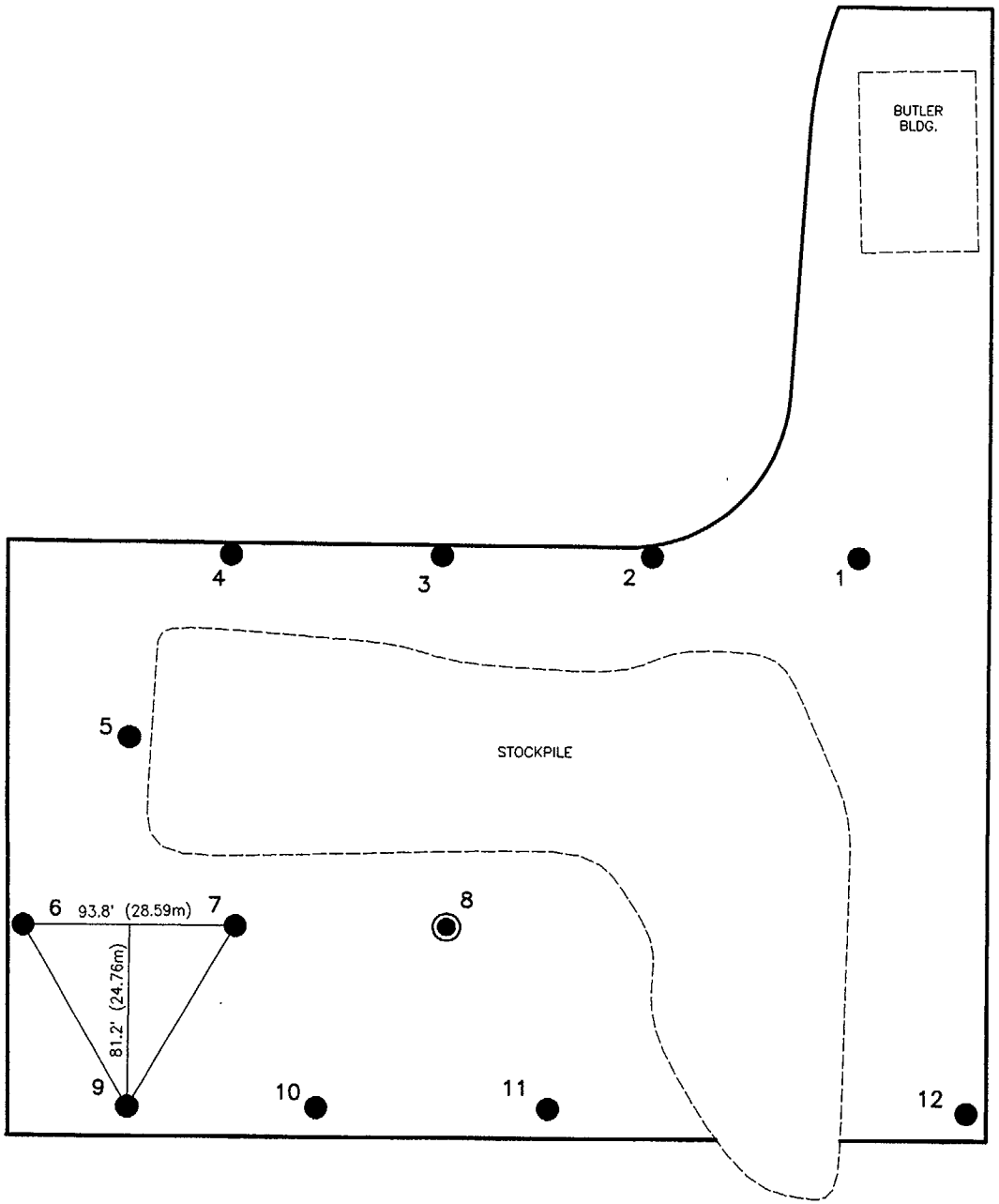


Background Measurements Ranged From
8.2 kcpm to 57.3 kcpm

Figure 6.1-28
Study Area 1B - Survey Unit 7
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su7-bck.srf



N

NOTES

A ≅ 91,390 FT^2 (8,490m^2)
n = 12
L = 93.8 FEET
◉ RANDOM START POINT

SCALE – FEET
80 0 80
20 0 20
SCALE – METERS

FIGURE 6.1–29
STUDY AREA 1B–SURVEY UNIT 7
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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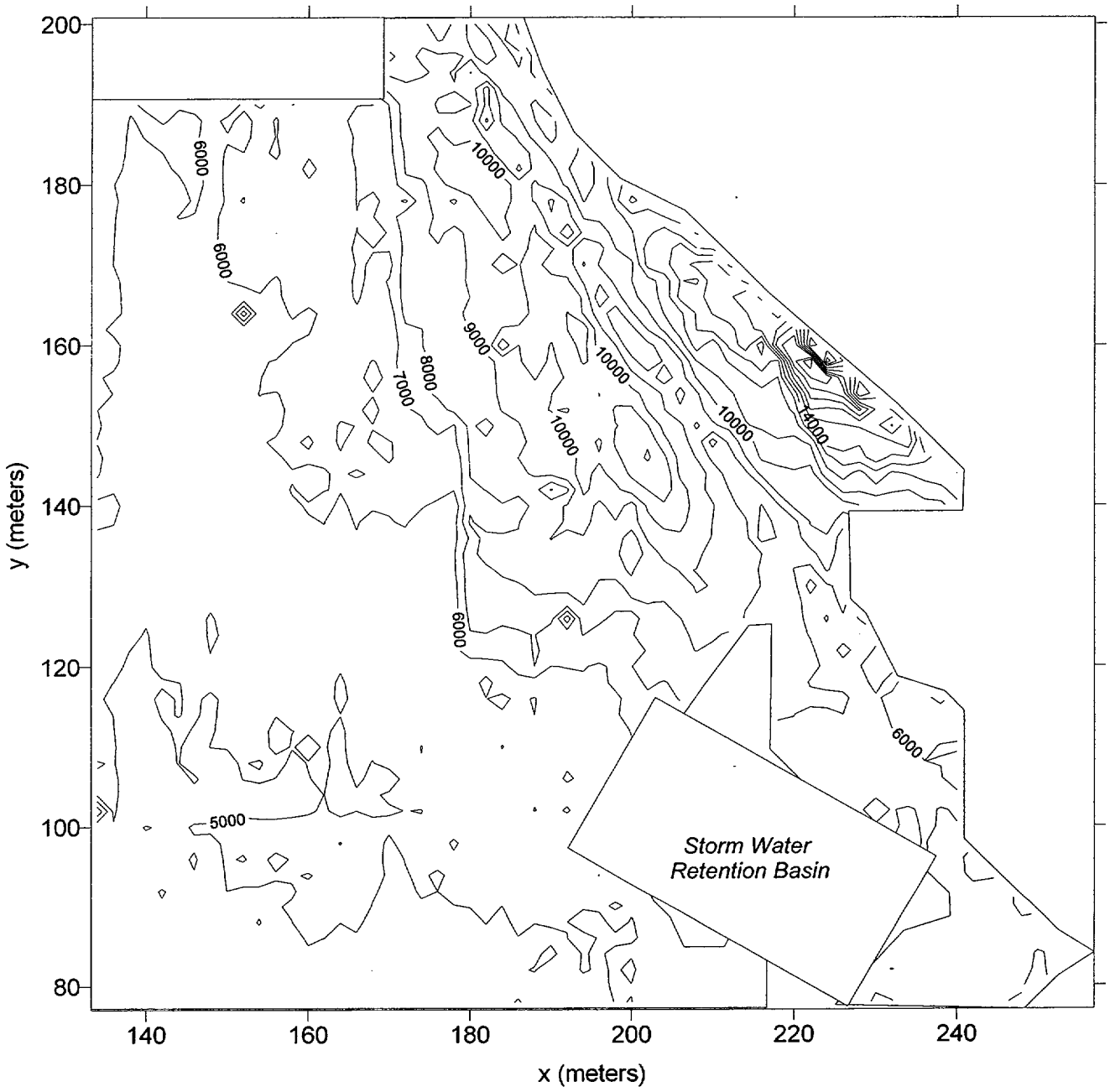
DRAWN	GJA 1/11/02
DRAWING NUMBER	5018120

Earth Sciences Consultants, Inc.



N

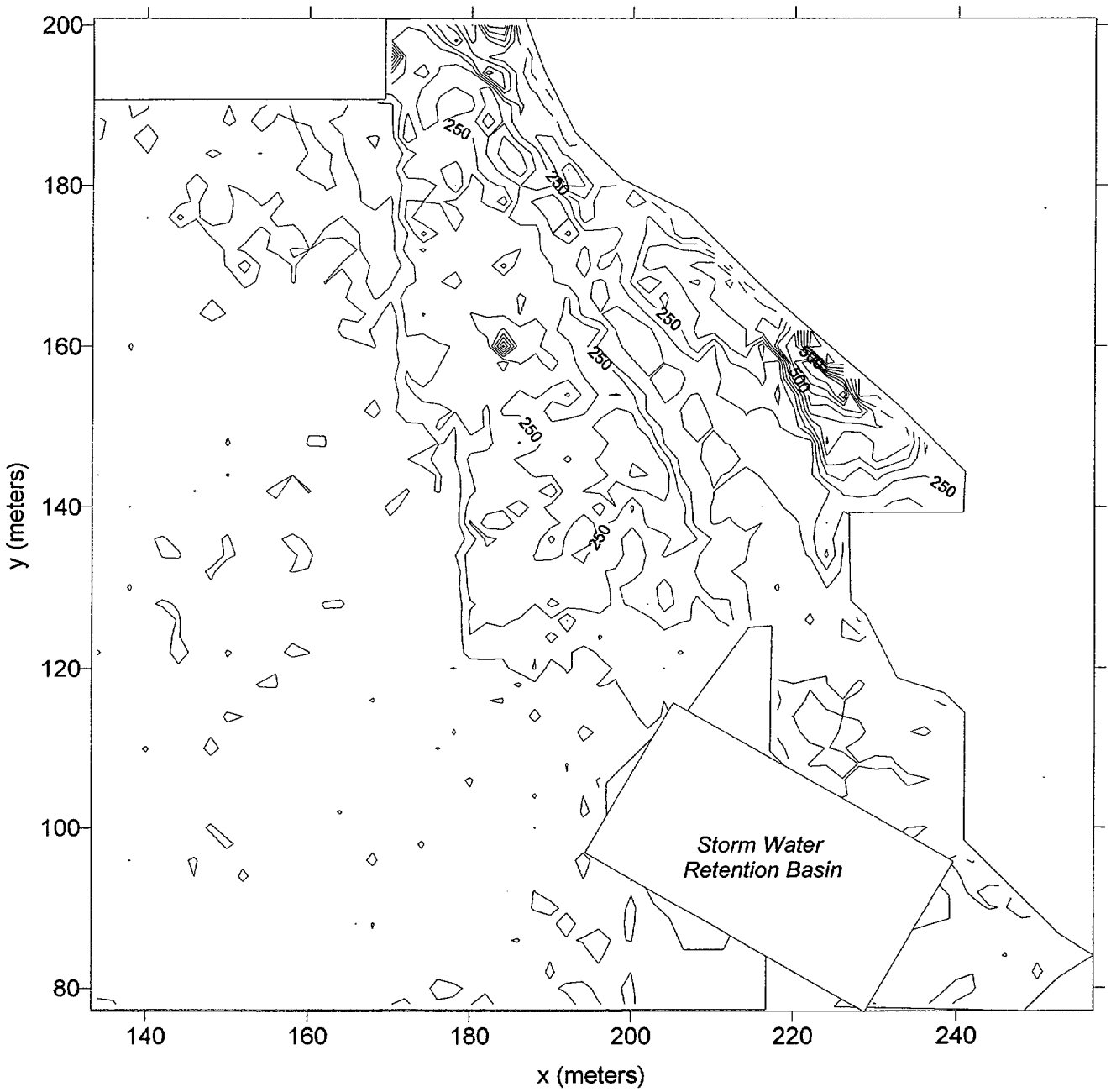
0 2E+001 4E+001

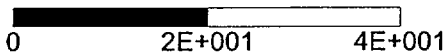
Total Spectrum Measurements Ranged From
2,156 to 186,145 counts per 10 seconds
with an average of 7,157 counts per 10 seconds

Figure 6.1-30
Study Area 1B - Survey Unit 8
1995 Gross Gamma Survey Data
Total Spectrum Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su8-spec.srf



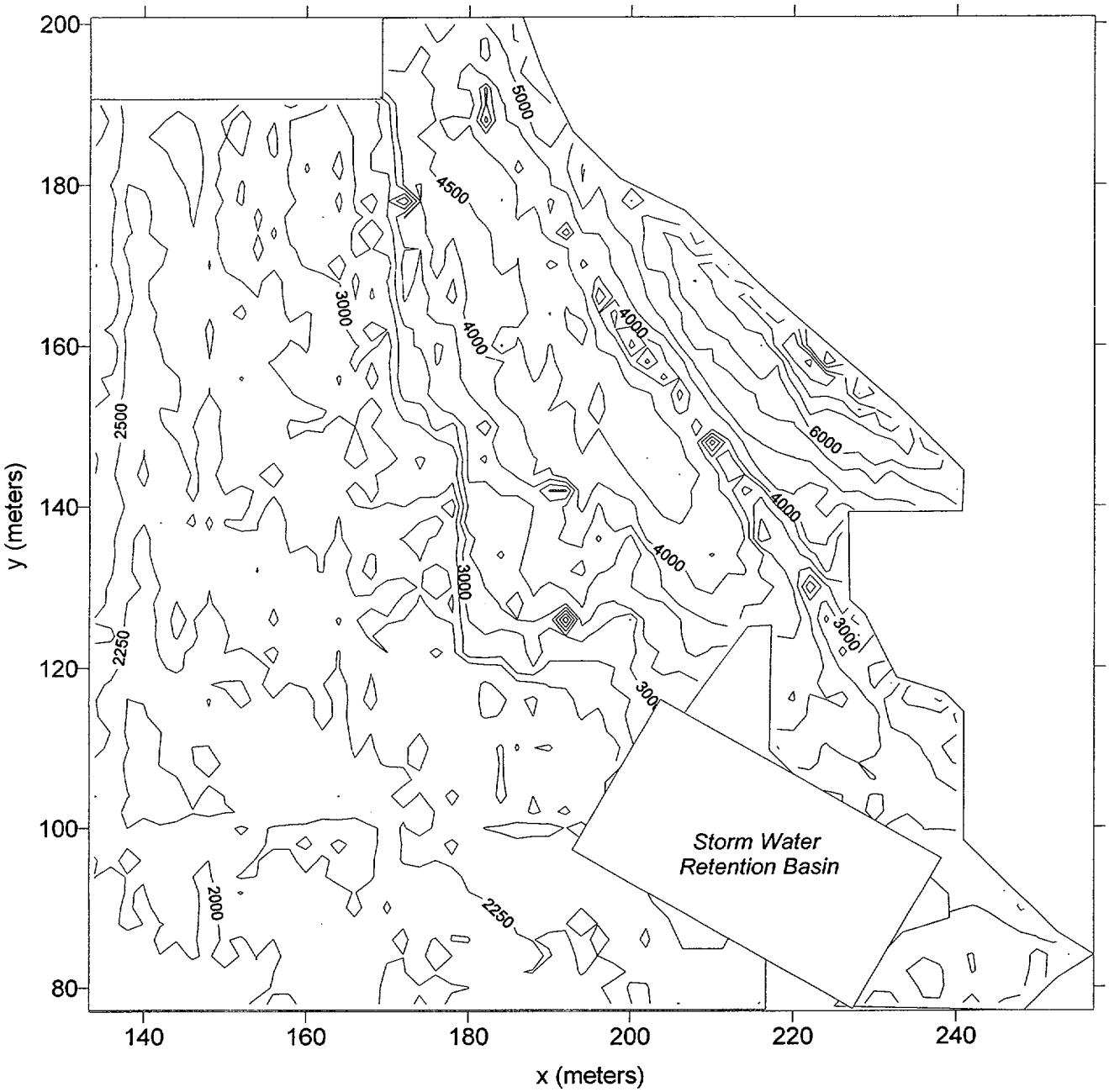


Cesium Measurements Ranged From
78 to 32,400 counts per 10 seconds
with an average of 198 counts per 10 seconds

Figure 6.1-31
Study Area 1B - Survey Unit 8
1995 Gross Gamma Survey Data
Cesium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su8-cs.srf



N

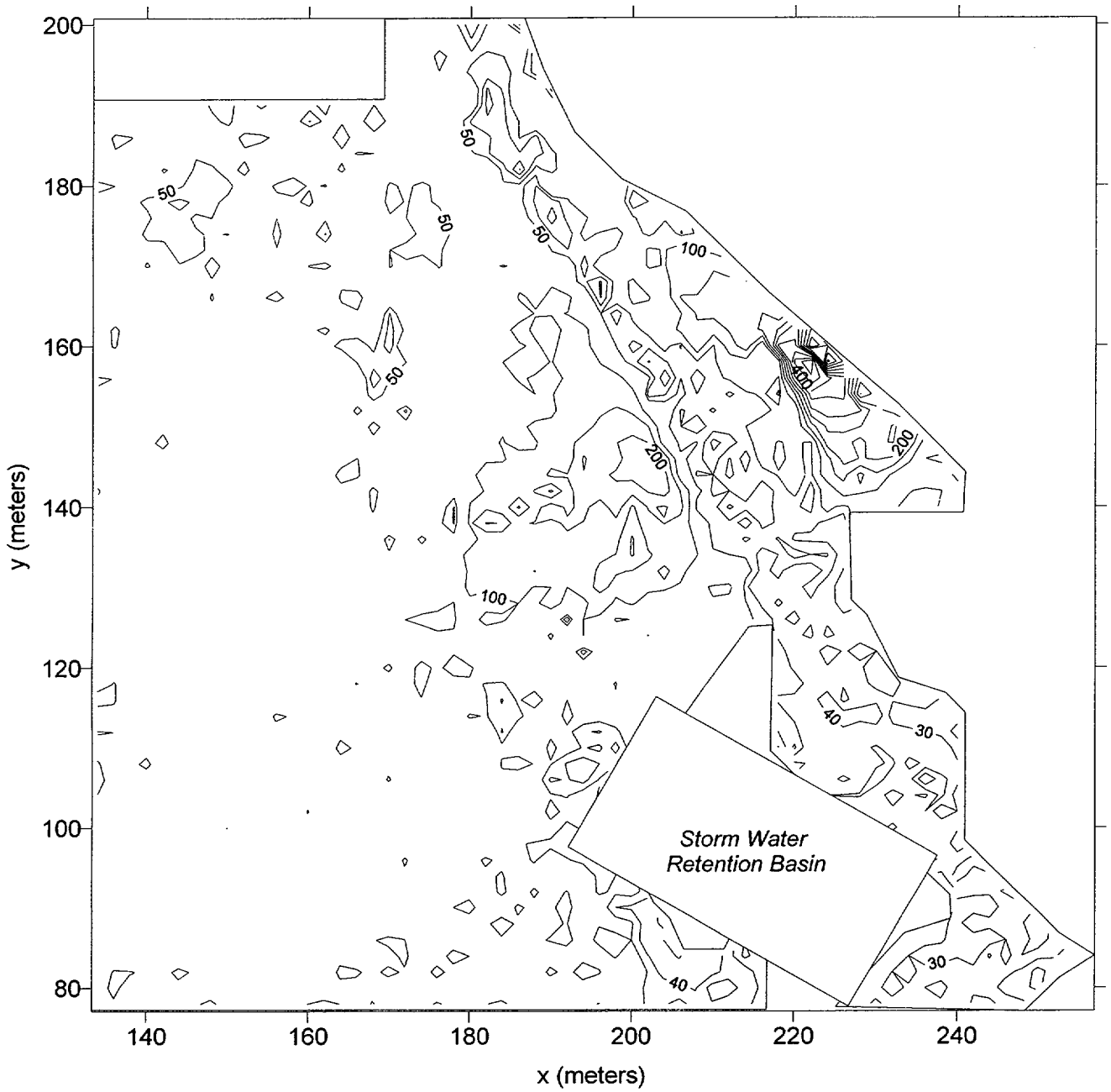
0 2E+001 4E+001

Uranium Measurements Ranged From
1,732 to 126,021 counts per 10 seconds
with an average of 3,232 counts per 10 seconds

Figure 6.1-32
Study Area 1B - Survey Unit 8
1995 Gross Gamma Survey Data
Uranium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su8-ur.srf



N

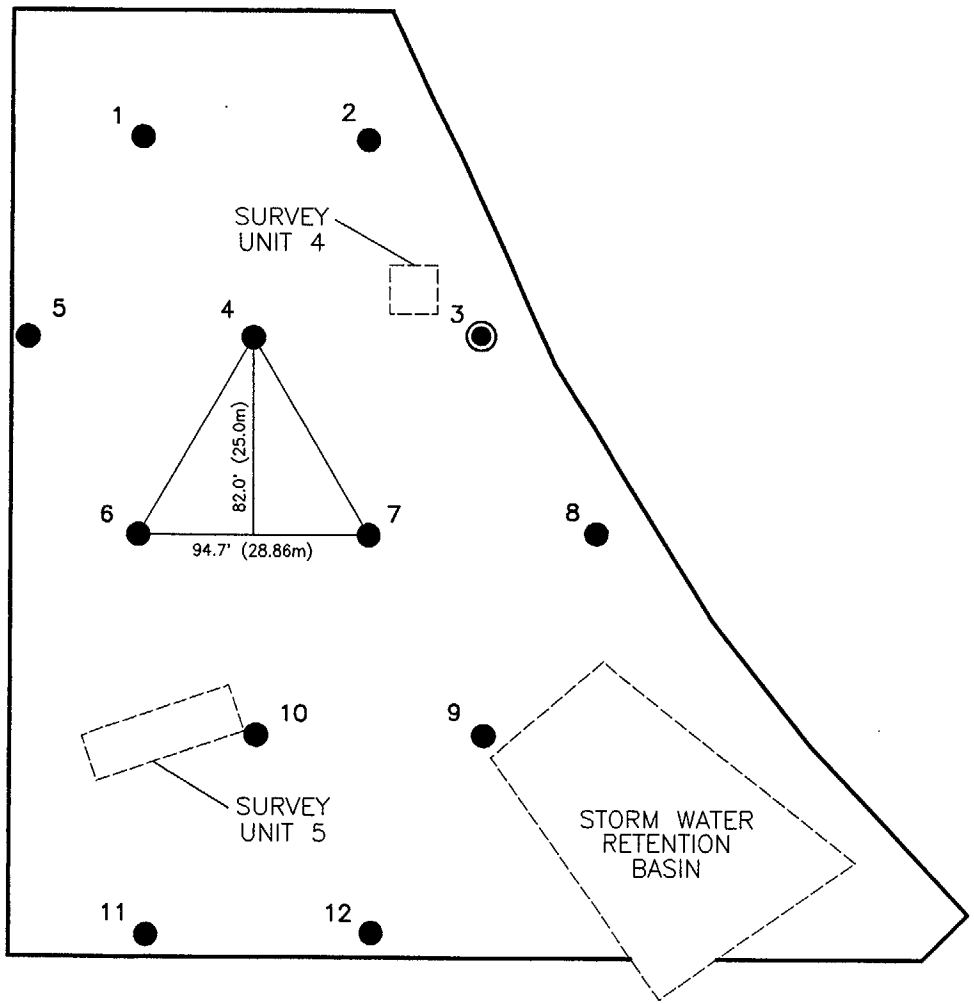
0 2E+001 4E+001

Cobalt Measurements Ranged From
15 to 544 counts per 10 seconds
with an average of 68 counts per 10 seconds

Figure 6.1-33
Study Area 1B - Survey Unit 8
1995 Gross Gamma Survey Data
Cobalt Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su8-co.srf



N

NOTES

A ≅ 93,162 FT^2 (8,655m^2)
n = 12
L = 94.7 FEET
◉ RANDOM START POINT

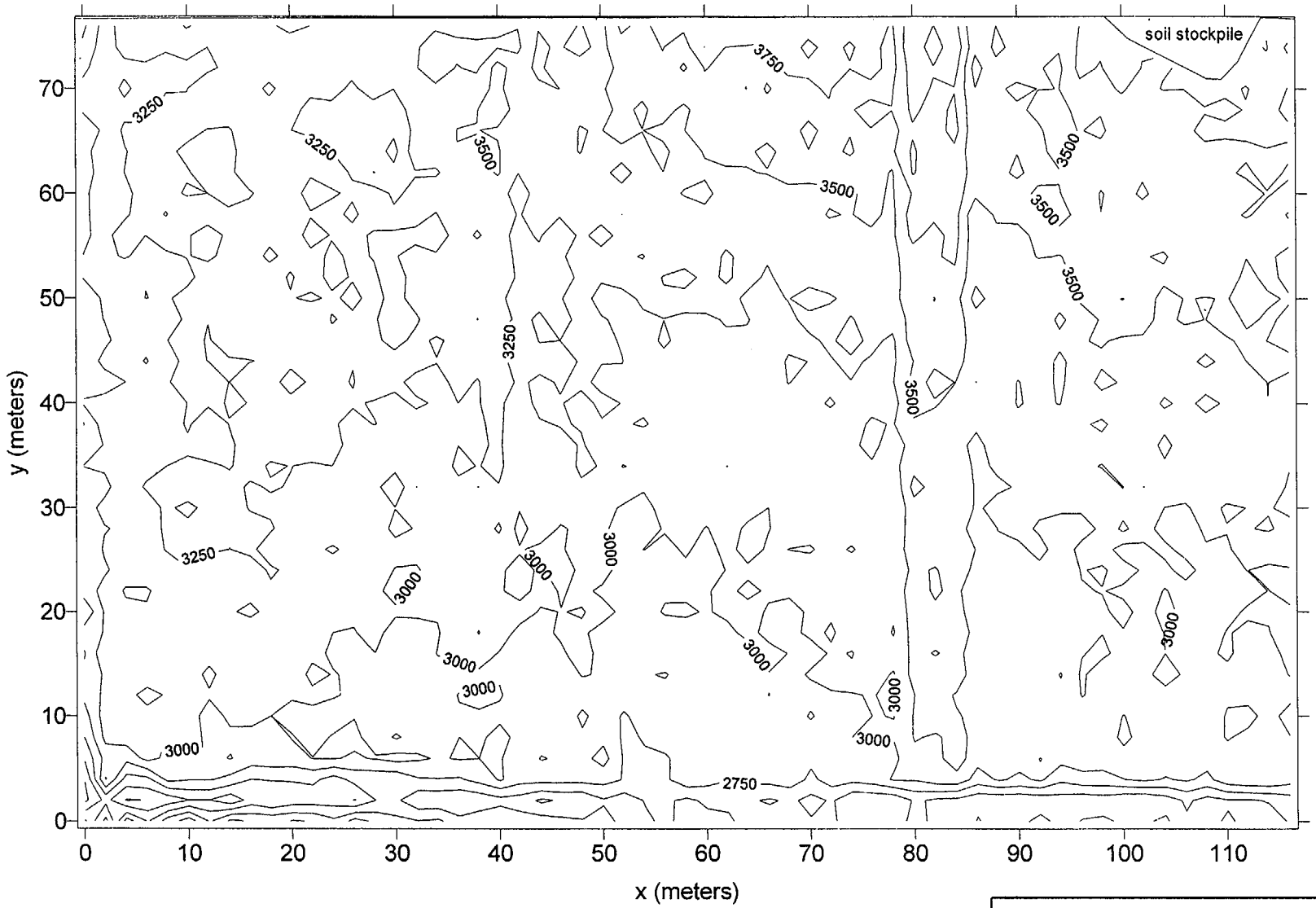
SCALE – FEET
80 0 80
20 0 20
SCALE – METERS

FIGURE 6.1–34
STUDY AREA 1B–SURVEY UNIT 8
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	
DRAWN	GJA 1/11/02
DRAWING NUMBER	5018117

Earth Sciences Consultants, Inc.



N

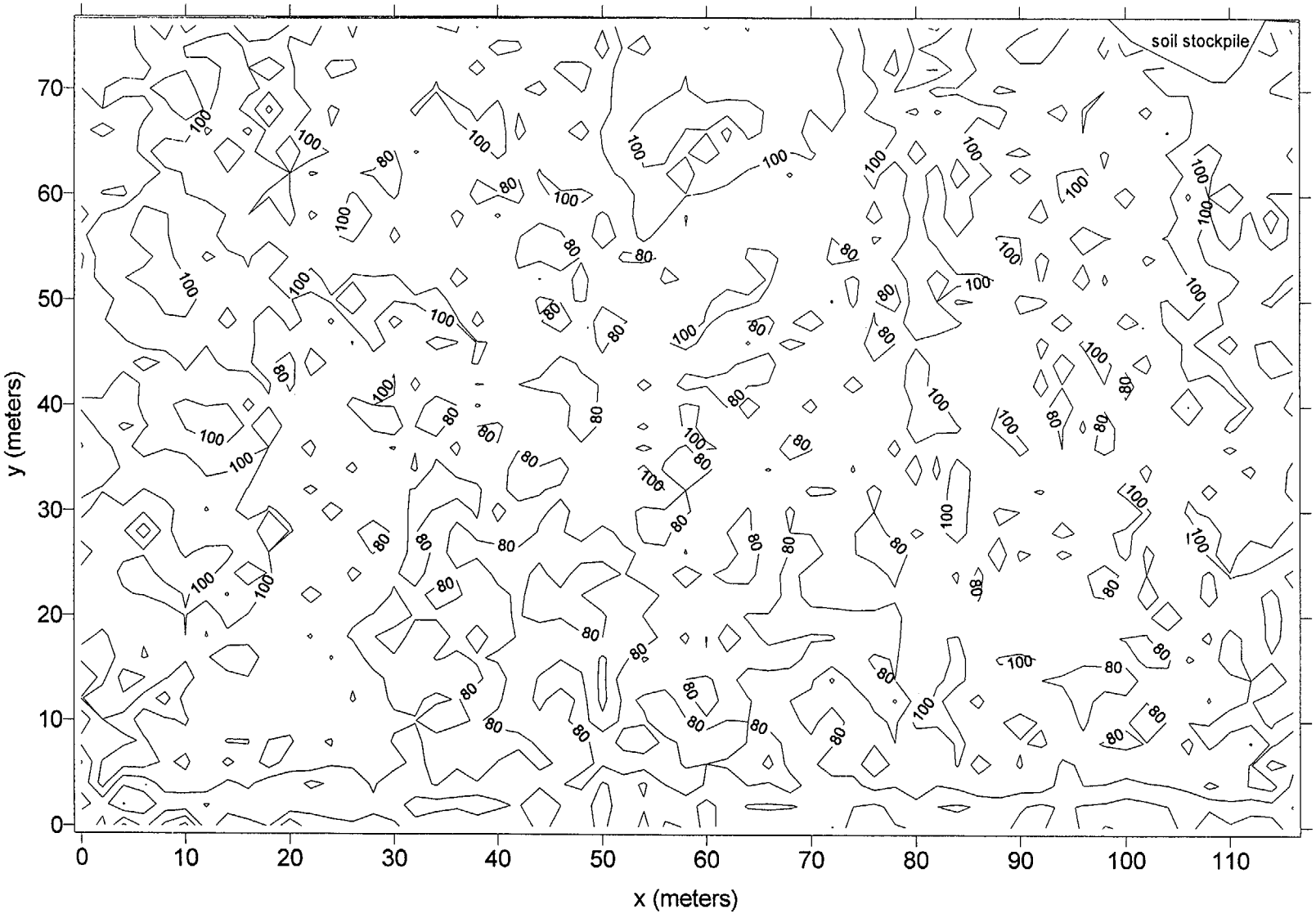
Total Spectrum Measurements Ranged From
1,933 to 4,250 counts per 10 seconds
with an average of 3,218 counts per 10 seconds

0 2E+001 4E+001

Figure 6.1-35
Study Area 1A - Survey Unit 9
1995 Gross Gamma Survey Data
Total Spectrum Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su9-spec.srf



N

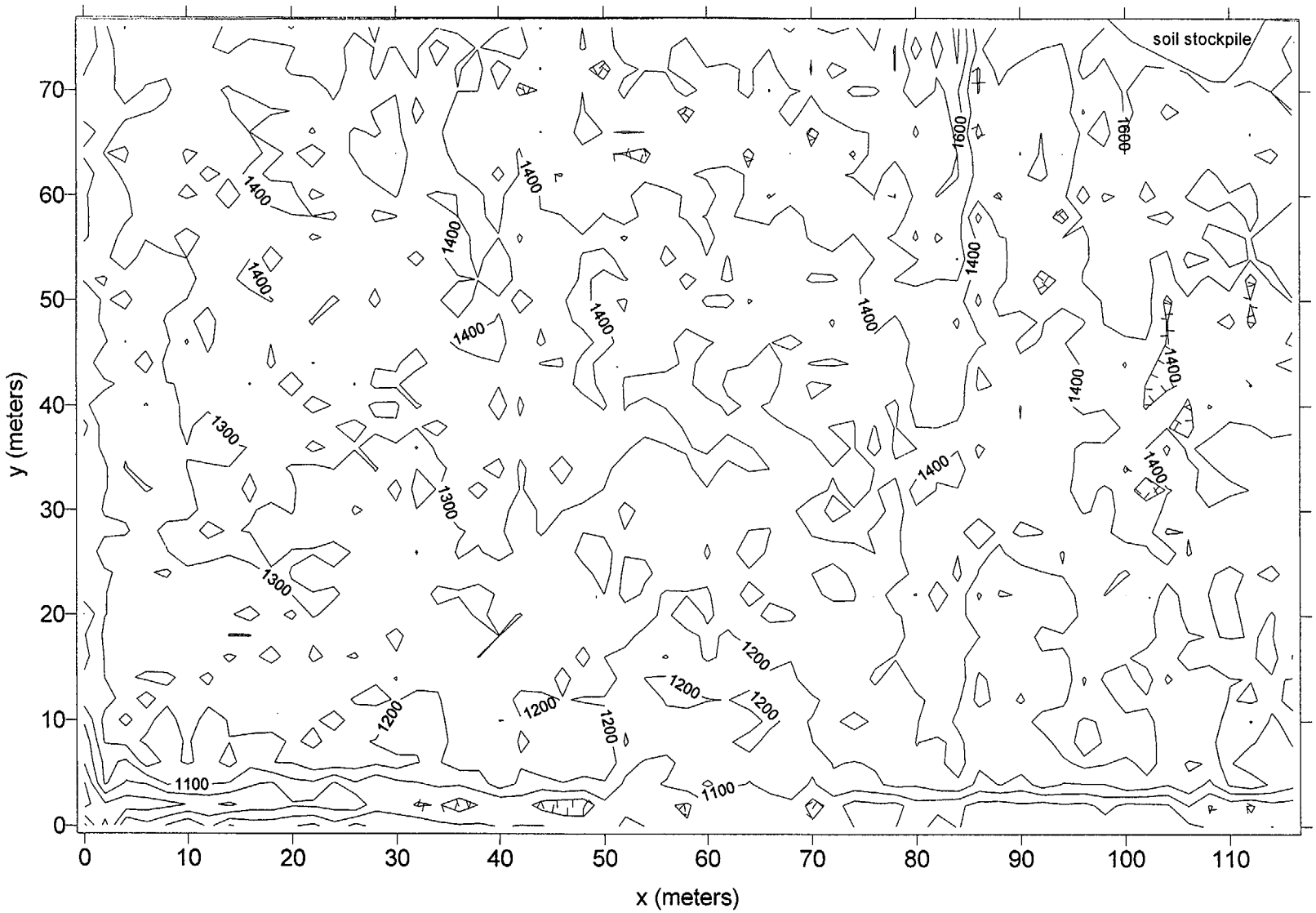
Cesium Measurements Ranged From
38 to 144 counts per 10 seconds
with an average of 90 counts per 10 seconds

0 2E+001 4E+001

Figure 6.1-36
Study Area 1A - Survey Unit 9
1995 Gross Gamma Survey Data
Cesium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su9-cs.srf



N

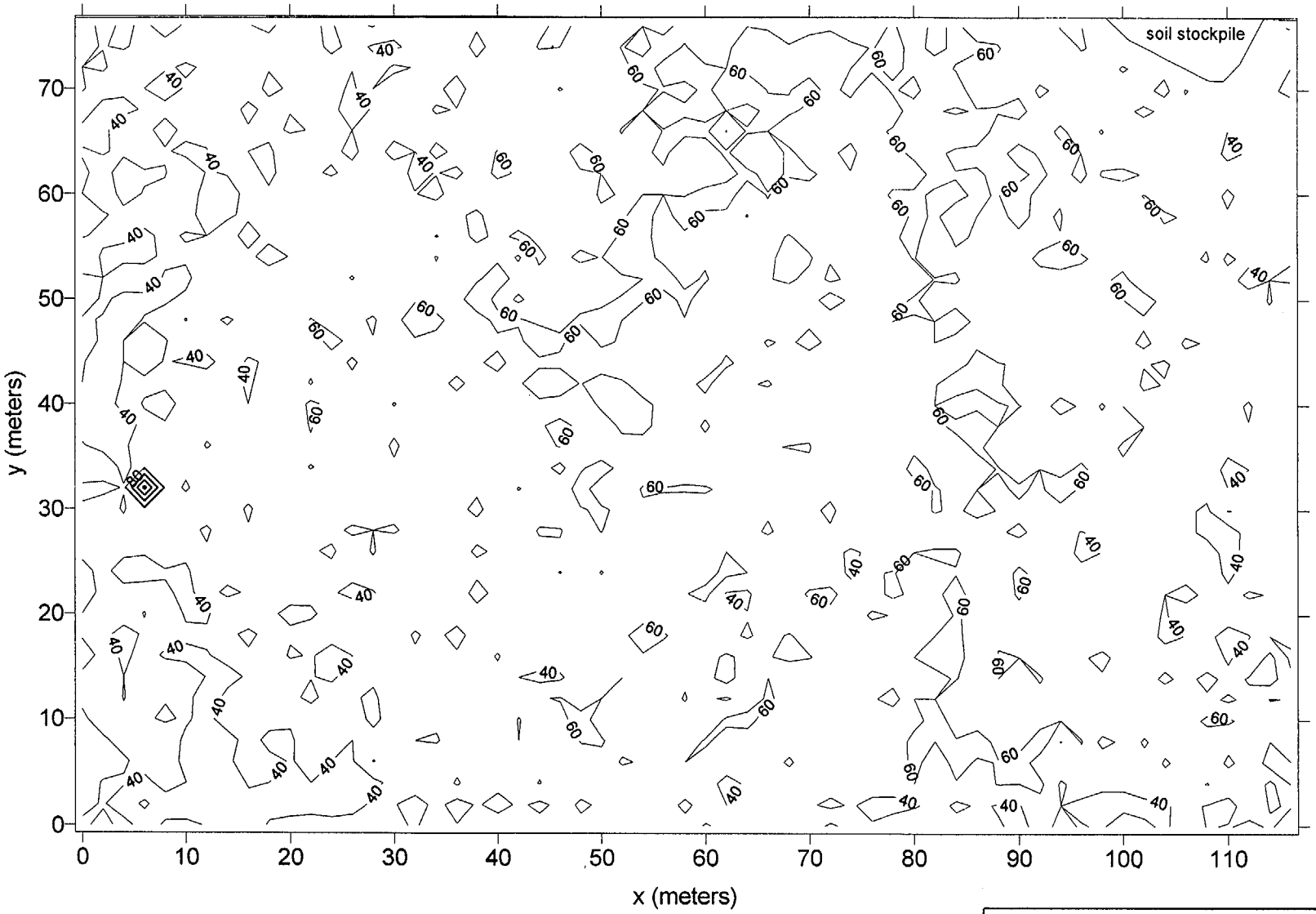
Uranium Measurements Ranged From
763 to 1,762 counts per 10 seconds
with an average of 1,324 counts per 10 seconds

0 2E+001 4E+001

Figure 6.1-37
Study Area 1A - Survey Unit 9
1995 Gross Gamma Survey Data
Uranium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su9-ur.srf



N

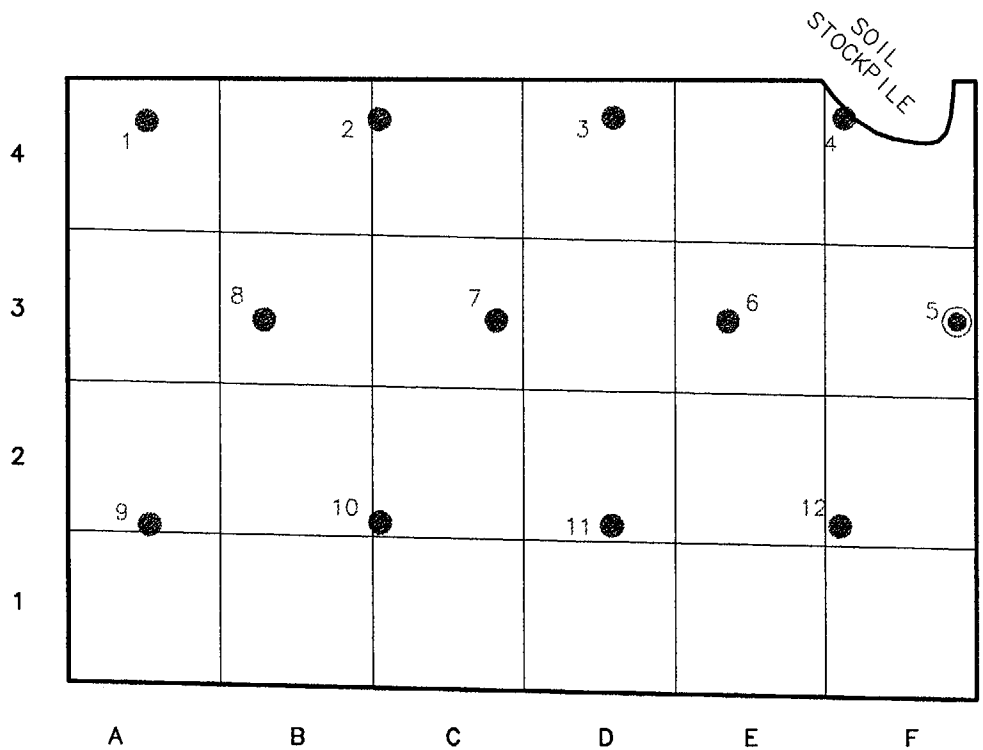
Cobalt Measurements Ranged From
17 to 347 counts per 10 seconds
with an average of 50 counts per 10 seconds

0 2E+001 4E+001

k:/5018/Fssr/Cas/Surfer/Area1/Su9-co.srf

Figure 6.1-38
Study Area 1A - Survey Unit 9
1995 Gross Gamma Survey Data
Cobalt Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.



N

NOTES

GRIDS ARE APPROXIMATELY 20m x 20m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.1–39
STUDY AREA 1A–SURVEY UNIT 9
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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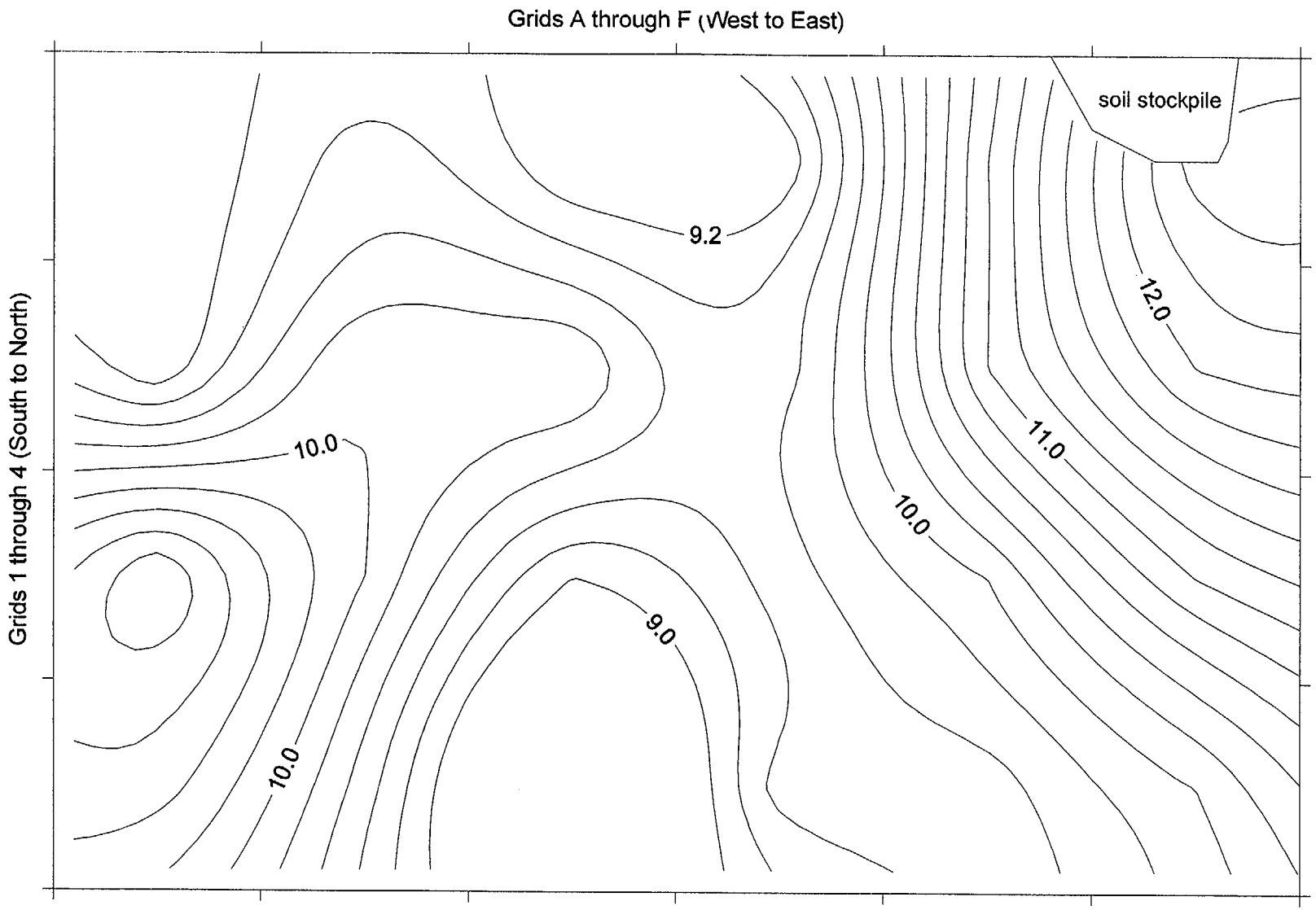
DRAWN	DBB 3/13/03
DRAWING NUMBER	5018S53A

Earth Sciences Consultants, Inc.



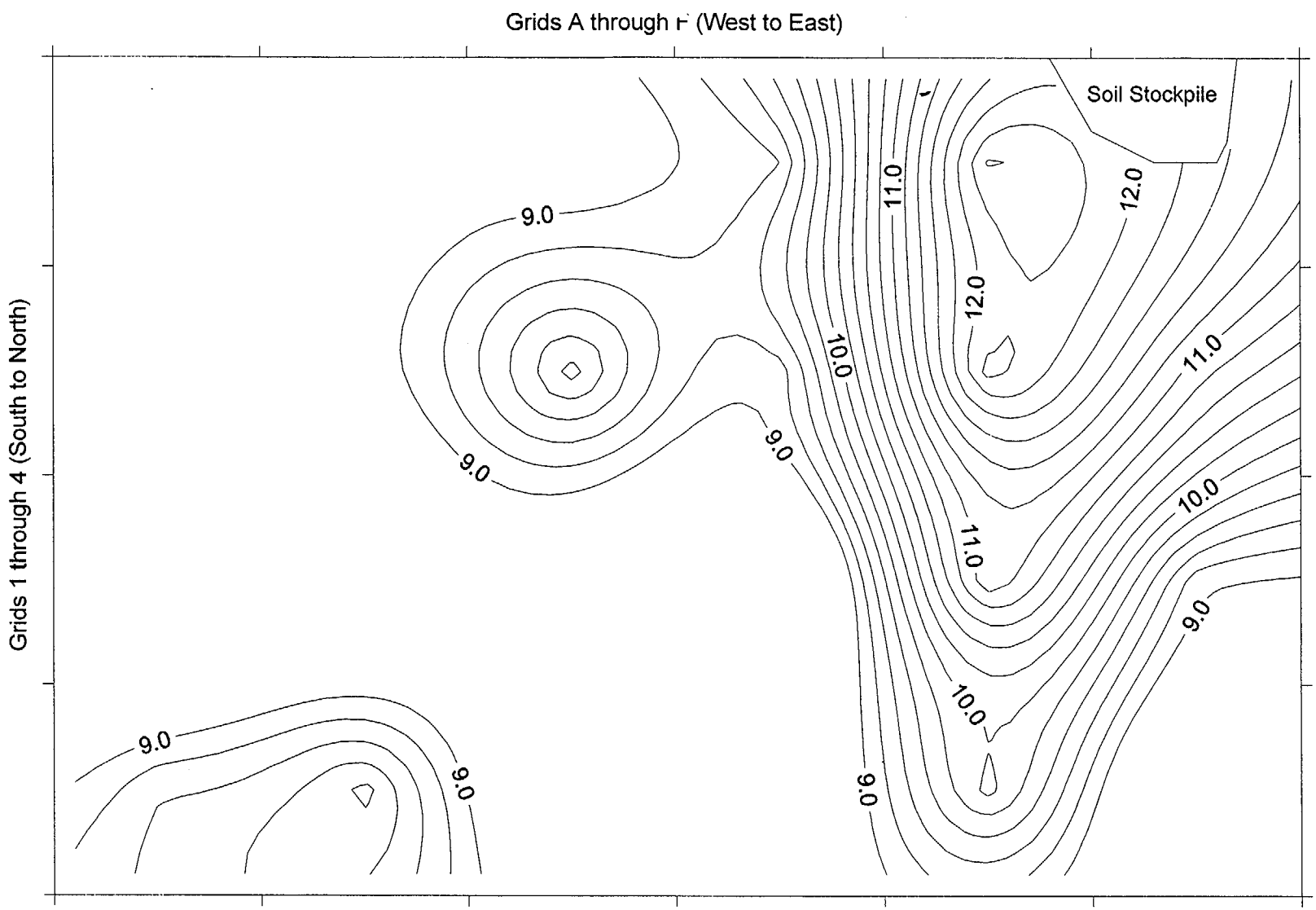
N

Average Gamma Scans Ranged From
8 kcpm to 12.5 kcpm

Figure 6.1-40
Study Area 1A - Survey Unit 9
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su9-avg.srf



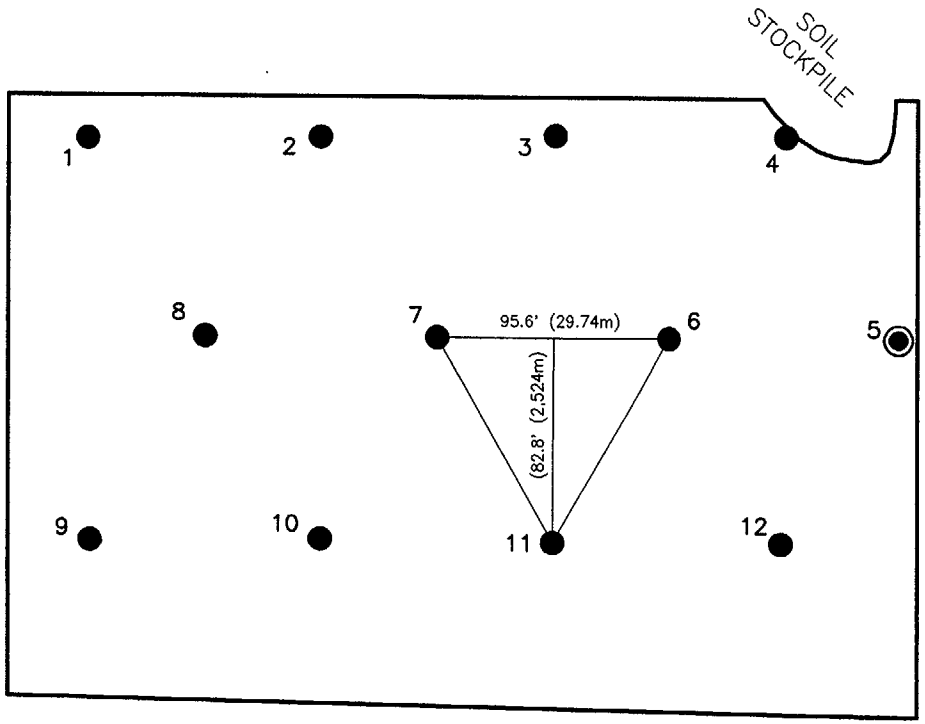
N

Background Measurements Ranged From
7.6 kcpm to 12.4 kcpm

Figure 6.1-41
Study Area 1A - Survey Unit 9
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su9-bck.srf



N

NOTES

A ≅ 95,153 FT^2 (8,840m^2)
n = 12
L = 95.6 FEET
◉ RANDOM START POINT

SCALE – FEET
80 0 80
20 0 20
SCALE – METERS

FIGURE 6.1–42
STUDY AREA 1A–SURVEY UNIT 9
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	Eg.
DRAWN	GJA 1/11/02
DRAWING NUMBER	5018119

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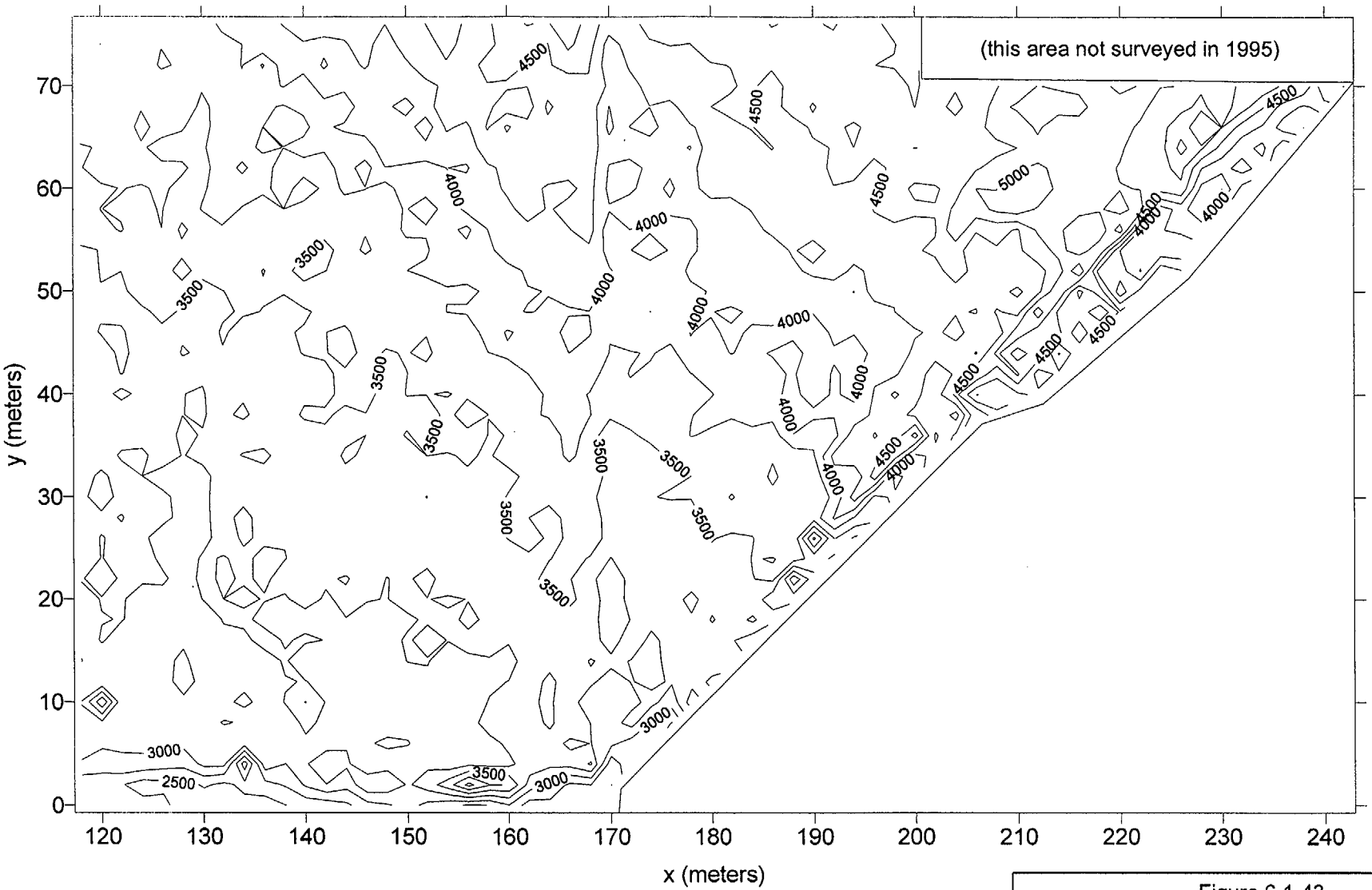


N

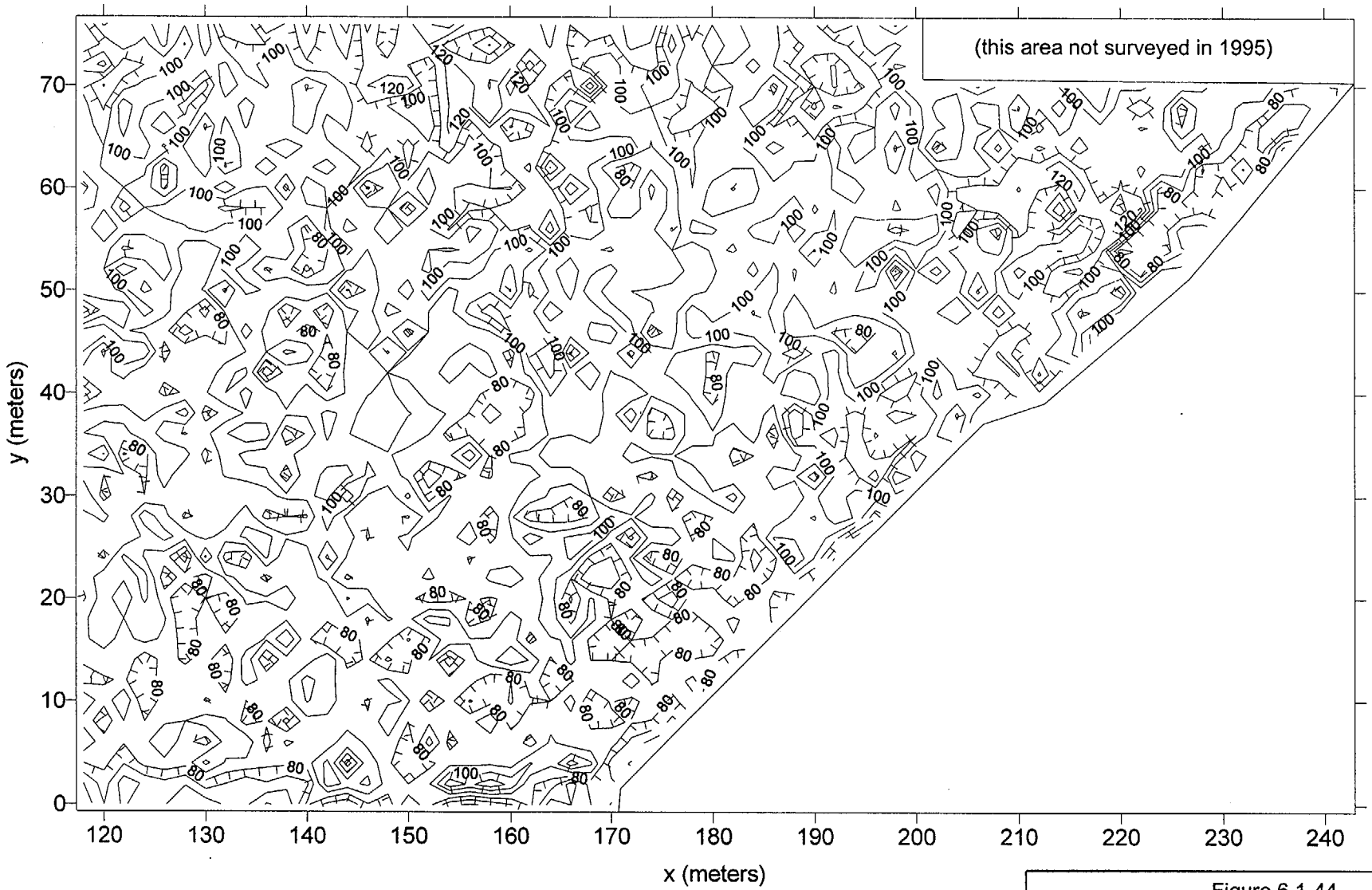
Total Spectrum Measurements Ranged From
2,119 to 5,261 counts per 10 seconds
with an average of 3,788 counts per 10 seconds

0 2E+001 4E+001

Figure 6.1-43
Study Area 1A - Survey Unit 10
1995 Gross Gamma Survey Data
Total Spectrum Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su10-spc.srf



N

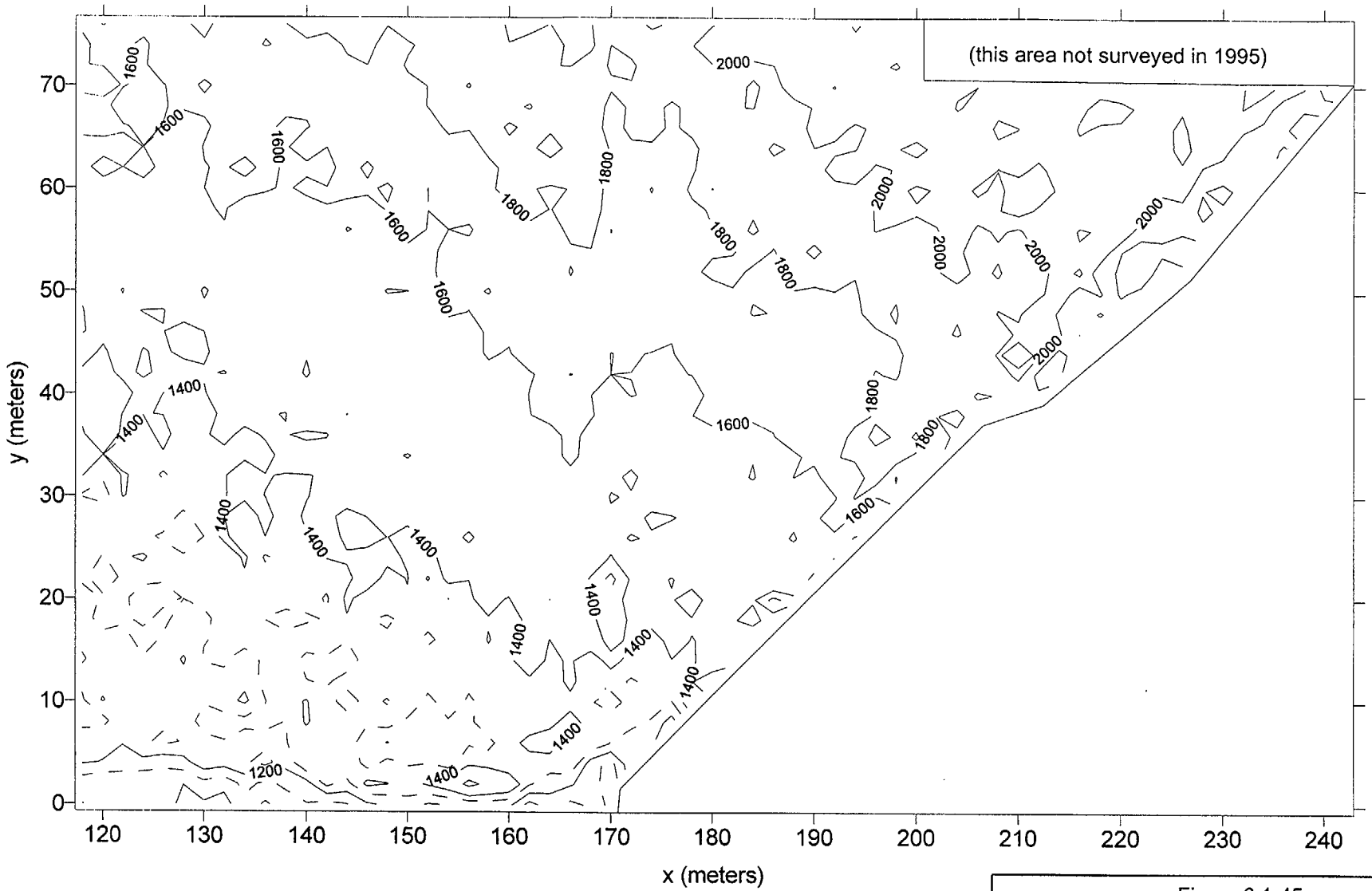
Cesium Measurements Ranged From
49 to 138 counts per 10 seconds
with an average of 92 counts per 10 seconds

0 2E+001 4E+001

k:/5018/Fssr/Cas/Surfer/Area1/Su10-cs.srf

Figure 6.1-44
Study Area 1A - Survey Unit 10
1995 Gross Gamma Survey Data
Cesium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.



N

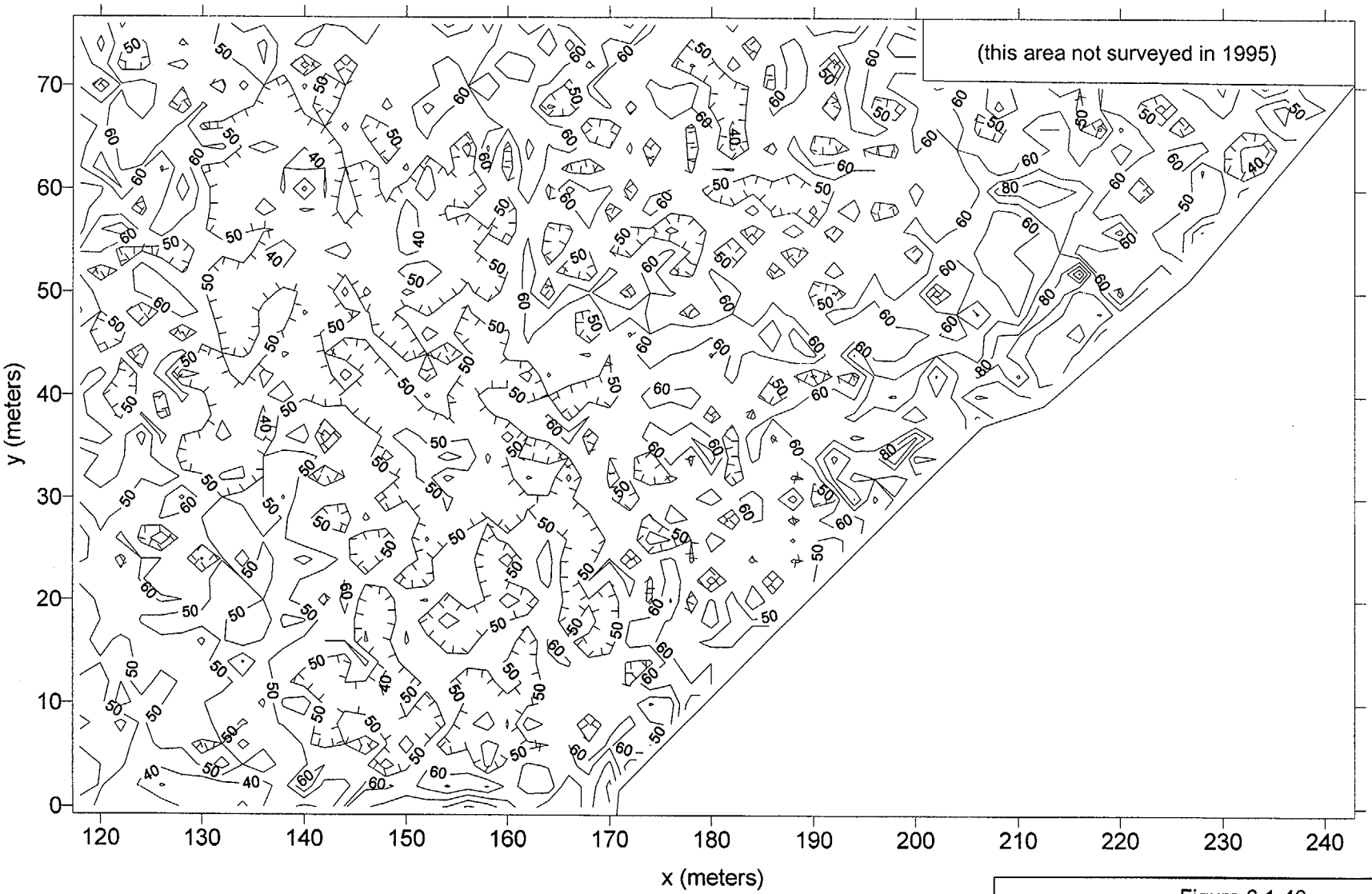
Uranium Measurements Ranged From
953 to 2,307 counts per 10 seconds
with an average of 1,623 counts per 10 seconds

0 2E+001 4E+001

Figure 6.1-45
Study Area 1A - Survey Unit 10
1995 Gross Gamma Survey Data
Uranium Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area1/Su10-ur.srf



N

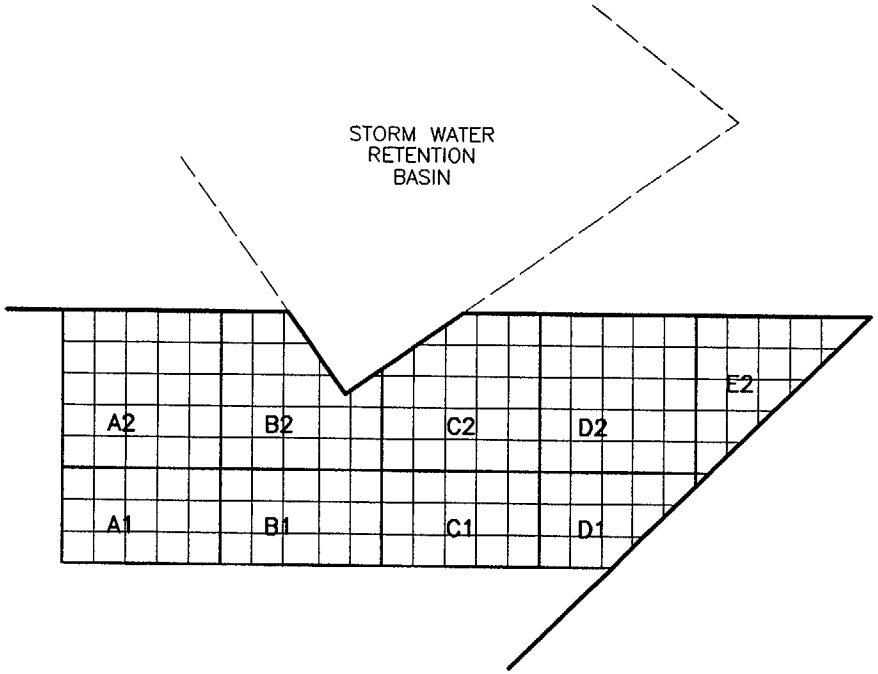
Cobalt Measurements Ranged From
27 to 112 counts per 10 seconds
with an average of 54 counts per 10 seconds

0 2E+001 4E+001

k:/5018/Fssr/Cas/Surfer/Area1/Su10-co.srf

Figure 6.1-46
Study Area 1A - Survey Unit 10
1995 Gross Gamma Survey Data
Cobalt Isopleths (counts per 10 seconds)

Earth Sciences Consultants, Inc.



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INSTRUMENT NUMBER:	126188	129401	129401
PROBE NUMBER:	157372	162409	162409
CAL DUE DATE–INSTRUMENT:	10/17/01	10/12/01	10/12/01
CAL DUE DATE–PROBE:	10/11/01	10/12/01	10/12/01

NOTE

1. NO DATA WAS PROVIDED FROM 1994 AND 1995 CHARACTERIZATION REPORTS FOR THE AREAS ENCOMPASSING GRIDS B2, C2, D2, AND E2. THEREFORE, 100% GROSS GAMMA SCANNING WAS CONDUCTED AND BACKGROUND READINGS OBTAINED.
2. GRIDS ARE APPROXIMATELY 10m x 10m AND SUBDIVIDED INTO 2m x 2m GRIDS.

DRAWING NOT TO SCALE

GRID	RANGE (kcpm)	AVERAGE (kcpm)	BACKGROUND (cpm)
A1	NA	NA	13,340
A2	NA	NA	13,409
B1	NA	NA	13,348
B2	11.5–14	12	12,861
C1	NA	NA	11,928
C2	11–13	12.5	12,648
D1	NA	NA	10,261
D2	12–14	12.5	12,650
E2	9.5–14	11	9,860

FIGURE 6.1–47
STUDY AREA 1A–SURVEY UNIT 10
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

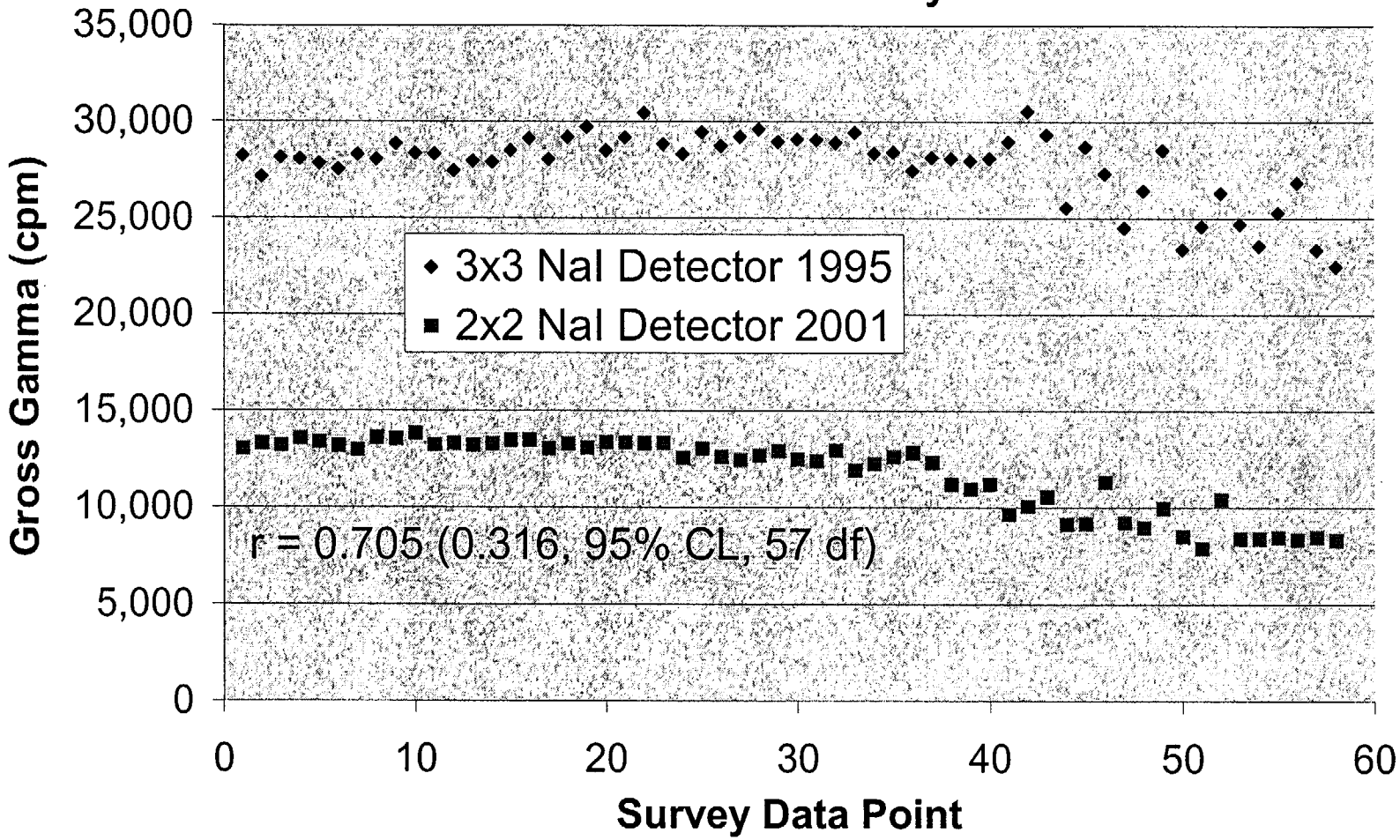
PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED
CHECKED
DRAWN JGJA 1/11/02

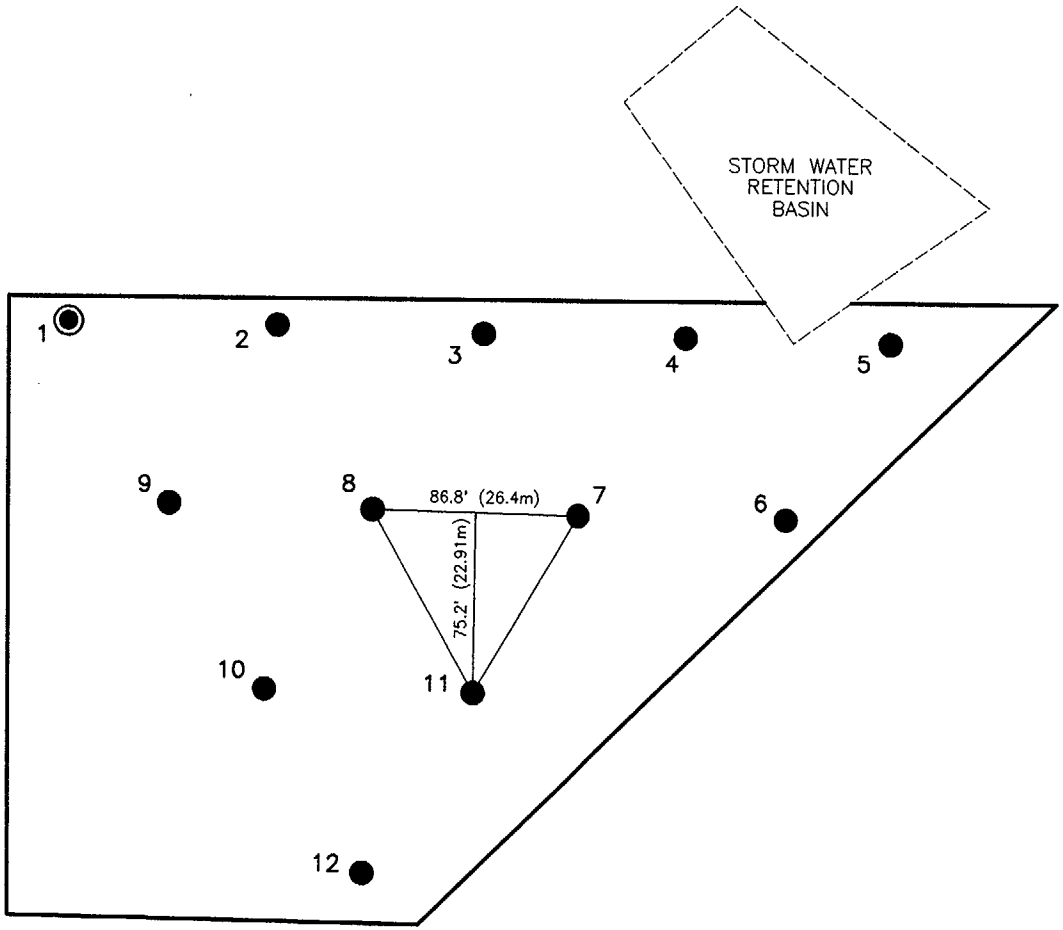
DRAWING NUMBER
5018S54

Earth Sciences Consultants, Inc.

Figure 6.1-48
Study Area 1A - Survey Unit 10
Gross Gamma Survey



k:/5018/Cas/Dataman/1995data.xls,SU10 (2) Chart 1



NOTES

A ≅ 78,780 FT^2 (7,319m^2)
n = 12
L = 86.8 FEET
◉ RANDOM START POINT

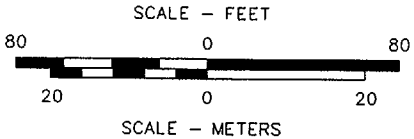
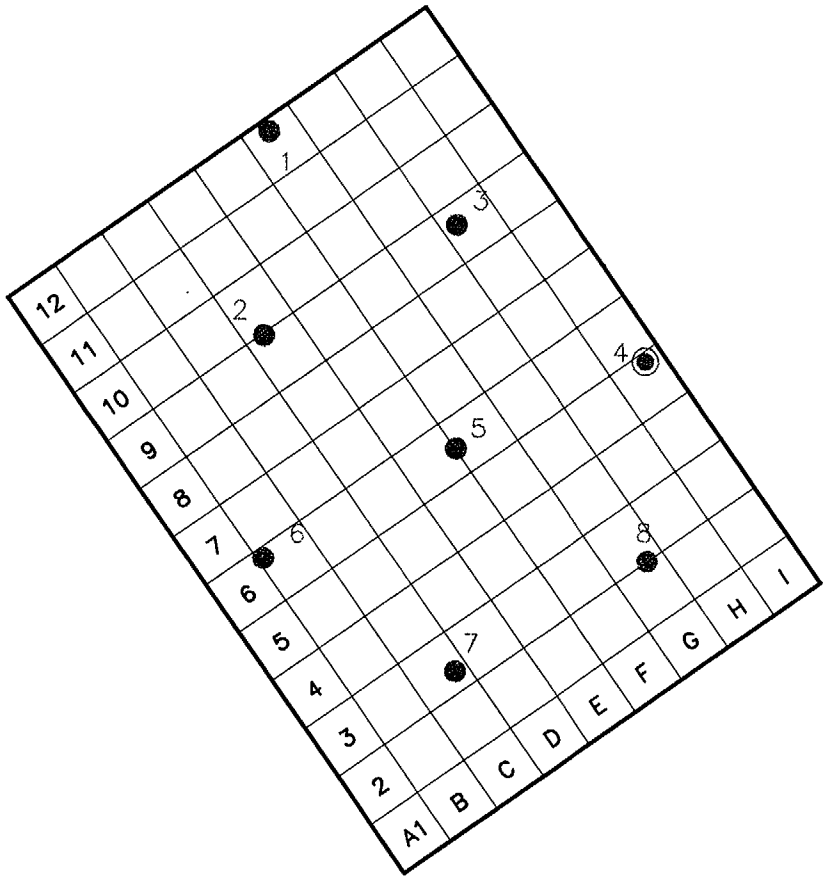


FIGURE 6.1–49
STUDY AREA 1A–SURVEY UNIT 10
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	
CHECKED	Eg
DRAWN	QJA 1/11/02
DRAWING NUMBER	5018118

Earth Sciences Consultants, Inc.



N

NOTES

1. GRIDS A1 THROUGH I12 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-1
STUDY AREA 2-SURVEY UNIT 1B
LWRB EXCAVATION BOTTOM
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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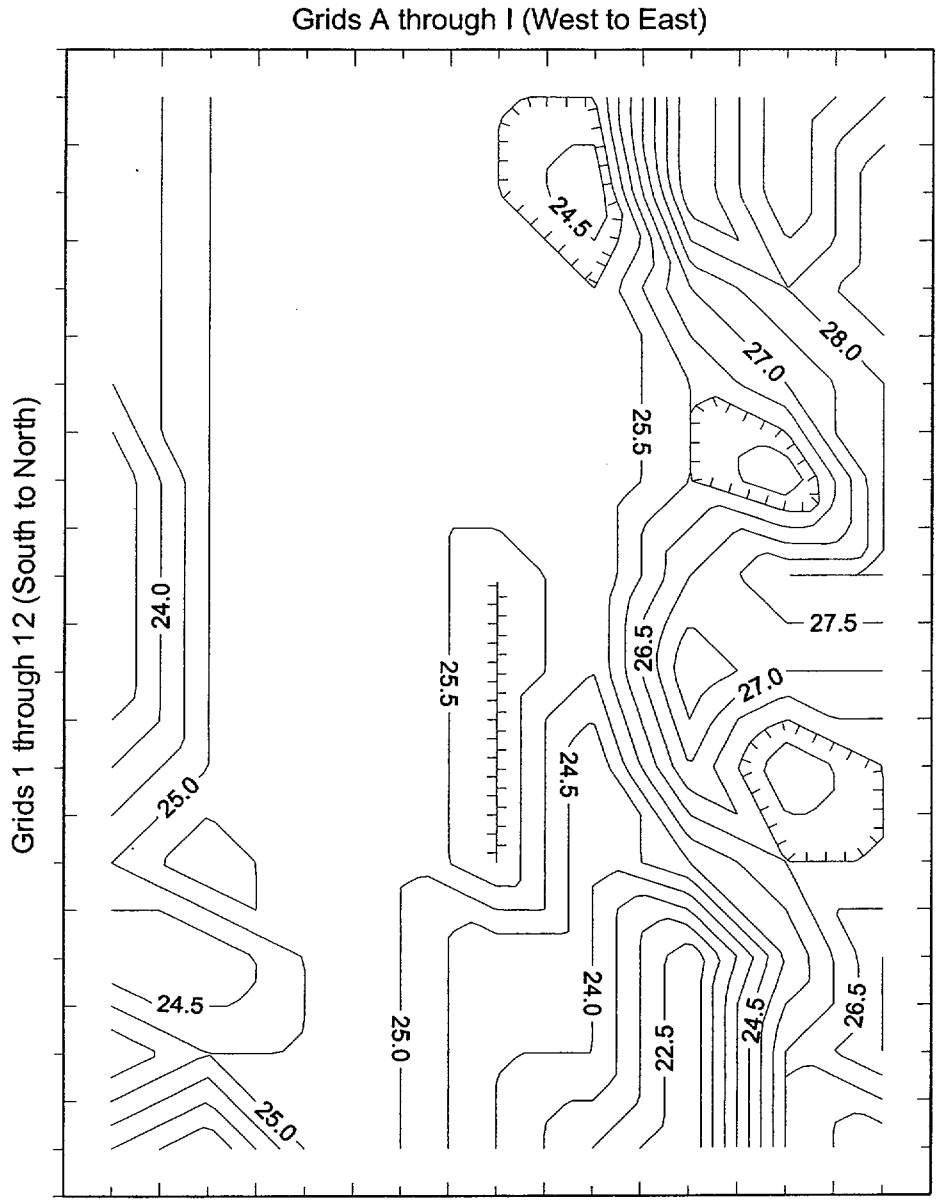
CHECKED	
DRAWN	JA 12/10/01
DRAWING NUMBER	5018S19A

Earth Sciences Consultants, Inc.

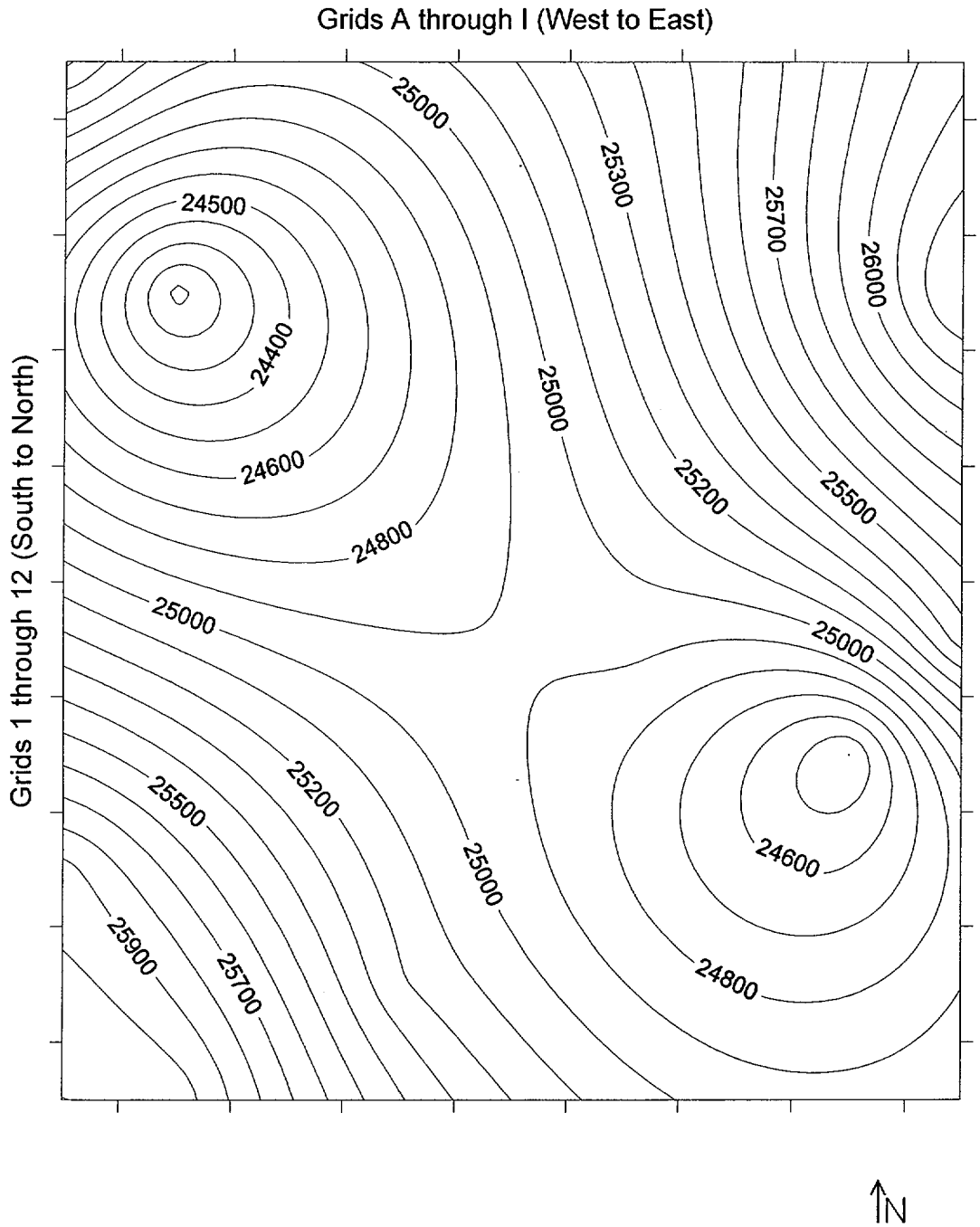


Average Gamma Scan Readings Ranged
From 22 kcpm to 29 kcpm

Figure 6.2-2
Study Area 2 - Survey Unit 1 - Bottom
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-bot.srf

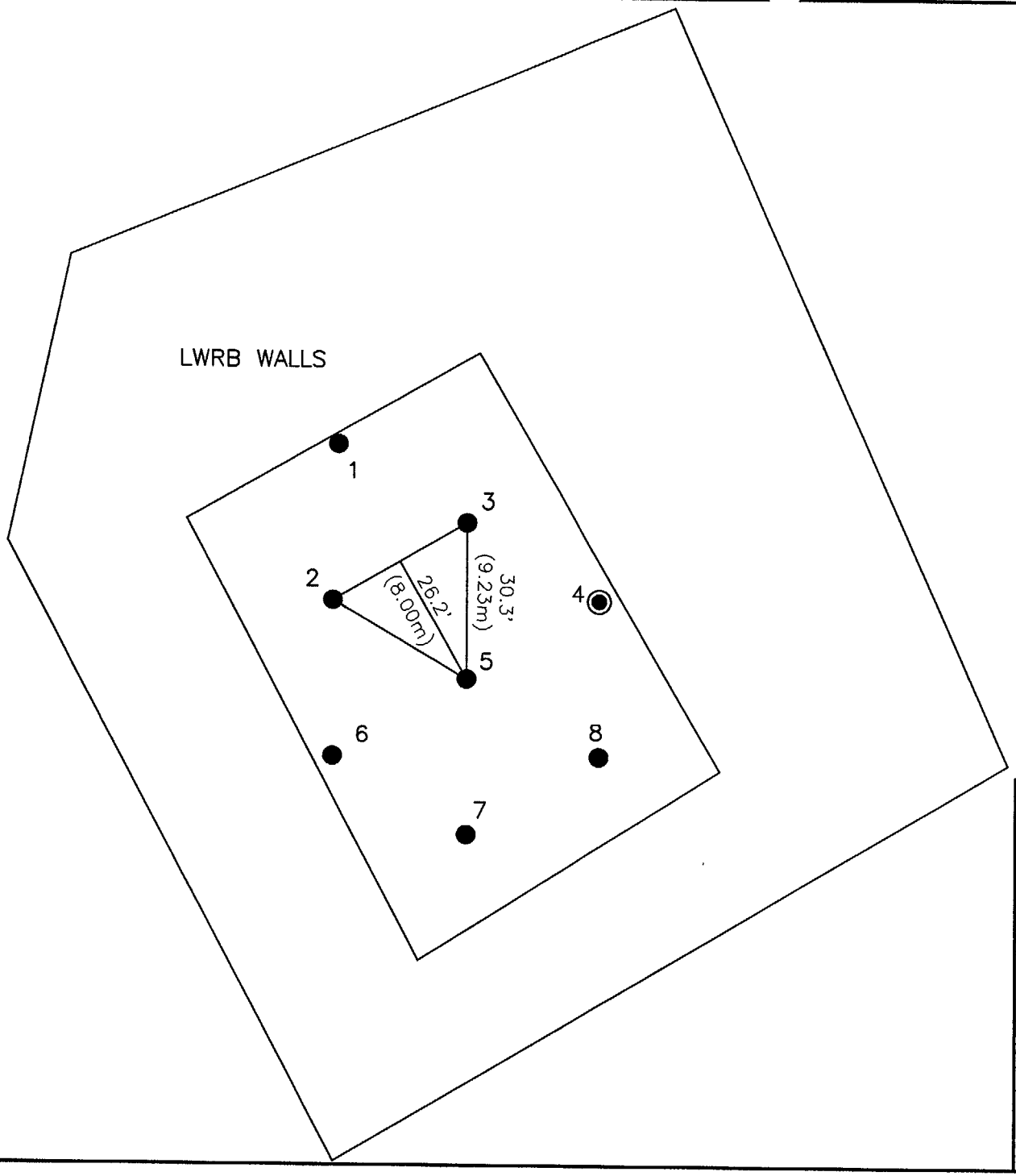


Background Measurements Ranged From
24,062 cpm to 26,341 cpm

Figure 6.2-3
Study Area 2 - Survey Unit 1 - Bottom
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-bb.srf



N

NOTES

A ≅ 6,355 FT^2 (590m^2)
n = 8
L = 30.3 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–4
STUDY AREA 2–SURVEY UNIT 1B
LWRB EXCAVATION BOTTOM
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	5018073

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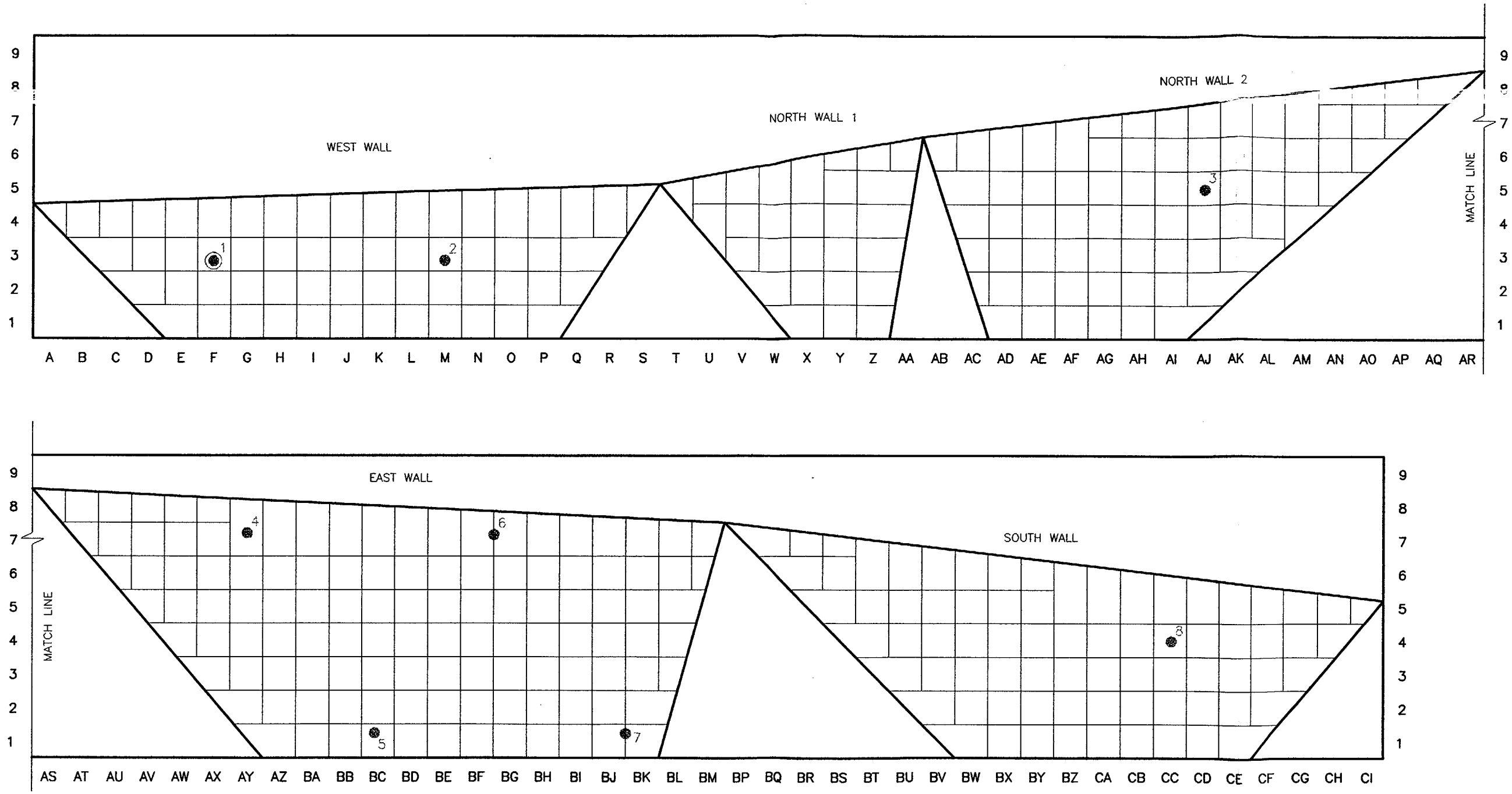

DRAWING NOT TO SCALE

NOTES

1. GRIDS ARE APPROXIMATELY 2m x 2m.
2. GRIDS BN AND BO WERE NOT USED.
3. SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.

◉ RANDOM START POINT

● SAMPLING LOCATION

FIGURE 6.2-5
STUDY AREA 2-SURVEY UNIT 1W
LWRB EXCAVATION WALLS
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	DEB 3/17/03
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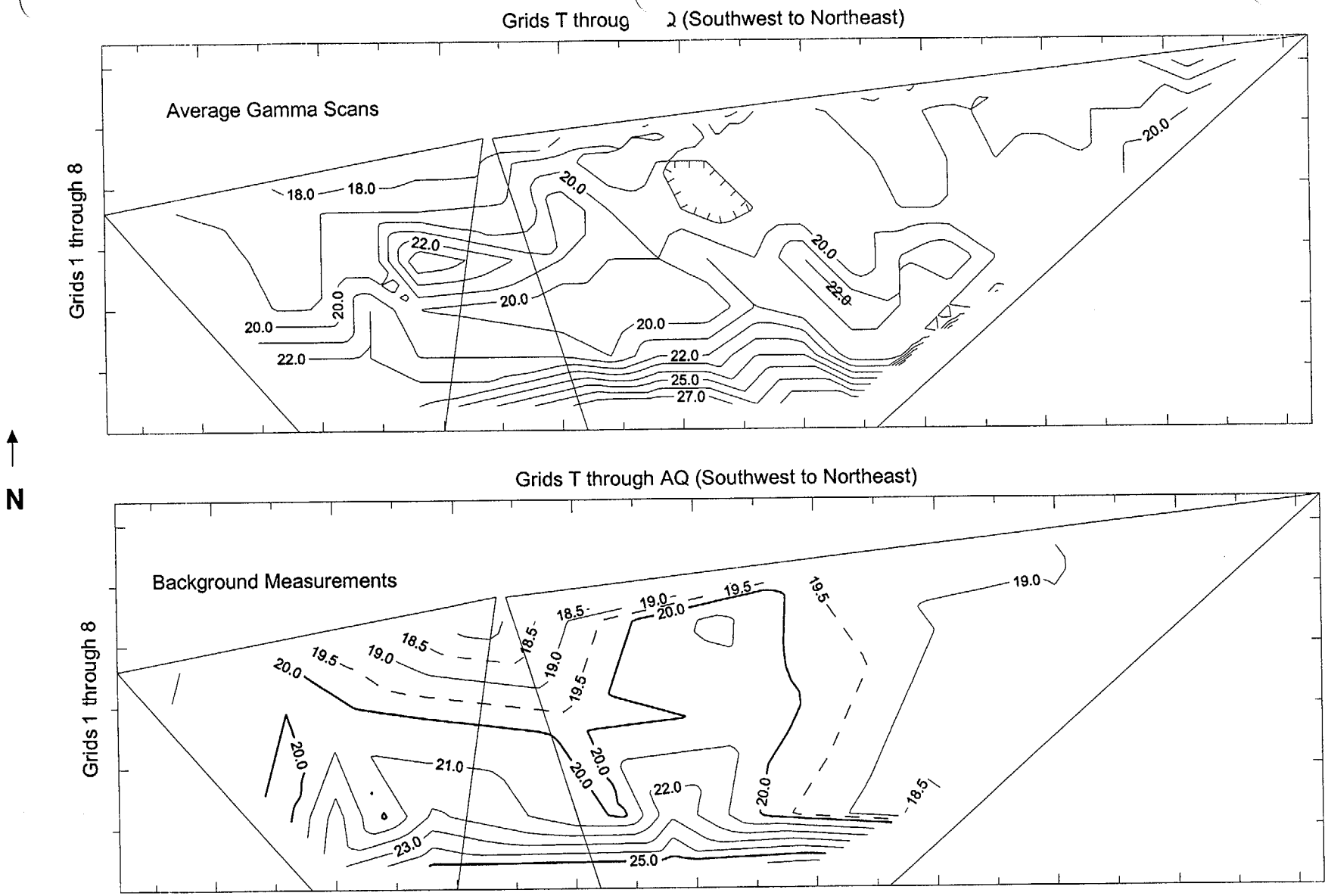


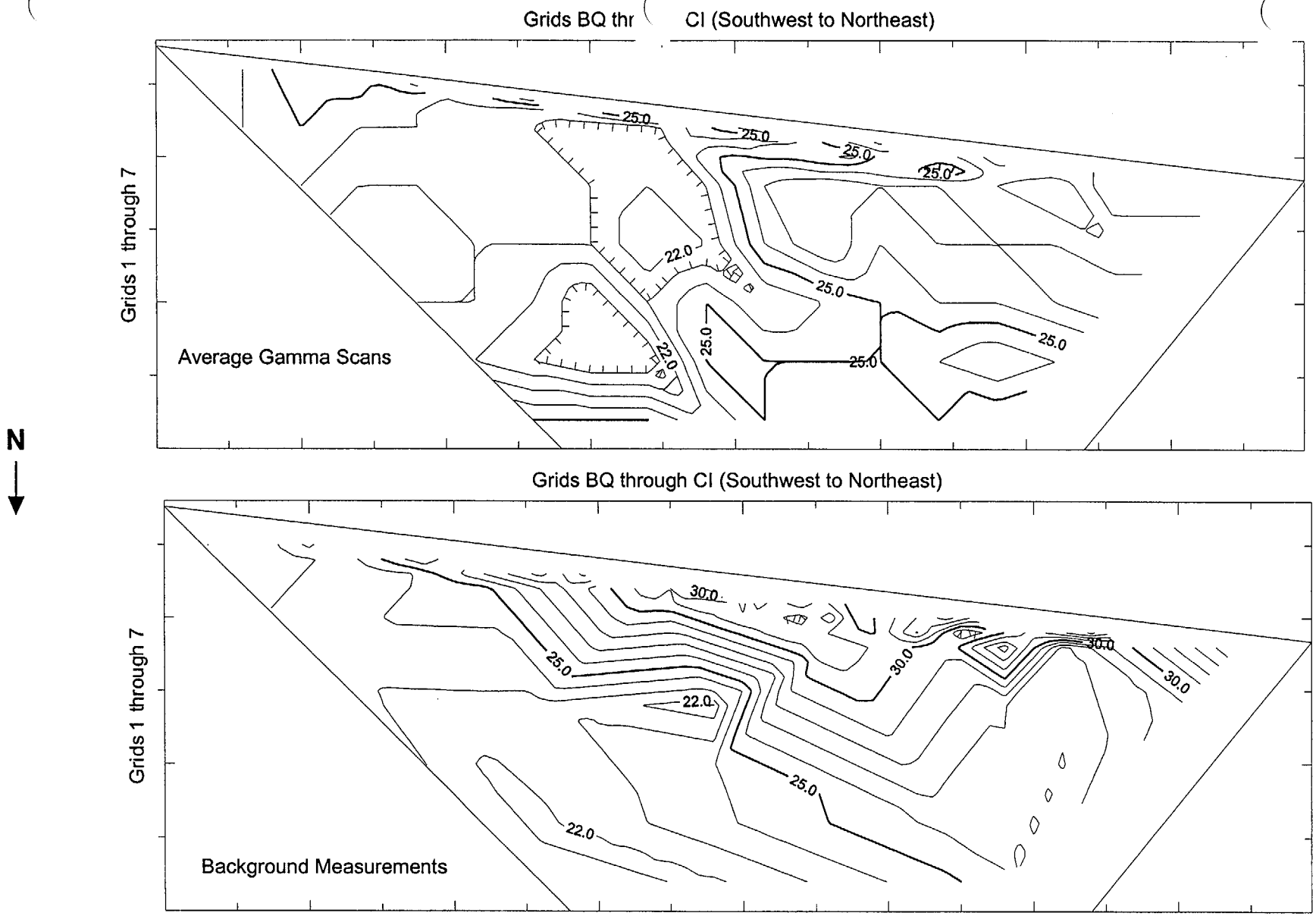
Average Gamma Scan Readings (for all walls)
Ranged from 16.5 kcpm to 37 kcpm

Background Measurements (for all walls)
Ranged from 17.2 kcpm to 54.2 kcpm

Figure 6.2-6
Study Area 2 - Survey Unit 1 (LWRB) North Wall
Average and Background Gamma Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-nw.srf



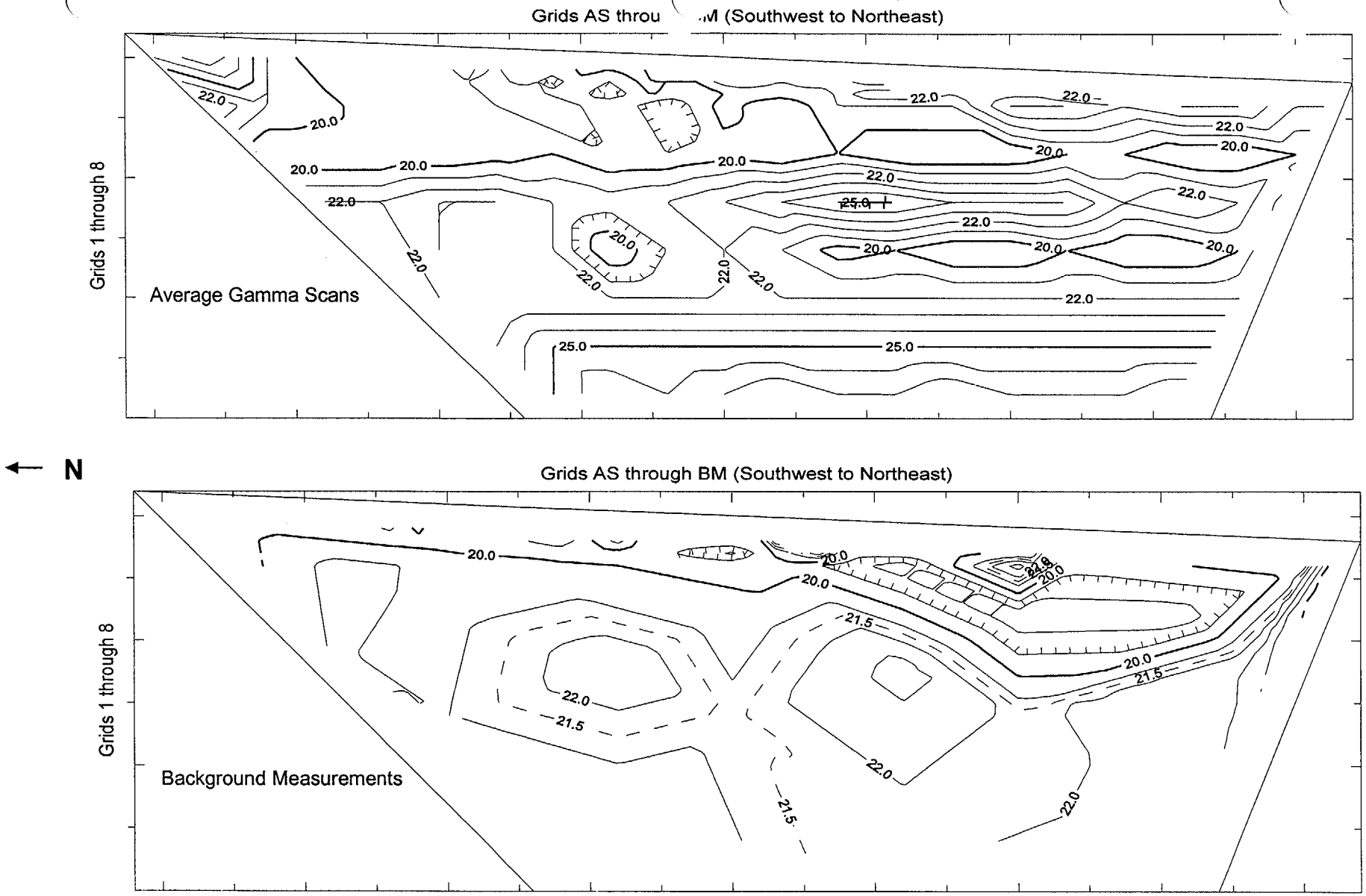
Average Gamma Scan Readings (for all walls)
Ranged from 16.5 kcpm to 37 kcpm

Background Measurements (for all walls)
Ranged from 17.2 kcpm to 54.2 kcpm

Figure 6.2-7
Study Area 2 - Survey Unit 1 (LWRB) South Wall
Average and Background Gamma Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-sw.srf



Average Gamma Scan Readings (for all walls)
Ranged from 16.5 kcpm to 37 kcpm

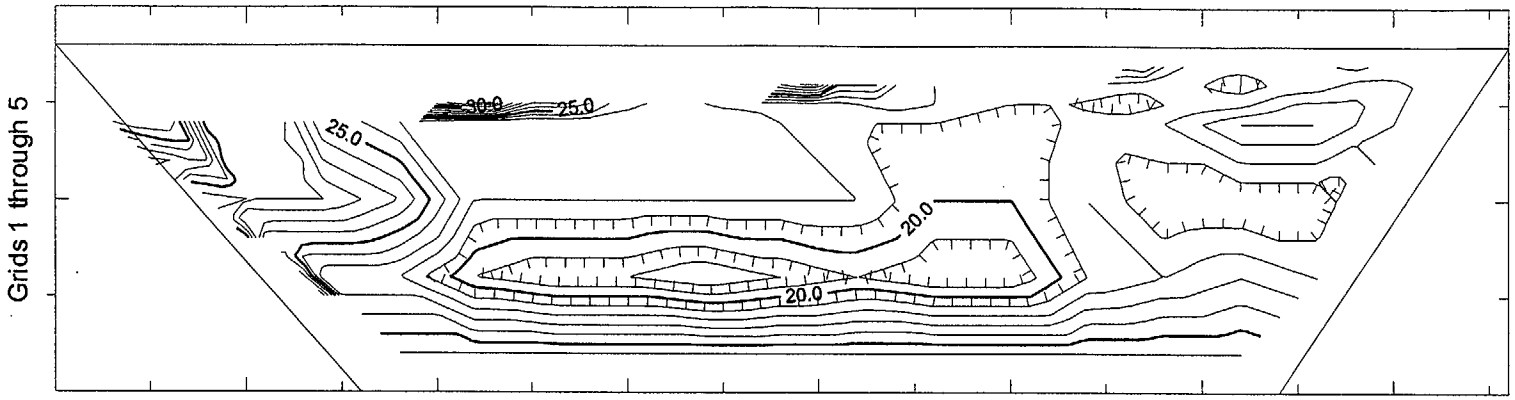
Background Measurements (for all walls)
Ranged from 17.2 kcpm to 54.2 kcpm

Figure 6.2-8
Study Area 2 - Survey Unit 1 (LWRB) East Wall
Average and Background Gamma Isopleths (kcpm)

Earth Sciences Consultants, Inc.

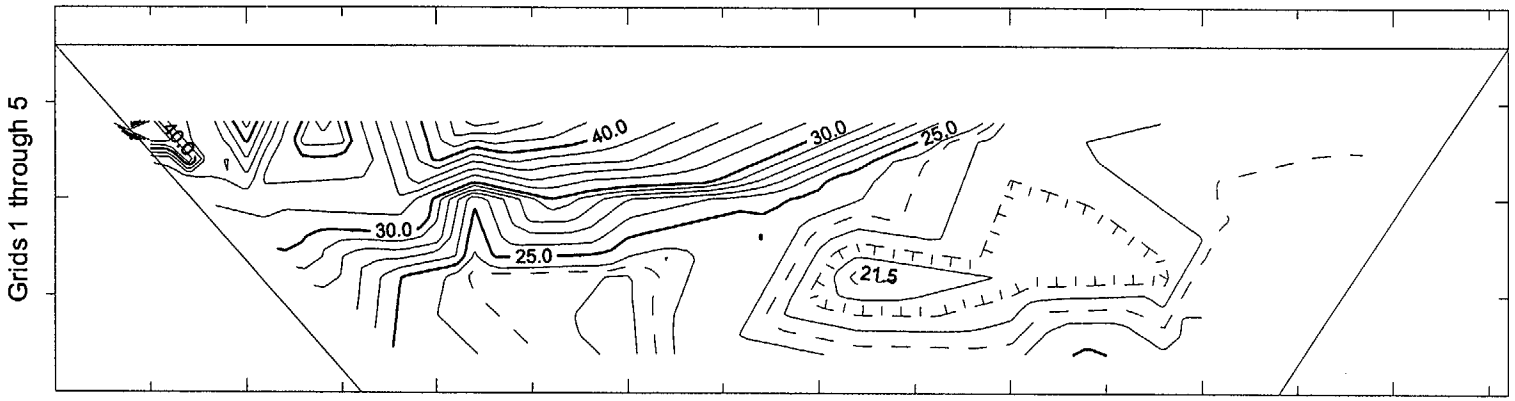
k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-ew.srf

Average Gamma Scans
Grids A through S (Southwest to Northeast)



← N

Background Measurements
Grids A through S (Southwest to Northeast)



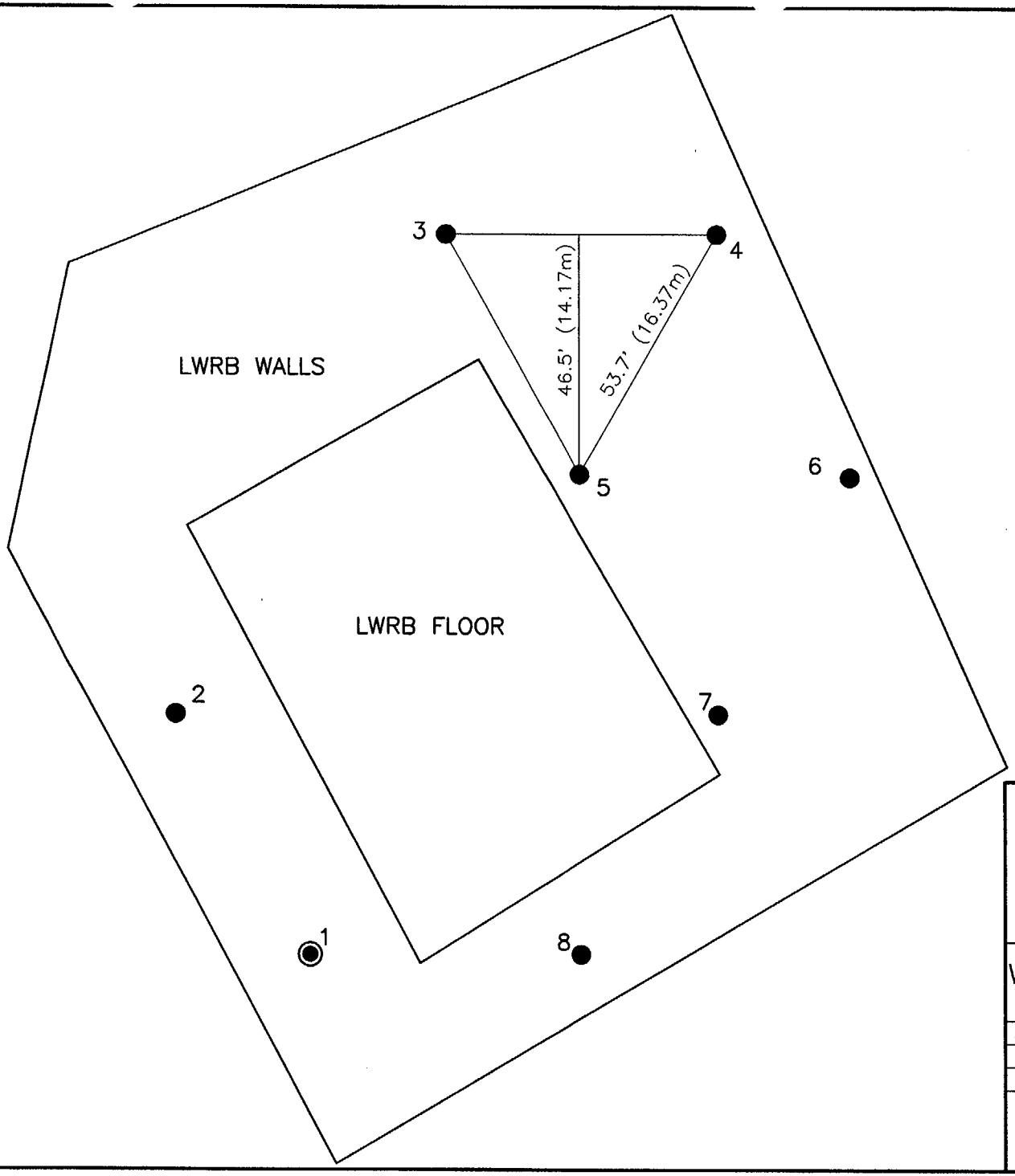
Average Gamma Scan Readings (for all walls)
Ranged from 16.5 kcpm to 37 kcpm

Background Measurements (for all walls)
Ranged from 17.2 kcpm to 54.2 kcpm

Figure 6.2-9
Study Area 2 - Survey Unit 1 (LWRB) West Wall
Average and Background Gamma Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-ww.srf



NOTES

A ≅ 20,024 FT^2 (1,860m^2)
n = 8
L = 53.7 FEET
◉ RANDOM START POINT

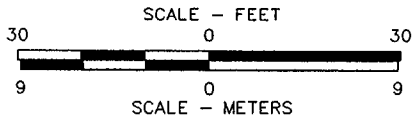


FIGURE 6.2–10
STUDY AREA 2–SURVEY UNIT 1W
LWRB EXCAVATION WALLS
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	EG
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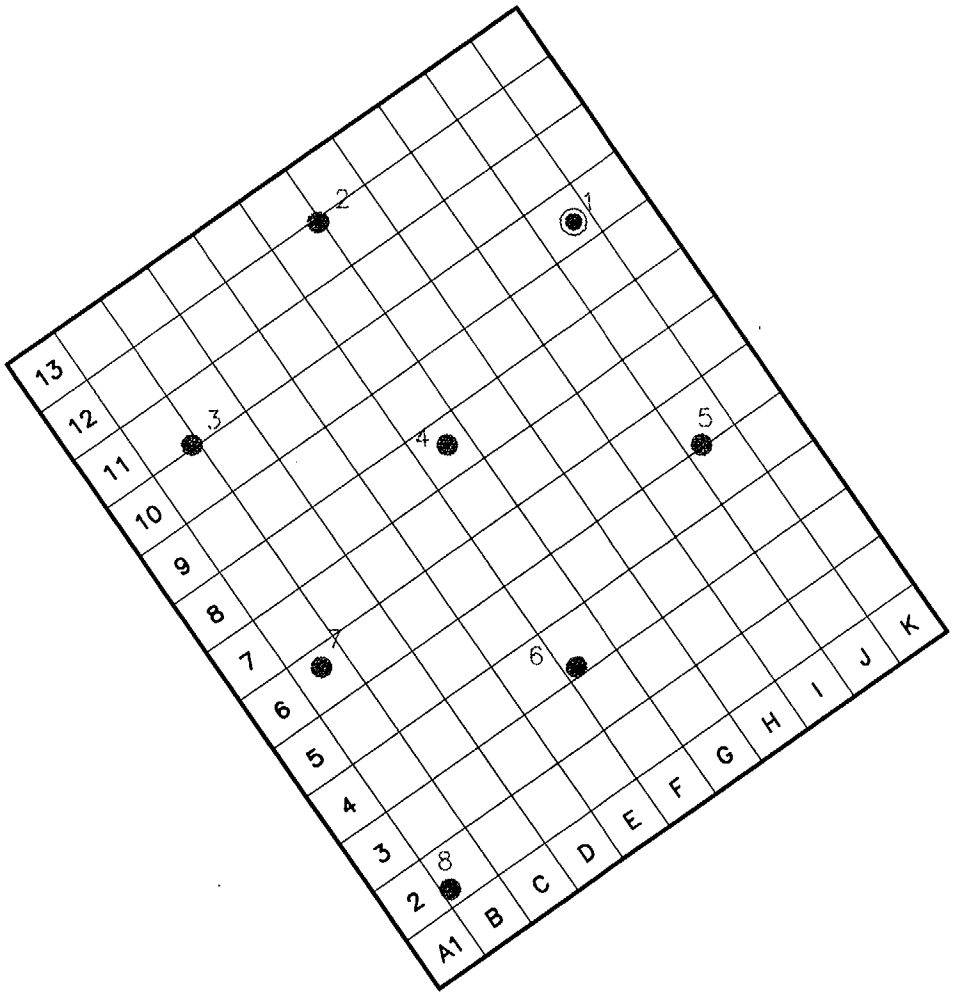

N

NOTES

1. GRIDS A1 THROUGH K13 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–11
STUDY AREA 2–SURVEY UNIT 1
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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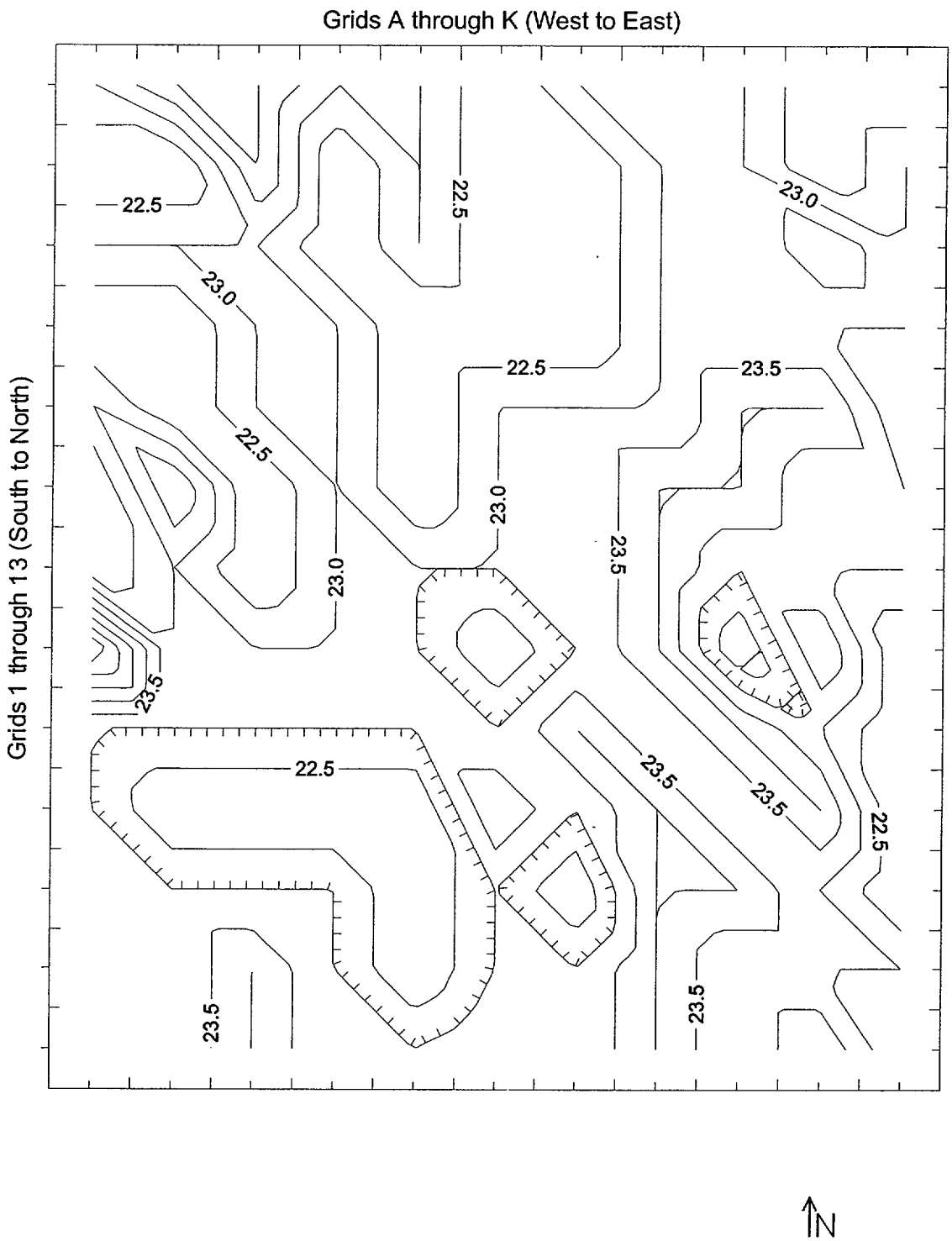
CHECKED	E.g.
DRAWN	GJA 12/7/01
DRAWING NUMBER	5018S13

Earth Sciences Consultants, Inc.

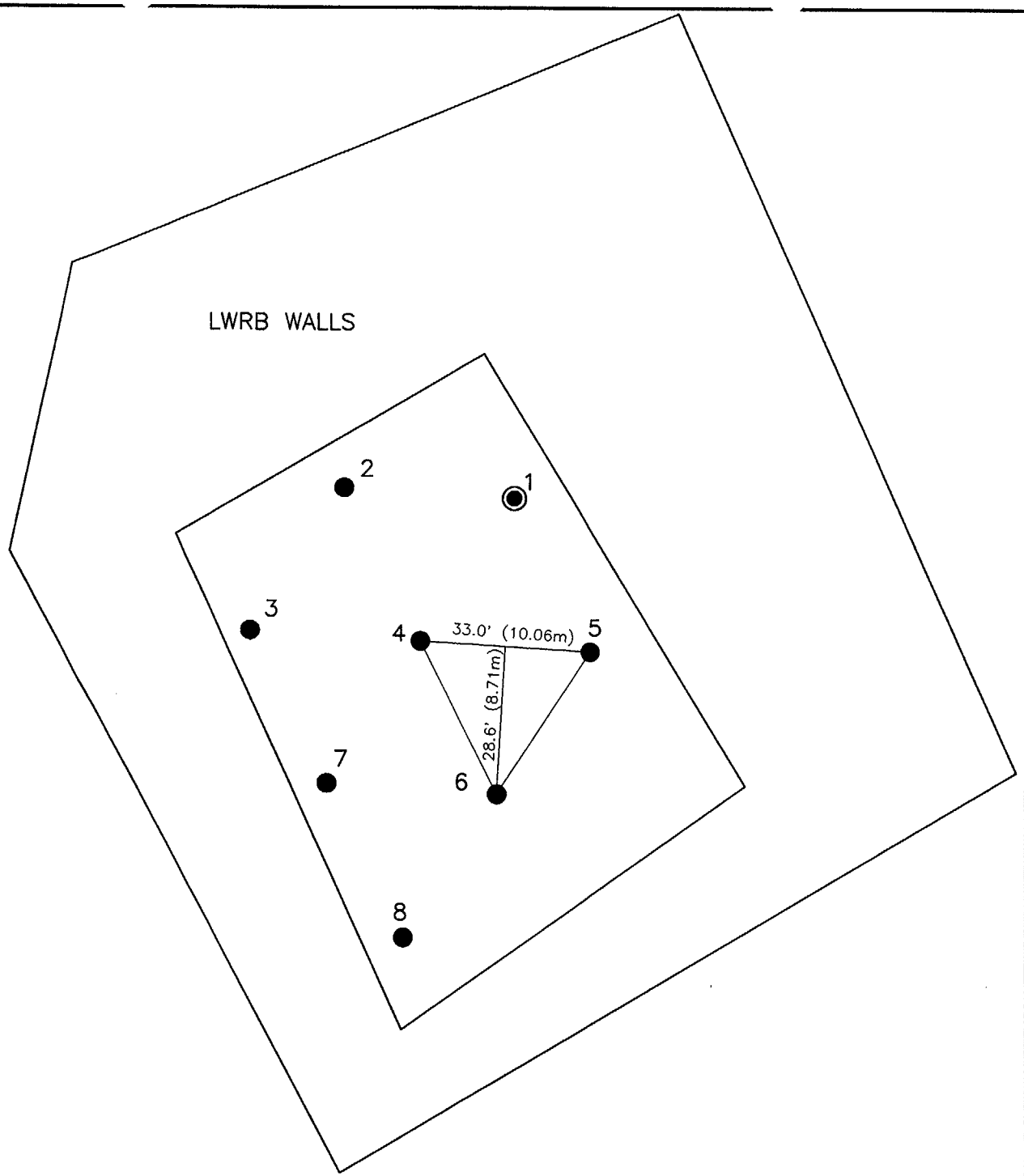


Average Gamma Scan Readings Ranged
From 22 kcpm to 24 kcpm

Figure 6.2-12
Study Area 2 - Survey Unit 1 - 1st Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l1.srf



N

NOTES

A ≅ 7,553 FT^2 ($702m^2$)
n = 8
L = 33.0 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–13
STUDY AREA 2–SURVEY UNIT 1
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	Eg
DRAWN	GJA 10/24/01
DRAWING NUMBER	5018067

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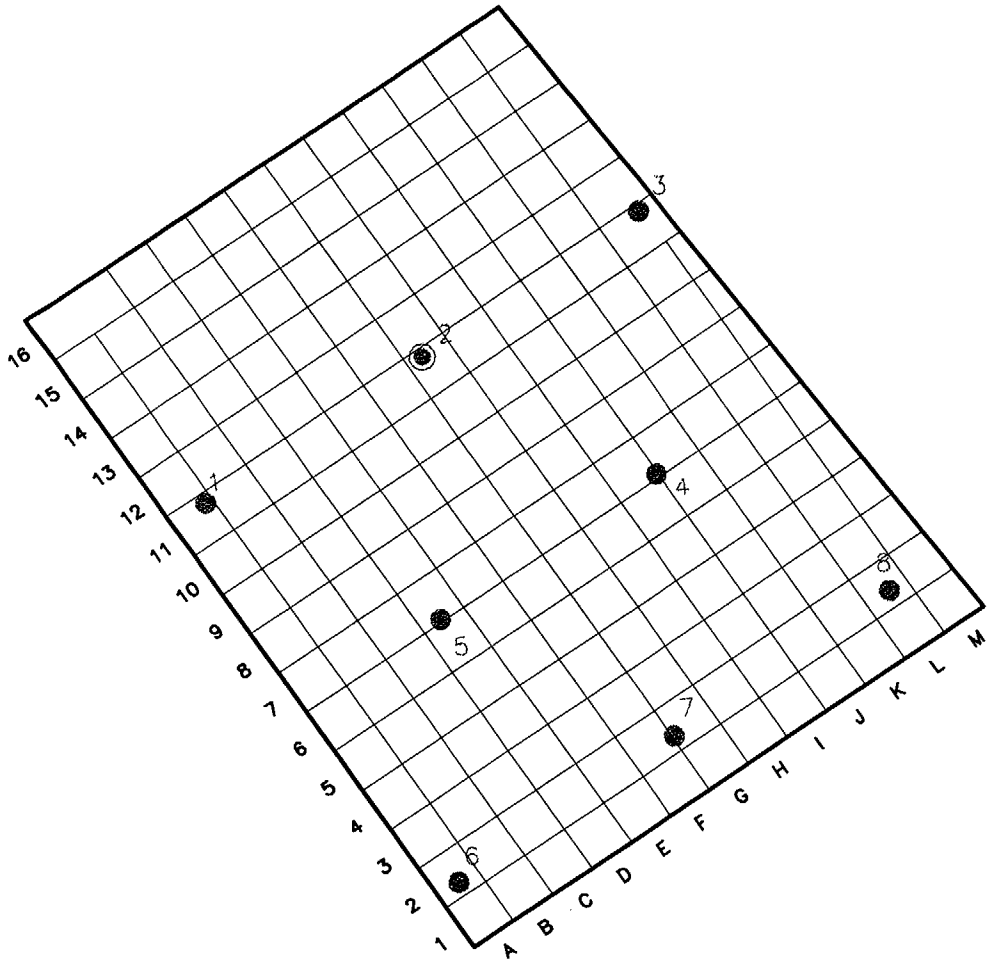

N

NOTES

1. GRIDS A1 THROUGH M10 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.
3. SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.

◉ RANDOM START

● SAMPLING POINT

DRAWING NOT TO SCALE

FIGURE 6.2-14
STUDY AREA 2-SURVEY UNIT 1
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	EG
DRAWN	DEB 3/13/03
DRAWING NUMBER	5018S14A

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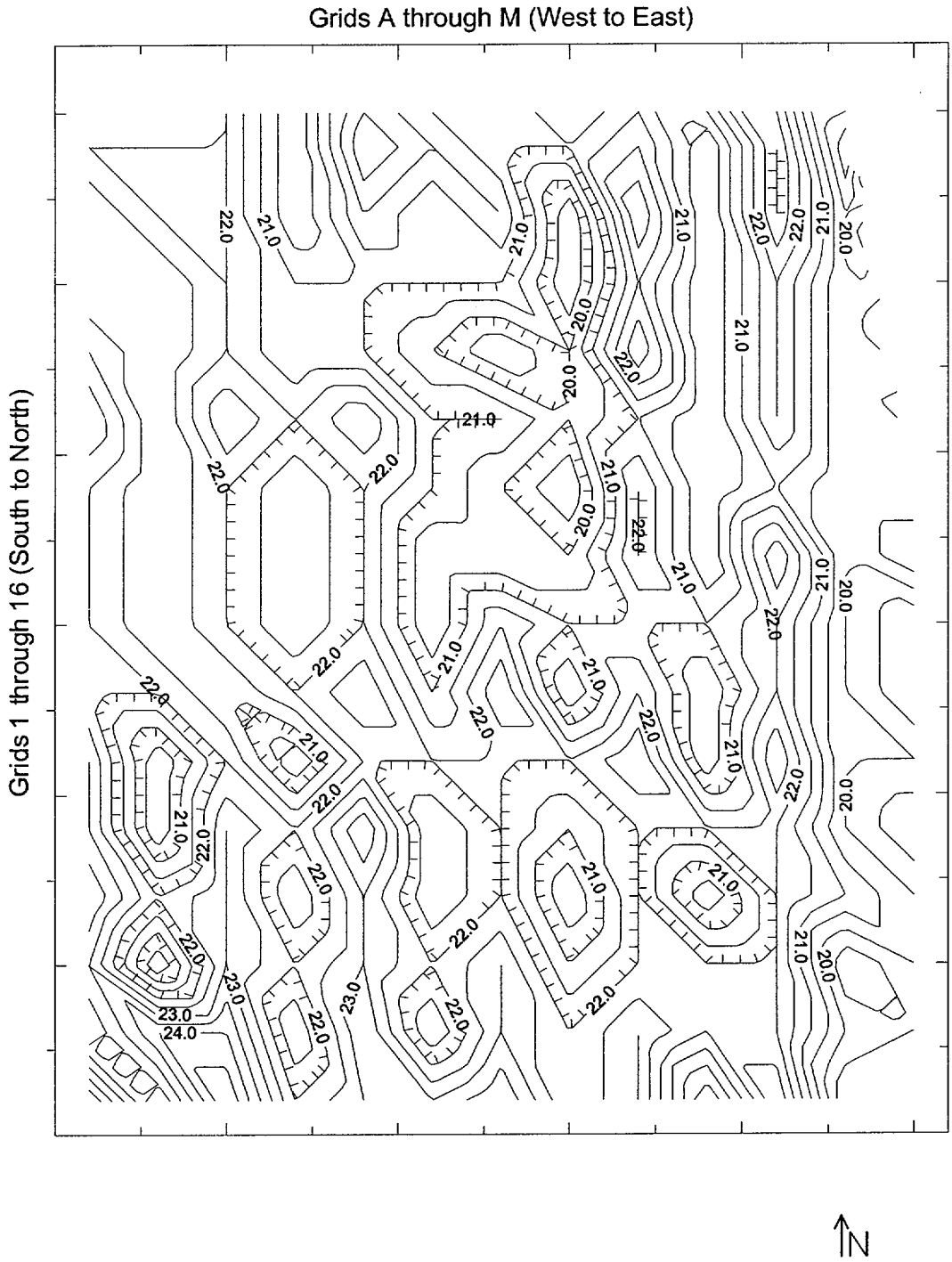
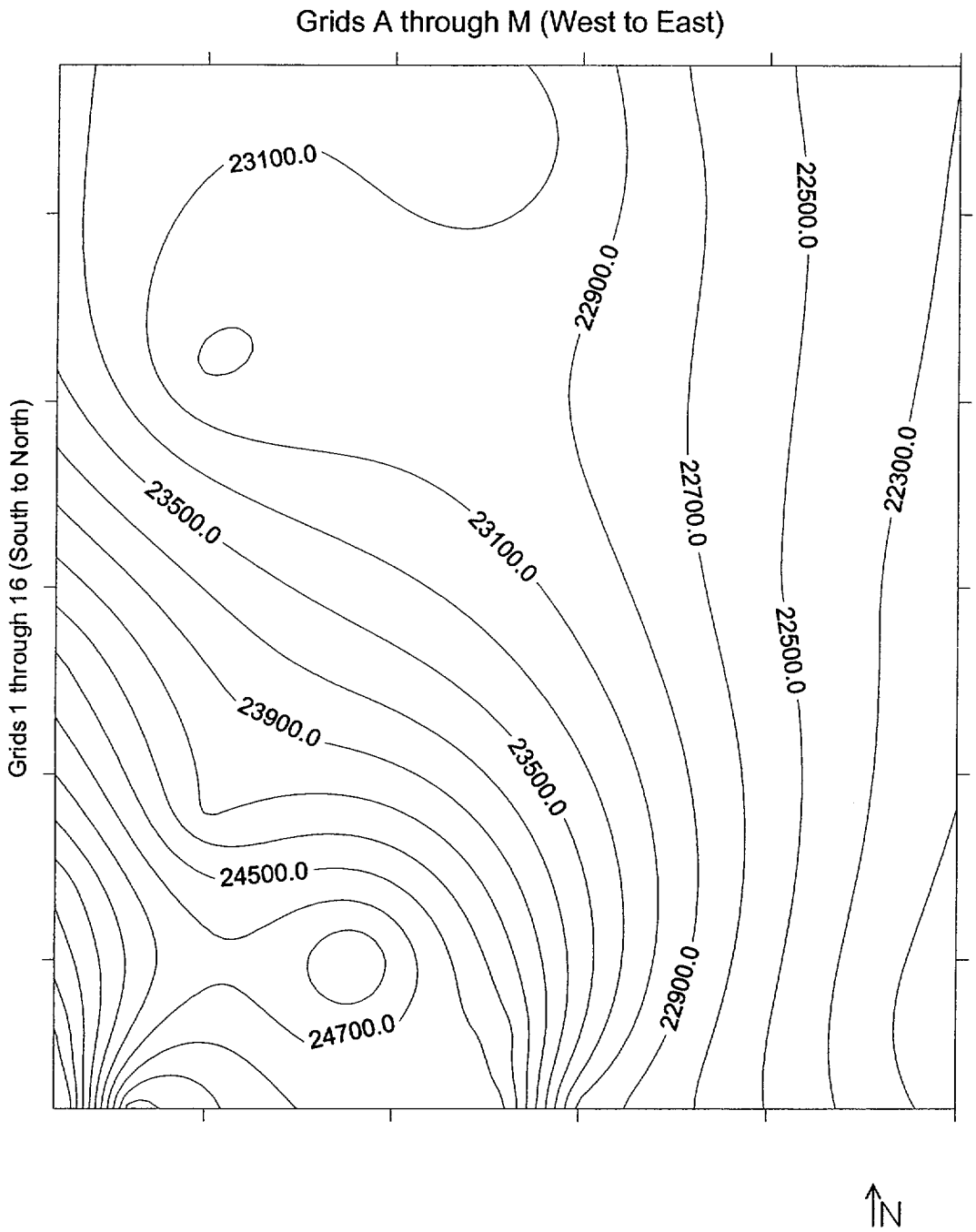


Average Gamma Scan Readings Ranged
From 19 kcpm to 25 kcpm

Figure 6.2-15
Study Area 2 - Survey Unit 1 - 2nd Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l2.srf

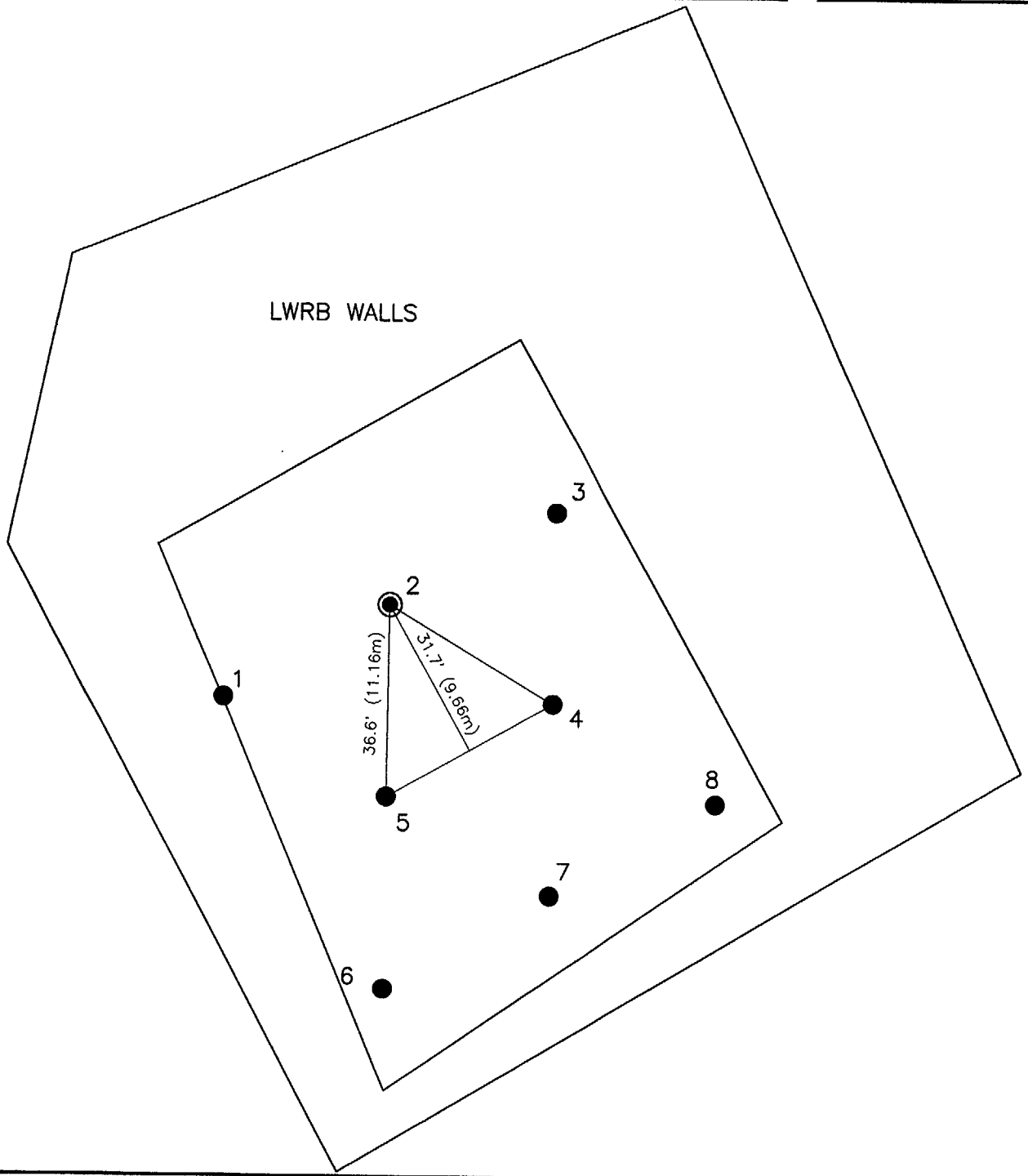


Background Measurements Ranged From
21,916 cpm to 26,459 cpm

Figure 6.2-16
Study Area 2 - Survey Unit 1 - 2nd Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-I2b.srf



N

NOTES

A ≅ 9,270 FT^2 (861m^2)
n = 8
L = 36.6 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–17
STUDY AREA 2–SURVEY UNIT 1
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	GJA 12/7/01
DRAWING NUMBER	5018068

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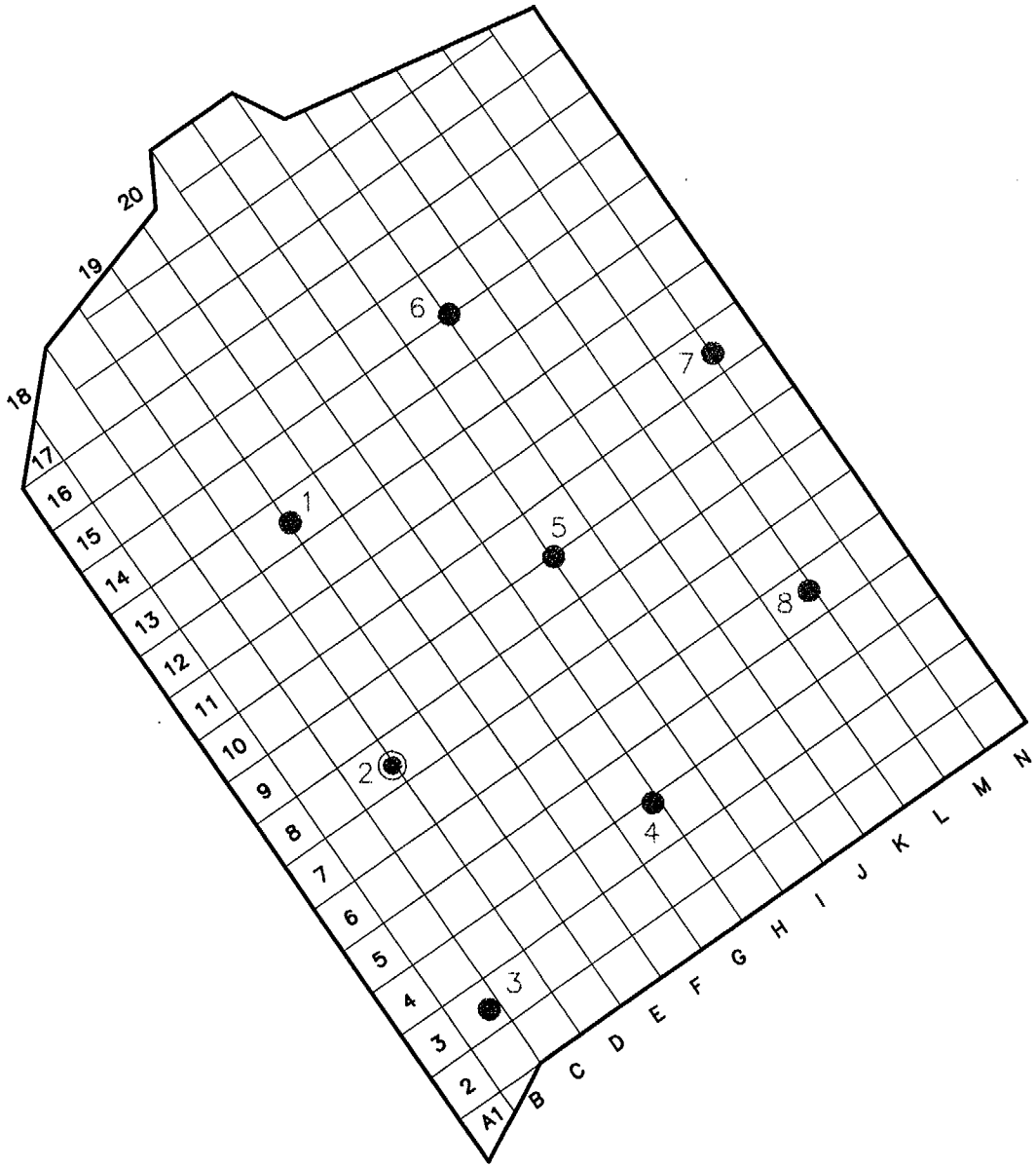

N

NOTES

1. GRIDS A1 THROUGH N18 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.
3. SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-18
STUDY AREA 2-SURVEY UNIT 1
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	EG
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DRAWING NUMBER	5018S15A

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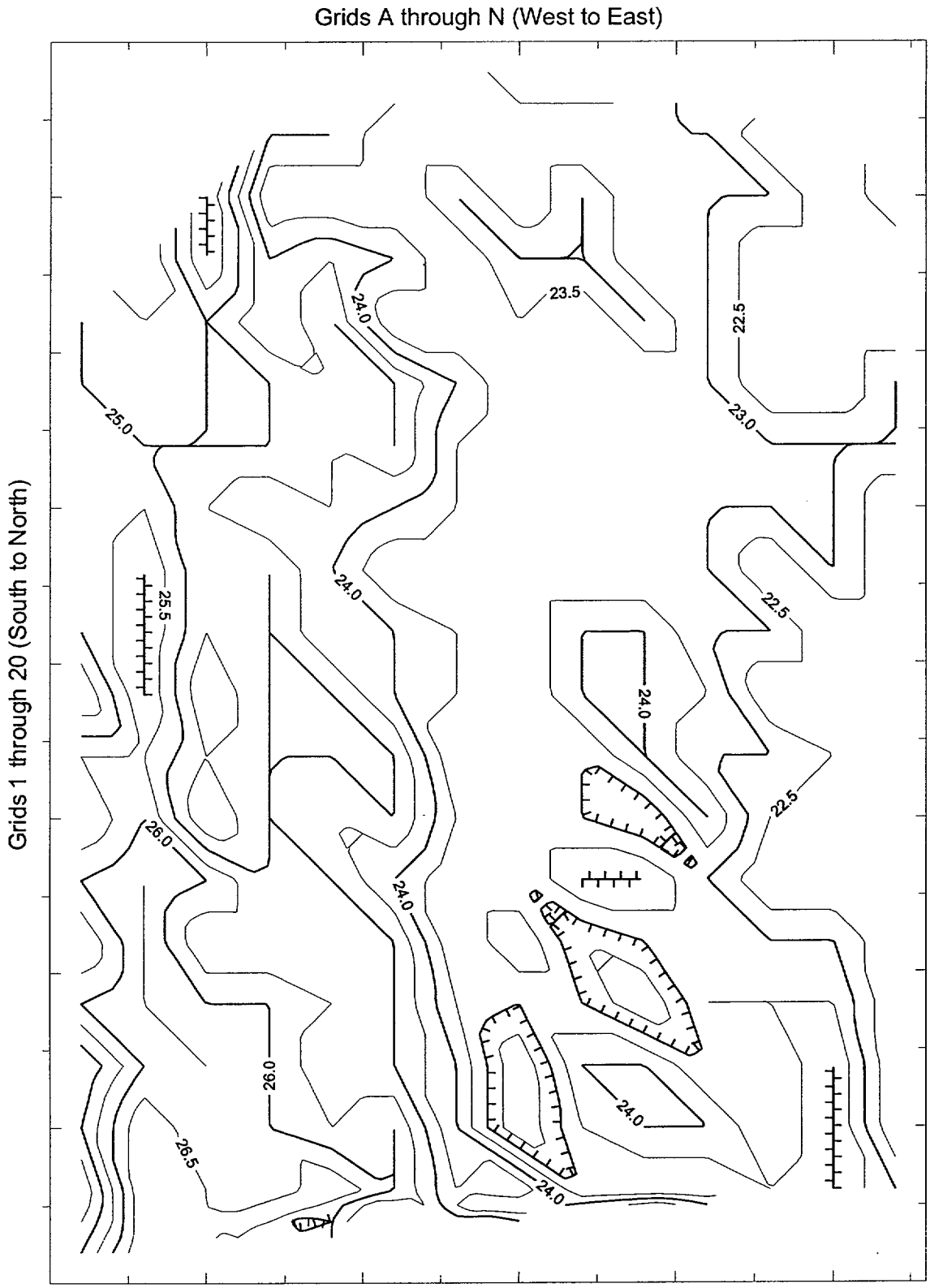
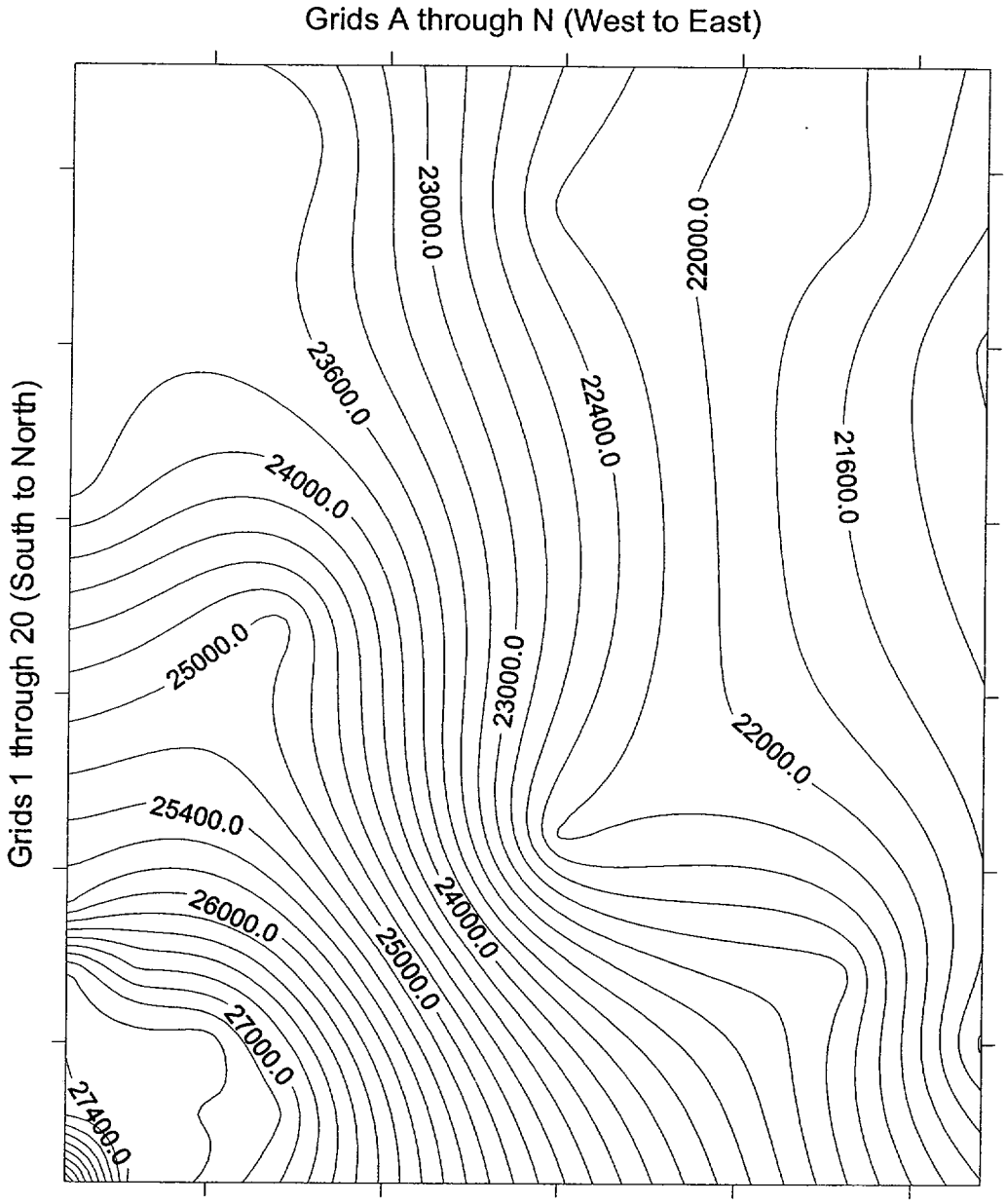


Figure 6.2-19
Study Area 2 - Survey Unit 1 - 3rd Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Average Gamma Scan Readings Ranged
From 22 kcpm to 27 kcpm

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-I3.srf



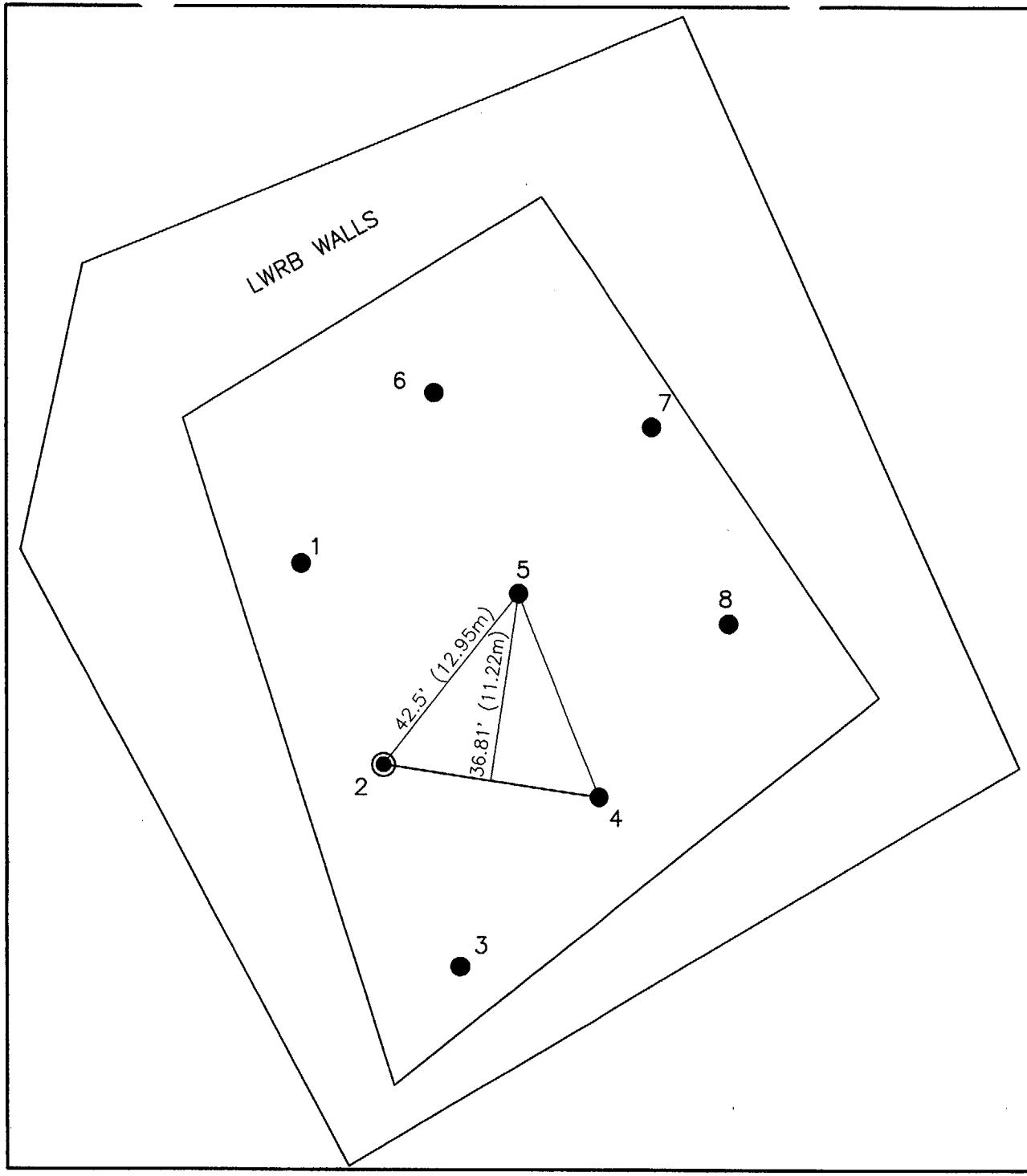
N

Background Measurements Ranged From
21,163 cpm to 27,595 cpm

Figure 6.2-20
Study Area 2 - Survey Unit 1 - 3rd Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l3b.srf



NOTES

A ≅ 12,517 FT^2 (1,163m^2)
n = 8
L = 42.5 FEET
◉ RANDOM START POINT

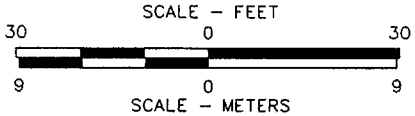


FIGURE 6.2–21
STUDY AREA 2–SURVEY UNIT
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	Eg.
DRAWN	GJA 12/7/01
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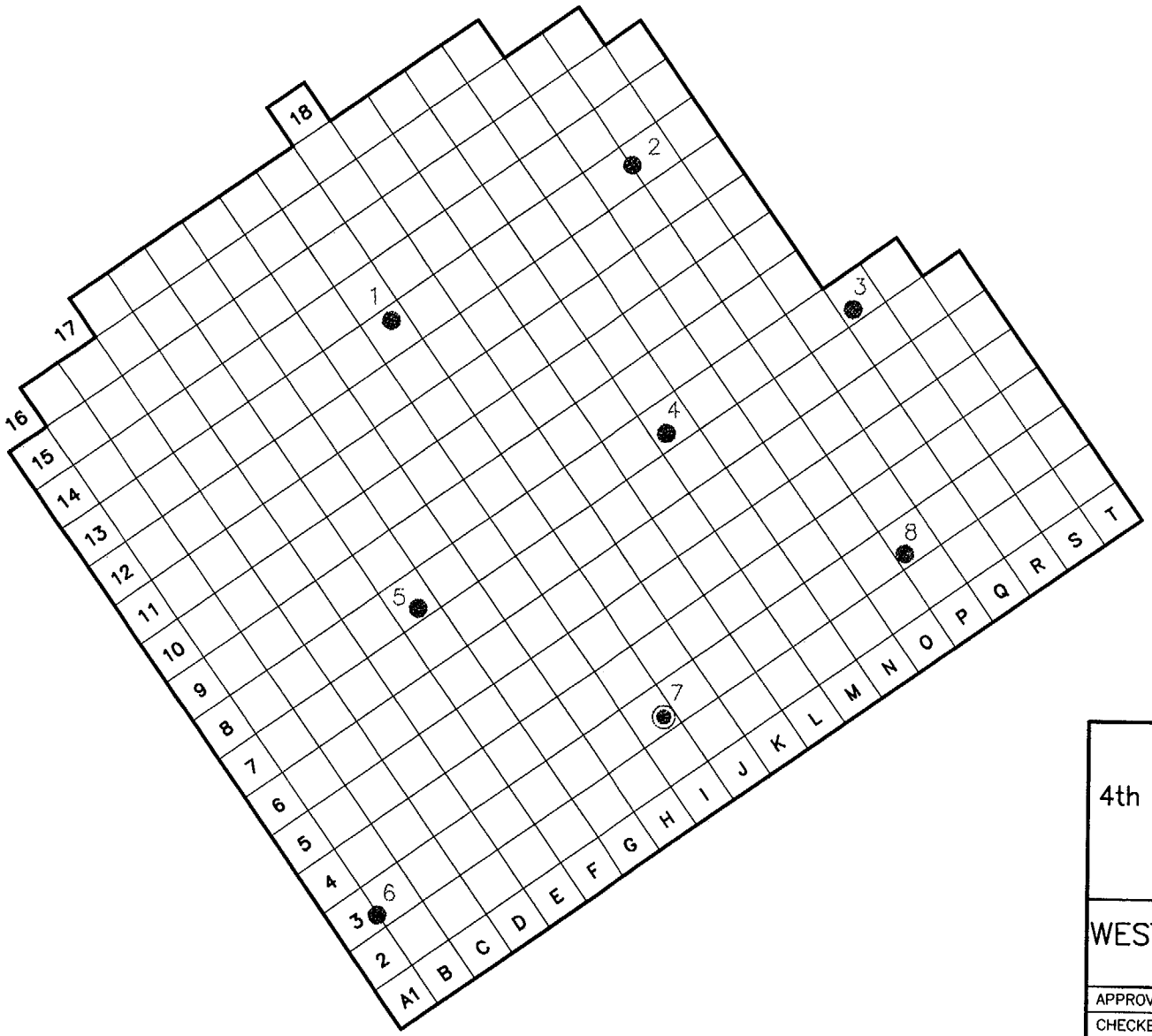

N

NOTES

1. GRIDS A1 THROUGH T7 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.
3. SAMPLING LOCATIONS SHOWN ARE APPROXIMATE.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-22
STUDY AREA 2-SURVEY UNIT 1
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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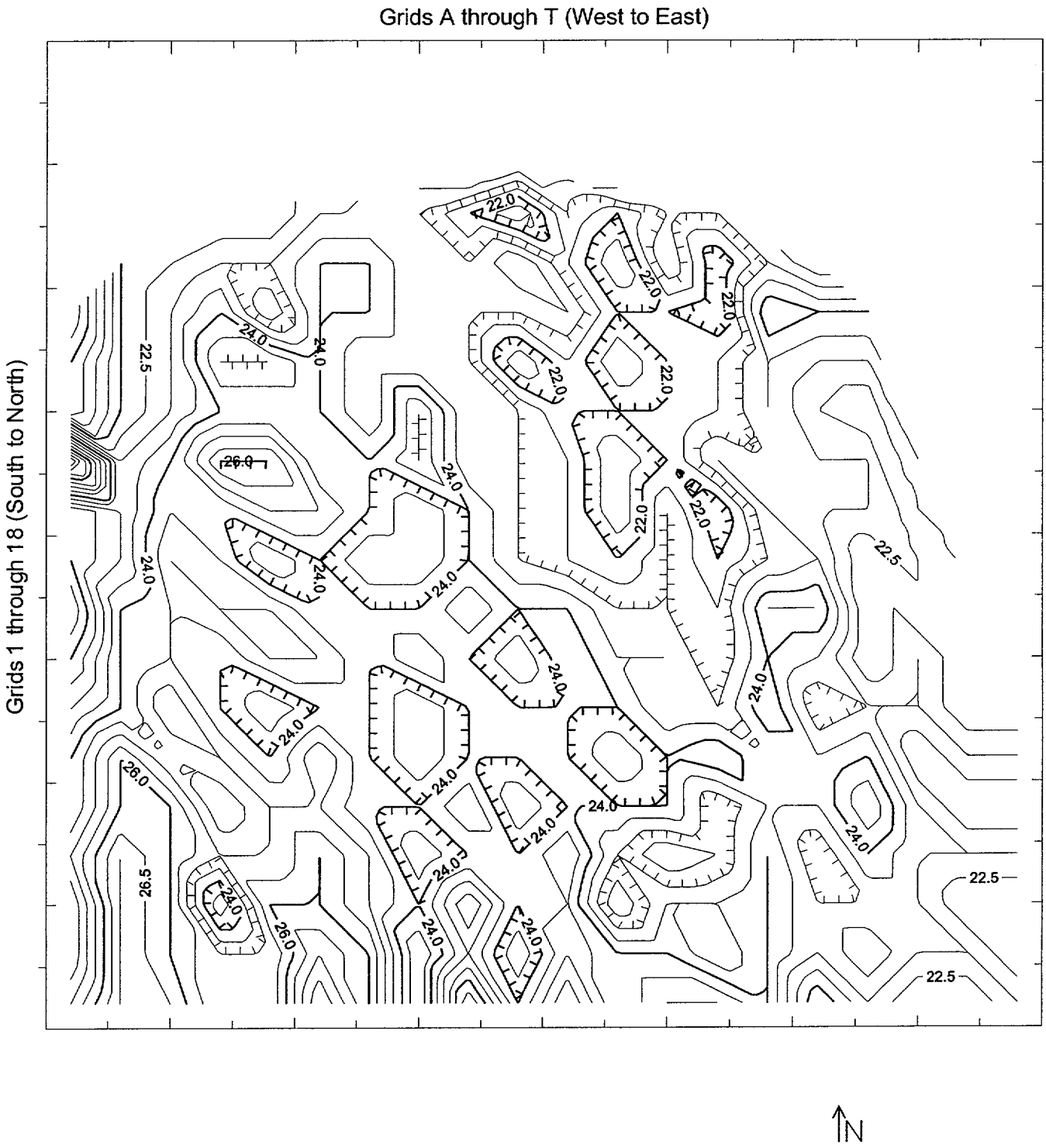
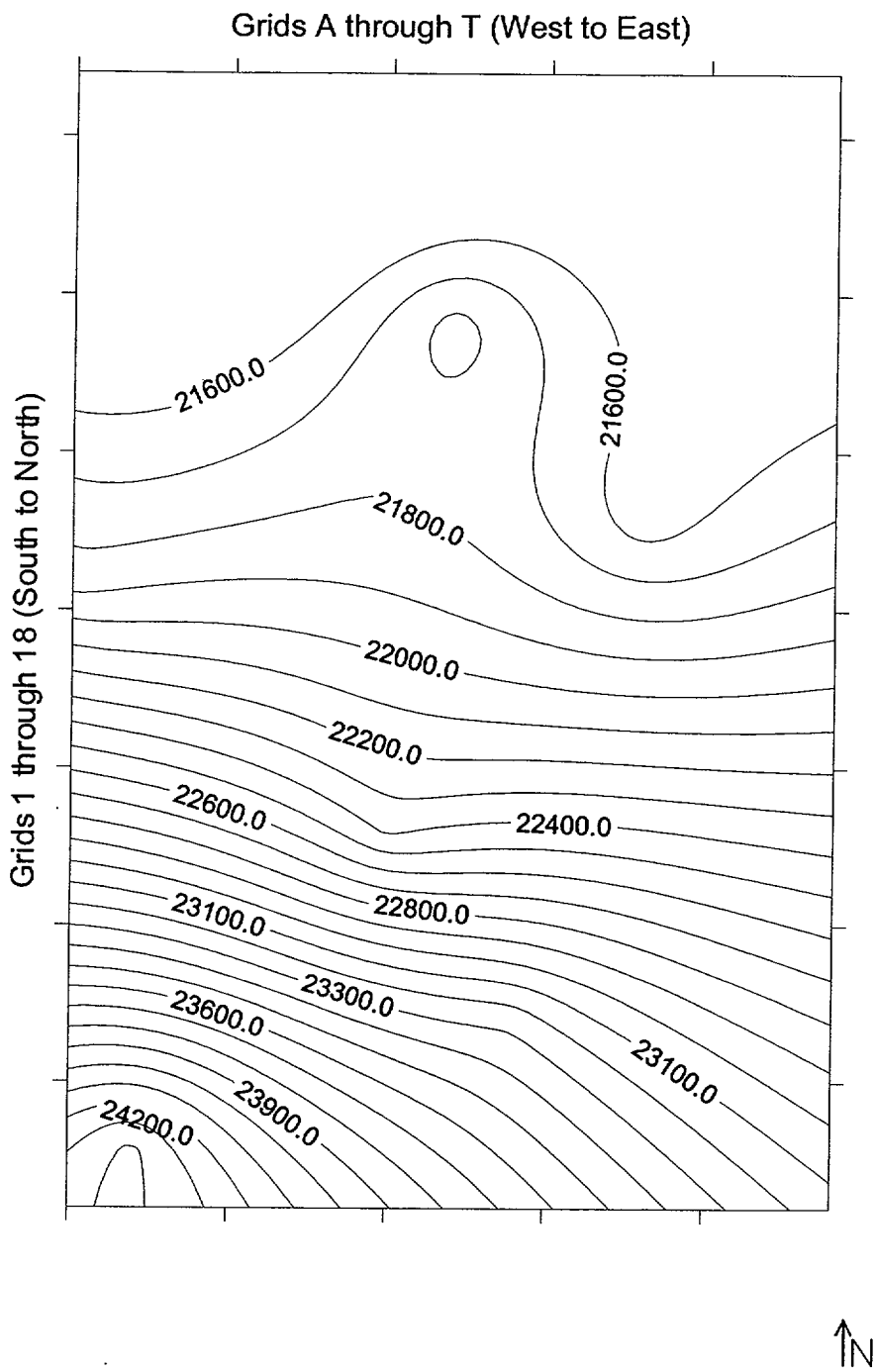


Average Gamma Scan Readings Ranged
From 19 kcpm to 28 kcpm

Figure 6.2-23
Study Area 2 - Survey Unit 1 - 4th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l4.srf

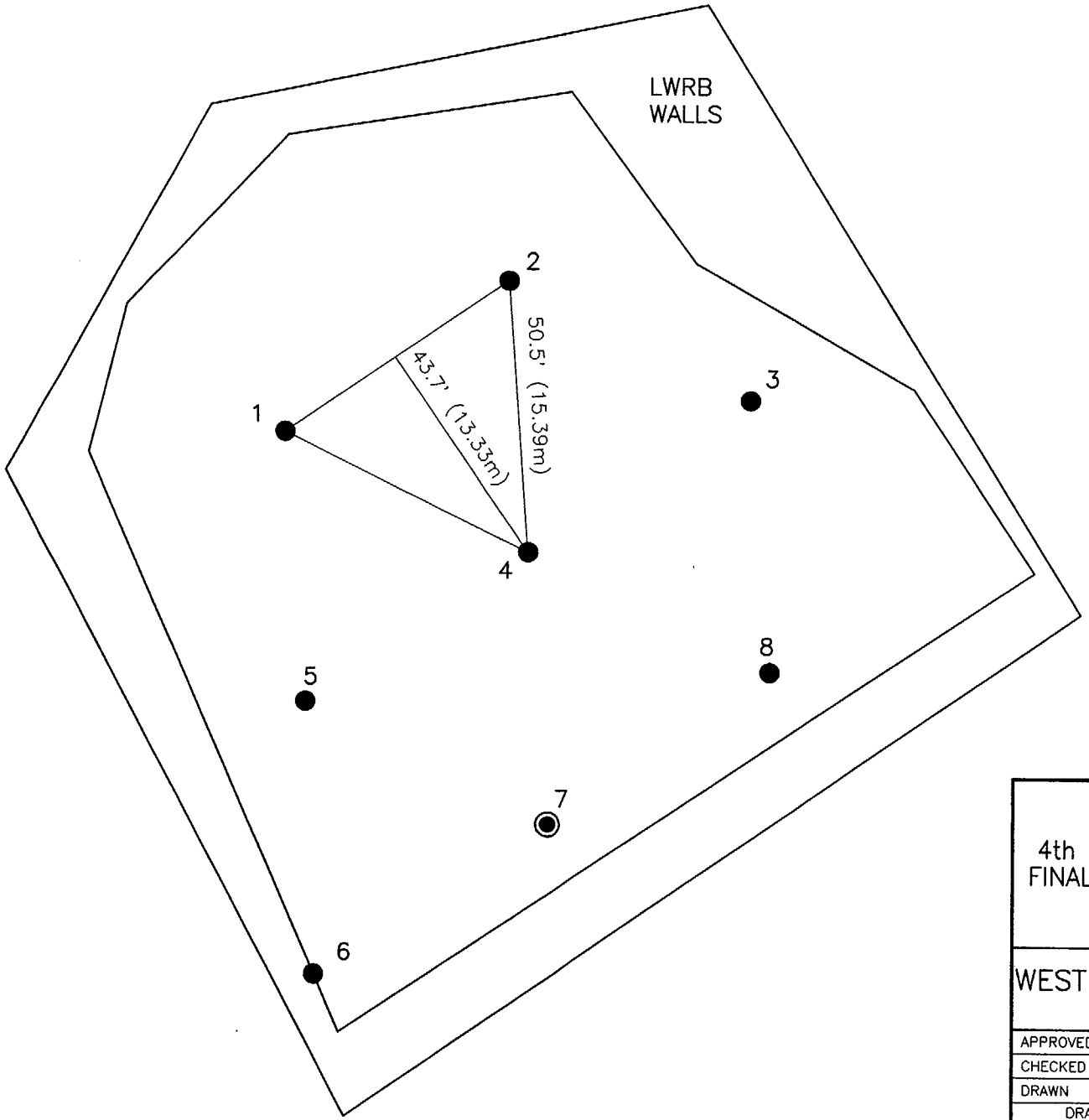


Background Measurements Ranged From
20,926 cpm to 24,417 cpm

Figure 6.2-24
Study Area 2 - Survey Unit 1 - 4th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l4b.srf



N

NOTES

A ≅ 17,705 FT^2 (1,645m^2)
n = 8
L = 50.5 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–25
STUDY AREA 2–SURVEY UNIT 1
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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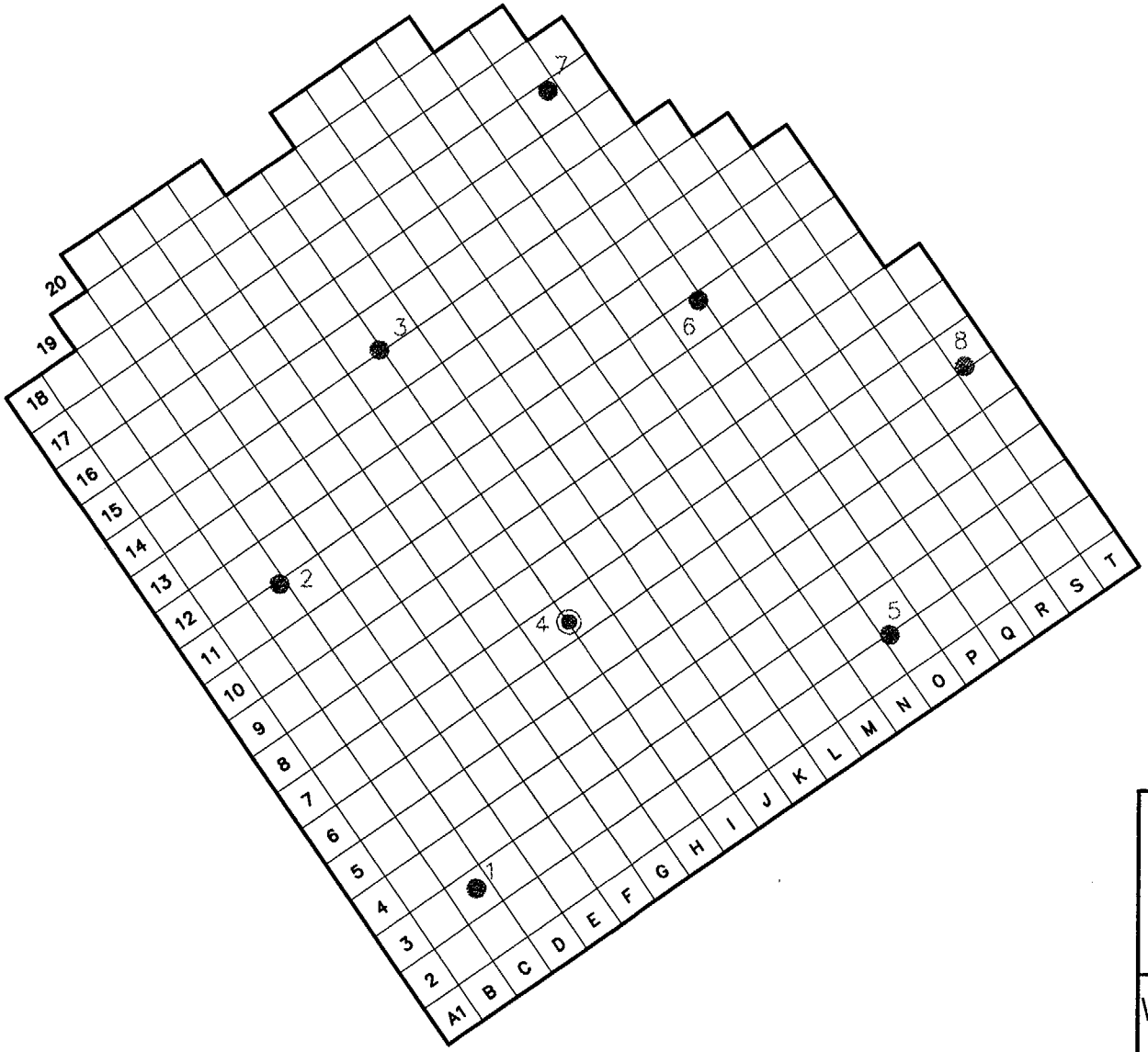
CHECKED	Eg.
DRAWN	GJA 12/7/01
DRAWING NUMBER	5018070

Earth Sciences Consultants, Inc.



N

NOTES

1. GRIDS A1 THROUGH T9 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.
3. SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.

◉ RANDOM SAMPLE POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-26
STUDY AREA 2-SURVEY UNIT 1
5th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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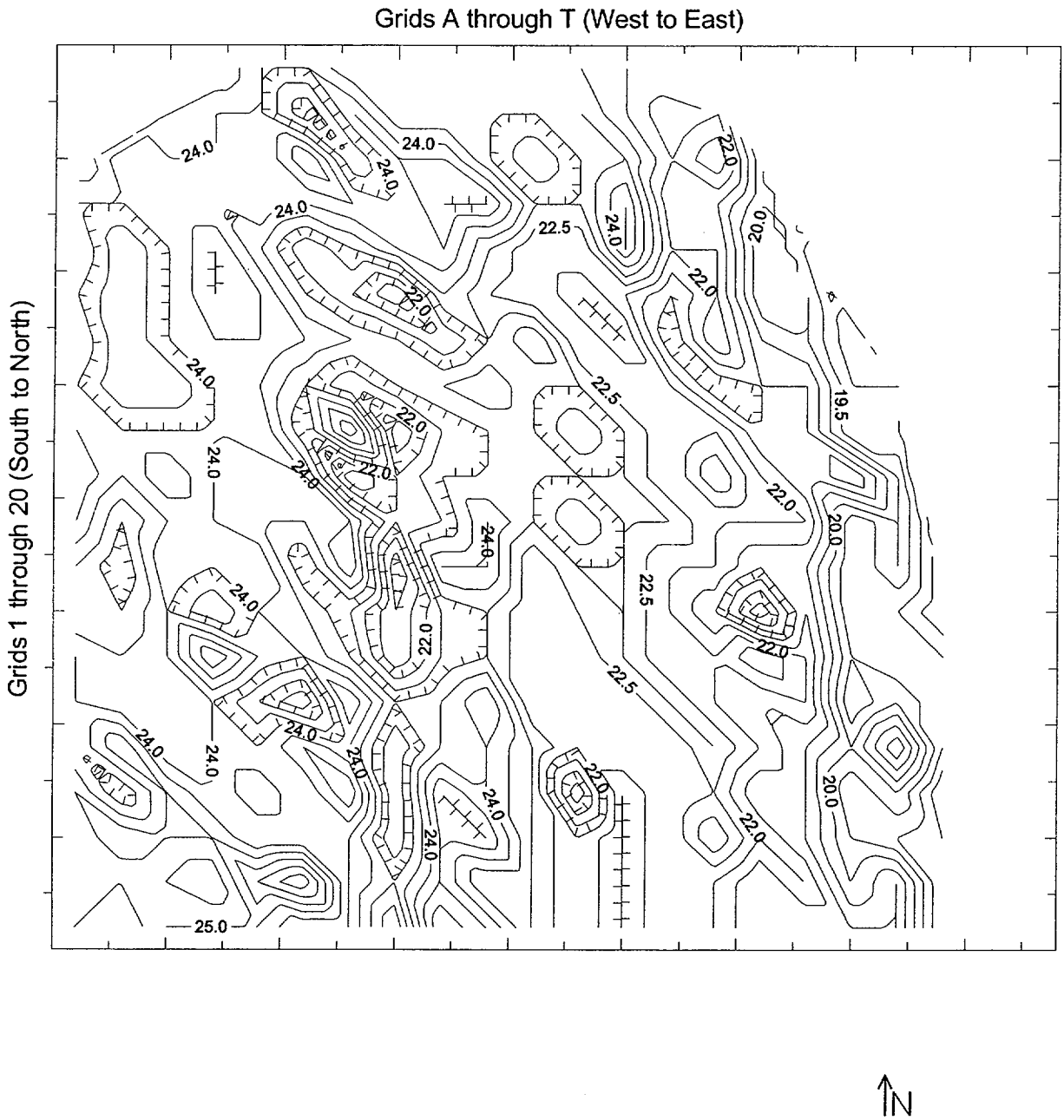
CHECKED	
DRAWN	GJA 12/7/01
DRAWING NUMBER	5018S17A

Earth Sciences Consultants, Inc.

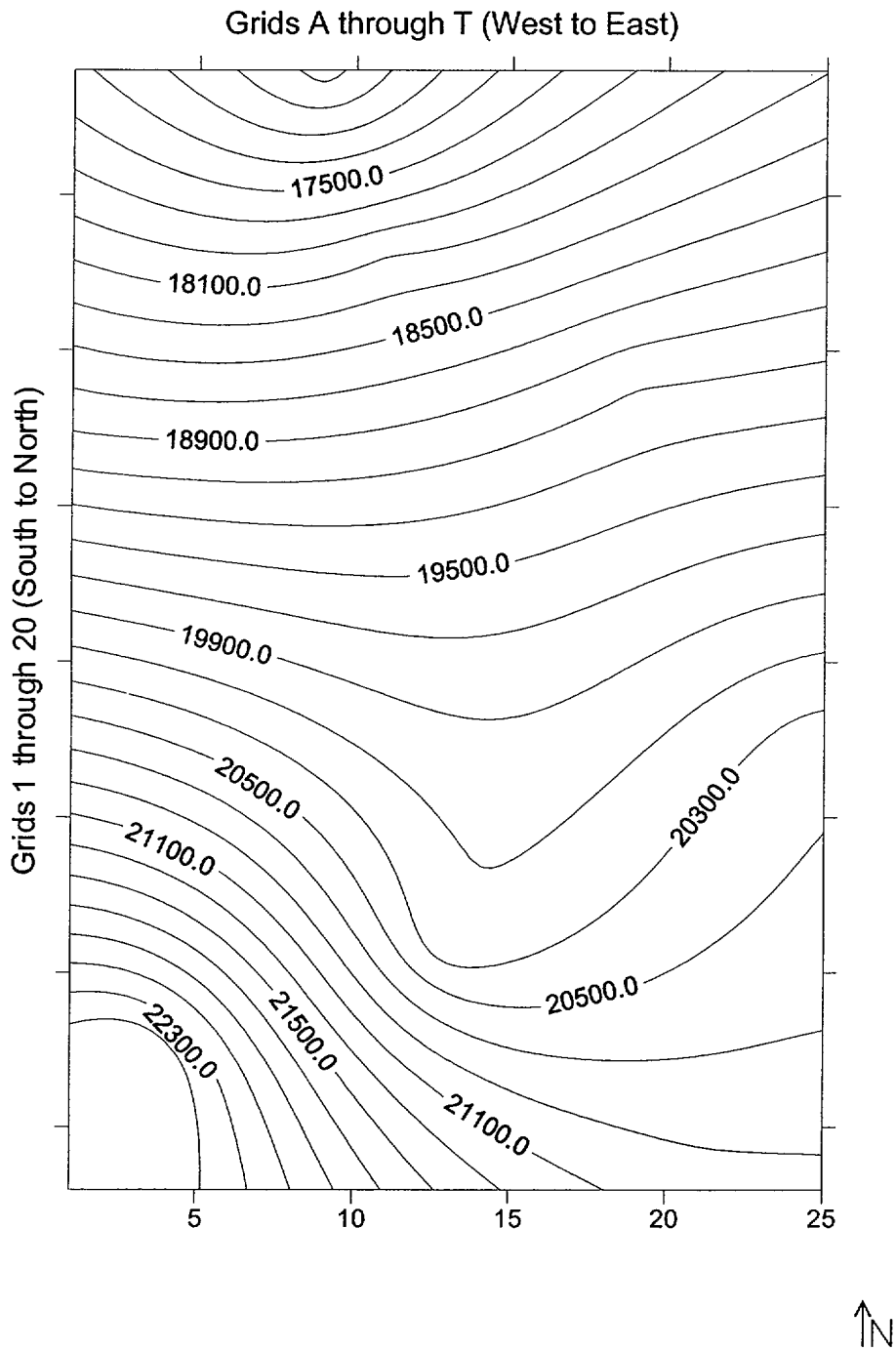


Average Gamma Scan Readings Ranged
From 18 kcpm to 26 kcpm

Figure 6.2-27
Study Area 2 - Survey Unit 1 - 5th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l5.srf

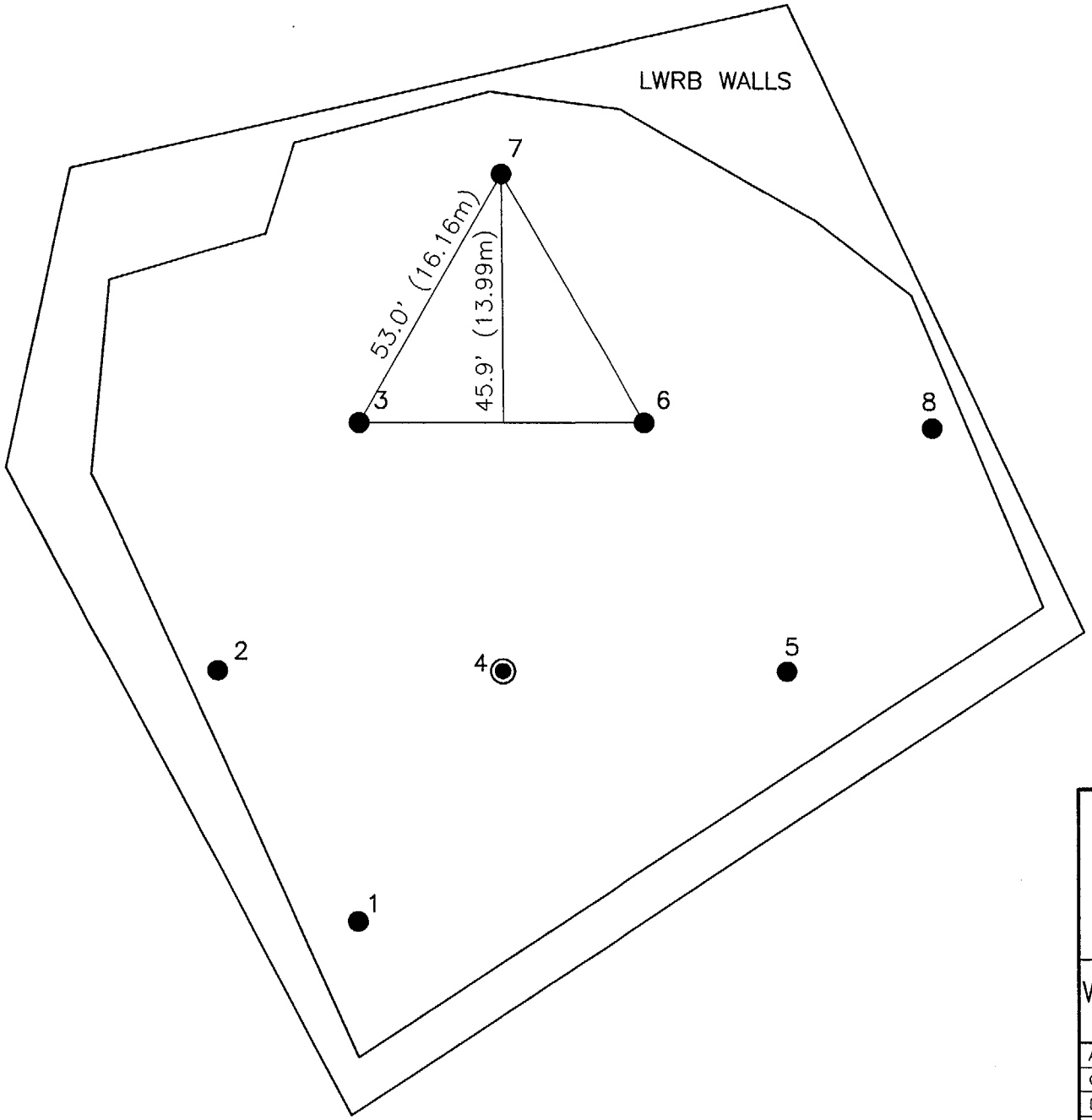


Background Measurements Ranged From
16,609 cpm to 22,866 cpm

Figure 6.2-28
Study Area 2 - Survey Unit 1 - 5th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l5b.srf



NOTES

A ≅ 19,472 FT^2 (1,809m^2)
n = 8
L = 53.0 FEET
◉ RANDOM START POINT

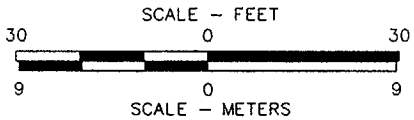


FIGURE 6.2–29
STUDY AREA 2–SURVEY UNIT 1
5th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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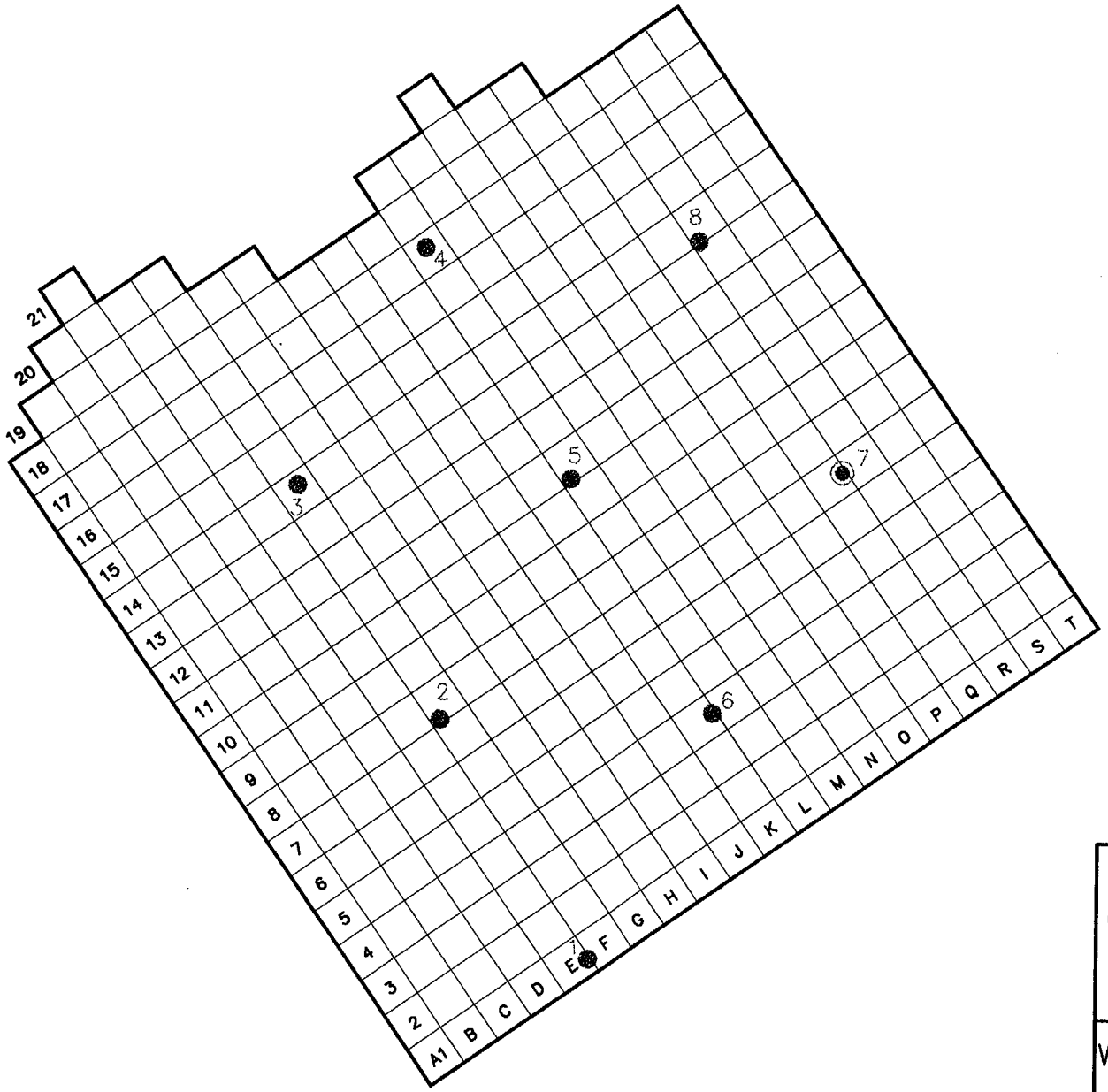

N

NOTES

1. GRIDS A1 THROUGH T18 REPRESENT THE EXCAVATION FLOOR.
2. GRIDS ARE APPROXIMATELY 2m x 2m.
3. SAMPLE LOCATIONS SHOWN ARE APPROXIMATE.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-30
STUDY AREA 2-SURVEY UNIT 1
6th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
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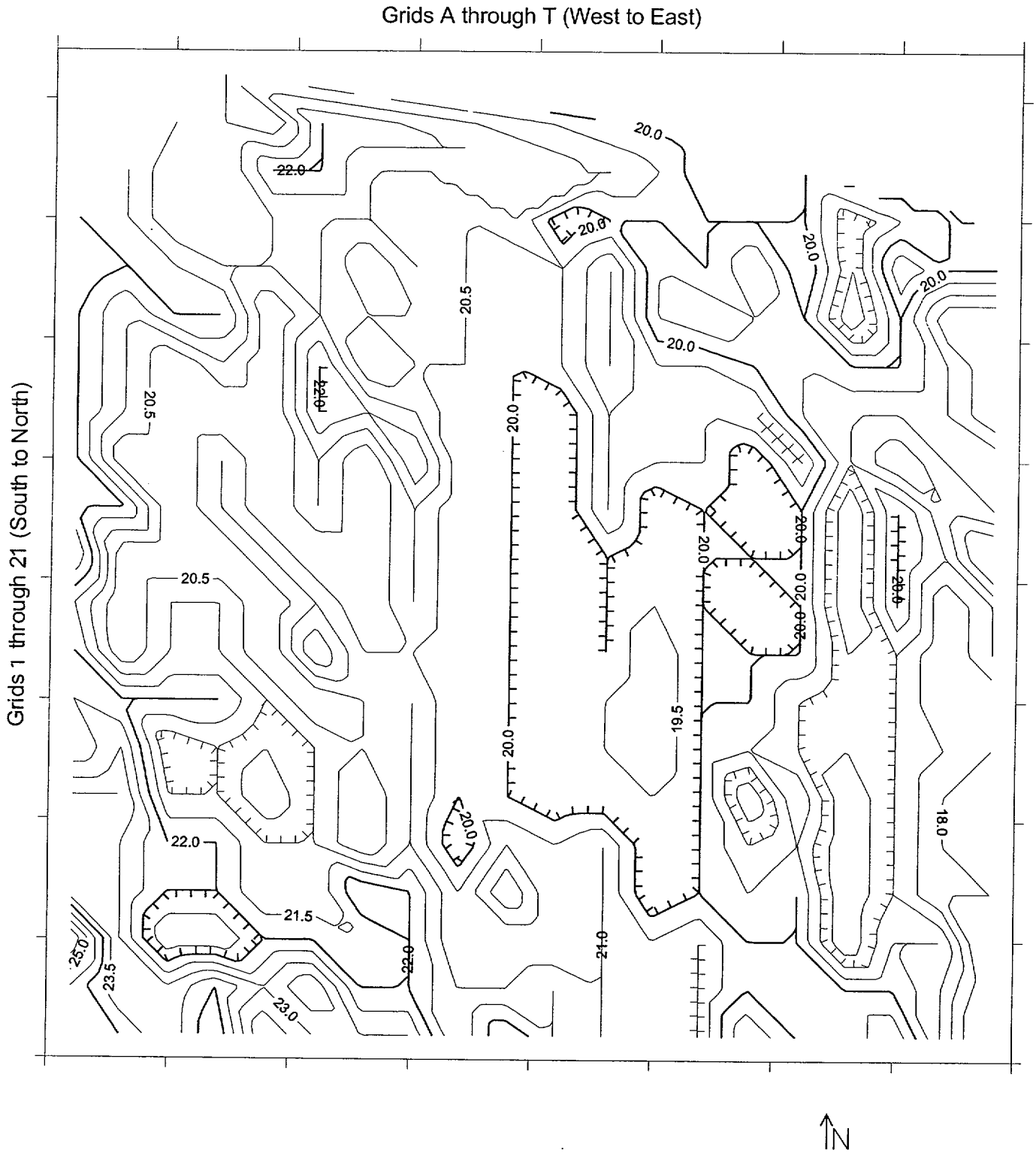

Average Gamma Scan Readings Ranged
From 17 kcpm to 26 kcpm

Figure 6.2-31
Study Area 2 - Survey Unit 1 - 6th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

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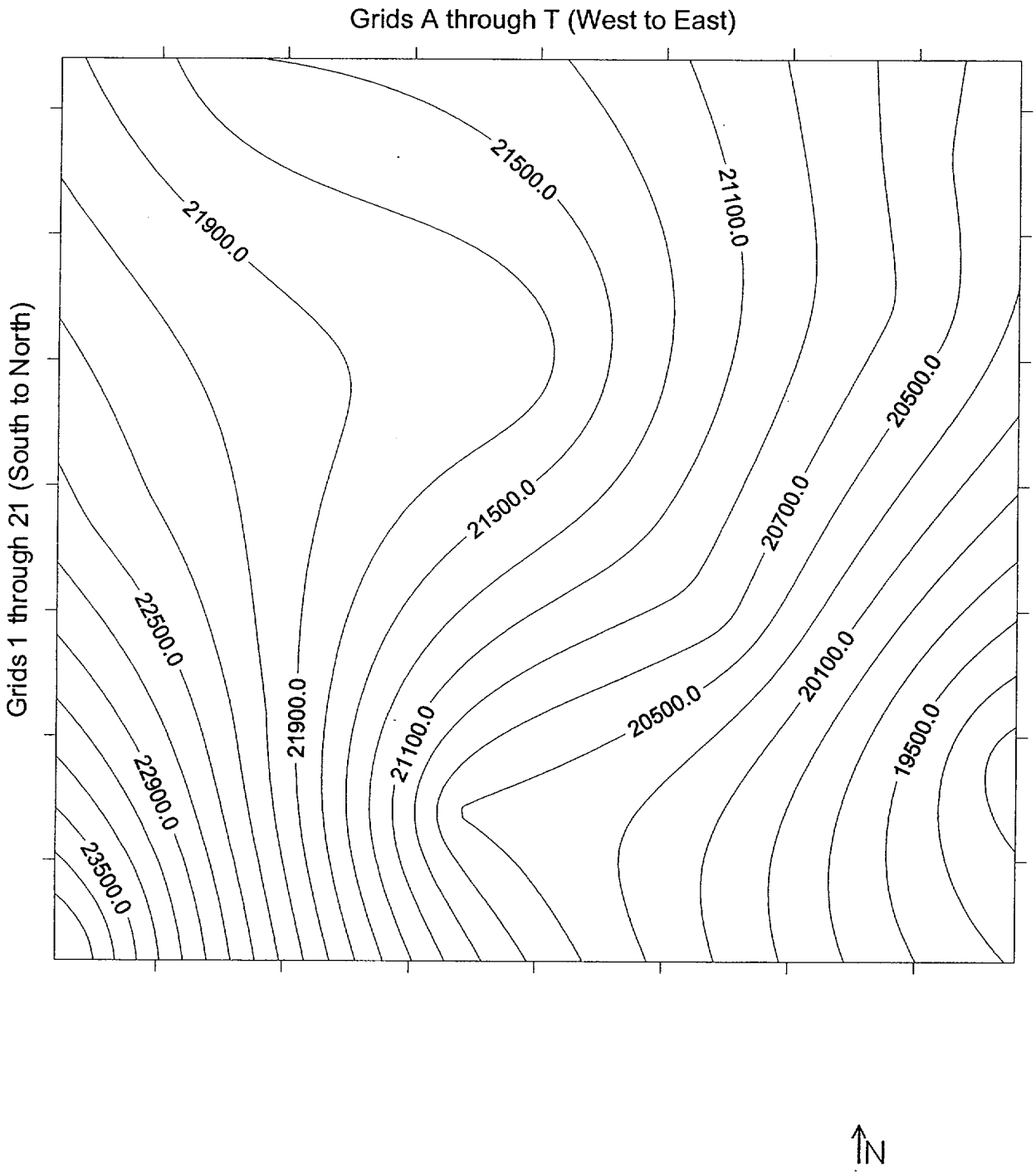
k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l6.srf

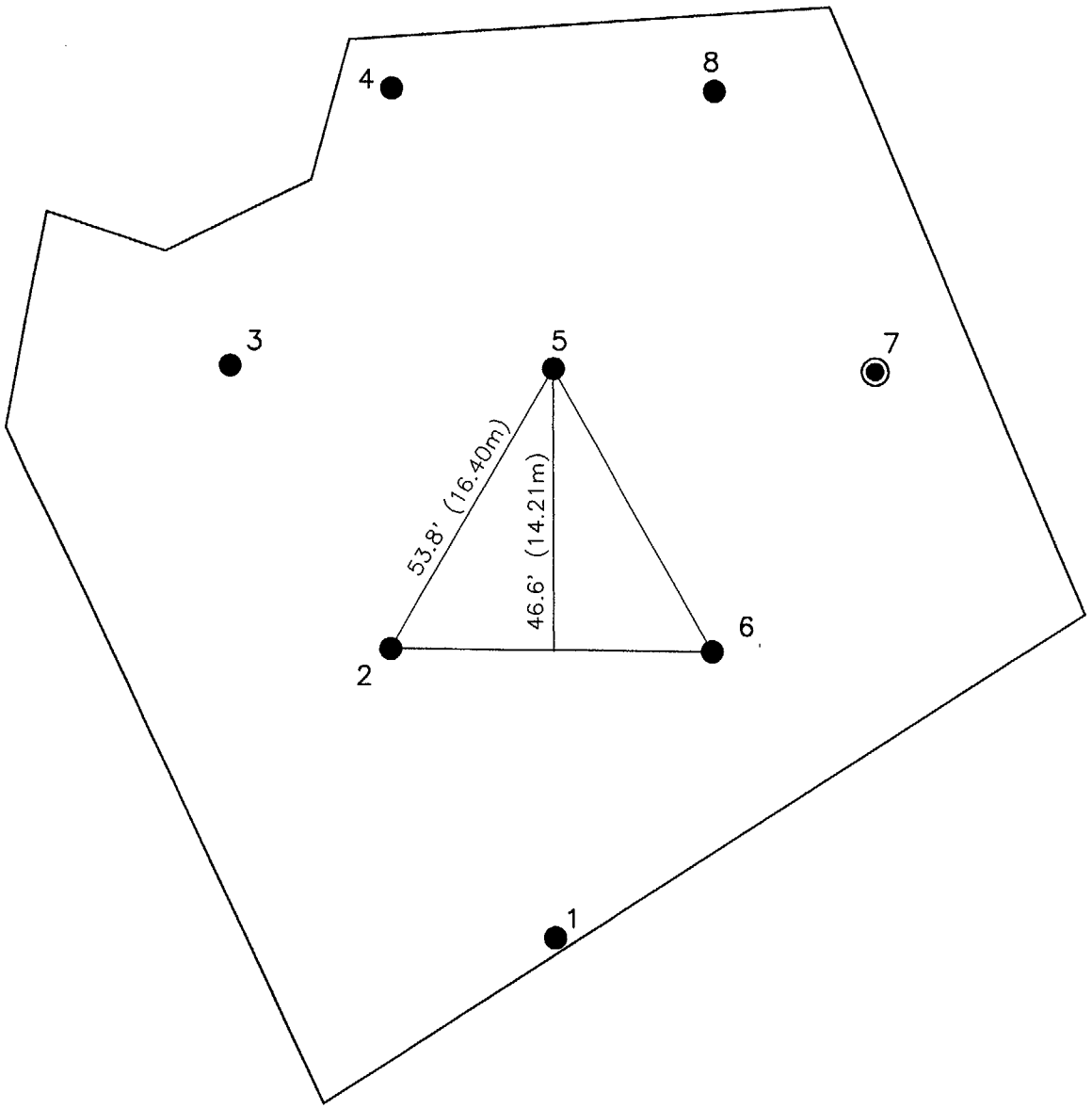


Background Measurements Ranged From
18,958 cpm to 24,257 cpm

Figure 6.2-32
Study Area 2 - Survey Unit 1 - 6th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Lwrb-l6b.srf



N

NOTES

A ≅ 20,090 FT^2 (1,866m^2)
n = 8
L = 53.8 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–33
STUDY AREA 2–SURVEY UNIT 1
6th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	SA 12/10/01
DRAWING NUMBER	5018072

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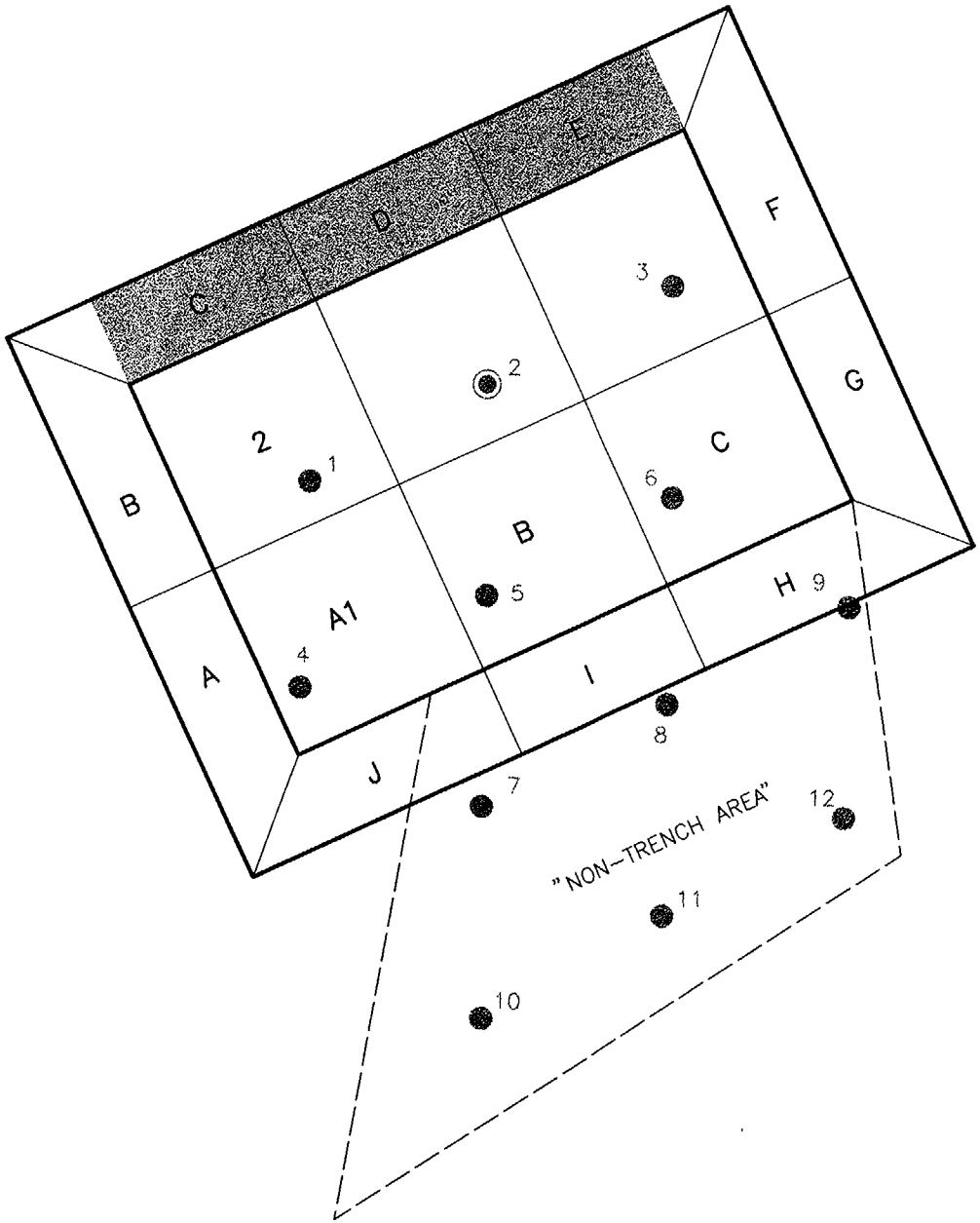

N

NOTES

1. GRIDS A THROUGH J ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH C2 REPRESENT THE EXCAVATION FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 10m x 10m.
4. WALL GRIDS ARE APPROXIMATELY 10m x 1.3m HIGH.
5. SHADED AREAS DENOTE NO WALL PRESENT.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–34
STUDY AREA 2–SURVEY UNIT 2
BOTTOM OF TRENCH EXCAVATION
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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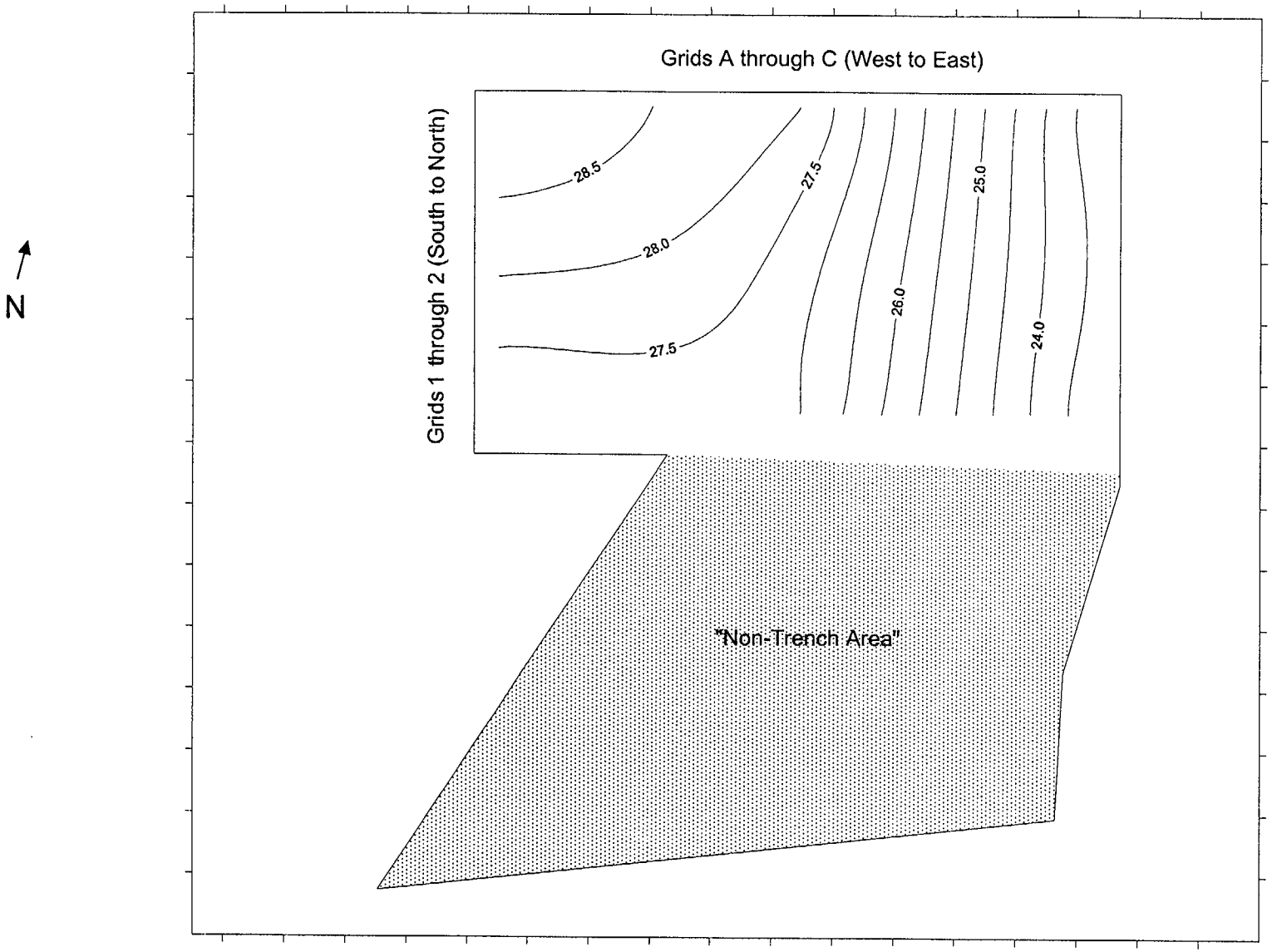
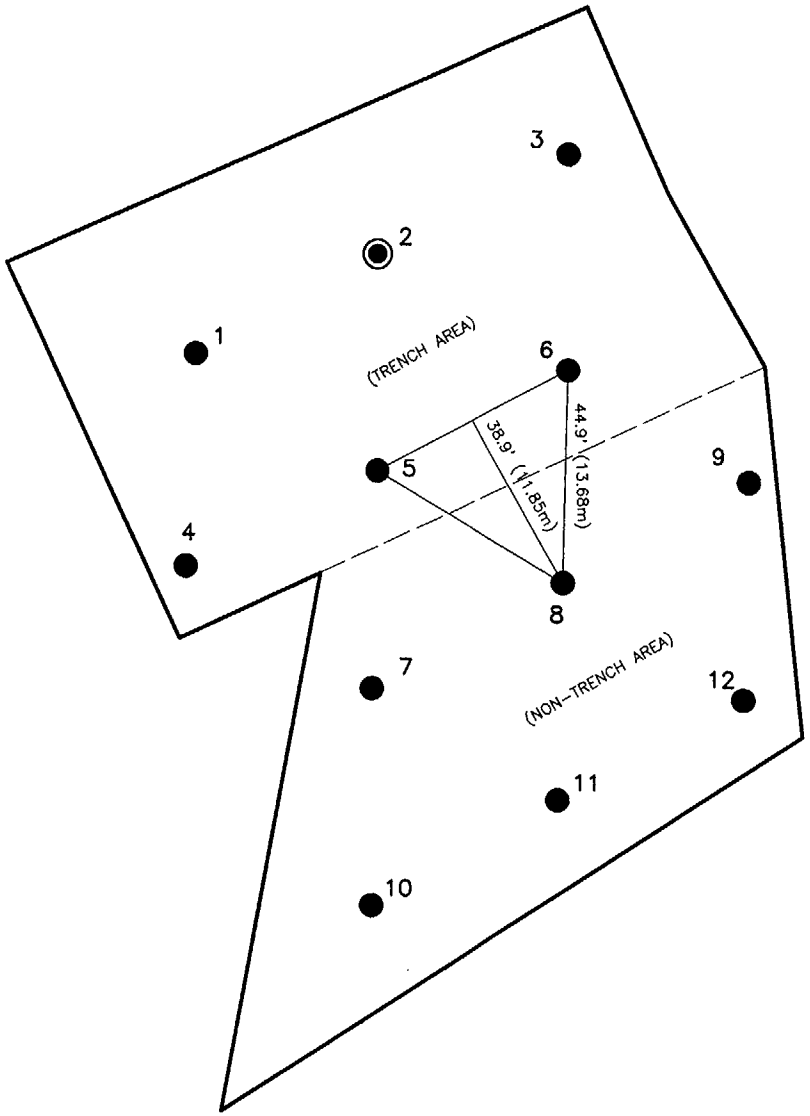


Figure 6.2-35
Study Area 2 - Survey Unit 2 - Trench Excavation Bottom
Average Gamma Scan Isopleths (kcpm)

Average Gamma Scan Readings Ranged
From 23 kcpm to 29 kcpm

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-bot.srf



N

NOTES

A ≅ 20,948 FT^2 (1,946m^2)
n = 12
L = 44.9 FEET
◉ RANDOM START POINT

SAMPLE 9 WAS MOVED APPROXIMATELY 10 FEET WEST DUE TO PROXIMITY TO CALLEY'S RUN.

SCALE – FEET
40 0 40 80
10 0 10 20
SCALE – METERS

FIGURE 6.2–36
STUDY AREA 2 – SURVEY UNIT 2
BOTTOM OF TRENCH EXCAVATION
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	JA 12/26/01
DRAWING NUMBER	5018091

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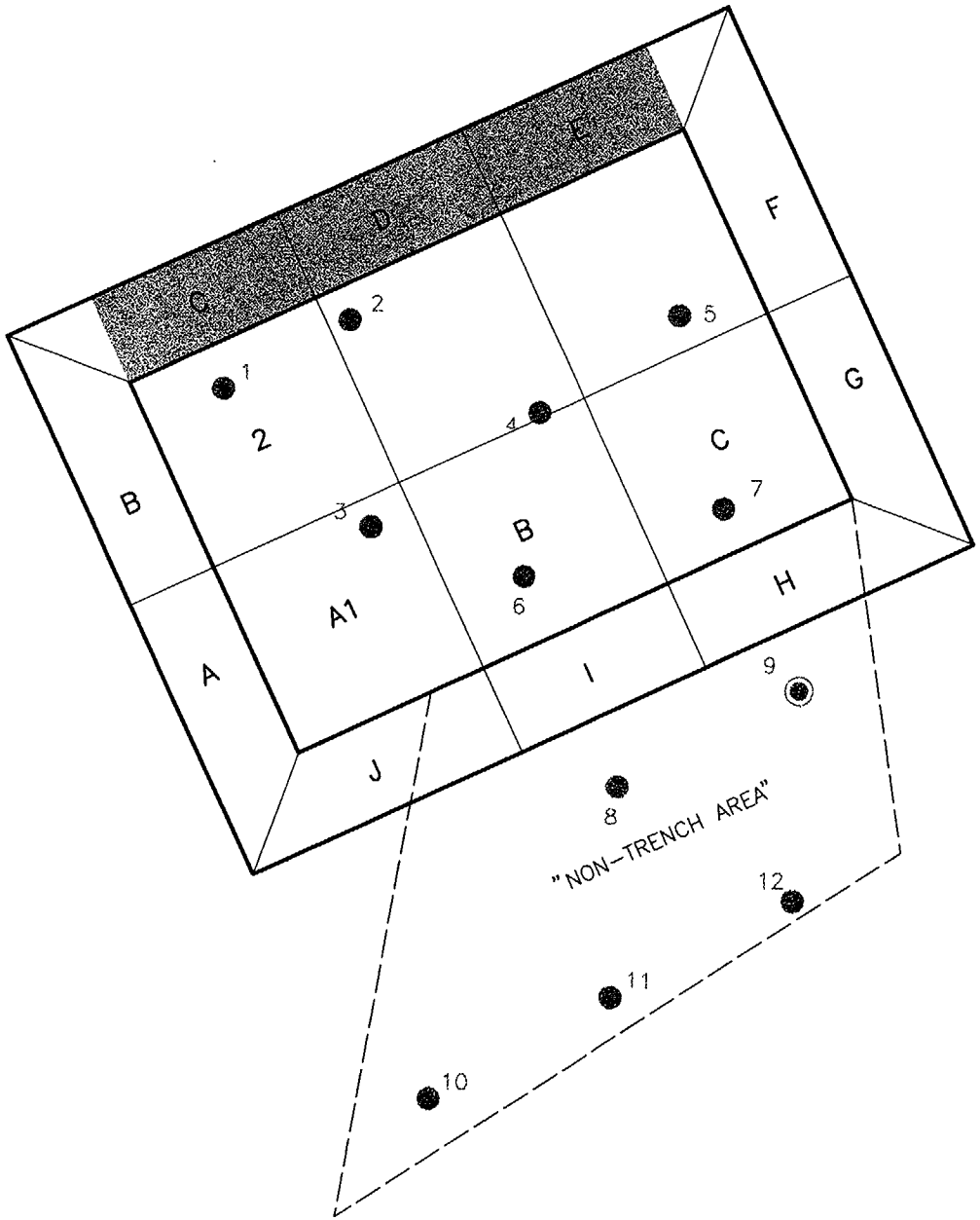

N

NOTES

1. GRIDS A THROUGH J ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH C2 REPRESENT THE EXCAVATION FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 10m x 10m.
4. WALL GRIDS ARE APPROXIMATELY 10m x 1.3m HIGH.
5. SHADED AREAS DENOTE NO WALL PRESENT.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-37
STUDY AREA 2-SURVEY UNIT 2
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
PITTSBURGH, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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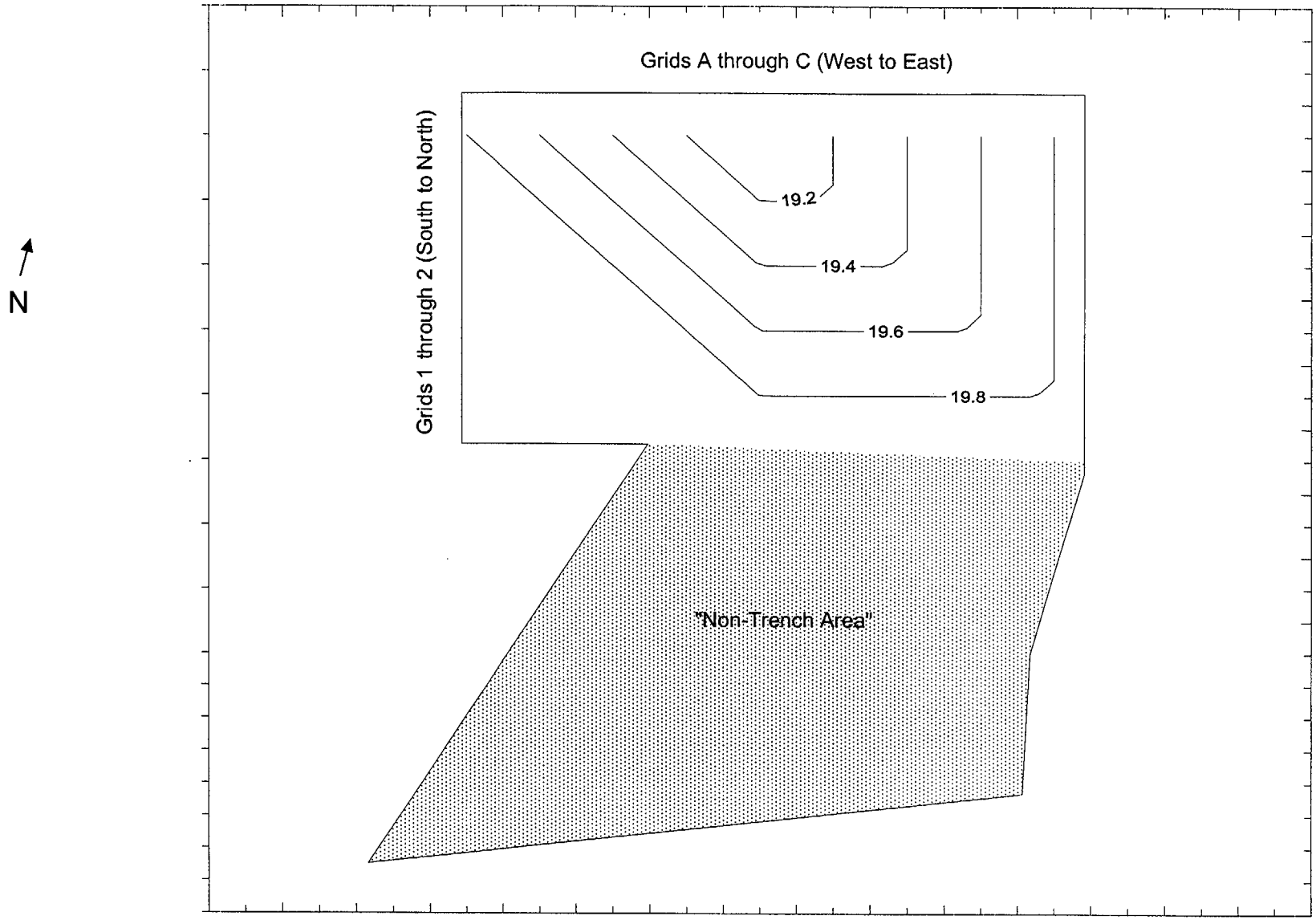
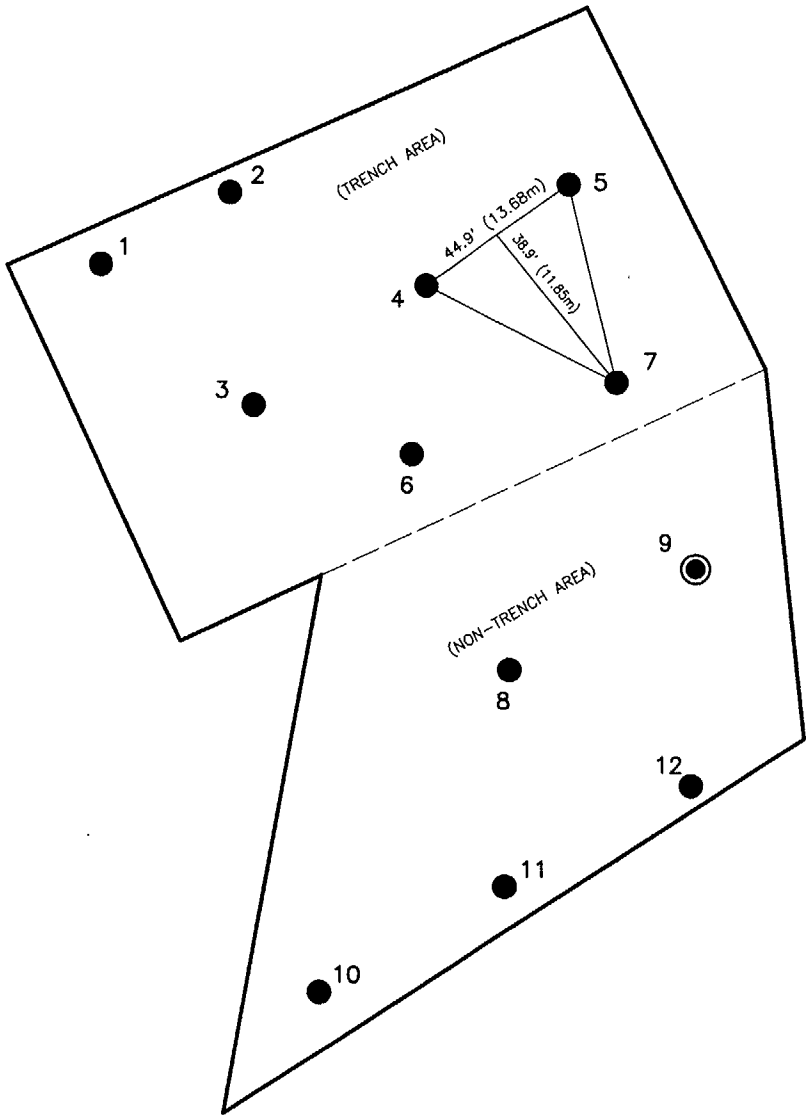


Figure 6.2-38
Study Area 2 - Survey Unit 2 - 1st Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Average Gamma Scan Readings Ranged
From 19 kcpm to 20 kcpm

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-I1.srf



N

NOTES

A ≅ 20,948 FT^2 (1,946m^2)
n = 12
L = 44.9 FEET
◉ RANDOM START POINT

1. ONLY SAMPLES FALLING IN TRENCH AREA WERE COLLECTED (#1–7)
2. #1, 5, AND 6 LOCATIONS WERE CHANGED IN FIELD DUE TO TRENCH LOCATION

SCALE – FEET
40 0 40 80
10 0 10 20
SCALE – METERS

FIGURE 6.2–39
STUDY AREA 2 – SURVEY UNIT 2
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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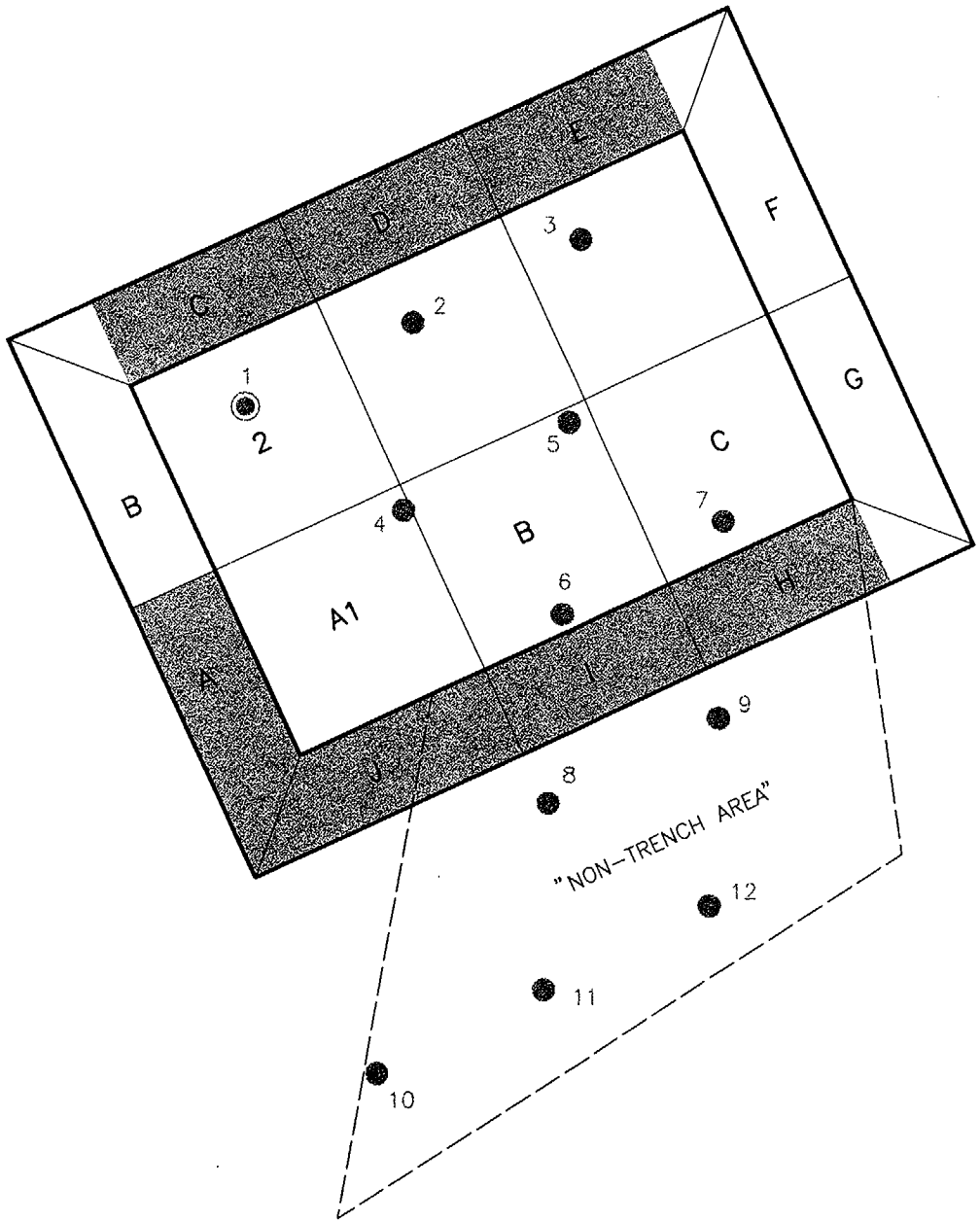

N

NOTES

1. GRIDS A THROUGH J ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH C2 REPRESENT THE EXCAVATION FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 10m x 10m.
4. WALL GRIDS ARE APPROXIMATELY 10m x 1.3m HIGH.
5. SHADED AREAS DENOTE NO WALL PRESENT.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–40
STUDY AREA 2–SURVEY UNIT 2
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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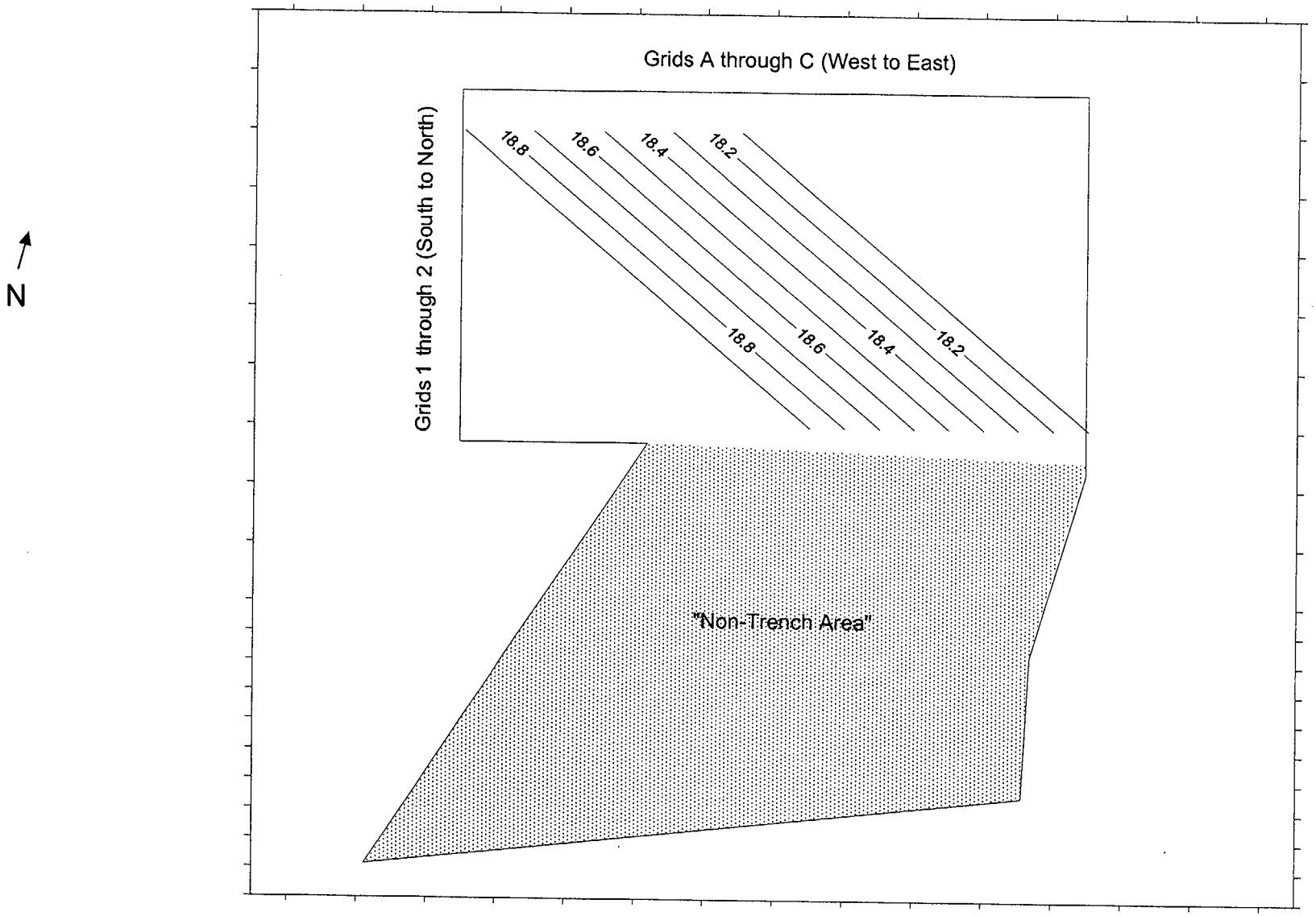


Average Gamma Scan Readings Ranged
From 18 kcpm to 19 kcpm

Figure 6.2-41
Study Area 2 - Survey Unit 2 - 2nd Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-l2.srf

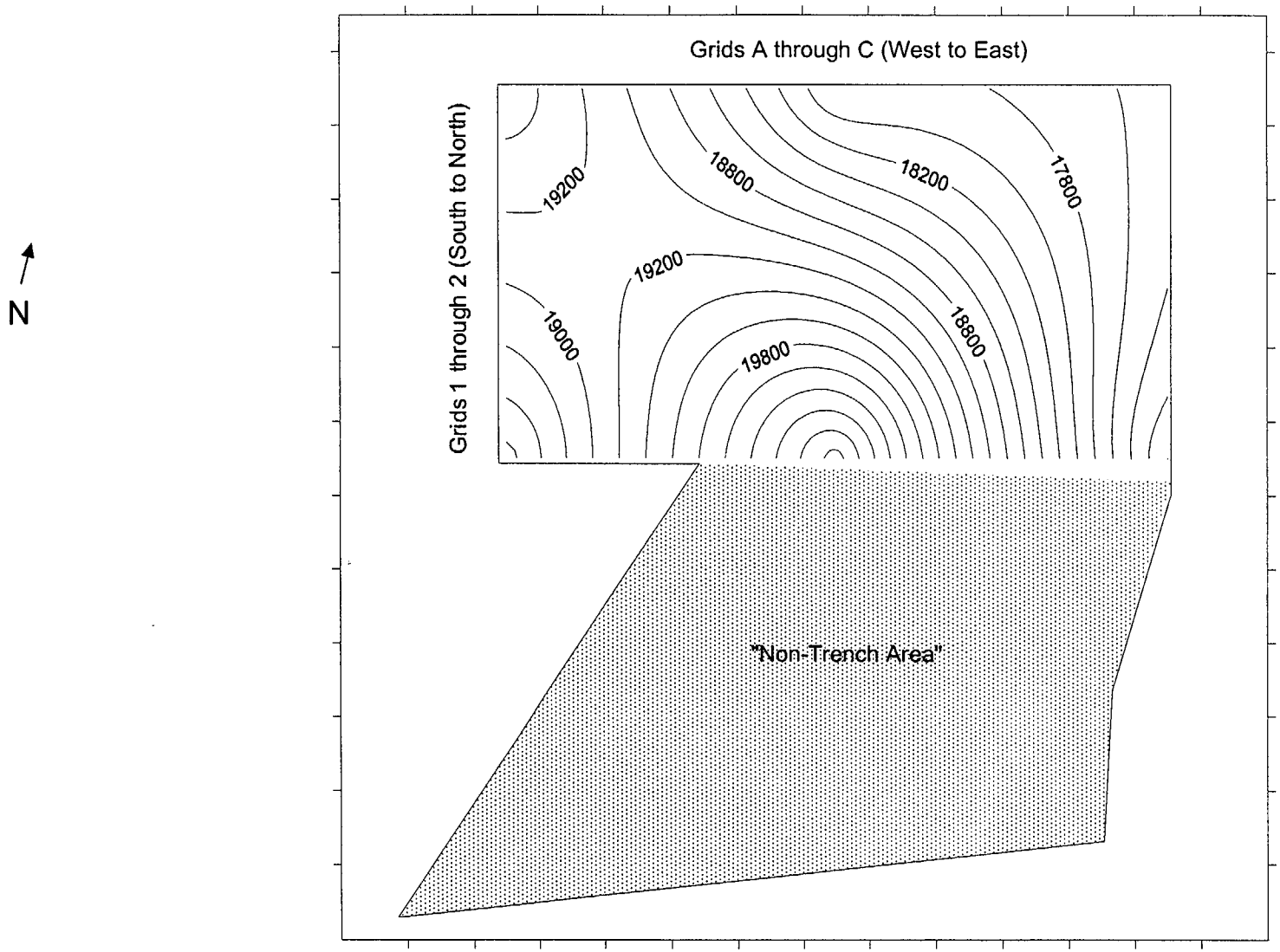
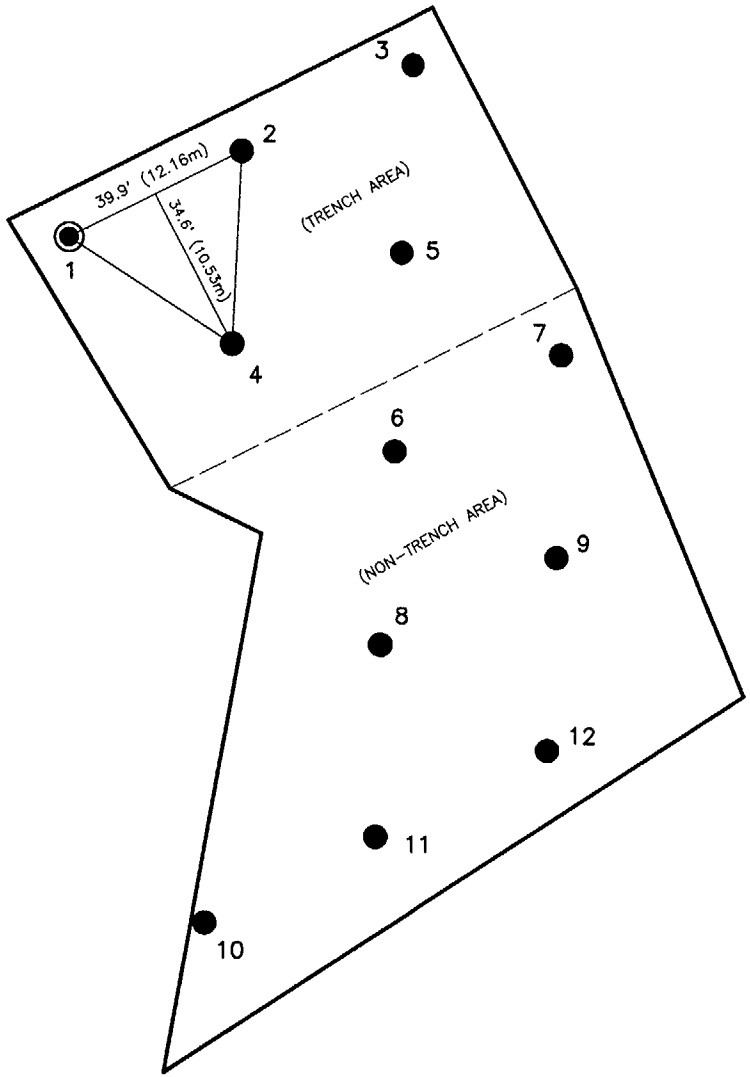


Figure 6.2-42
Study Area 2 - Survey Unit 2 - 2nd Lift of ABM
Background Isopleths (cpm)

Background Measurements Ranged
From 16,999 cpm to 20,904 cpm

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-l2b.srf



NOTES

A ≅ 16,560 FT^2 (1,538m^2)
n = 12
L = 39.9 FEET
◉ RANDOM START POINT

ONLY SAMPLES FALLING IN TRENCH AREA WERE COLLECTED (#1–5)

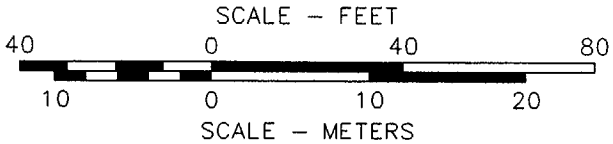


FIGURE 6.2–43
STUDY AREA 2 – SURVEY UNIT 2
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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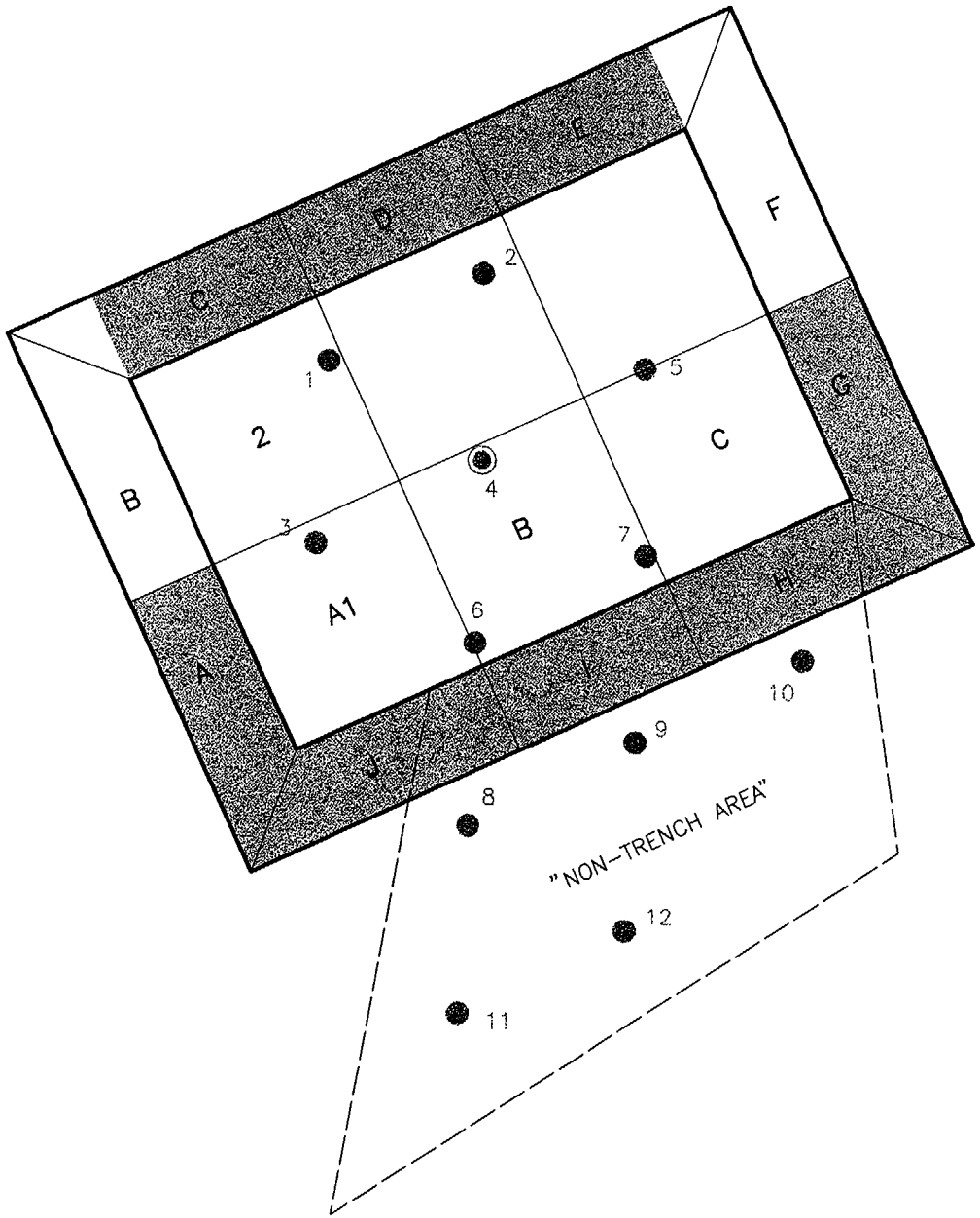

NOTES

1. GRIDS A THROUGH J ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH C2 REPRESENT THE EXCAVATION FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 10m x 10m.
4. WALL GRIDS ARE APPROXIMATELY 10m x .66m HIGH.
5. SHADED AREAS DENOTE NO WALL PRESENT.

◉ RANDOM START POINT

● SAMPLING LOCATION

N

DRAWING NOT TO SCALE

FIGURE 6.2-44
STUDY AREA 2-SURVEY UNIT 2
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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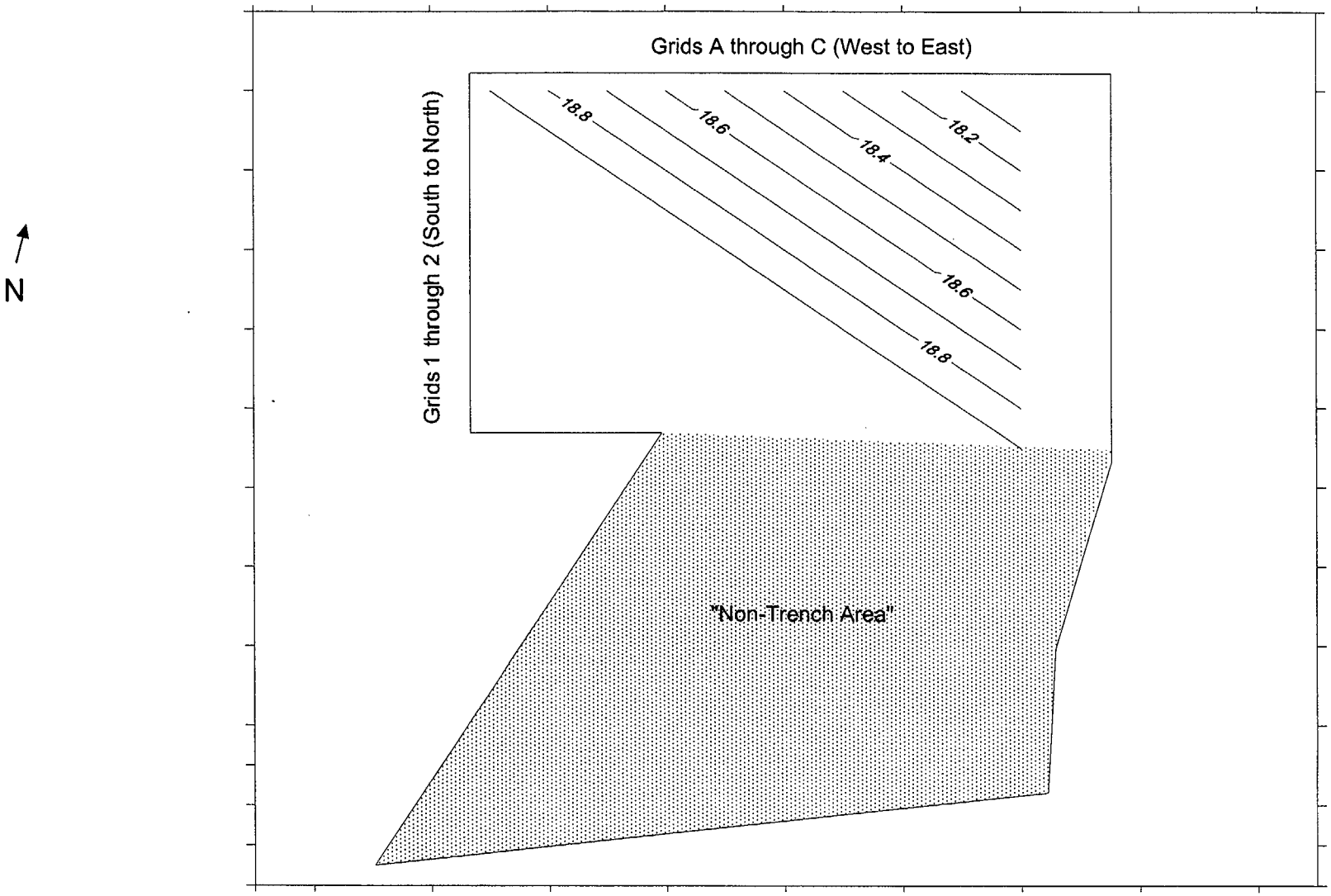


Figure 6.2-45
Study Area 2 - Survey Unit 2 - 3rd Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Average Gamma Scan Readings Ranged
From 18 kcpm to 19 kcpm

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-I3.srf

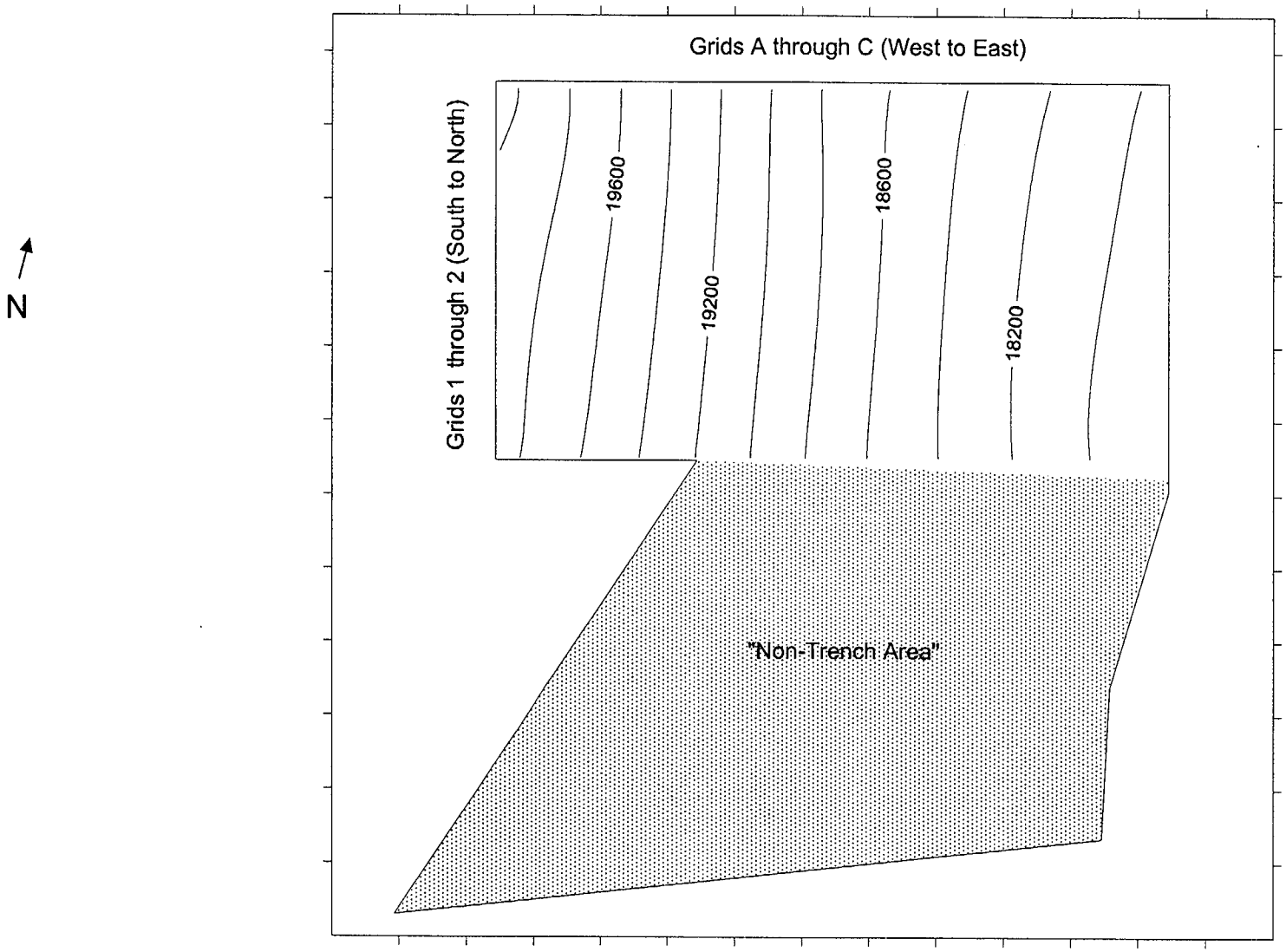
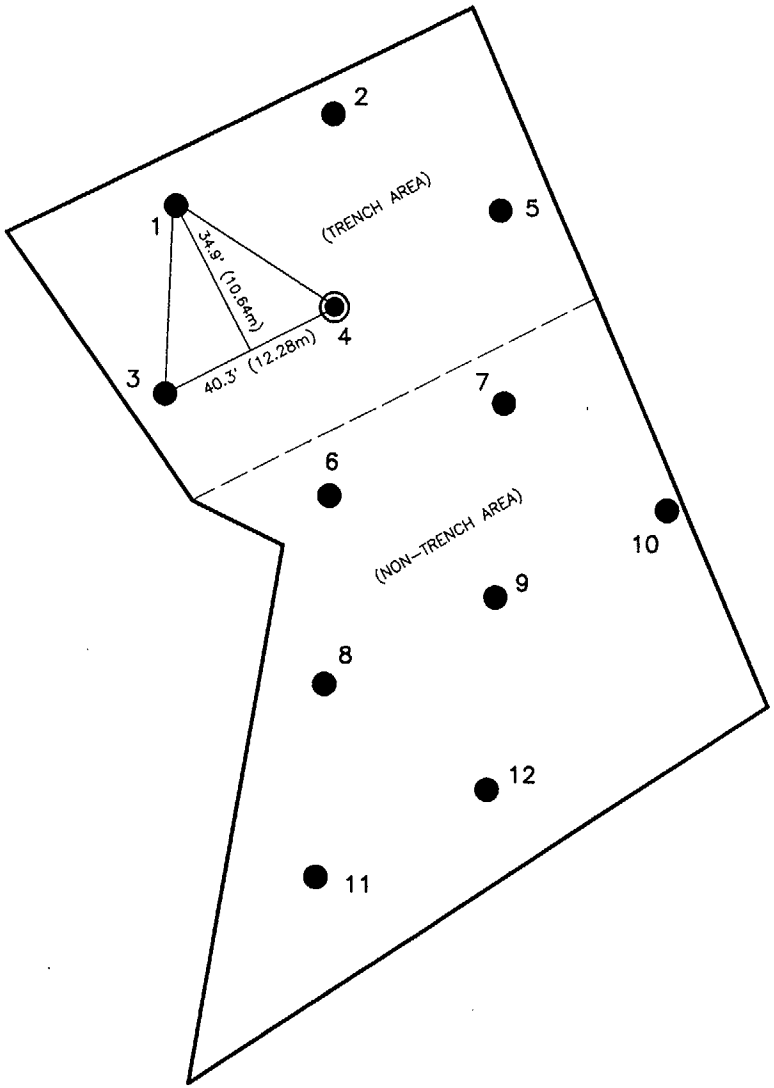


Figure 6.2-46
Study Area 2 - Survey Unit 2 - 3rd Lift of ABM
Background Isopleths (cpm)

Background Measurements Ranged
From 17,800 cpm to 20,067 cpm

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-I3b.srf



N

NOTES

A ≅ 16,856 FT^2 (1,566m^2)
n = 12
L = 40.3 FEET
◉ RANDOM START POINT

ONLY SAMPLES FALLING IN TRENCH AREA WERE COLLECTED (#1–5)

SCALE – FEET
40 0 40 80
10 0 10 20
SCALE – METERS

FIGURE 6.2–47
STUDY AREA 2 – SURVEY UNIT 2
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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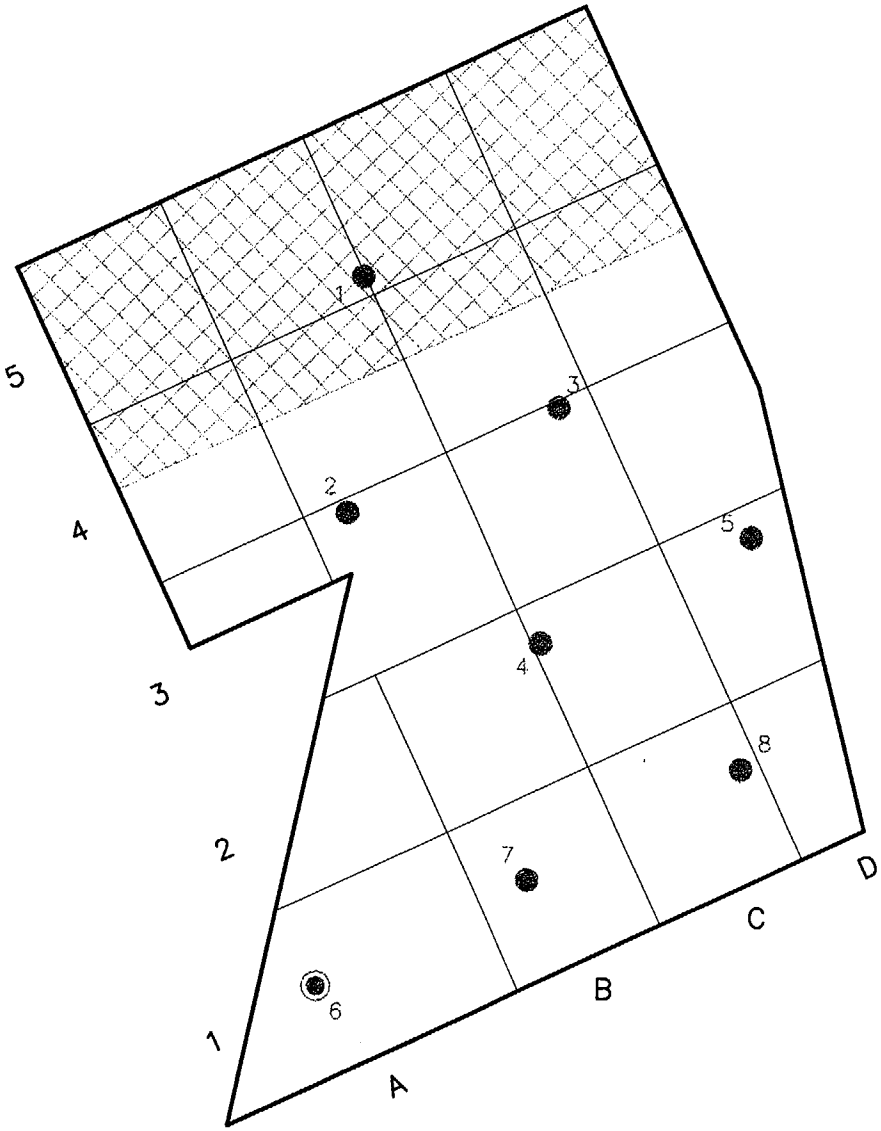

N

NOTES

1. GRIDS A1 THROUGH D5 REPRESENT THE FLOOR.
2. GRIDS ARE APPROXIMATELY 10m x 10m.
3. SHADED AREA REPRESENTS THE APPROXIMATE PLACEMENT AREA OF ACCEPTABLE BACKFILL MATERIAL.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-48
STUDY AREA 2-SURVEY UNIT 2
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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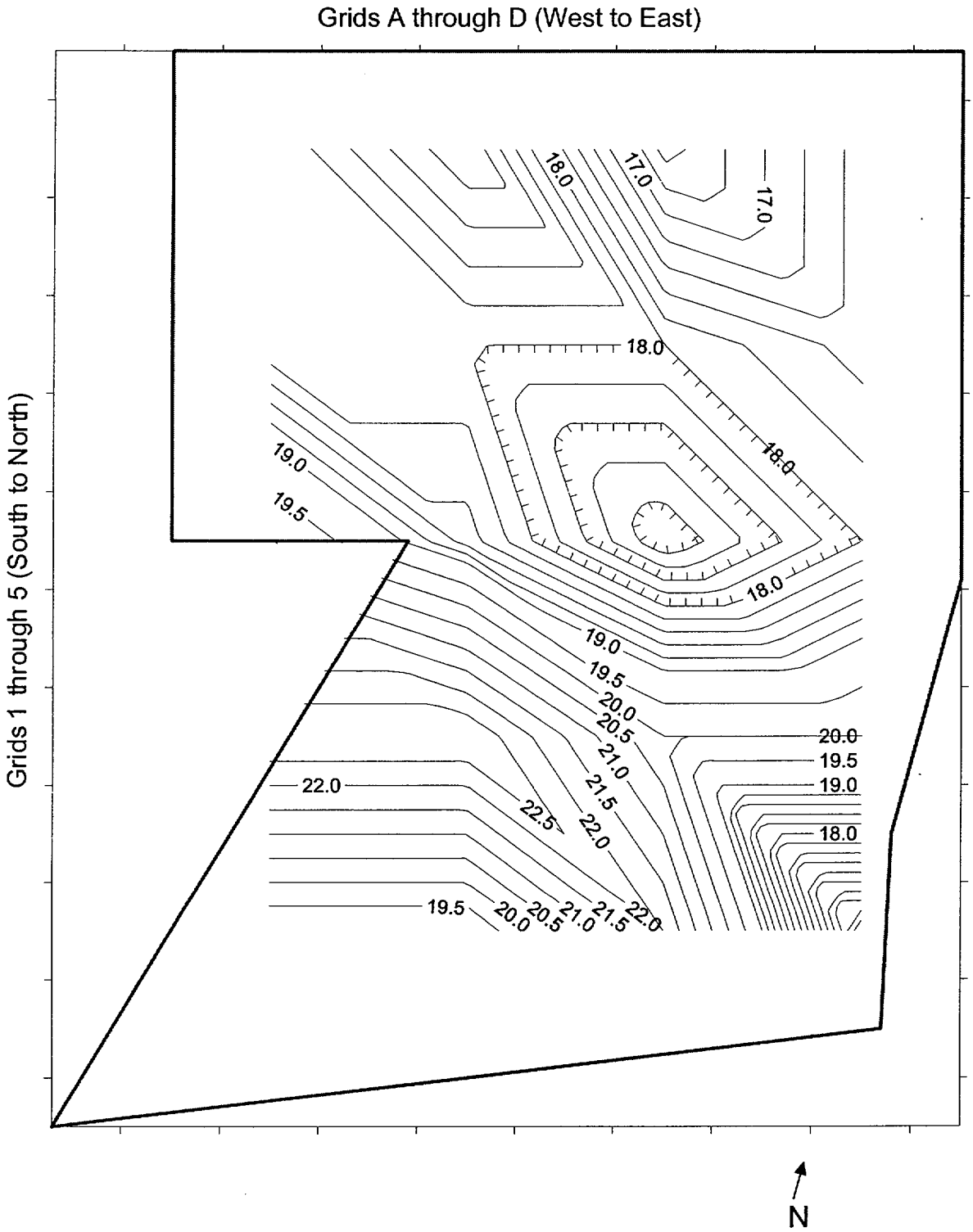
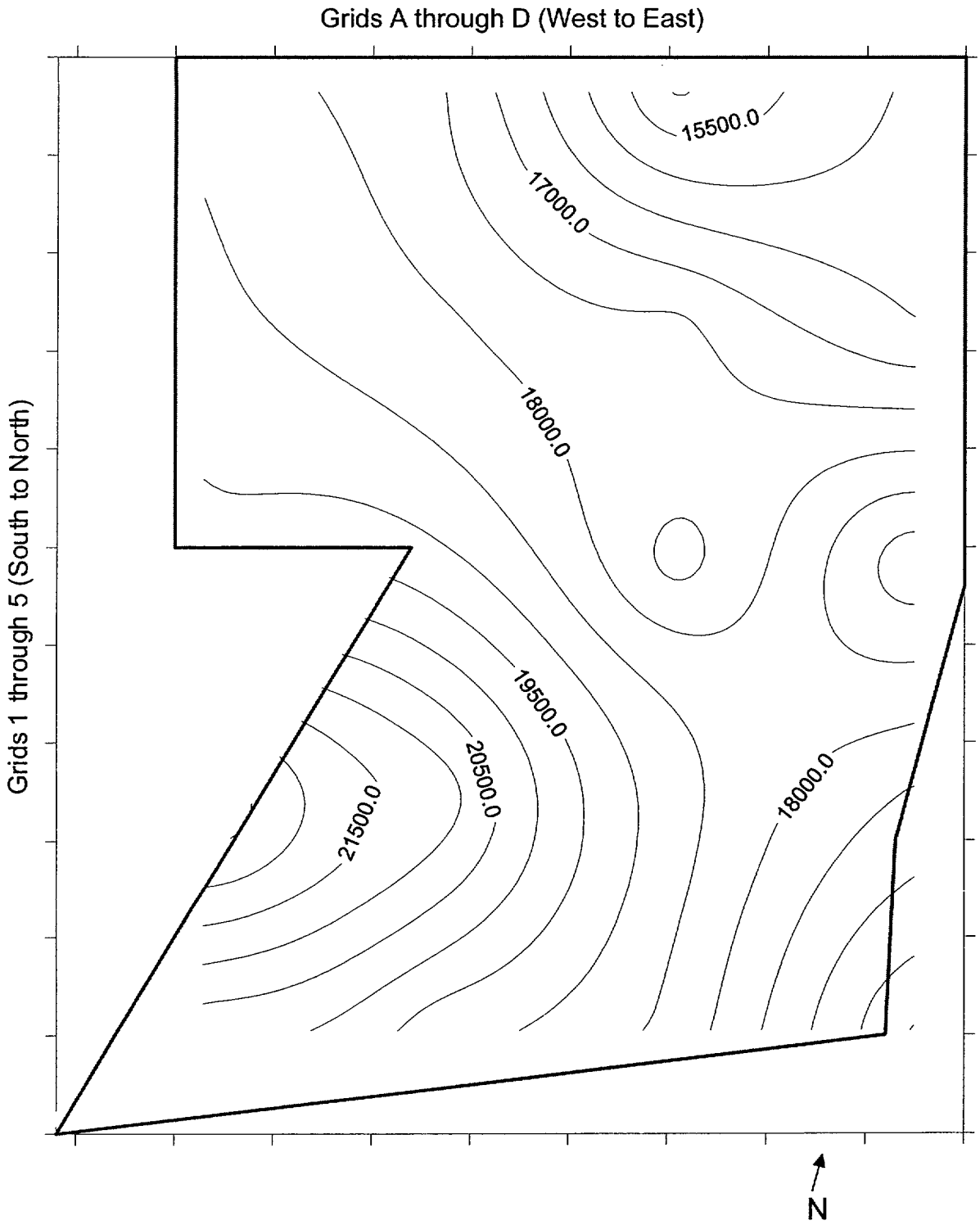


Average Gamma Scan Readings Ranged
From 16 kcpm to 23 kcpm

Figure 6.2-49
Study Area 2 - Survey Unit 2 - 4th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su2-I4.srf



Background Measurements Ranged
From 14,931 cpm to 23,091 cpm

Figure 6.2-50
Study Area 2 - Survey Unit 2 - 4th Lift of ABM
Background Isopleths (cpm)

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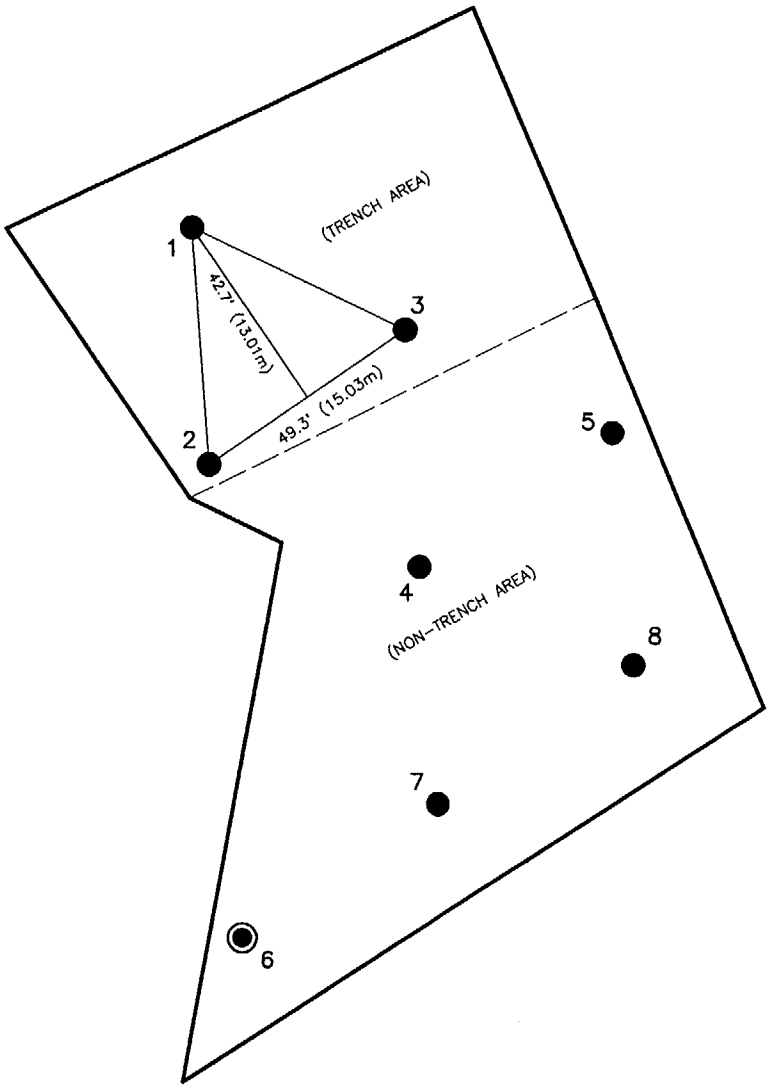
k:/5018/Fssr/Cas/Surfer/Area2/Su2-l4b.srf



N

NOTES

A ≅ 16,856 FT^2 (1,566m^2)
n = 8
L = 49.3 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40 80
10 0 10 20
SCALE – METERS

FIGURE 6.2–51
STUDY AREA 2 – SURVEY UNIT 2
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	Eg
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DRAWING NUMBER	5018095

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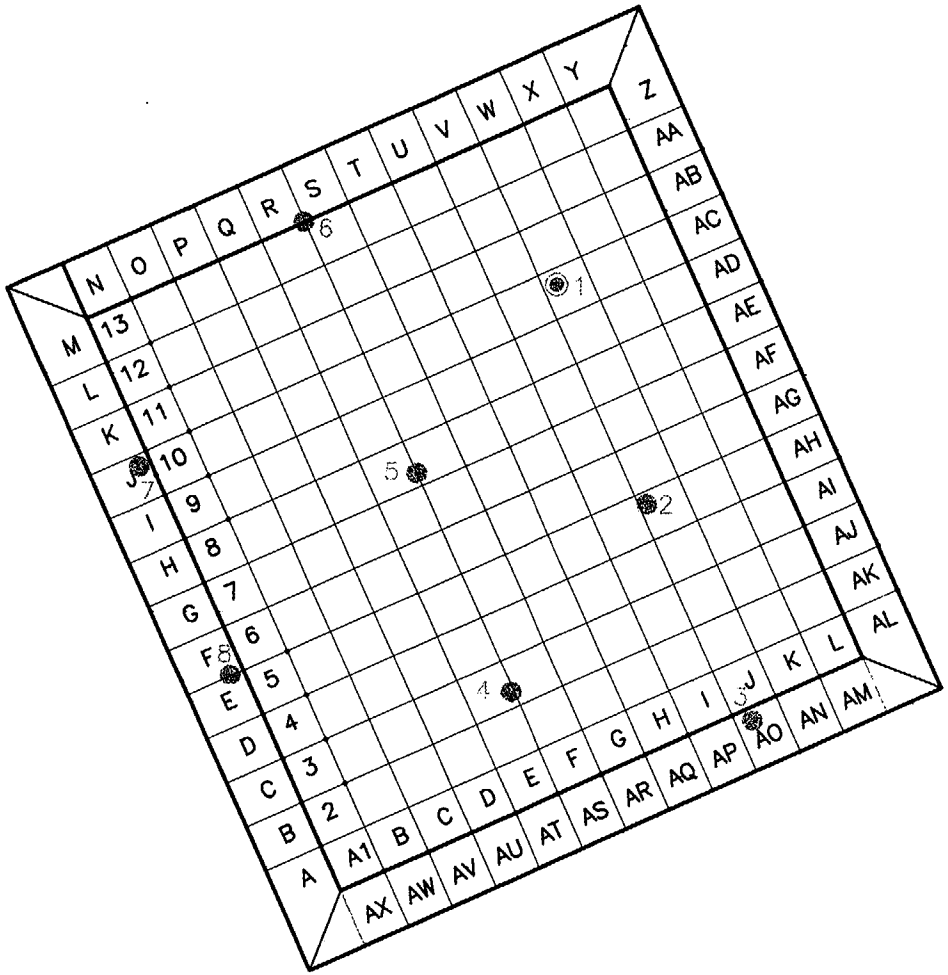


N

NOTES

1. GRIDS A THROUGH AX ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH L13 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.3m HIGH.

◎ RANDOM START POINT

● SAMPLING LOCATION

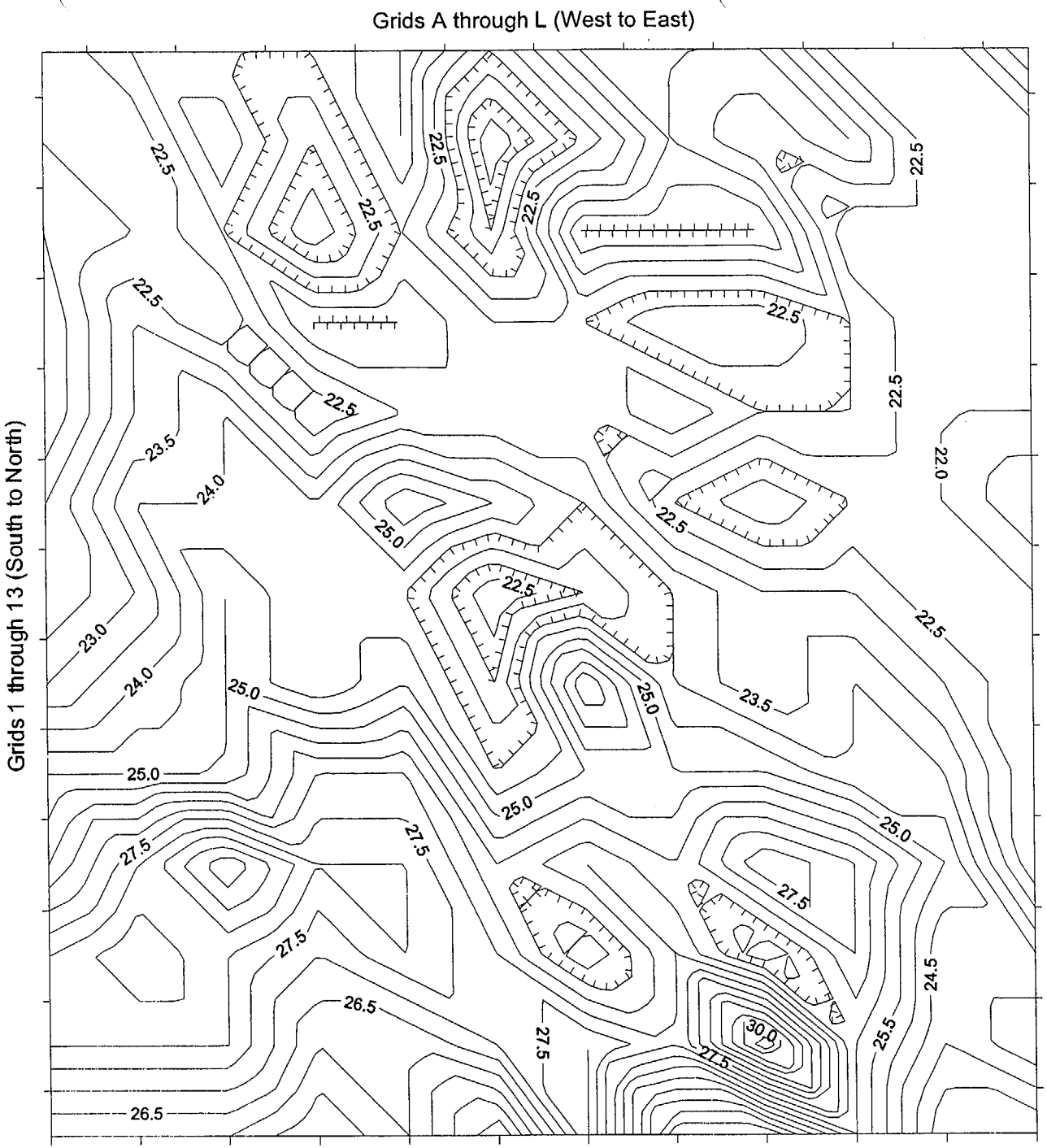
DRAWING NOT TO SCALE

FIGURE 6.2-52
STUDY AREA 2-SURVEY UNIT 3
WTR BASINS 2 AND 3-EXCAVATION BOTTOM
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

APPROVED	GBO
CHECKED	Eg.
DRAWN	DEB 3/14/03
DRAWING NUMBER	5018S26A

Earth Sciences Consultants, Inc.



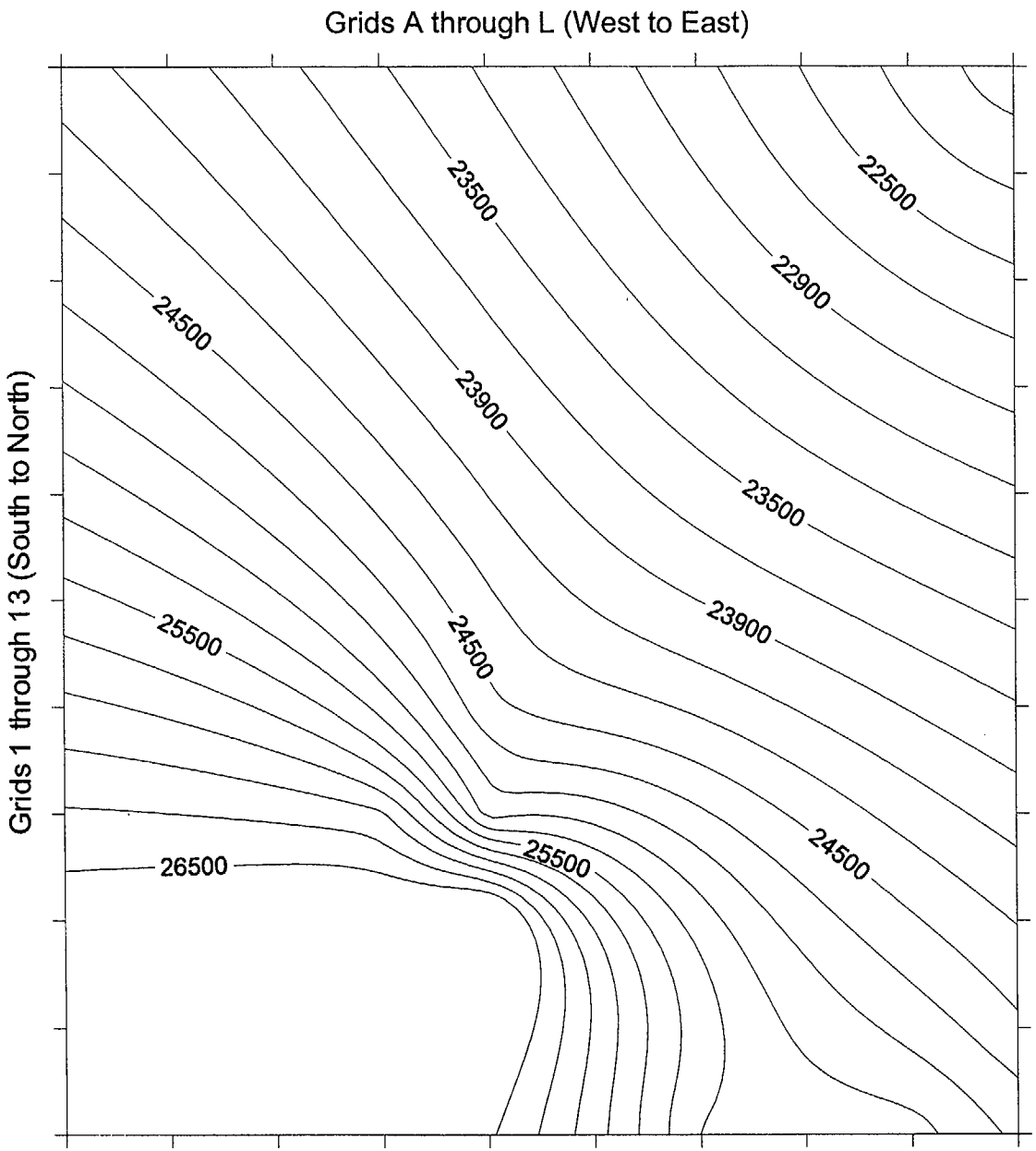
N

Average Gamma Scans Ranged
From 20 kcpm to 31 kcpm

Figure 6.2-53
Study Area 2 - Survey Unit 3 - Bottom
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-bot.srf

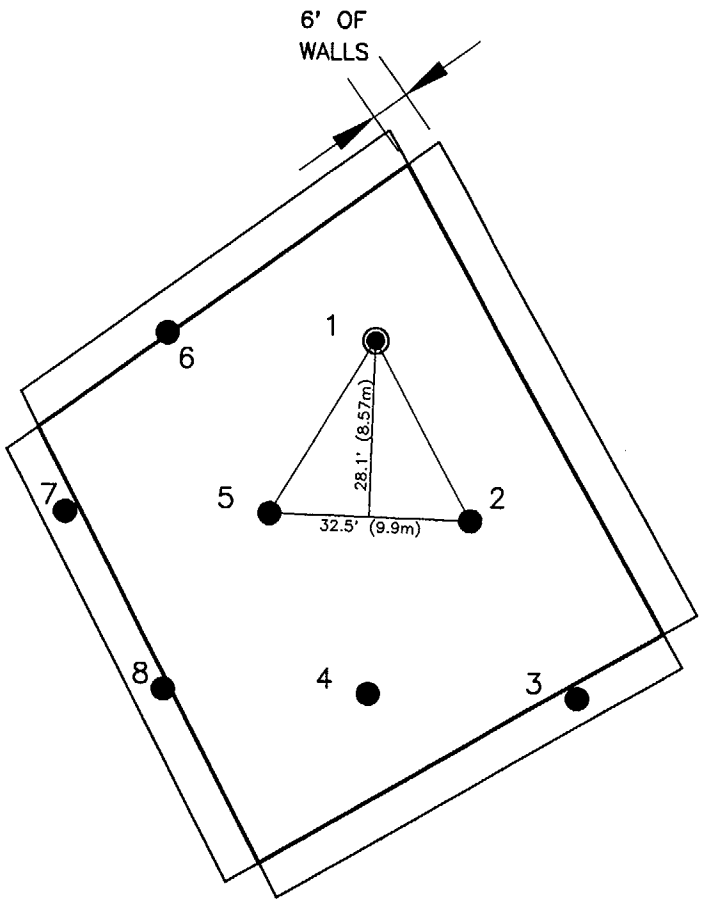


Background Measurements Ranged From
21,970 cpm to 27,008 cpm

Figure 6.2-54
Study Area 2 - Survey Unit 3 - Bottom
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-bb.srf



N

NOTES

A ≅ 7,300 FT^2 ($678m^2$)
n = 8
L = 32.5 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–55
STUDY AREA 2–SURVEY UNIT 3
WTR BASINS 2 & 3 EXCAVATION BOTTOM
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	GJA 12/27/01
DRAWING NUMBER	5018061

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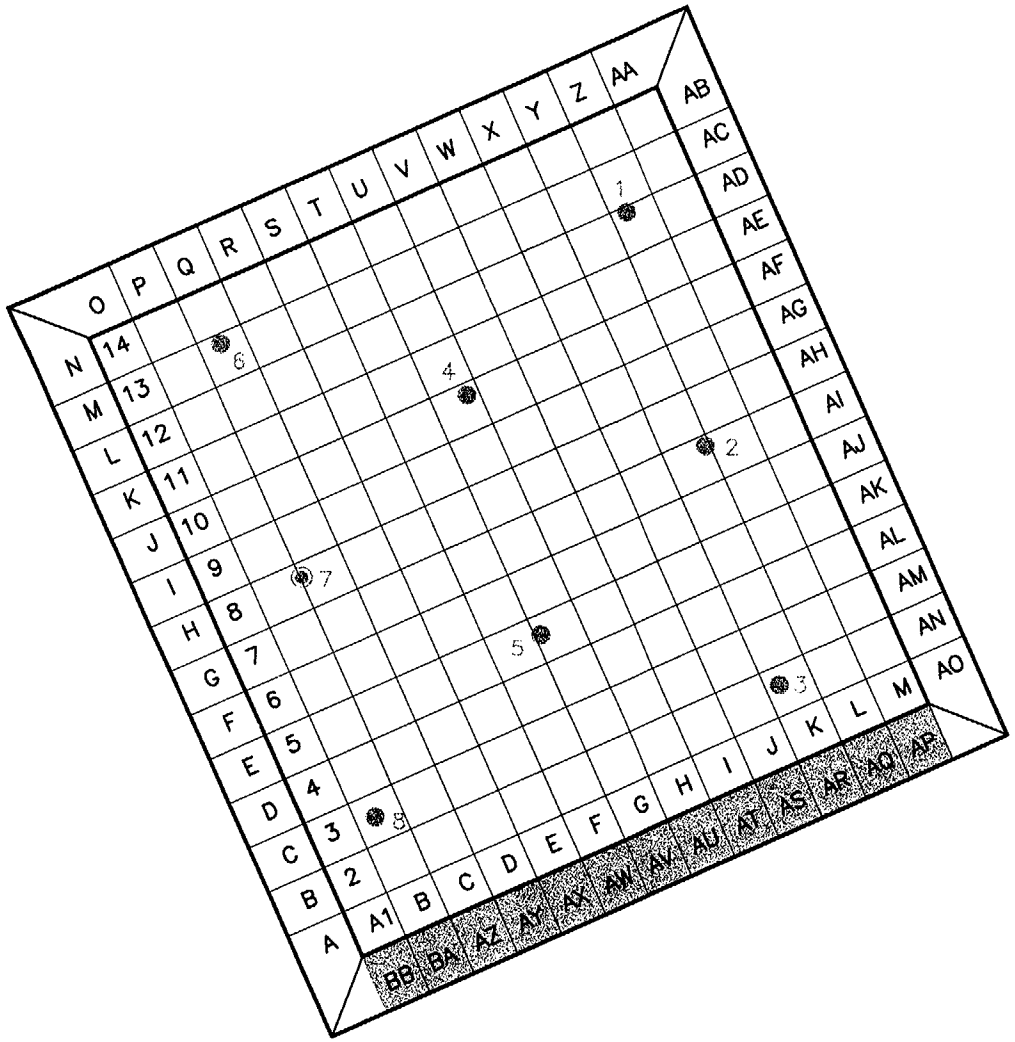

N

NOTES

1. GRIDS A THROUGH BB ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH M14 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.3m HIGH.
5. SHADED AREA INDICATES NO WALL PRESENT.

◎ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-56
STUDY AREA 2-SURVEY UNIT 3
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	DEB 3/14/03
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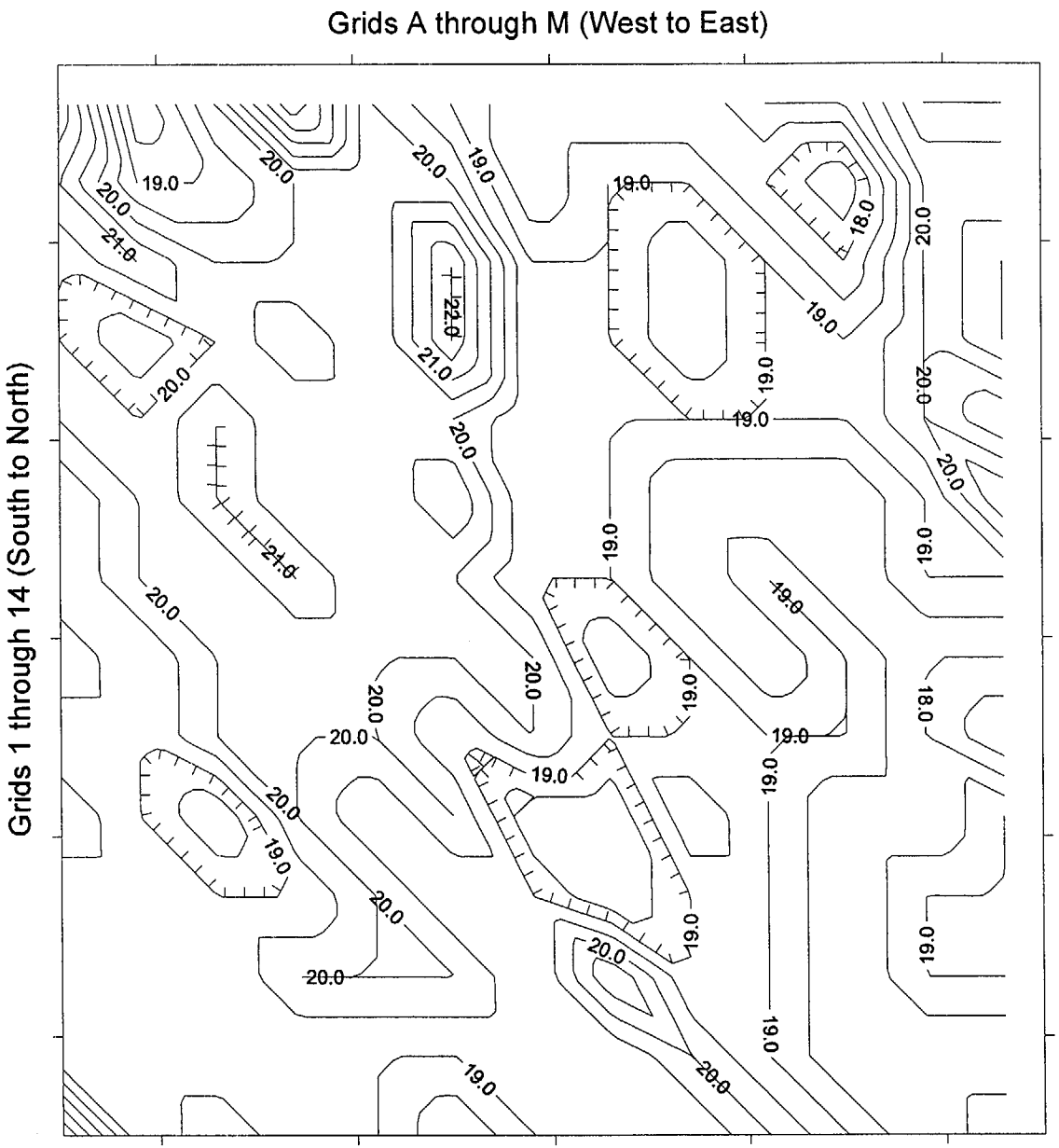


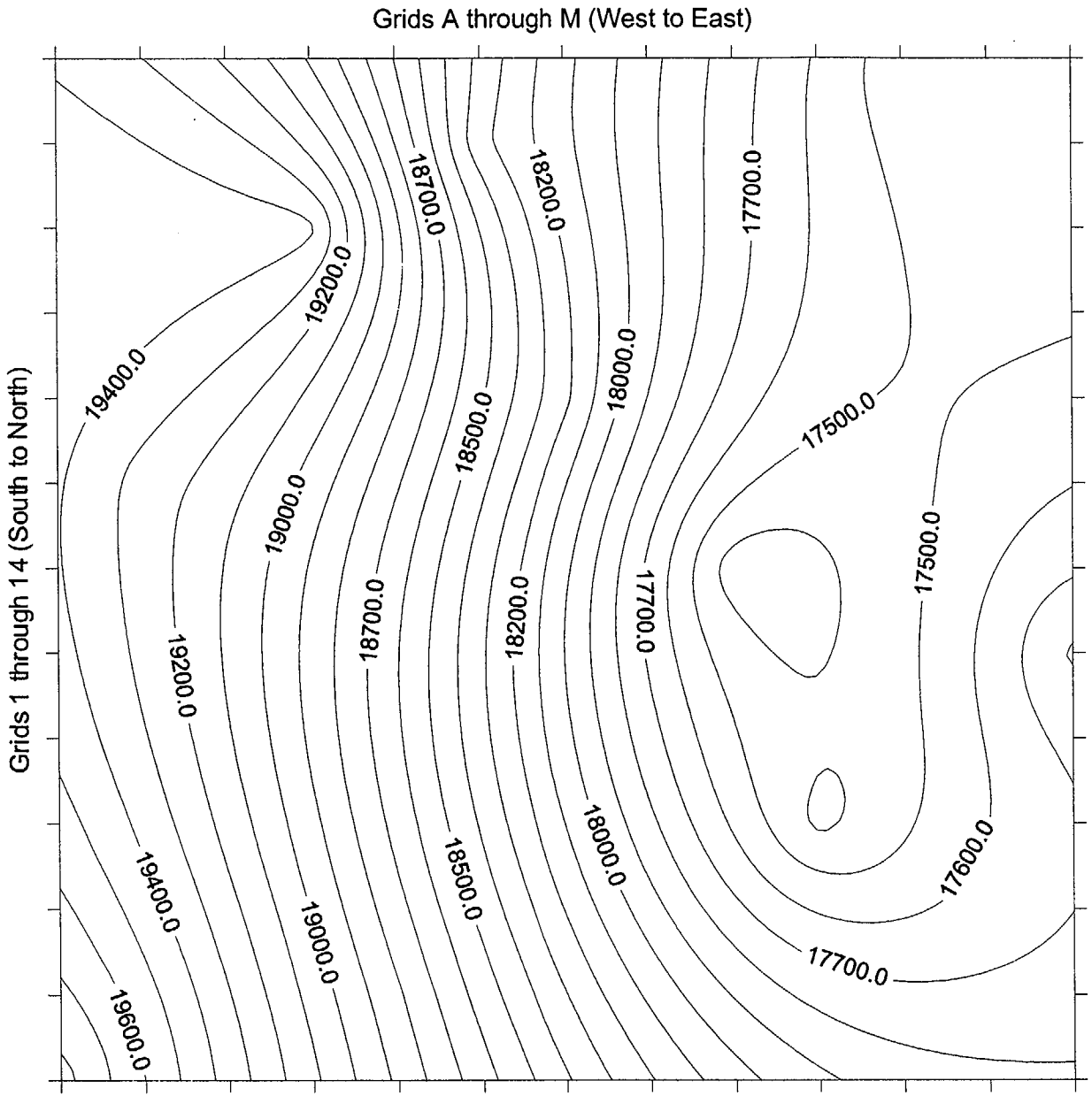
N

Average Gamma Scans Ranged
From 17 kcpm to 23 kcpm

Figure 6.2-57
Study Area 2 - Survey Unit 3 - 1st Lift ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-l1t.srf



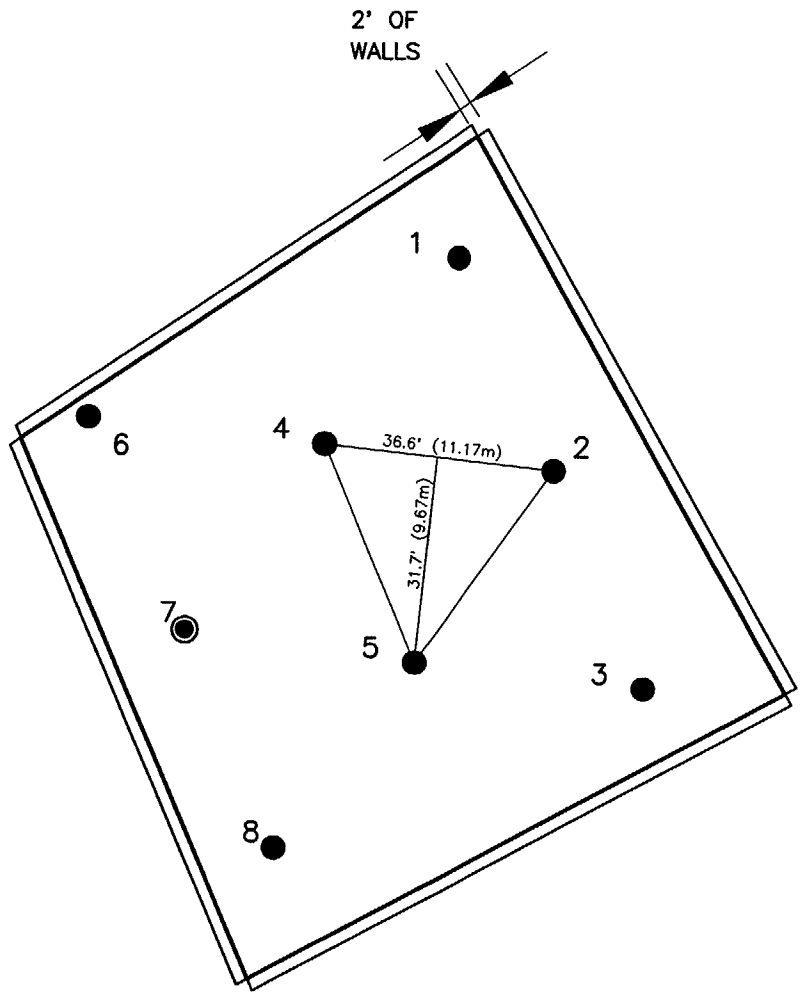
N

Background Measurements Ranged From
17,344 cpm to 19,838 cpm

Figure 6.2-58
Study Area 2 - Survey Unit 3 - 1st Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-l1b.srf



NOTES

A ≅ 9,300 FT^2 ($864m^2$)
n = 8
L = 36.6 FEET
◉ RANDOM START POINT

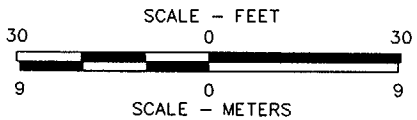


FIGURE 6.2–59
STUDY AREA 2–SURVEY UNIT 3
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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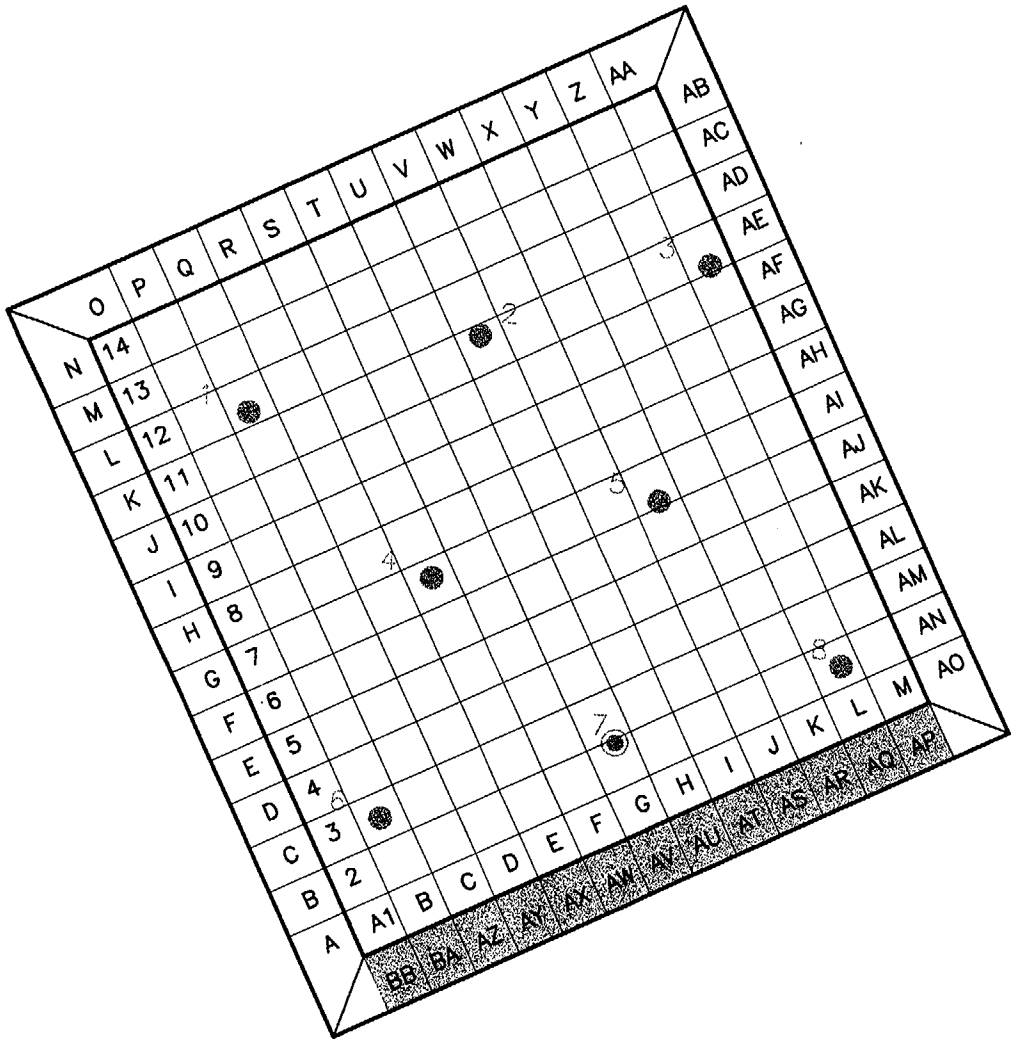
CHECKED	Eg.
DRAWN	GJA 12/27/01
DRAWING NUMBER	5018062

Earth Sciences Consultants, Inc.



NOTES

1. GRIDS A THROUGH BB ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH M14 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.3m HIGH.
5. SHADED AREA INDICATES NO WALL PRESENT.

RANDOM START POINT

SAMPLING LOCATION

N

DRAWING NOT TO SCALE

FIGURE 6.2-60
STUDY AREA 2-SURVEY UNIT 3
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	5018S28A

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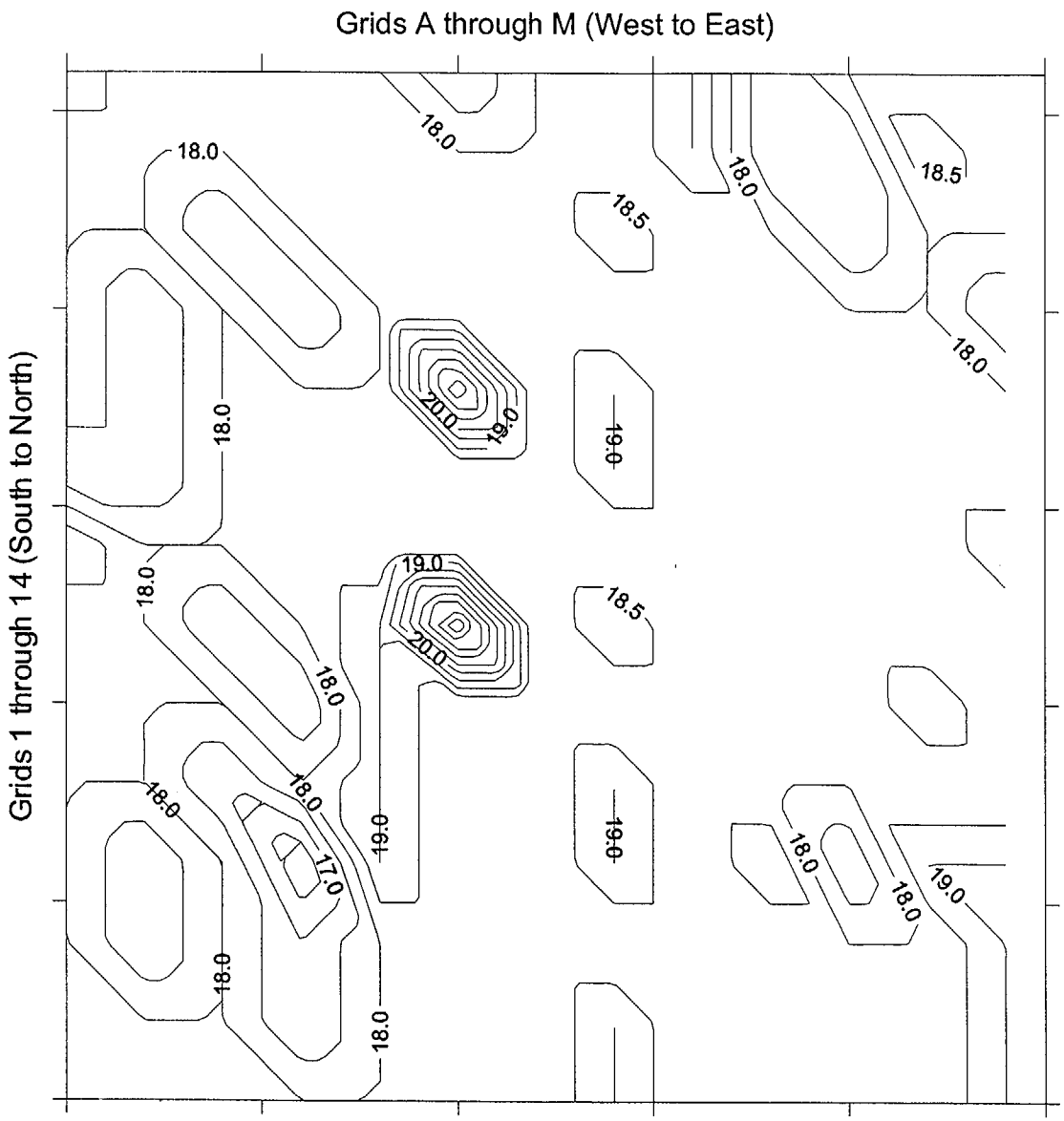


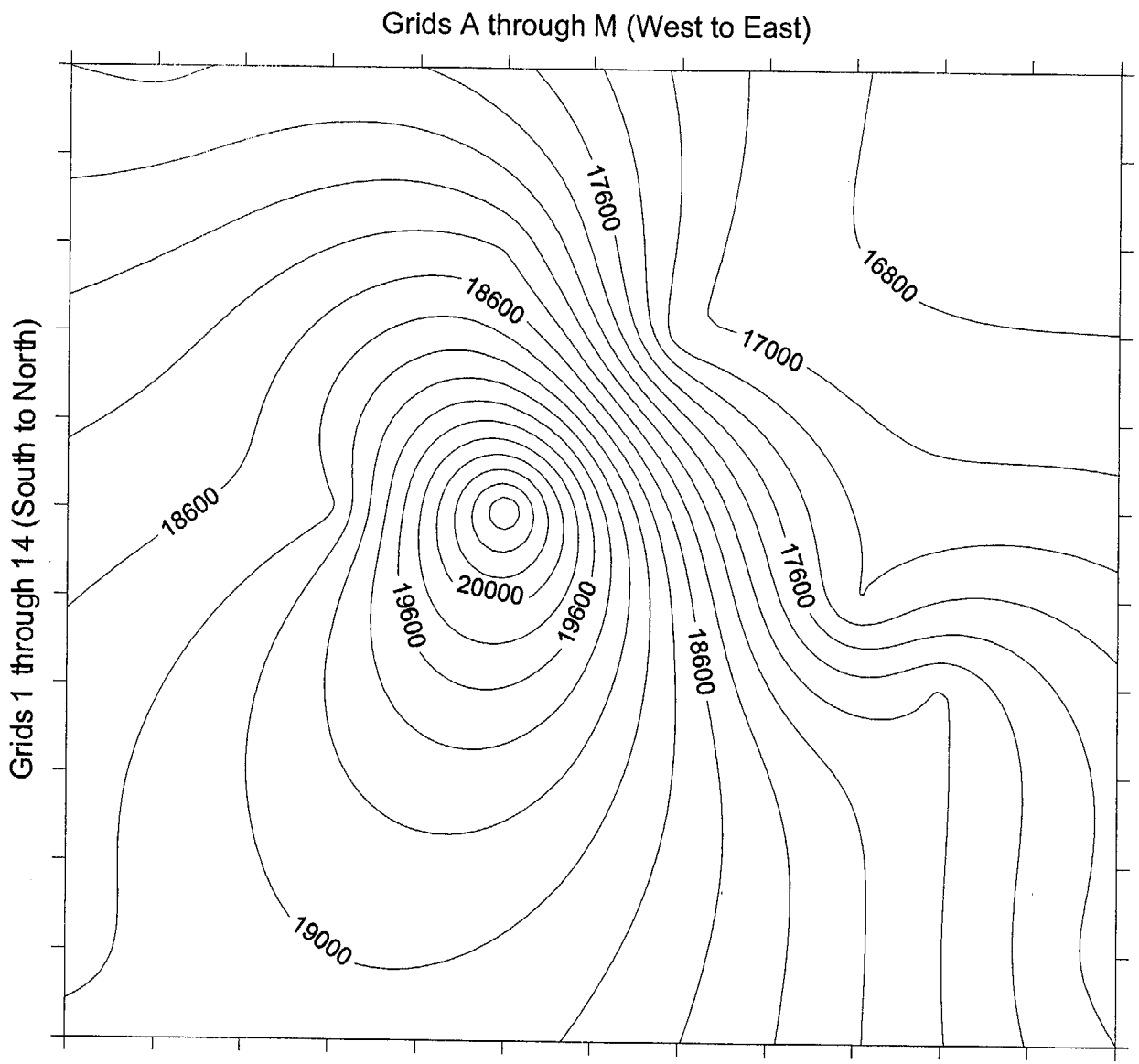
N

Average Gamma Scans Ranged
From 16 kcpm to 23 kcpm

Figure 6.2-61
Study Area 2 - Survey Unit 3 - 2nd Lift ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-I2.srf



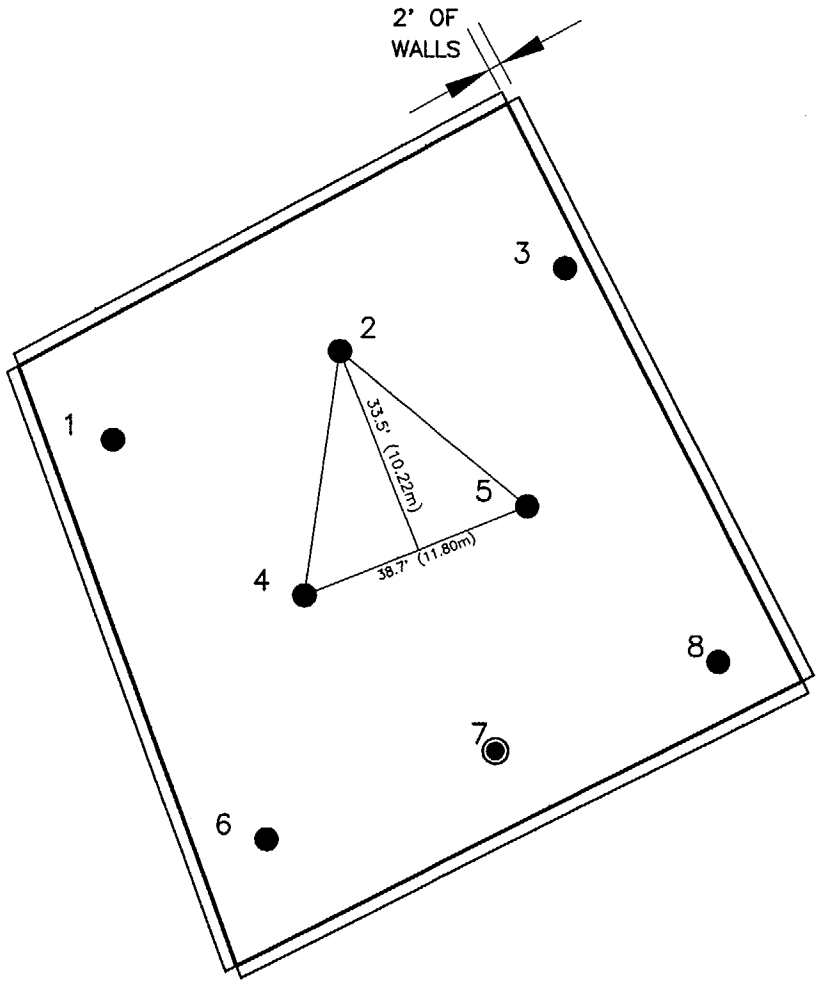
N

Background Measurements Ranged From
17,052 cpm to 20,800 cpm

Figure 6.2-62
Study Area 2 - Survey Unit 3 - 2nd Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-l2b.srf



N

NOTES

A ≅ 10,400 FT^2 (966m^2)
n = 8
L = 38.7 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–63
STUDY AREA 2–SURVEY UNIT 3
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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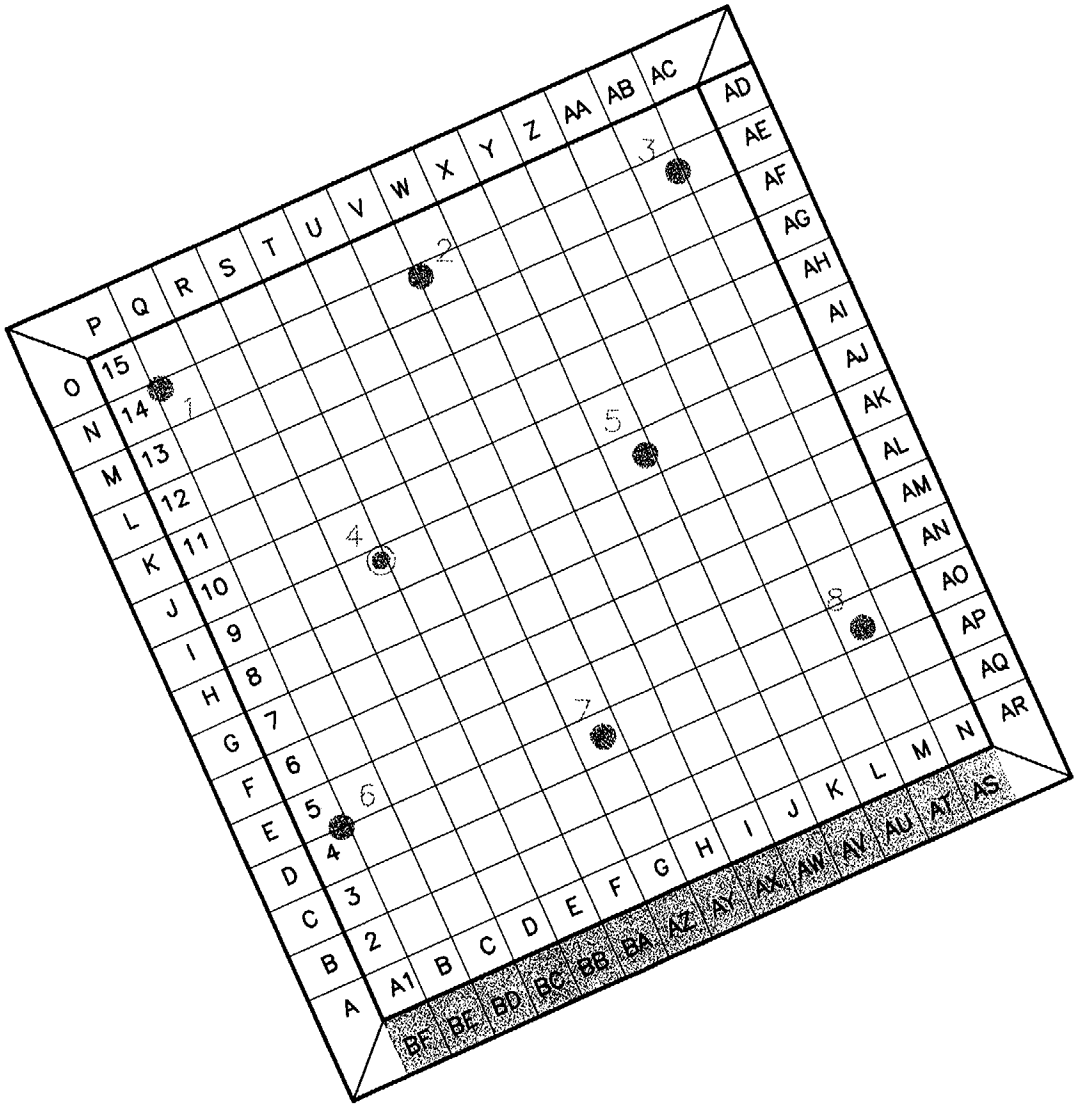
DRAWN	GJA 12/27/01
DRAWING NUMBER	5018063

Earth Sciences Consultants, Inc.



NOTES

1. GRIDS A THROUGH BF ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH N15 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.3m HIGH.
5. SHADED AREA INDICATES NO WALL PRESENT.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-64
STUDY AREA 2-SURVEY UNIT 3
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADSON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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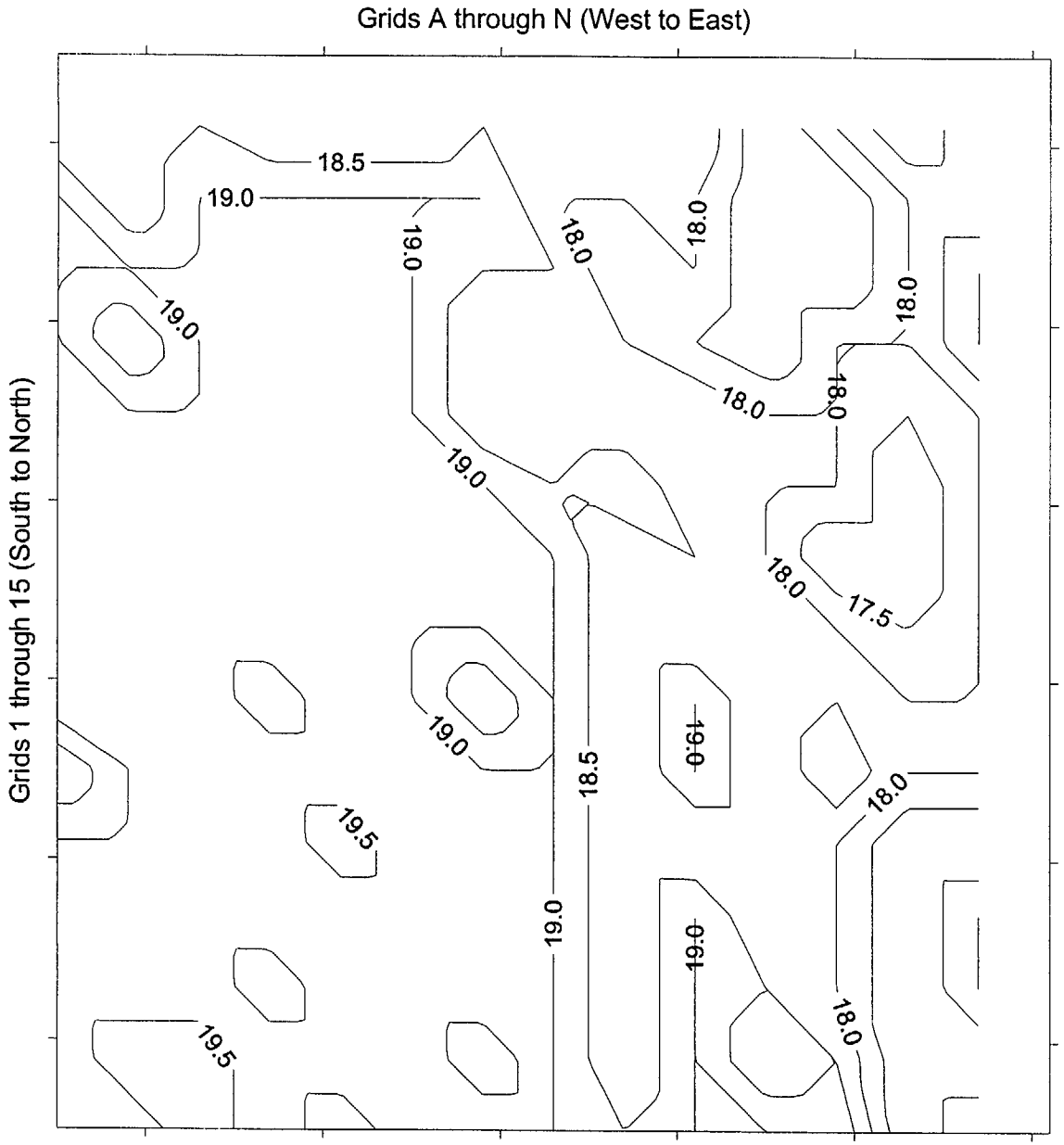


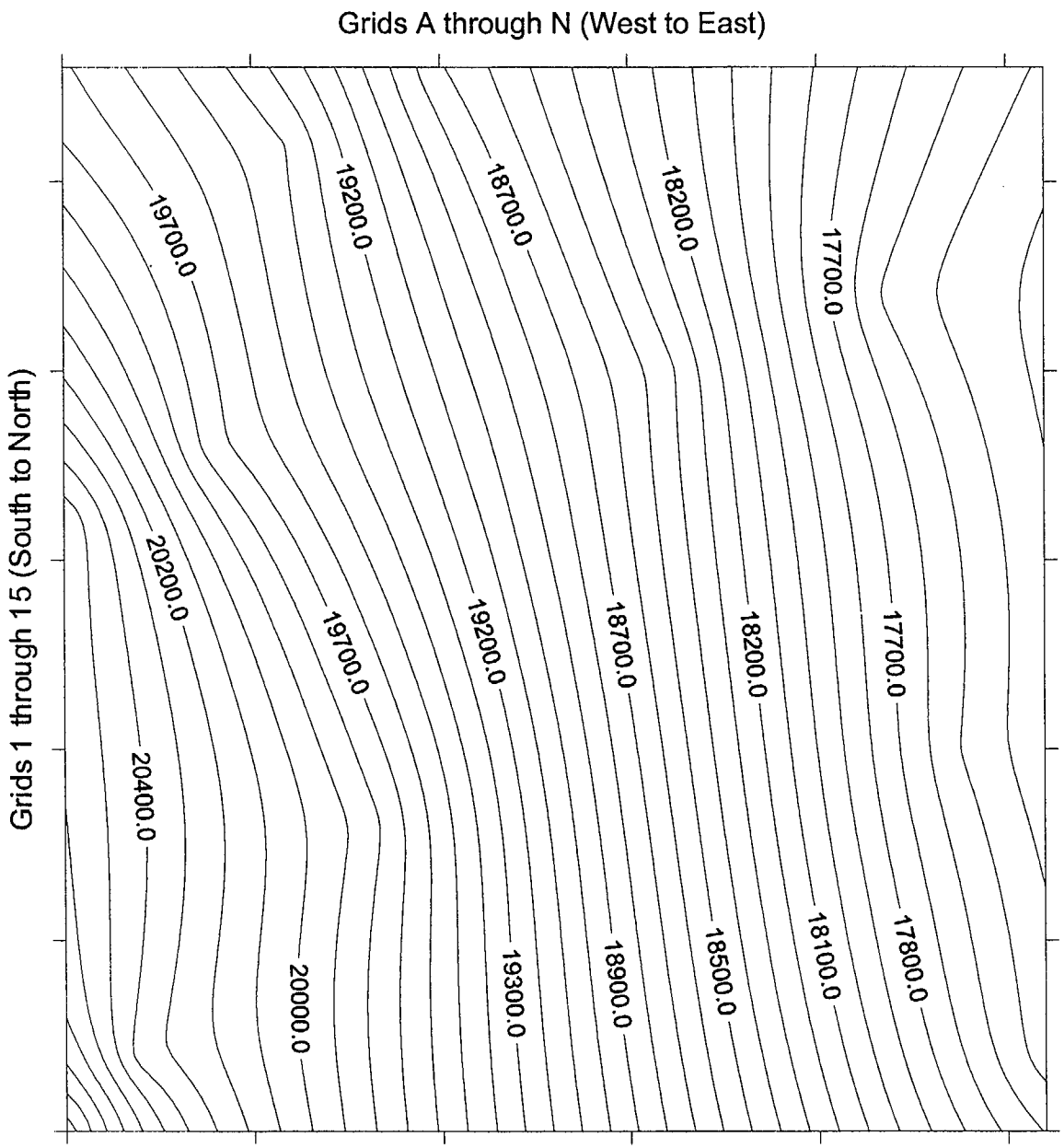
N

Average Gamma Scans Ranged
From 17 kcpm to 20 kcpm

Figure 6.2-65
Study Area 2 - Survey Unit 3 - 3rd Lift ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-I3.srf



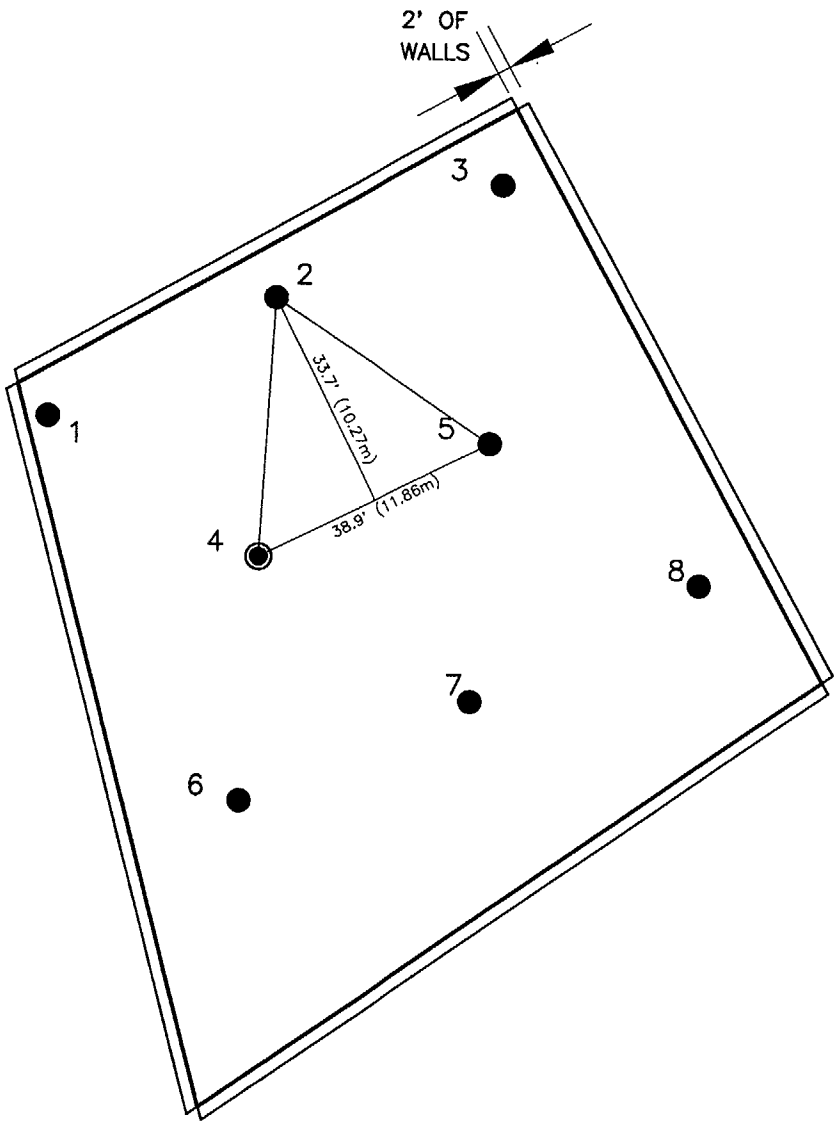
N

Background Measurements Ranged From
17,448 cpm to 21,060 cpm

Figure 6.2-66
Study Area 2 - Survey Unit 3 - 3rd Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-l3b.srf



NOTES

A ≅ 10,490 FT^2 ($975m^2$)
n = 8
L = 38.9 FEET
◉ RANDOM START POINT

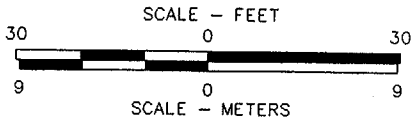


FIGURE 6.2–67
STUDY AREA 2–SURVEY UNIT 3
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	GA 12/28/01
DRAWING NUMBER	5018064

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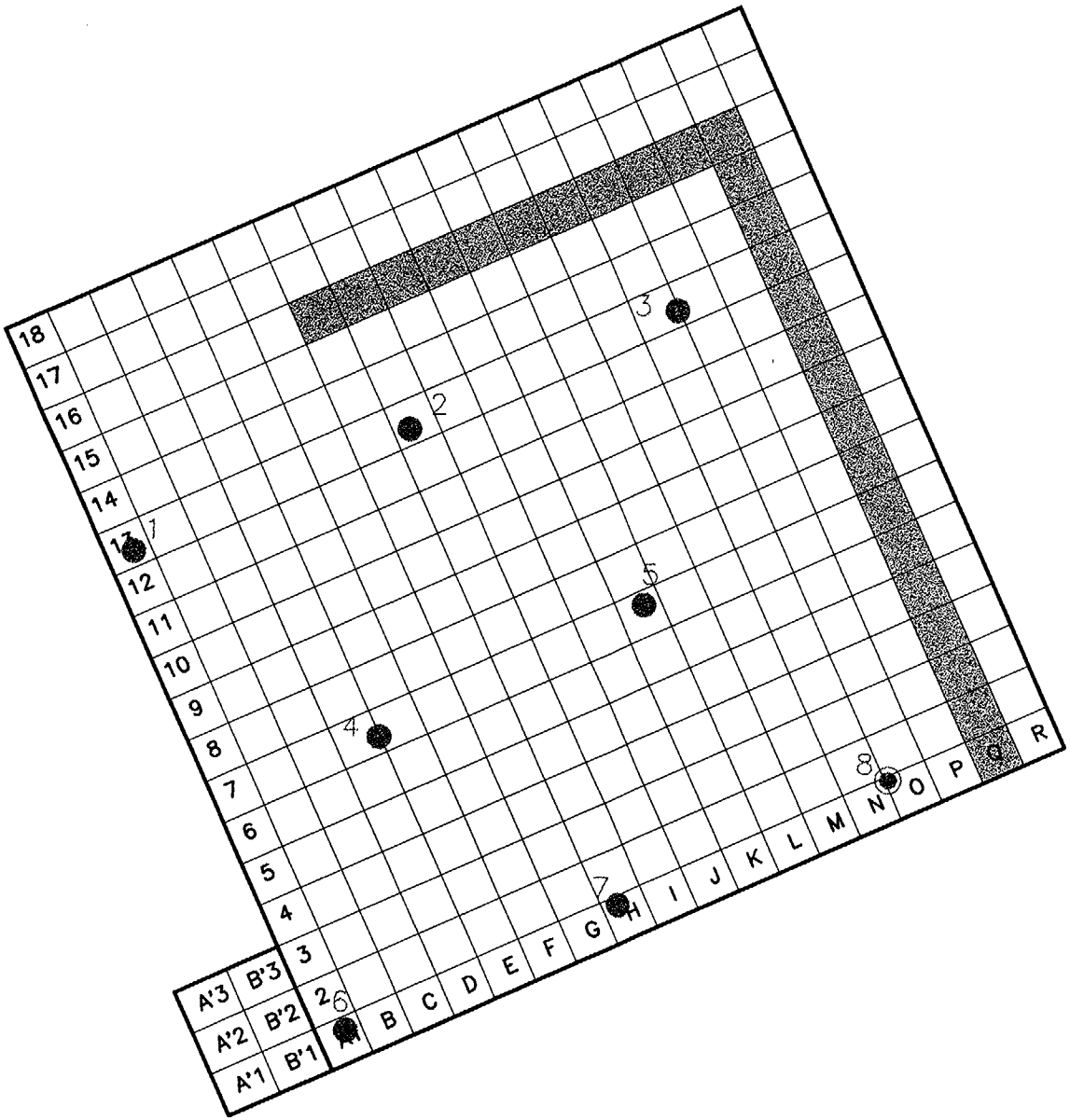

NOTES

1. GRIDS A'1 THROUGH B'3 ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH R18 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.3m HIGH.
5. SHADED AREA INDICATES A SLOPED WALL, APPROXIMATELY 0.66m x 1.3m HIGH.

RANDOM STARTING POINT

SAMPLING LOCATION

N

DRAWING NOT TO SCALE

FIGURE 6.2-68
STUDY AREA 2-SURVEY UNIT 3
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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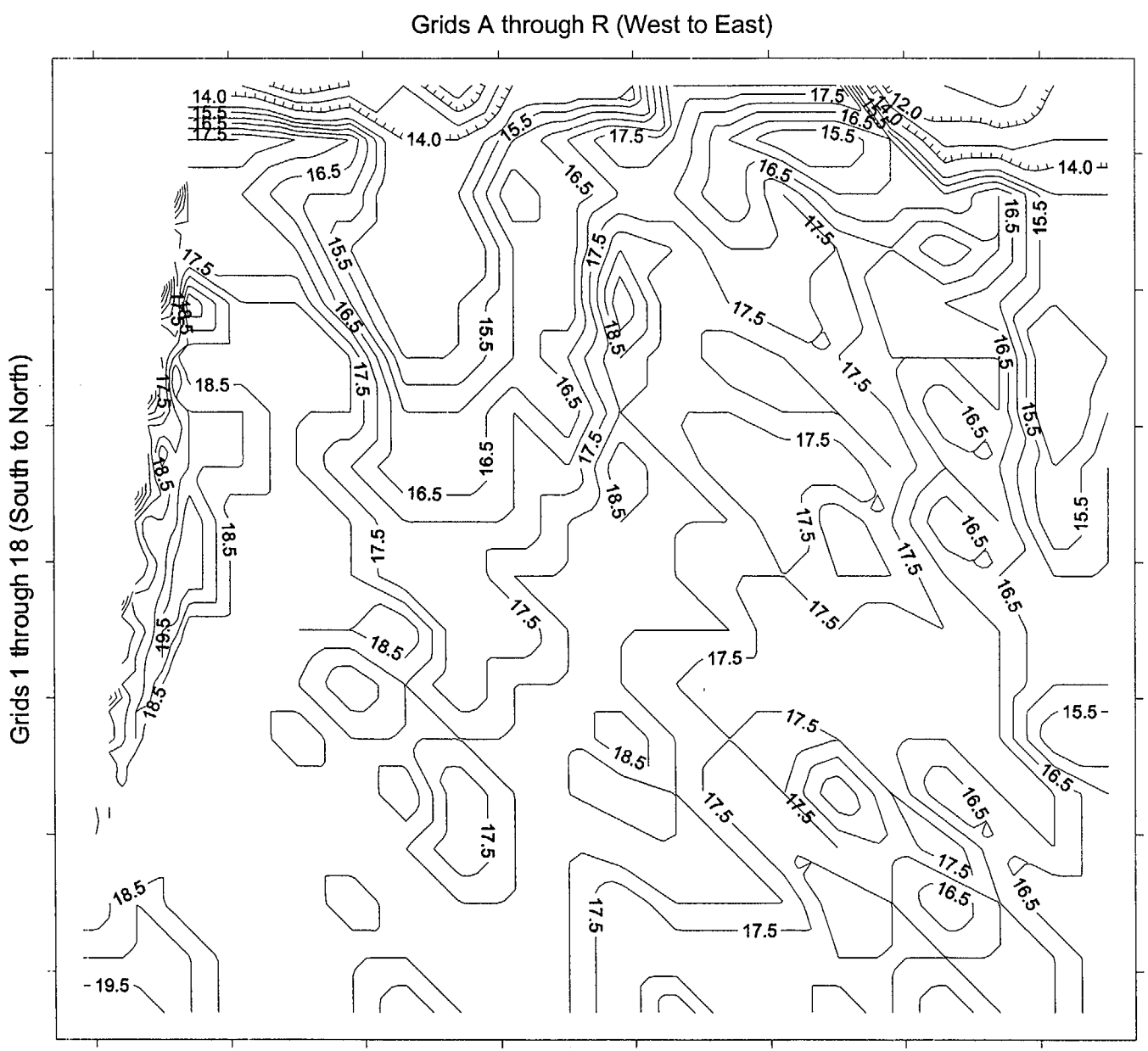
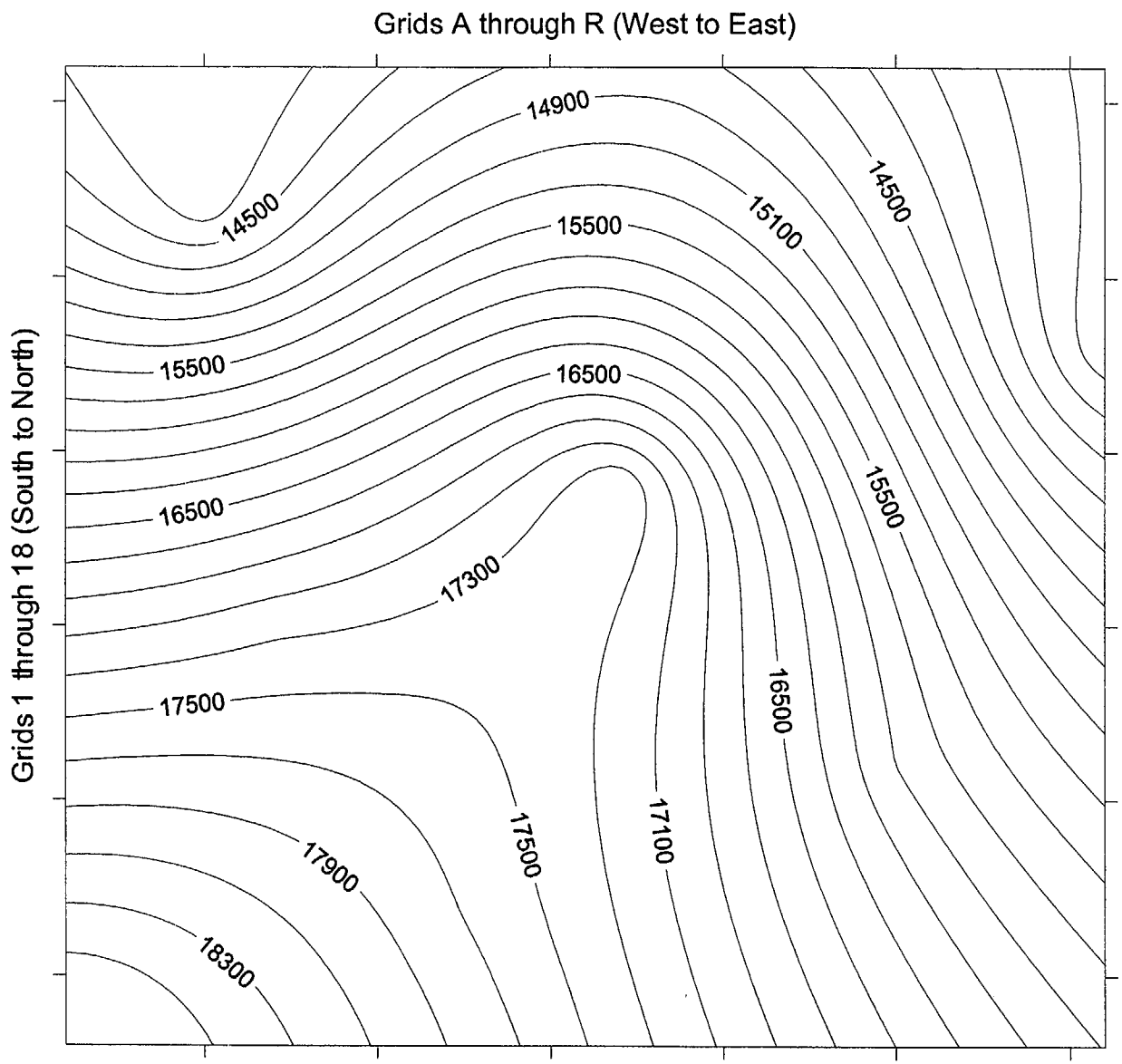


Average Gamma Scans Ranged
From 10 kcpm to 20 kcpm

Figure 6.2-69
Study Area 2 - Survey Unit 3 - 4th Lift ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-l4.srf



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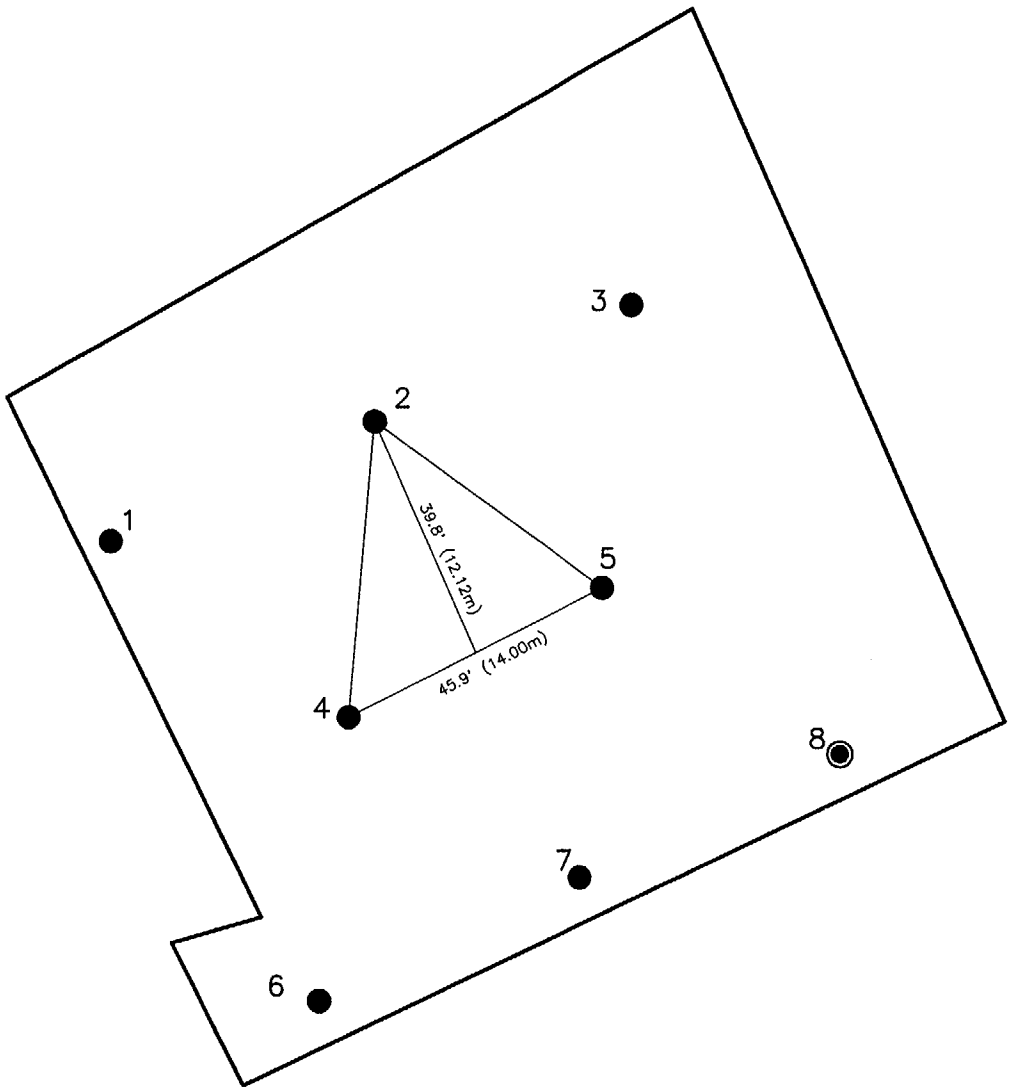
Background Measurements Ranged From
13,537 cpm to 18,868 cpm

Figure 6.2-70
Study Area 2 - Survey Unit 3 - 4th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su3-l4b.srf



N

NOTES

A ≅ 14,600 FT^2 (1,356m^2)
n = 8
L = 45.9 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–71
STUDY AREA 2–SURVEY UNIT 3
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	Eg
DRAWN	JA 12/28/01
DRAWING NUMBER	5018065

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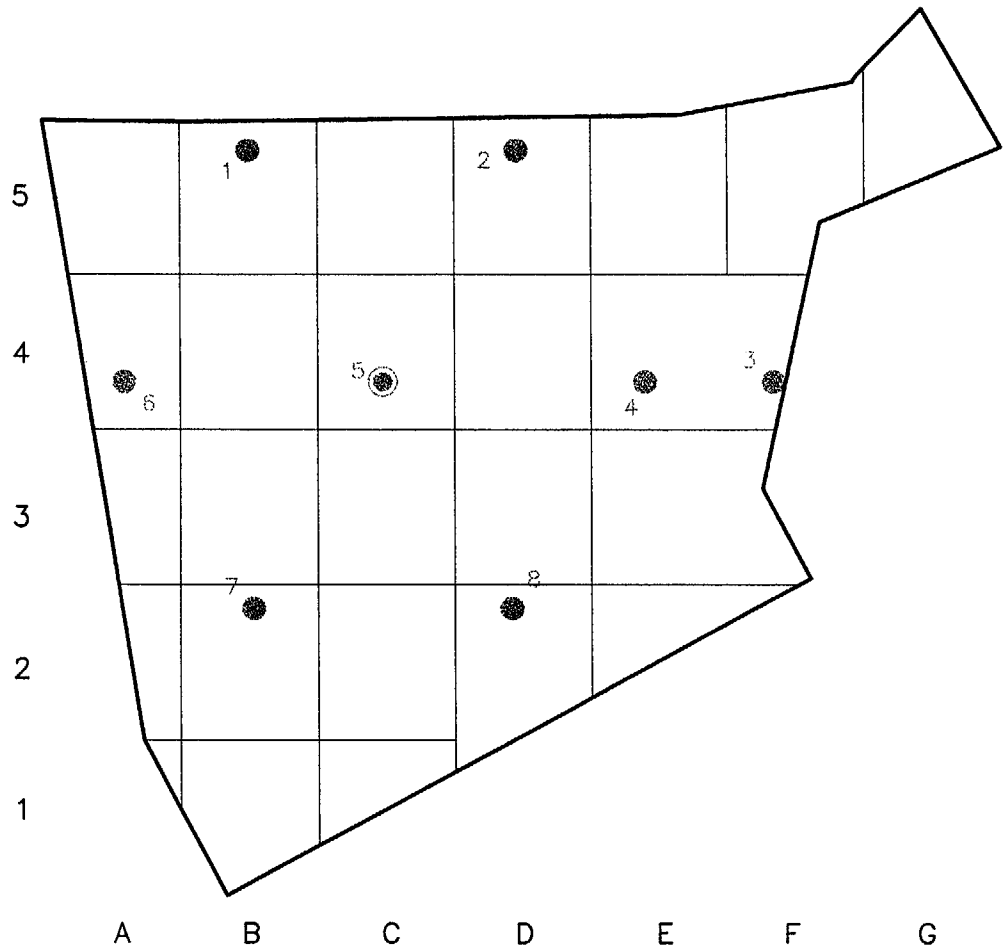

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM STARTING POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-72
STUDY AREA 2-SURVEY UNIT 4
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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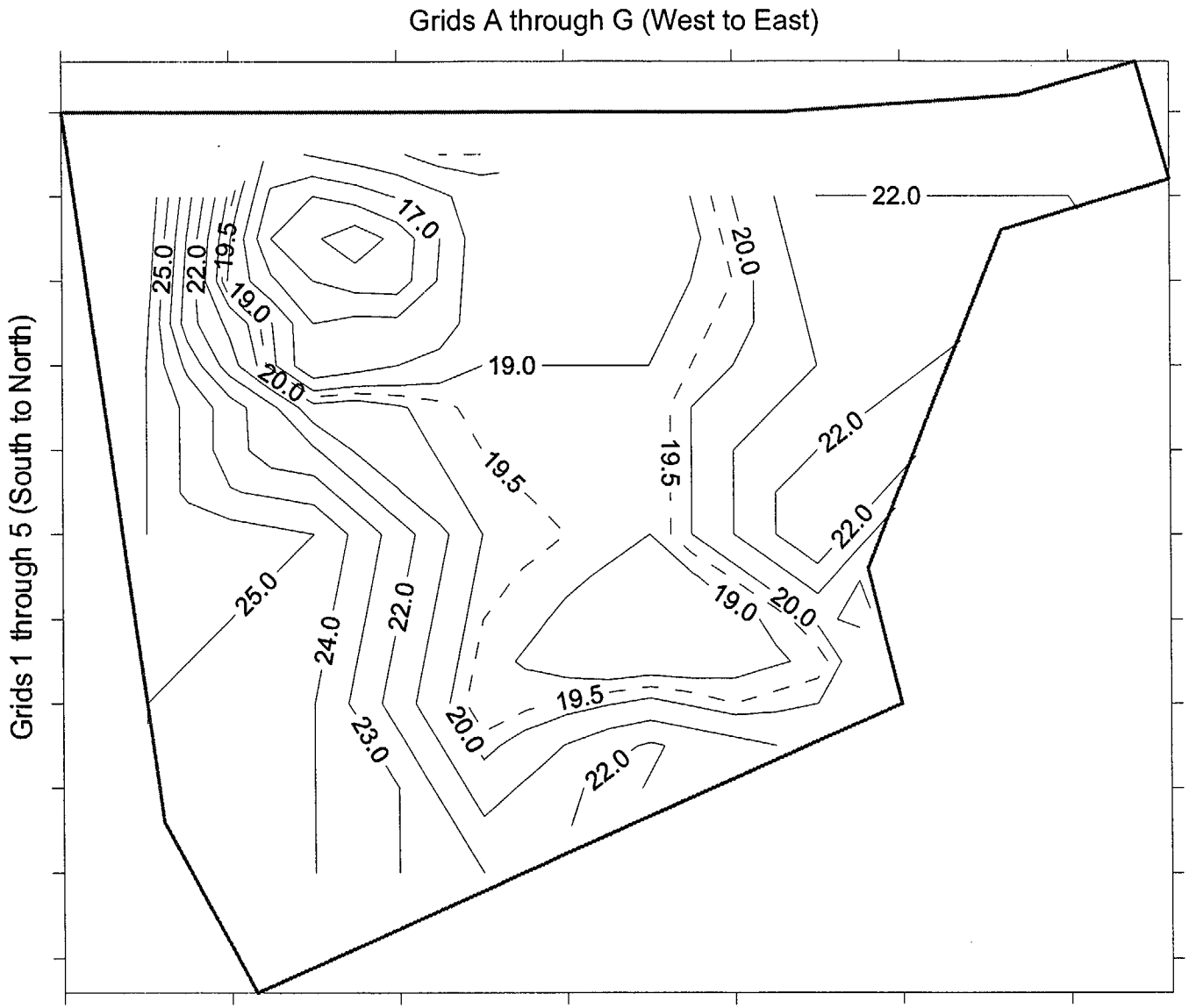
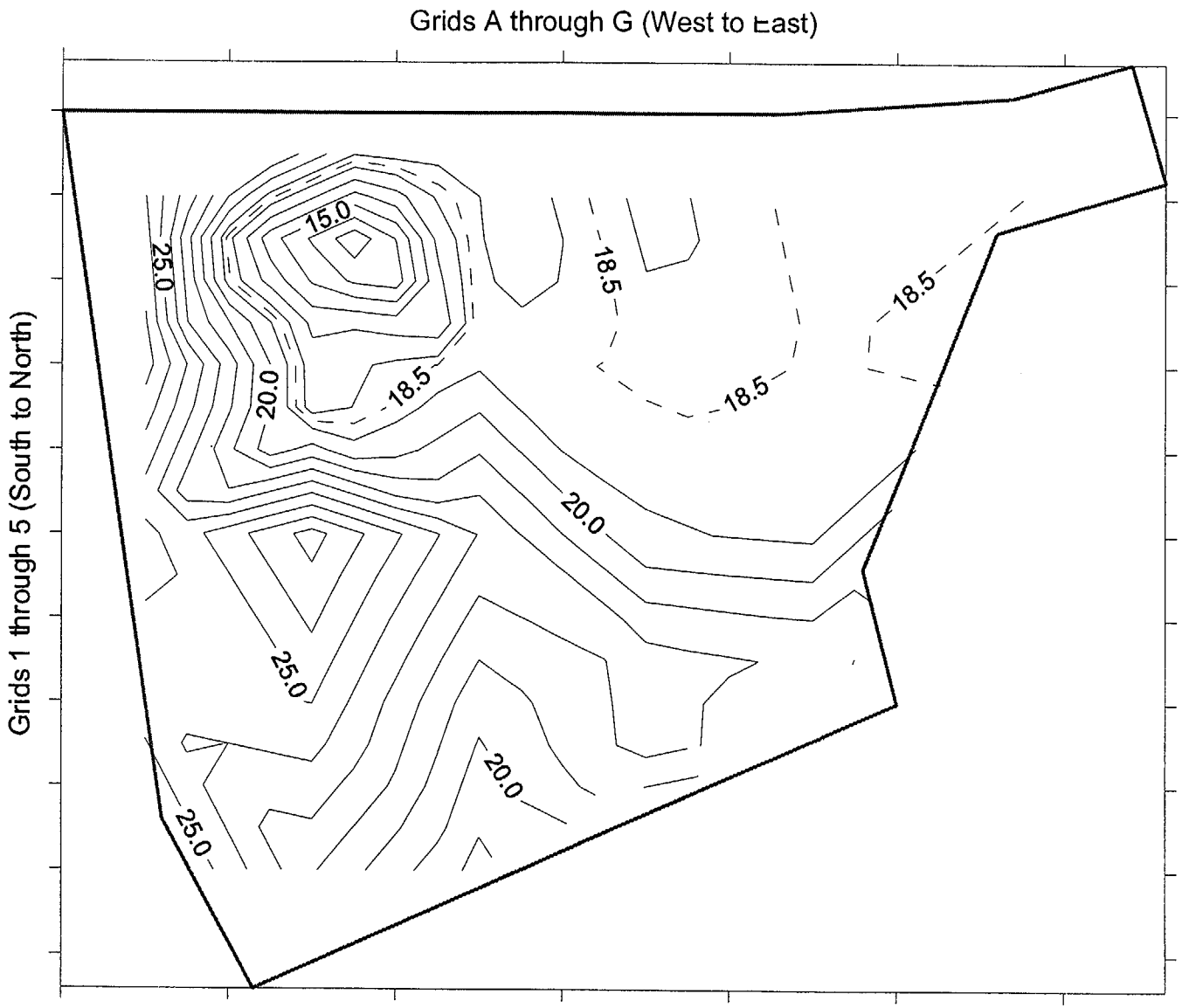


Average Gamma Scans Ranged
From 14 kcpm to 27 kcpm

Figure 6.2-73
Study Area 2 - Survey Unit 4
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su4.srf



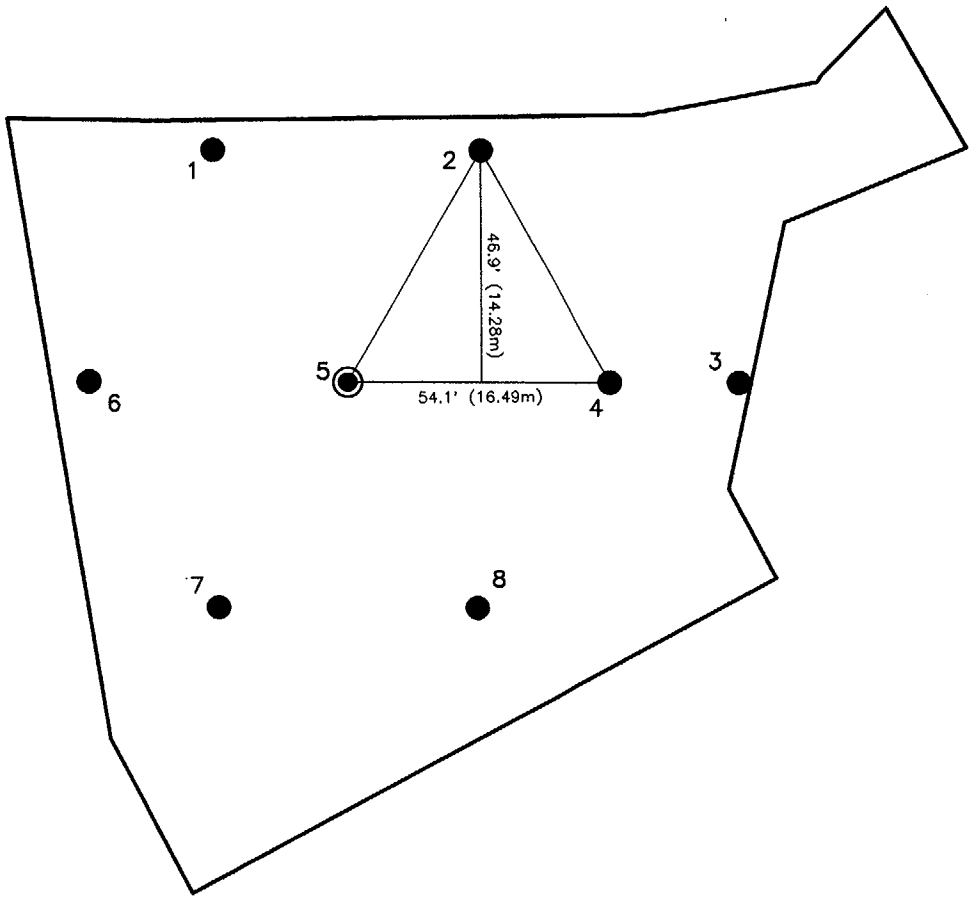
N

Background Measurements Ranged
From 11.3 kcpm to 27.6 kcpm

Figure 6.2-74
Study Area 2 - Survey Unit 4
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su4-b.srf



N

NOTES

A ≅ 20,290 FT^2 (1,885m^2)
n = 8
L = 54.1 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40
10 0 10
SCALE – METERS

FIGURE 6.2–75
STUDY AREA 2 – SURVEY UNIT 4
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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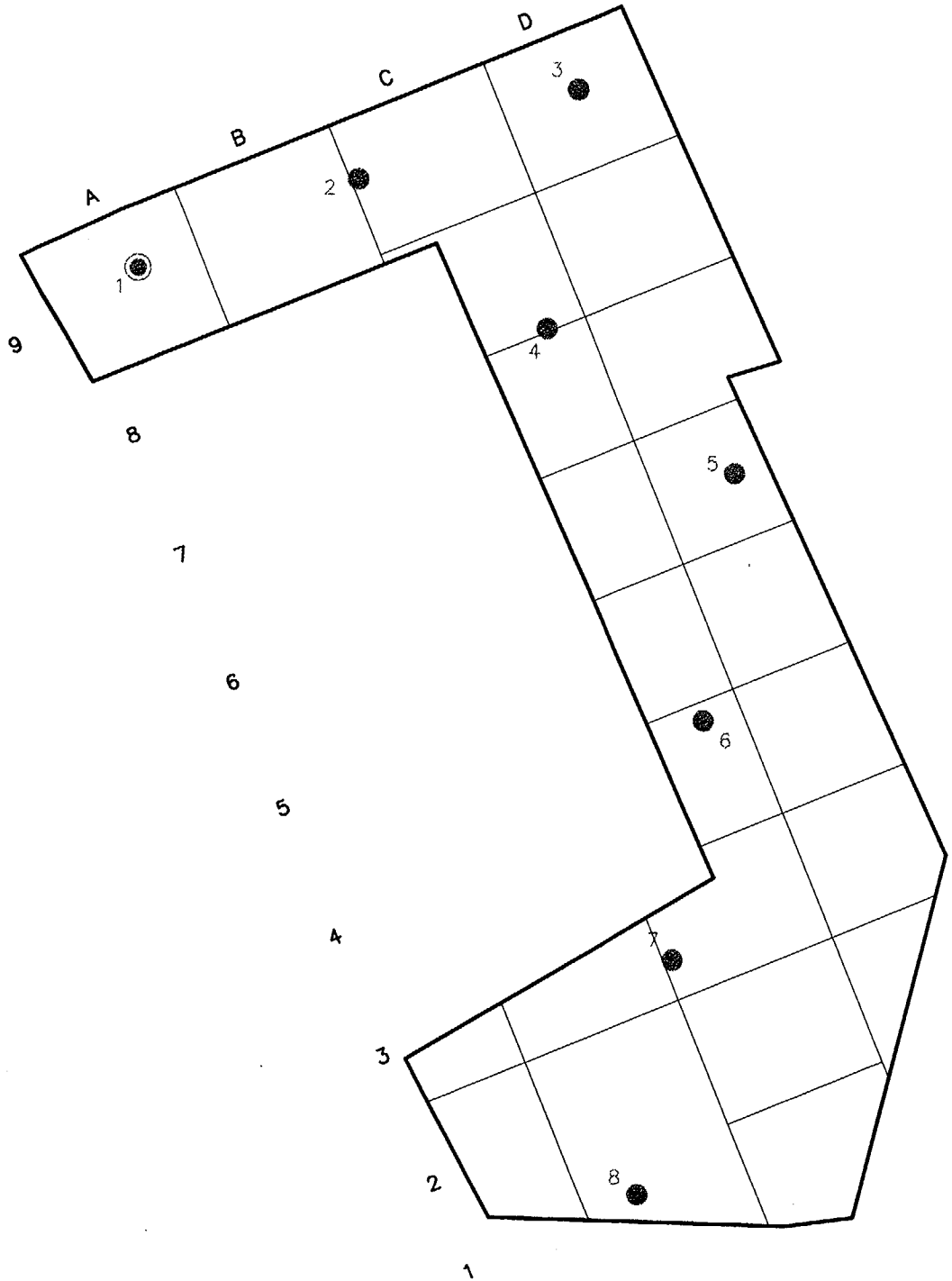

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–76
STUDY AREA 2–SURVEY UNIT 5
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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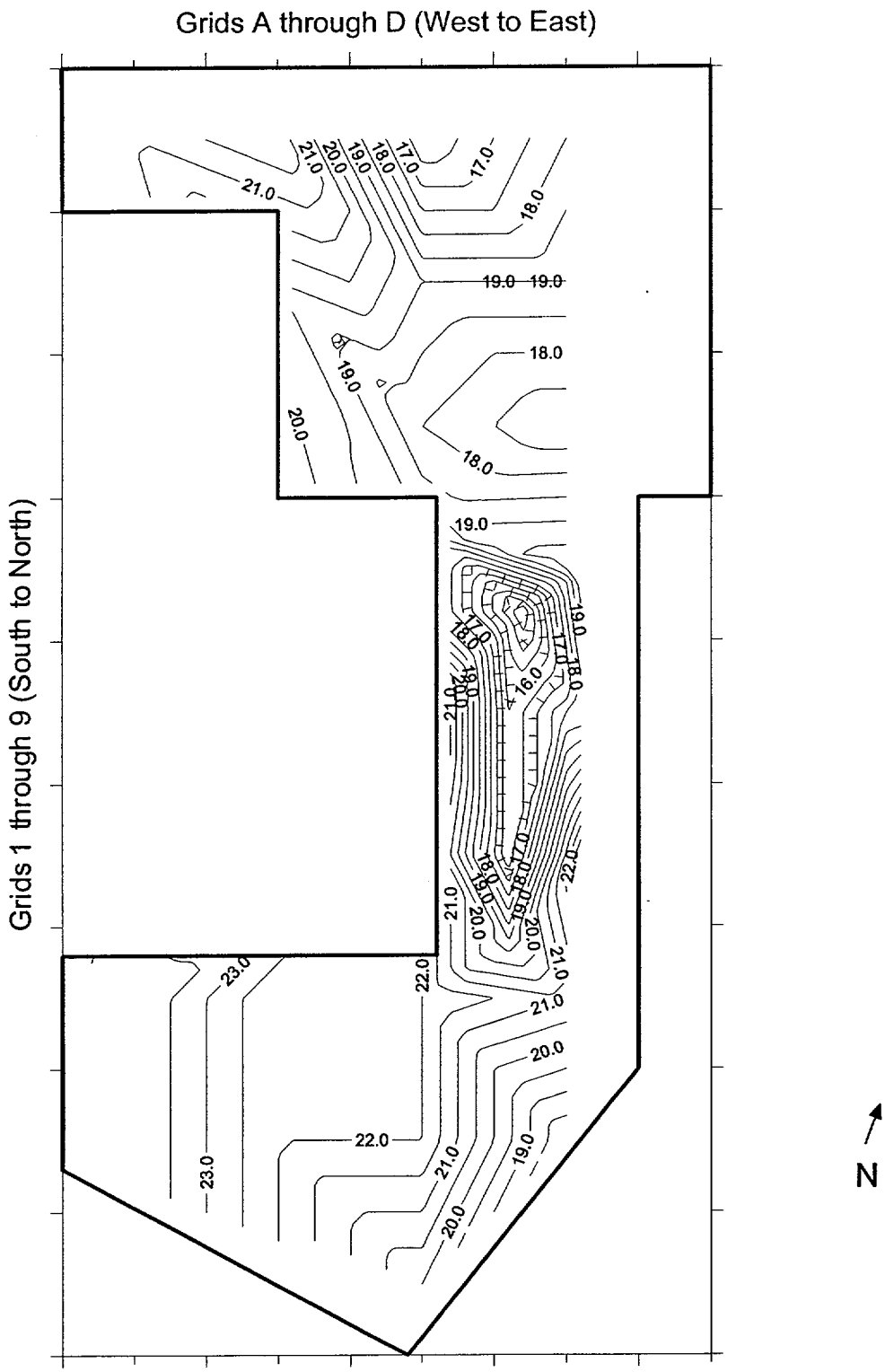
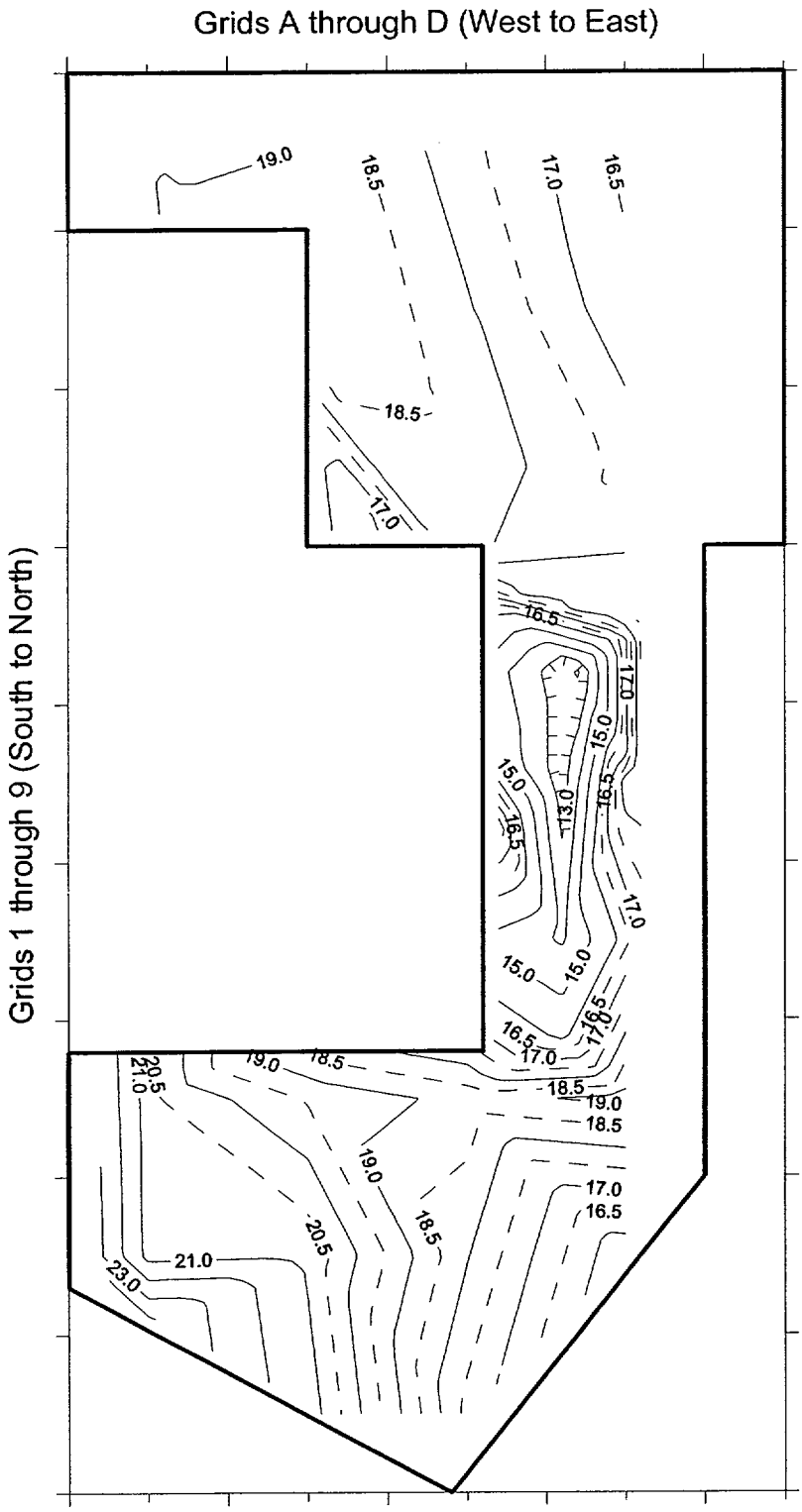


Average Gamma Scan Readings Ranged
From 14 kcpm to 24 kcpm

Figure 6.2-77
Study Area 2 - Survey Unit 5
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su5.srf

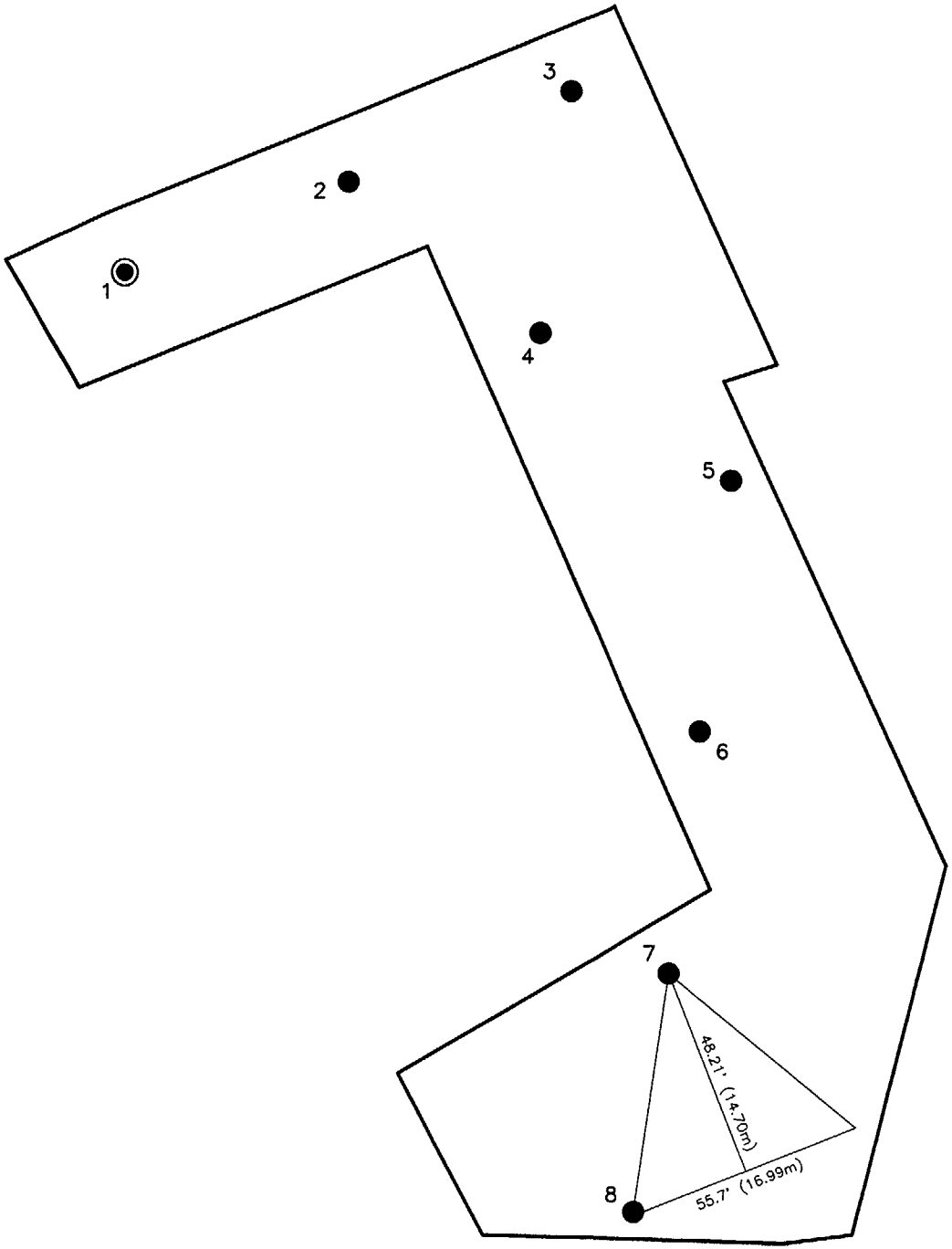


Background Measurements Ranged
From 11.9 kcpm to 24.2 kcpm

Figure 6.2-78
Study Area 2 - Survey Unit 5
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su5-b.srf



N

NOTES

A ≅ 21,528 FT^2 (2,000m^2)
n = 8
L = 55.7 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40
10 0 10
SCALE – METERS

FIGURE 6.2–79
STUDY AREA 2 – SURVEY UNIT 5
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	GJA 1/02/02
DRAWING NUMBER	5018097

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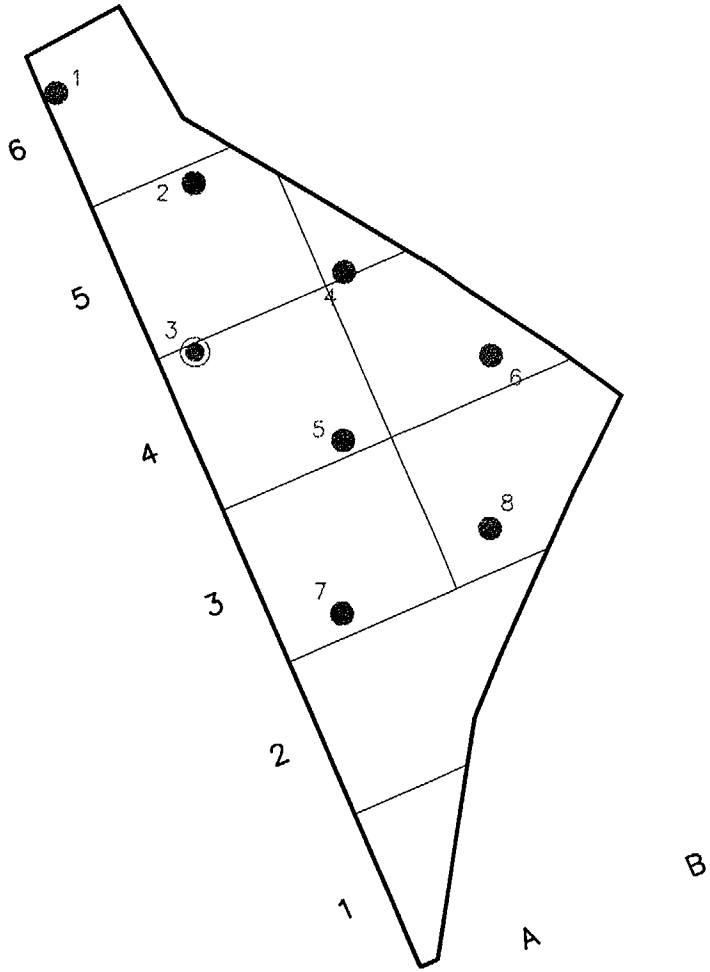

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–80
STUDY AREA 2–SURVEY UNIT 6
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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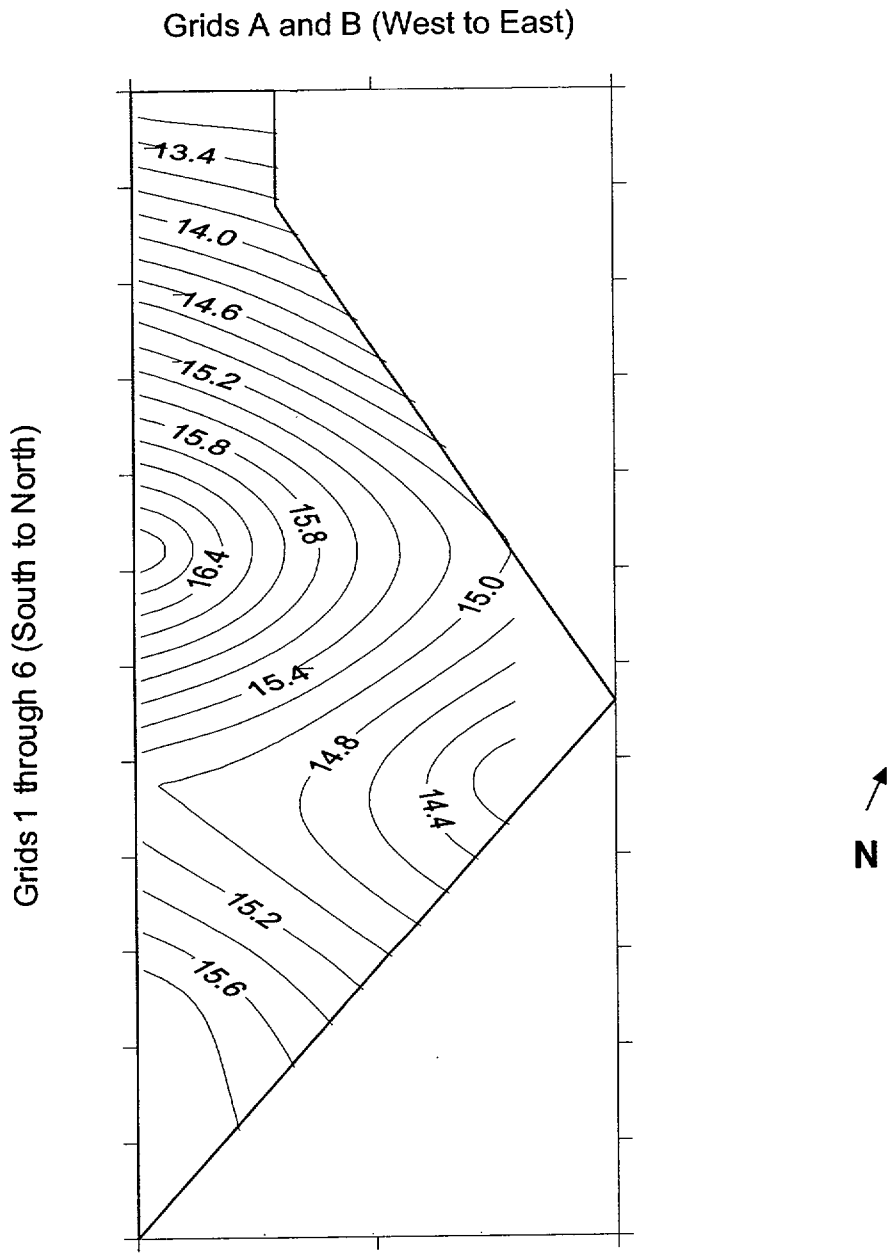
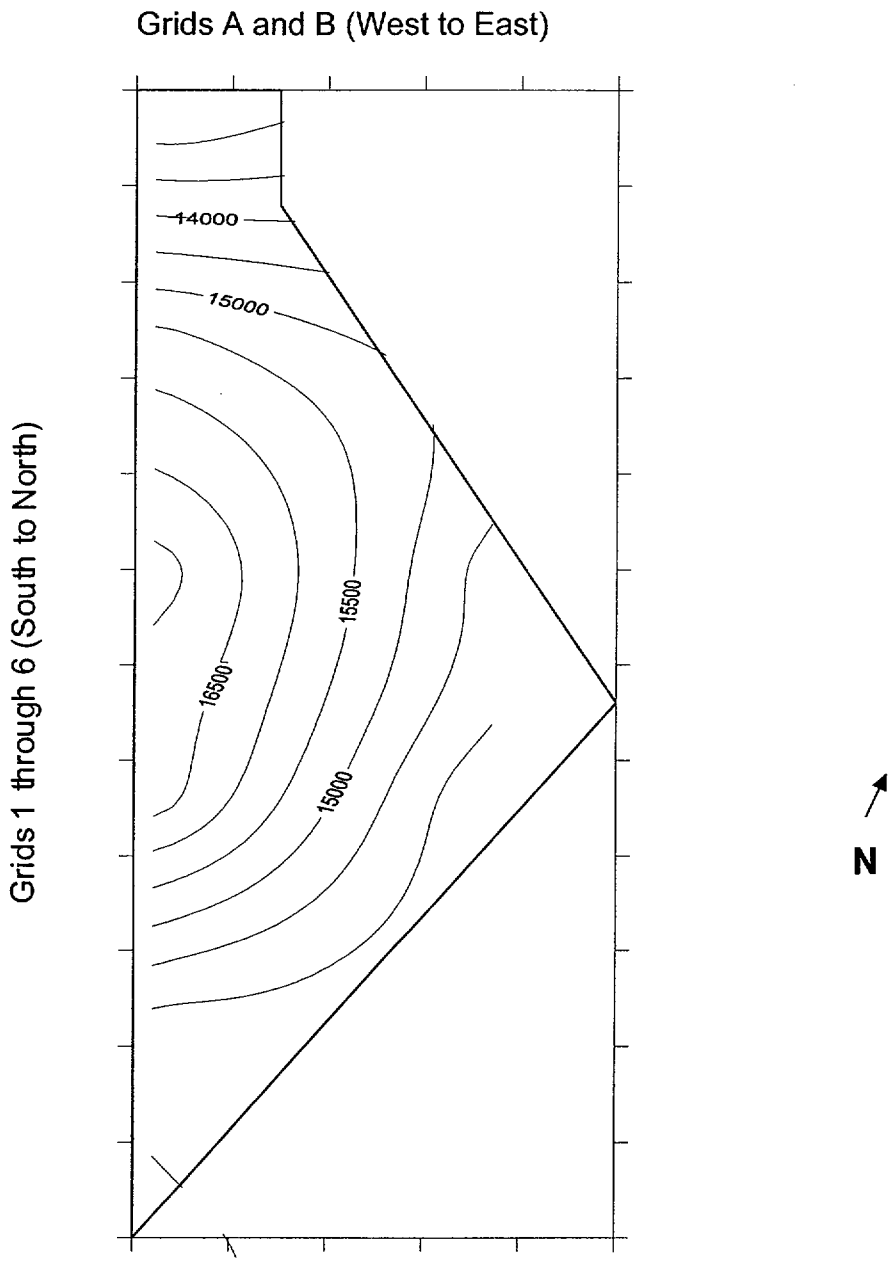


Average Gamma Scans Ranged
From 13 kcpm to 17 kcpm

Figure 6.2-81
Study Area 2 - Survey Unit 6
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su6-a.srf

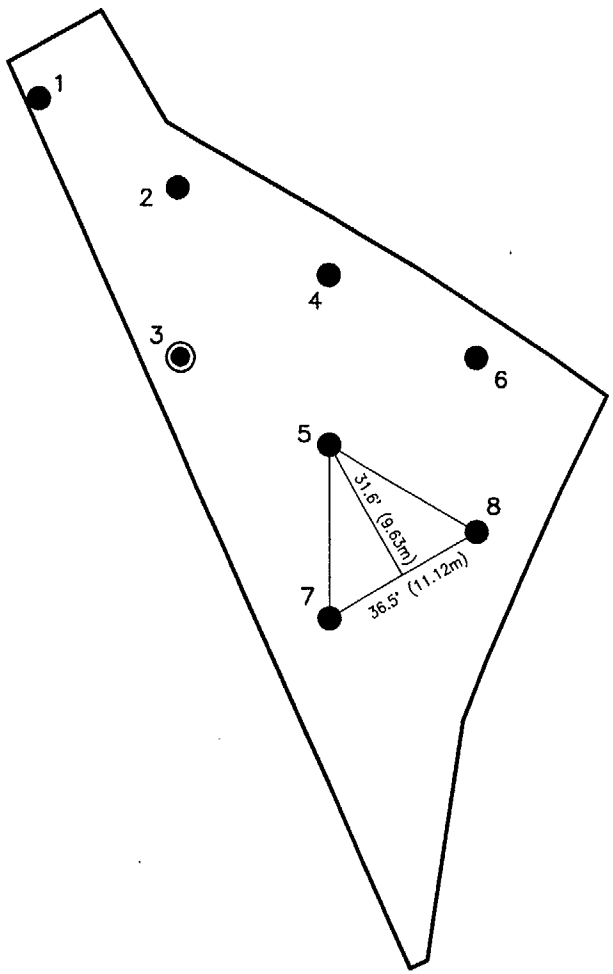


Background Measurements Ranged
From 12,513 cpm to 17,225 cpm

Figure 6.2-82
Study Area 2 - Survey Unit 6
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su6-b.srf



N

NOTES

A ≅ 9,257 FT^2 ($860m^2$)
n = 8
L = 36.5 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40
10 0 10
SCALE – METERS

FIGURE 6.2–83
STUDY AREA 2 – SURVEY UNIT 6
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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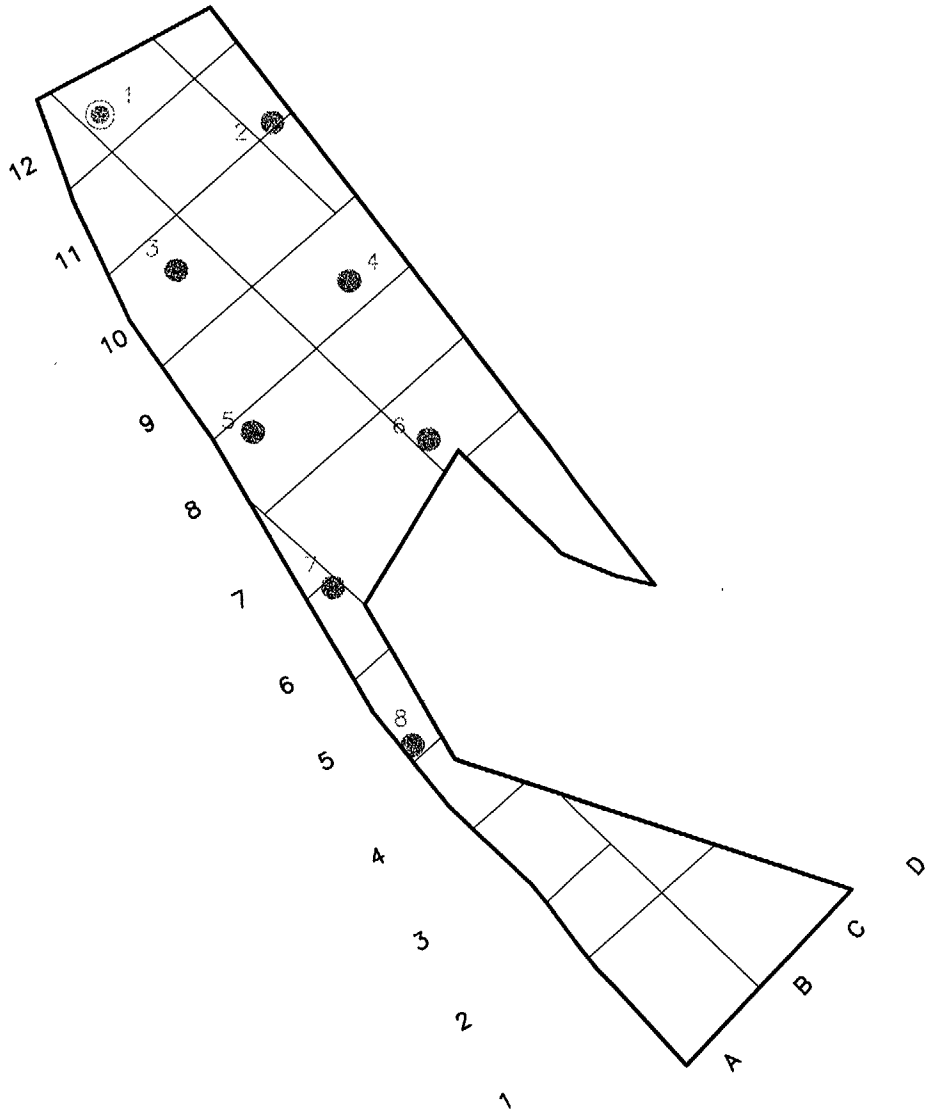

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-84
STUDY AREA 2-SURVEY UNIT 7
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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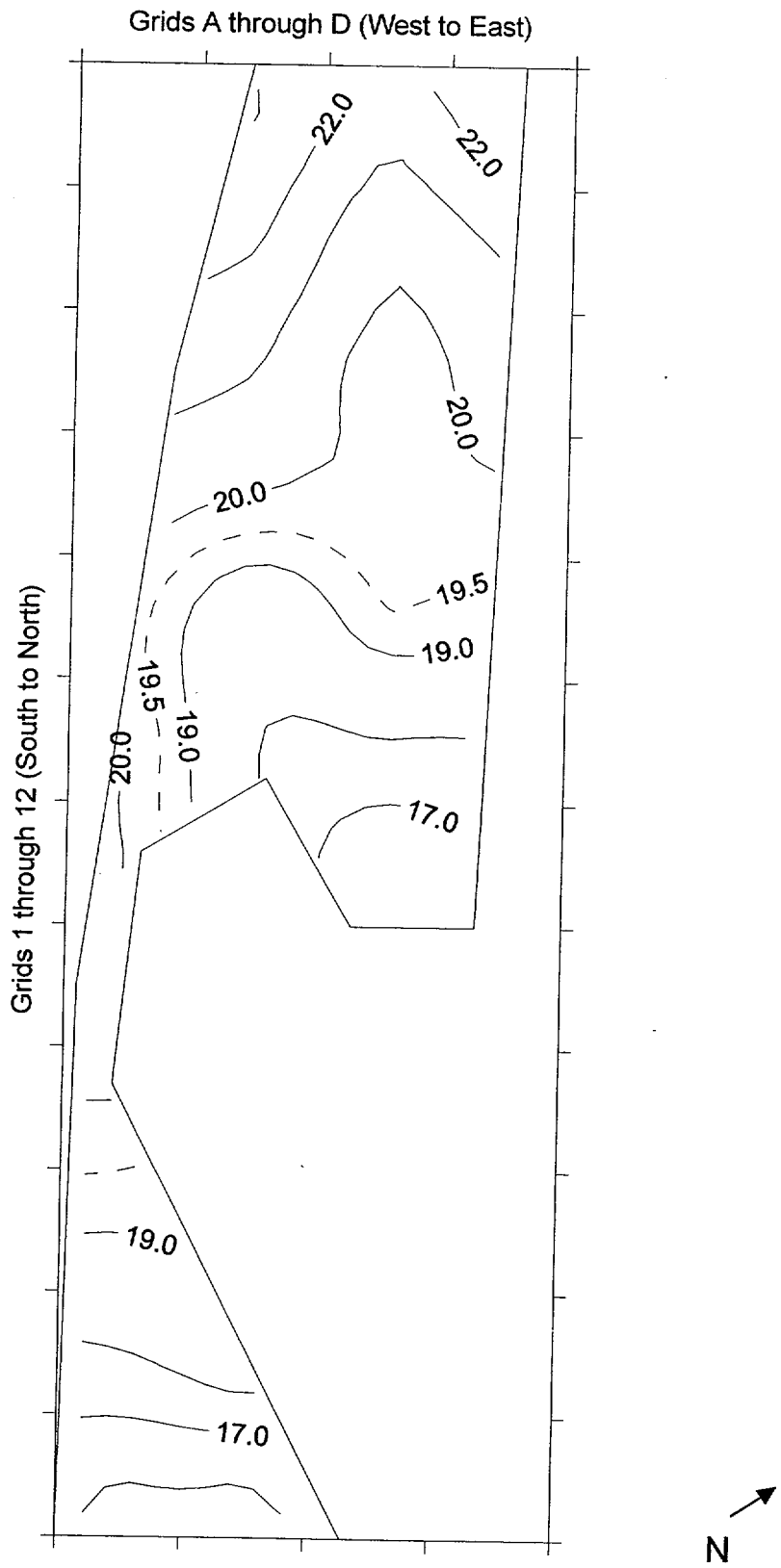


Average Gamma Scan Readings Ranged
From 16 kcpm to 24 kcpm

Figure 6.2-85
Study Area 2 - Survey Unit 7
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

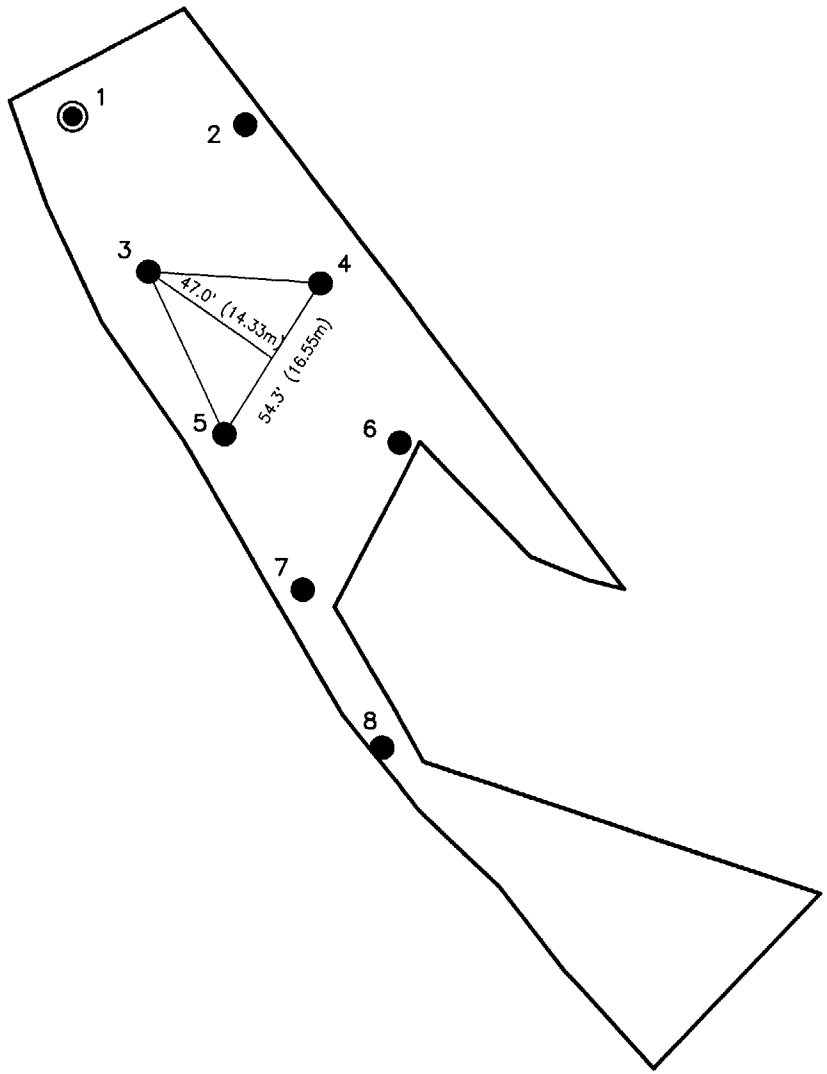
k:/5018/Fssr/Cas/Surfer/Area2/Su7-a.srf

Background Measurements Ranged
From 14.4 kcpm to 22.3 kcpm

Figure 6.2-86
Study Area 2 - Survey Unit 7
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su7-b.srf



NOTES

A ≅ 20,451 FT^2 (1,900m^2)
n = 8
L = 54.3 FEET
◉ RANDOM START POINT

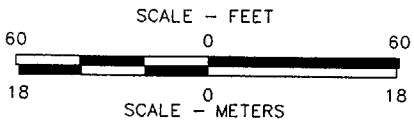


FIGURE 6.2–87
STUDY AREA 2 – SURVEY UNIT 7
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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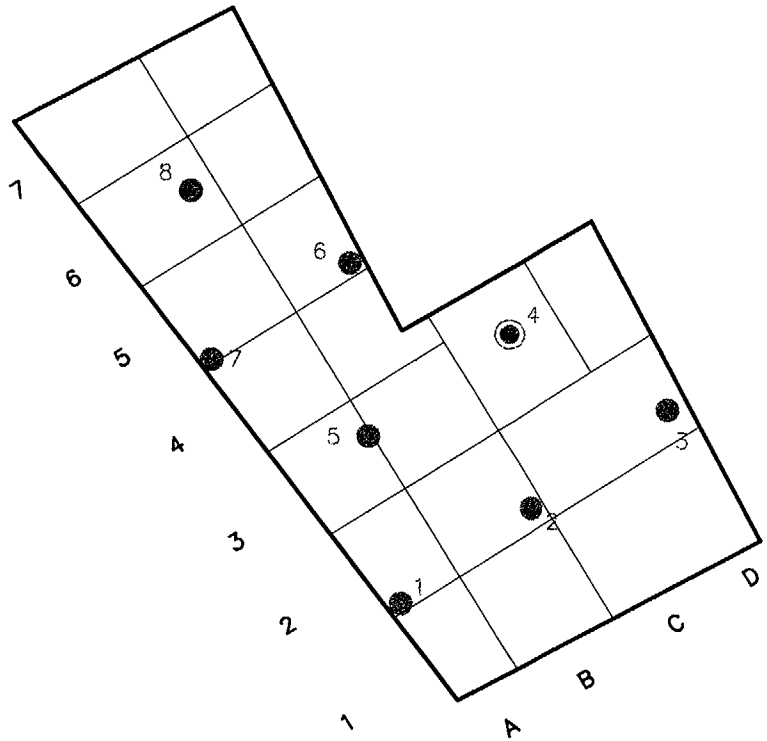

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM STARTING POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-88
STUDY AREA 2-SURVEY UNIT 8
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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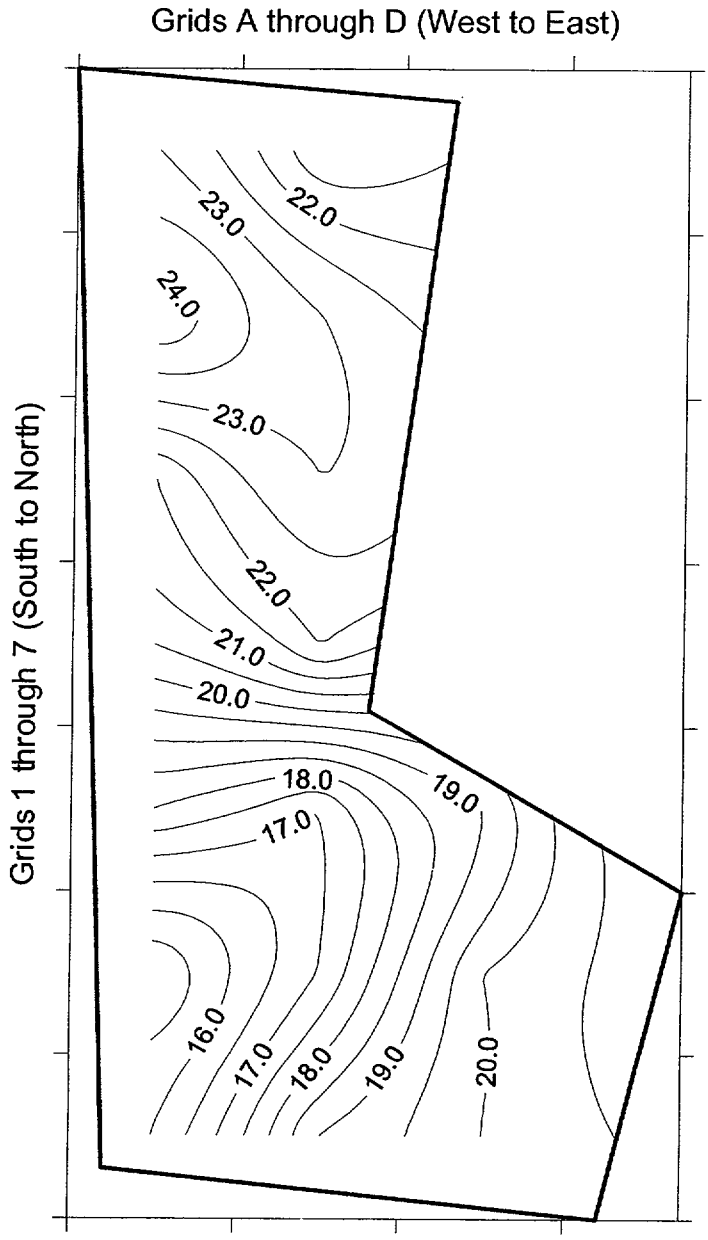


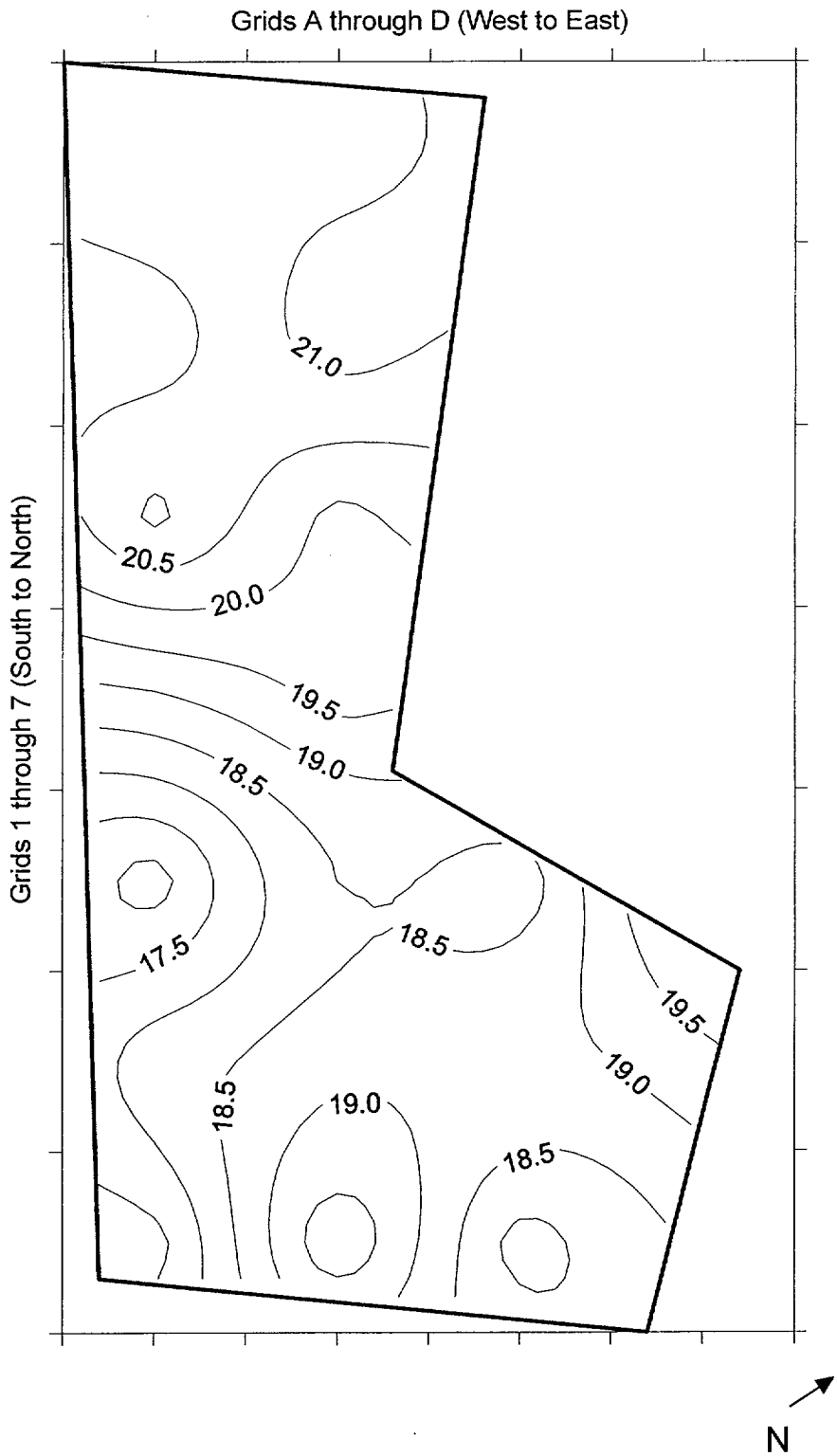
N

Average Gamma Scan Readings Ranged
From 15 kcpm to 24.5 kcpm

Figure 6.2-89
Study Area 2 - Survey Unit 8
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su8-a.srf

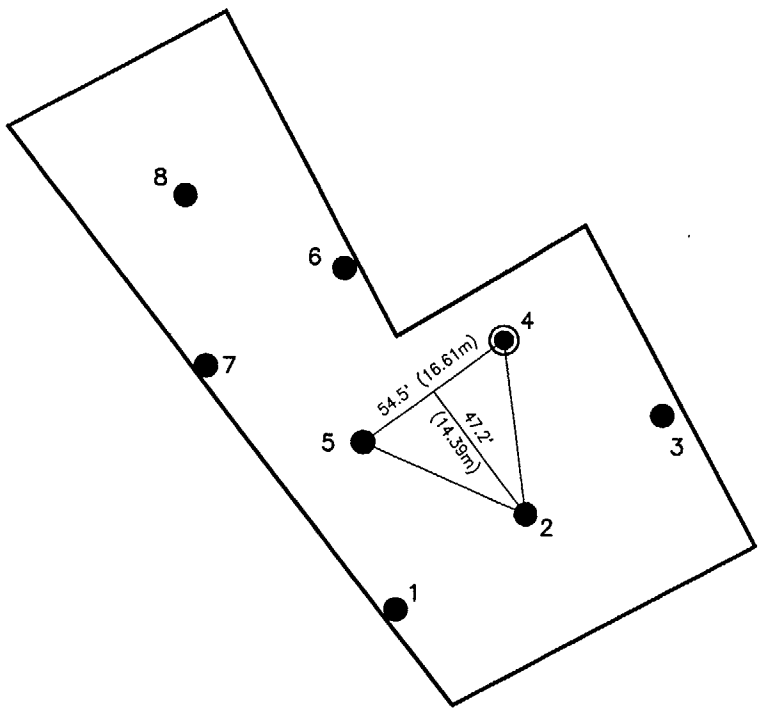


Background Measurements Ranged
From 16.7 kcpm to 21.5 kcpm

Figure 6.2-90
Study Area 2 - Survey Unit 8
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su8-b.srf



N

NOTES

A ≅ 20,615 FT^2 (1,915m^2)
n = 8
L = 54.5 FEET
◉ RANDOM START POINT

SCALE – FEET
60 0 60
18 0 18
SCALE – METERS

FIGURE 6.2–91
STUDY AREA 2 – SURVEY UNIT 8
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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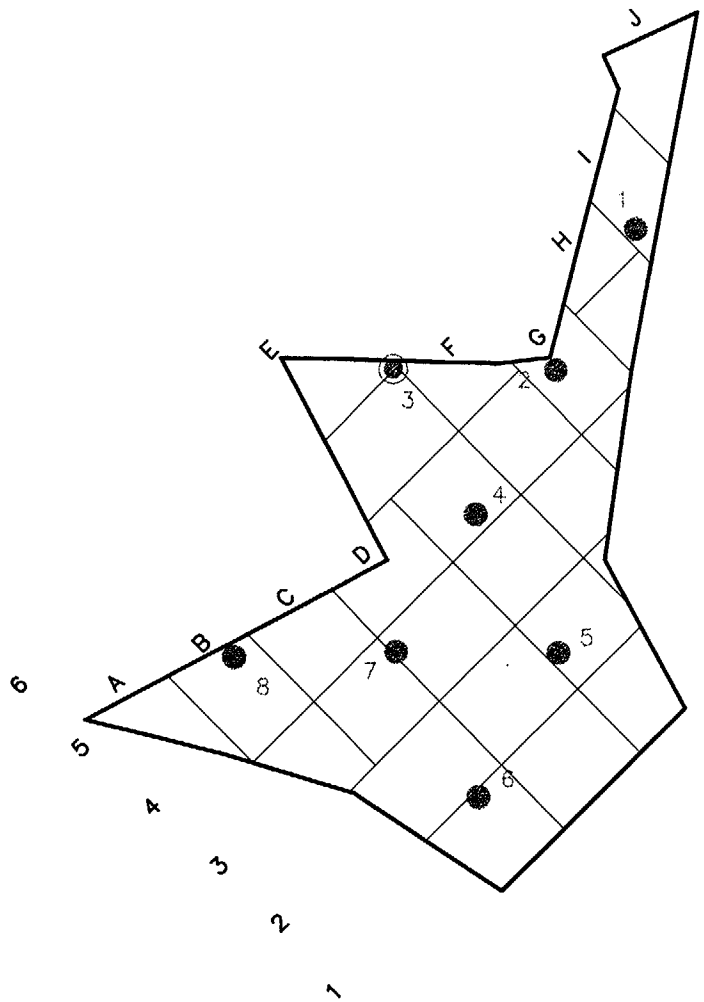

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-92
STUDY AREA 2-SURVEY UNIT 11
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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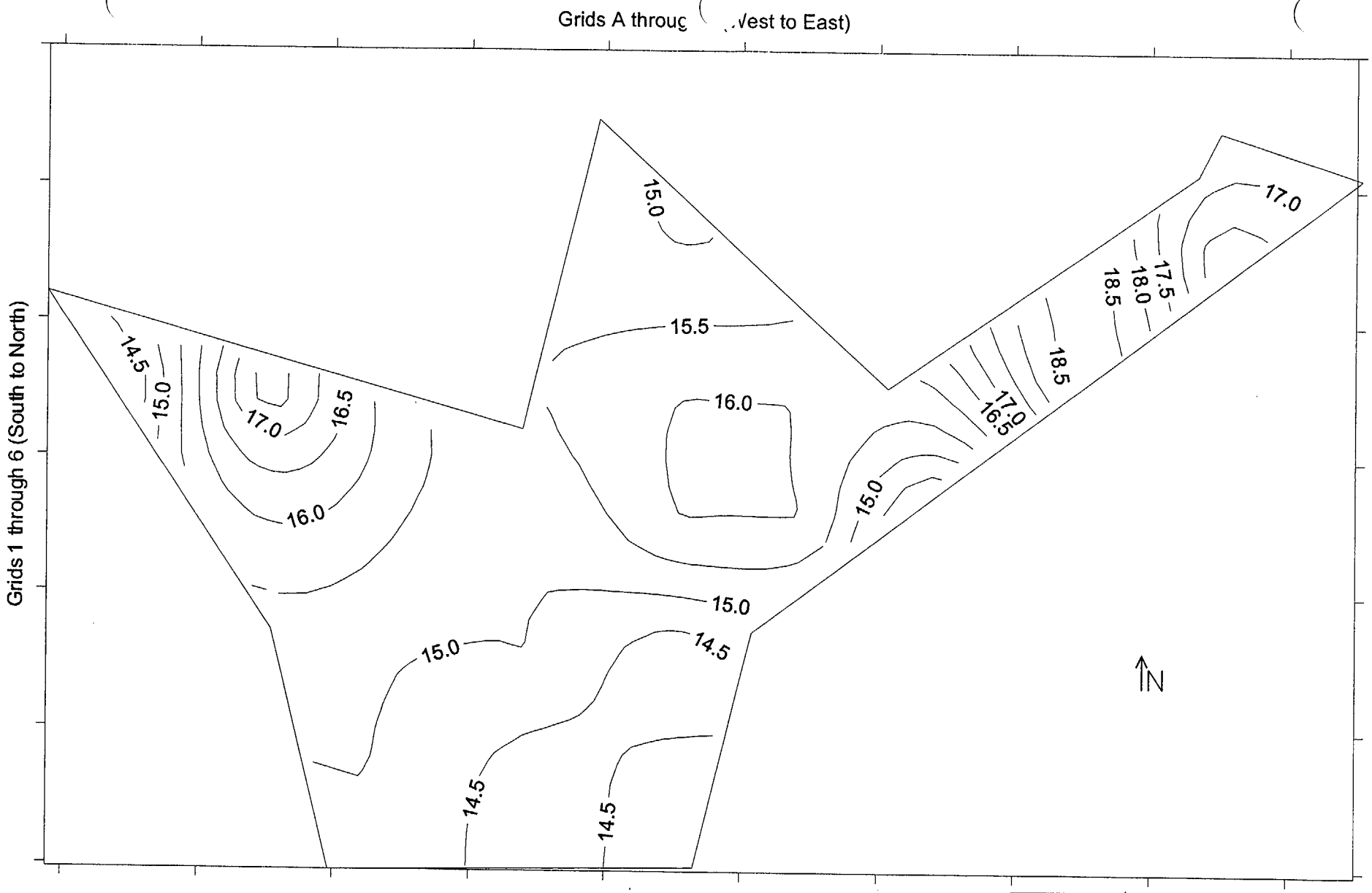
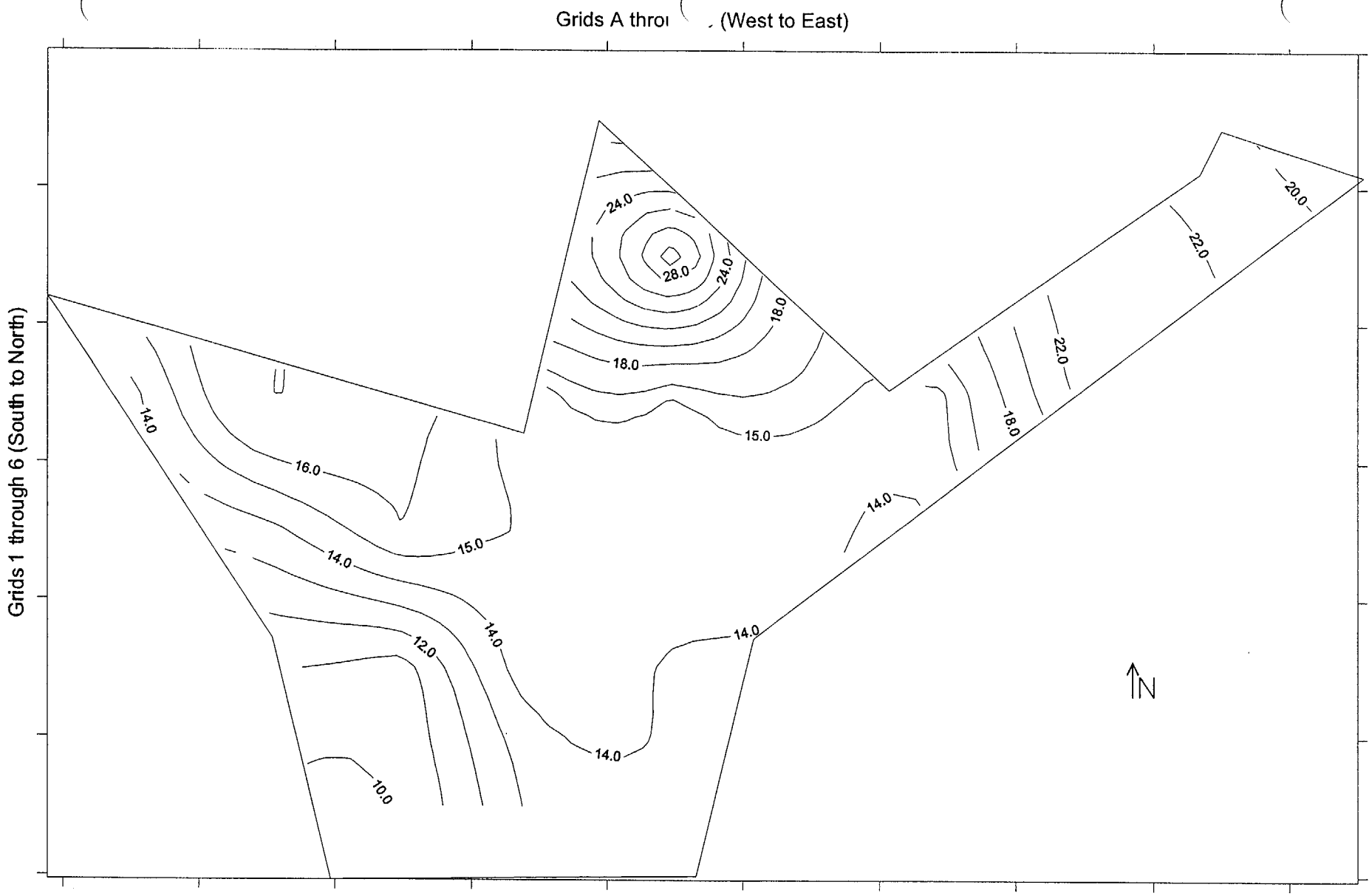


Average Gamma Scans Ranged
From 13 kcpm to 19 kcpm

Figure 6.2-93
Study Area 2 - Survey Unit 11
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su11-a.srf

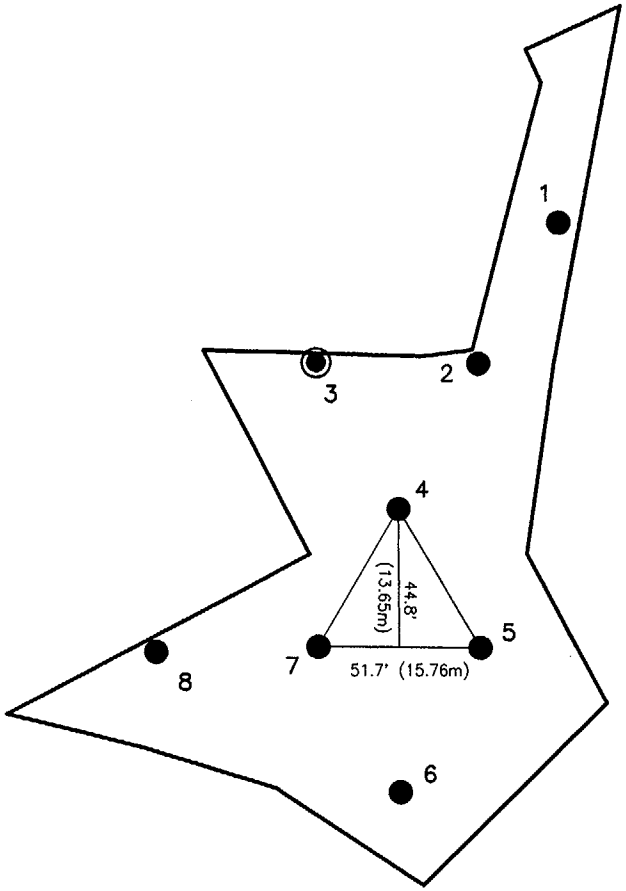


Background Measurements Ranged
From 10.1 kcpm to 31.7 kcpm

Figure 6.2-94
Study Area 2 - Survey Unit 11
Background Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su11-b.srf



N

NOTES

A ≅ 18,514 FT^2 (1,720m^2)
n = 8
L = 51.7 FEET
◉ RANDOM START POINT

SCALE – FEET
60 0 60
18 0 18
SCALE – METERS

FIGURE 6.2–95
STUDY AREA 2 – SURVEY UNIT 11
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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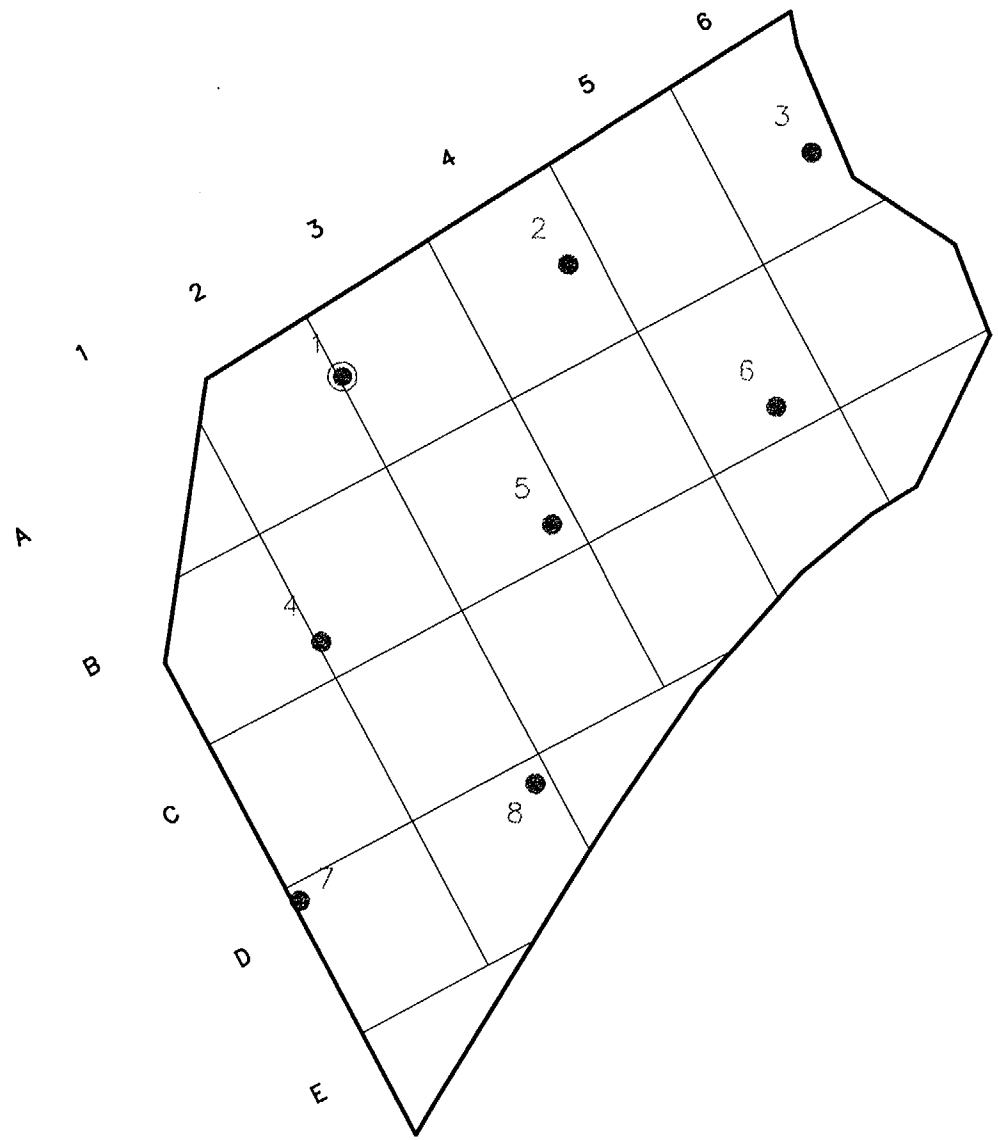

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM STARTING POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-96
STUDY AREA 2-SURVEY UNIT 12
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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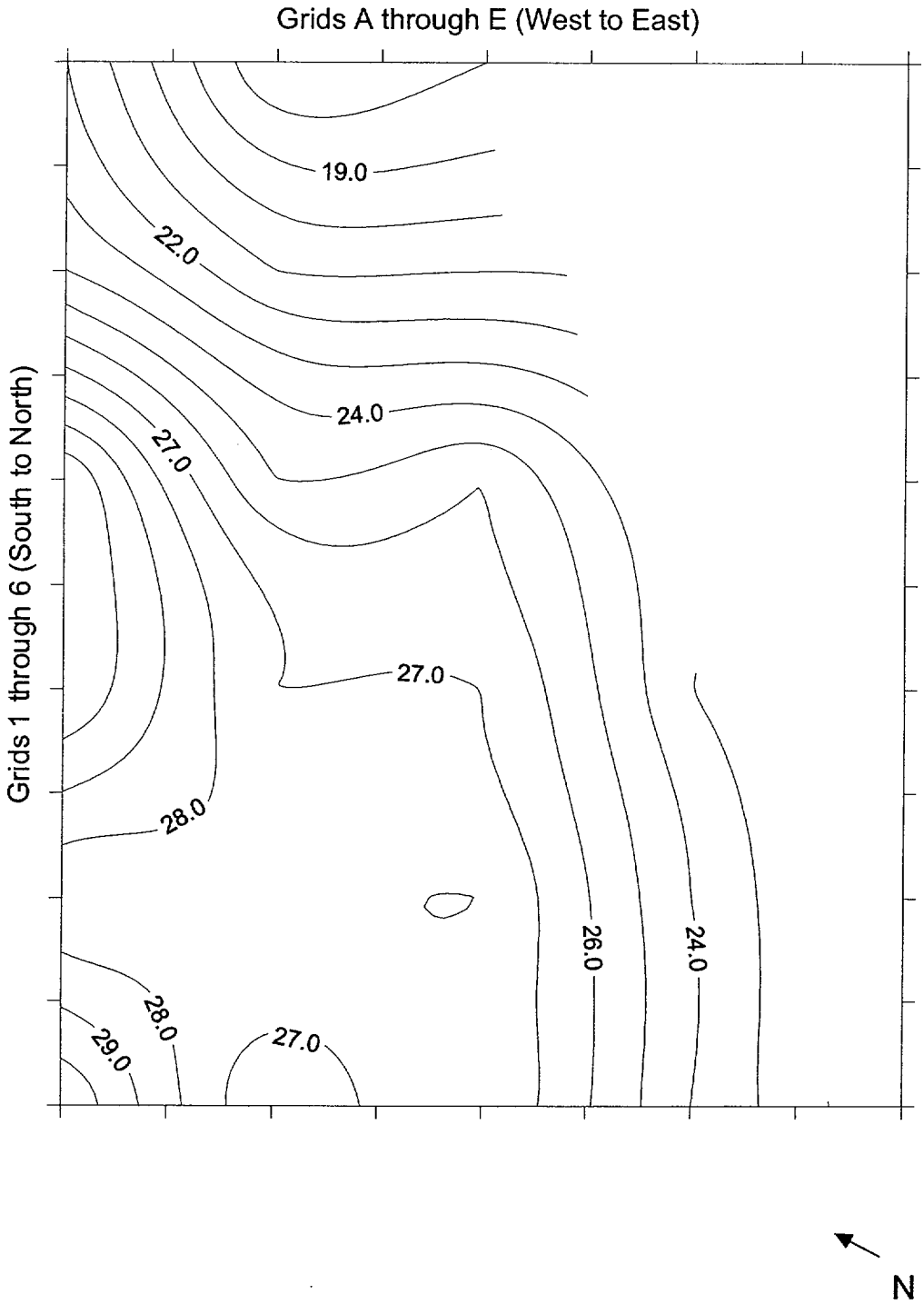
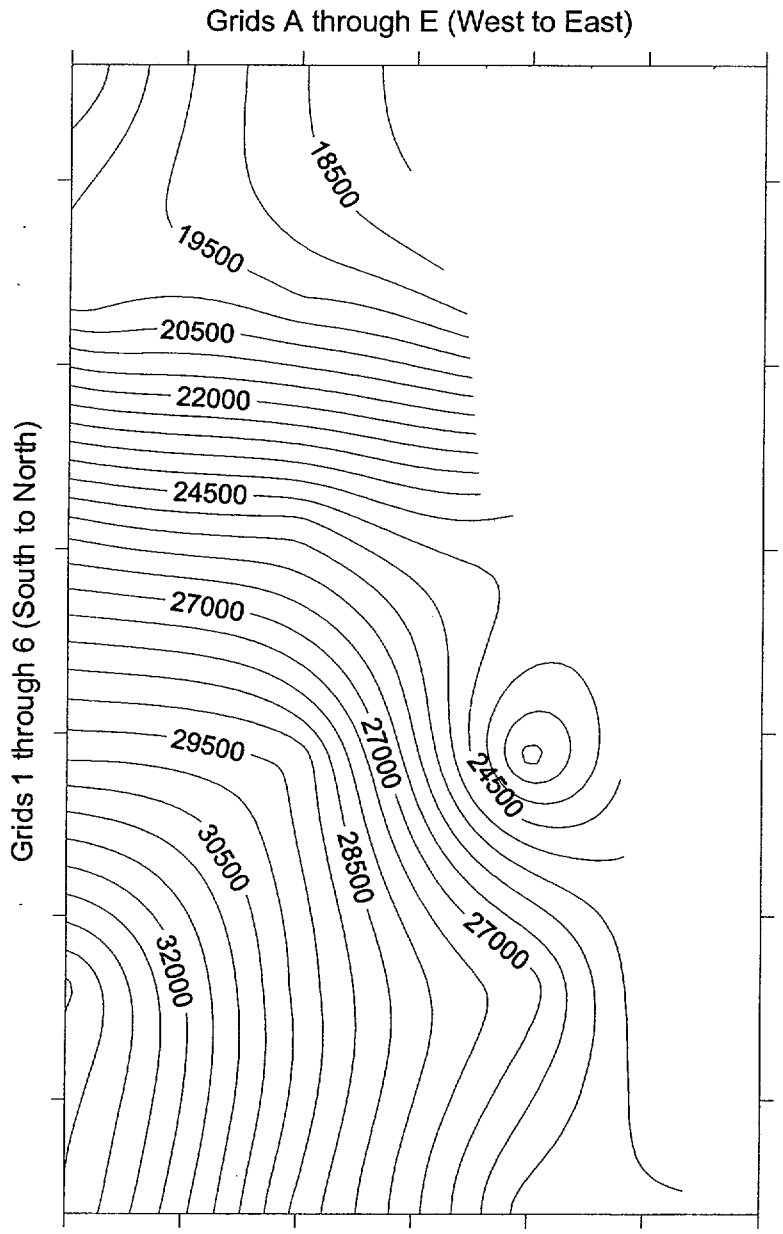


Average Gamma Scan Readings Ranged
From 17 kcpm to 31 kcpm

Figure 6.2-97
Study Area 2 - Survey Unit 12
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su12-a.srf



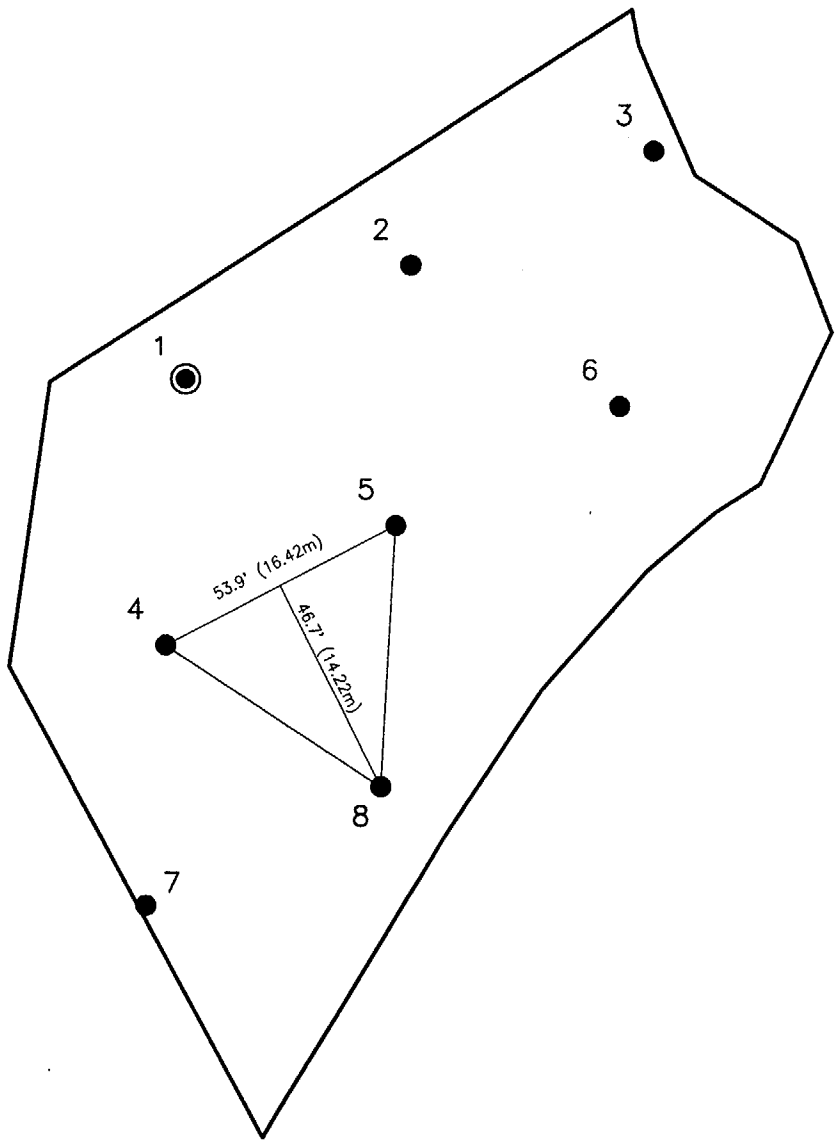
N

Background Measurements Ranged
From 17,365 cpm to 34,127 cpm

Figure 6.2-98
Study Area 2 - Survey Unit 12
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su12-b.srf



NOTES

A ≅ 20,118 FT^2 (1,869m^2)
n = 8
L = 53.9 FEET
◉ RANDOM START POINT

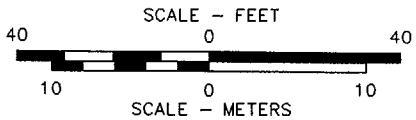


FIGURE 6.2–99
STUDY AREA 2–SURVEY UNIT 12
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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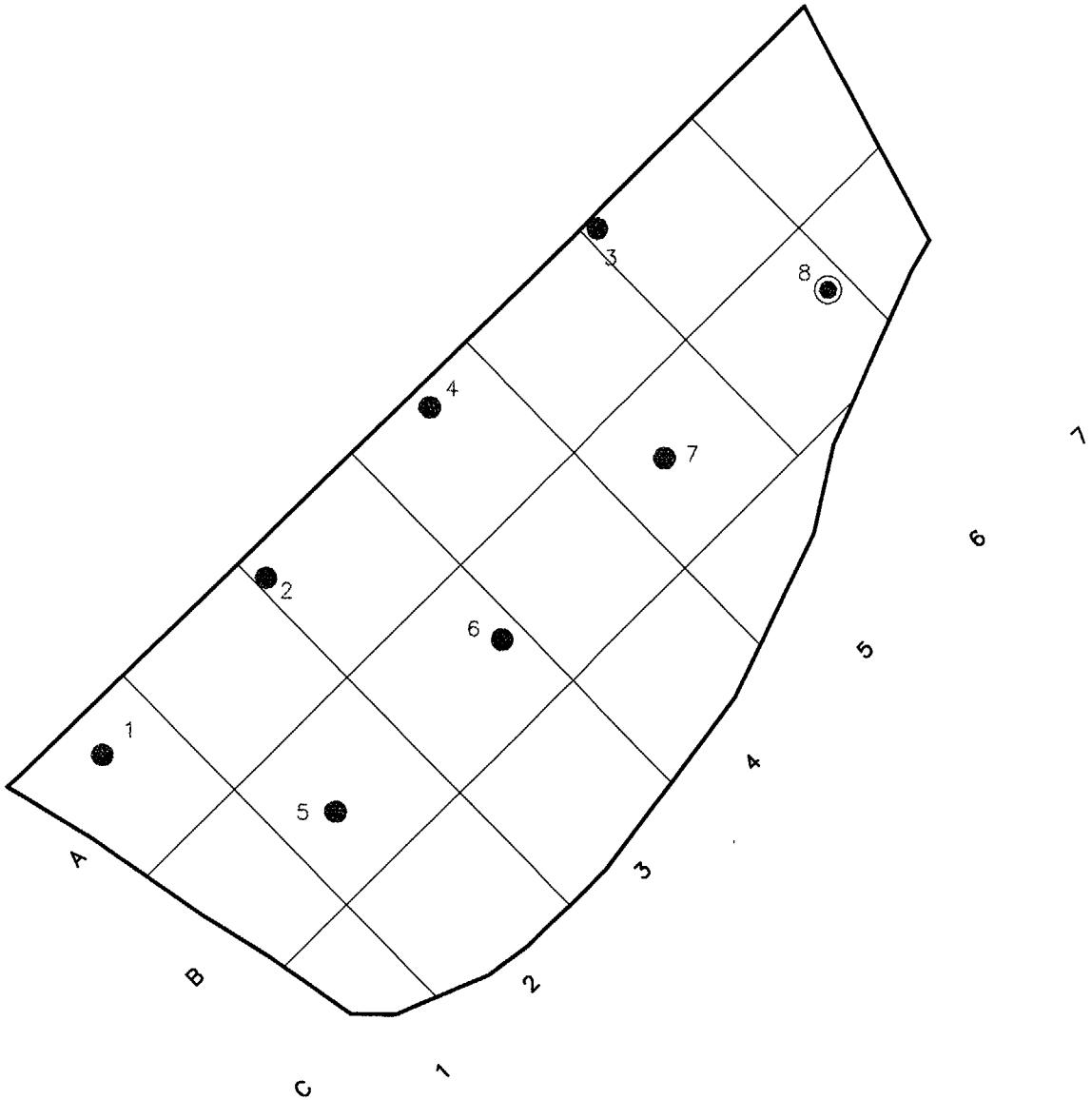

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–100
STUDY AREA 2–SURVEY UNIT 13
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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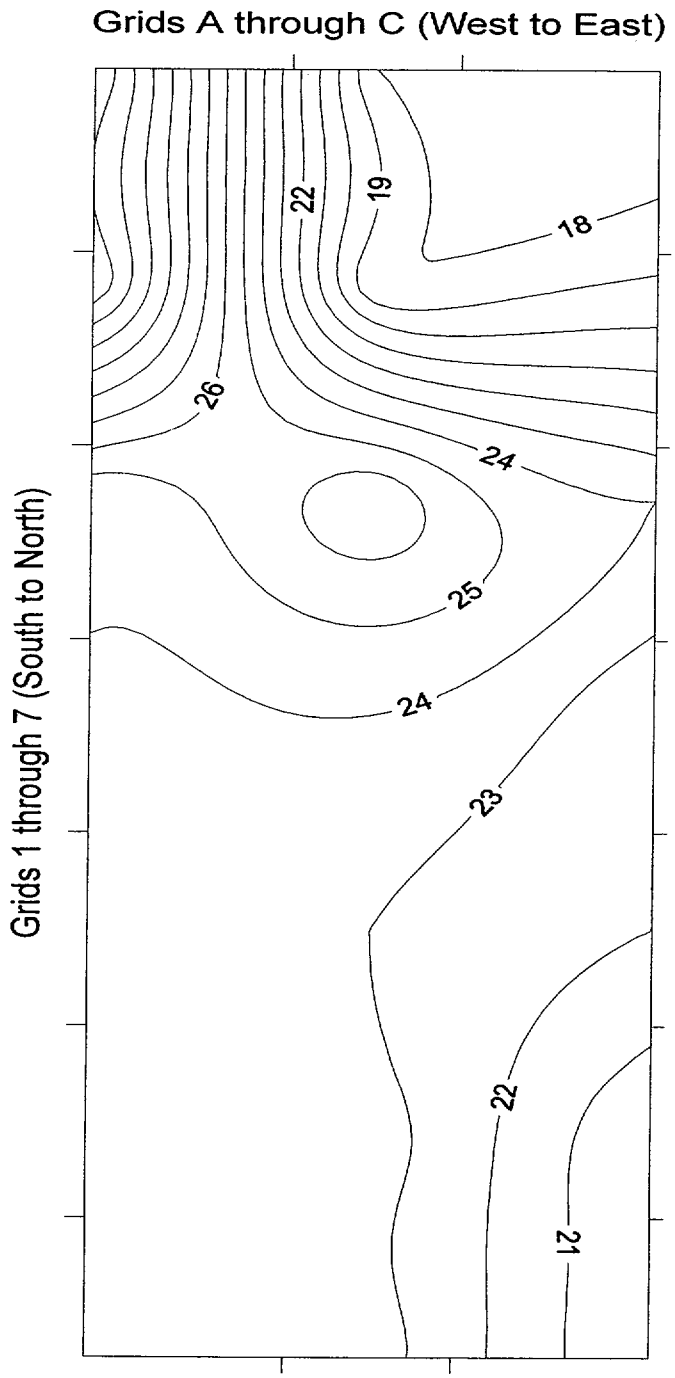


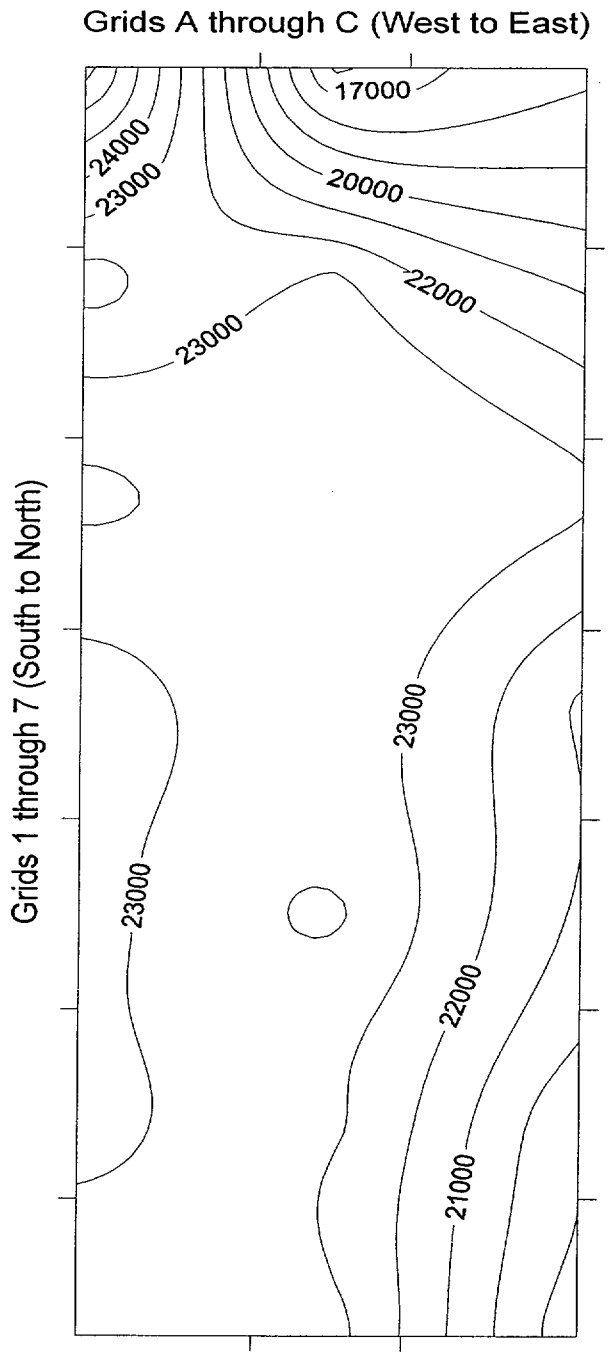
N

Average Gamma Scan Readings Ranged
From 18 kcpm to 33 kcpm

Figure 6.2-101
Study Area 2 - Survey Unit 13
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su13-a.srf



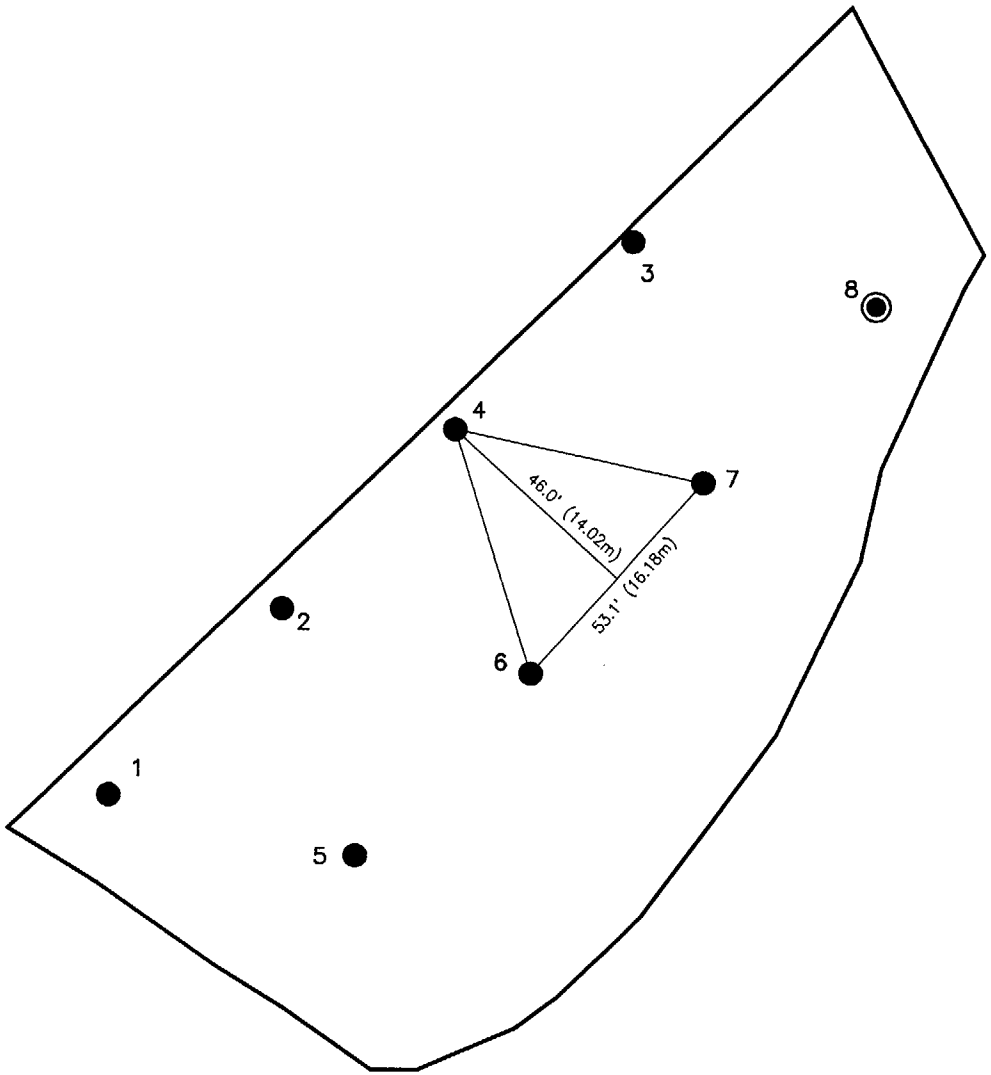
N

Background Measurements Ranged
From 15,775 cpm to 27,494 cpm

Figure 6.2-102
Study Area 2 - Survey Unit 13
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Su13-b.srf



NOTES

A ≅ 19,537 FT^2 (1,815m^2)
n = 8
L = 53.1 FEET
◉ RANDOM START POINT

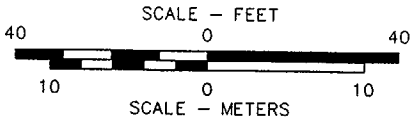


FIGURE 6.2–103
STUDY AREA 2–SURVEY UNIT 13
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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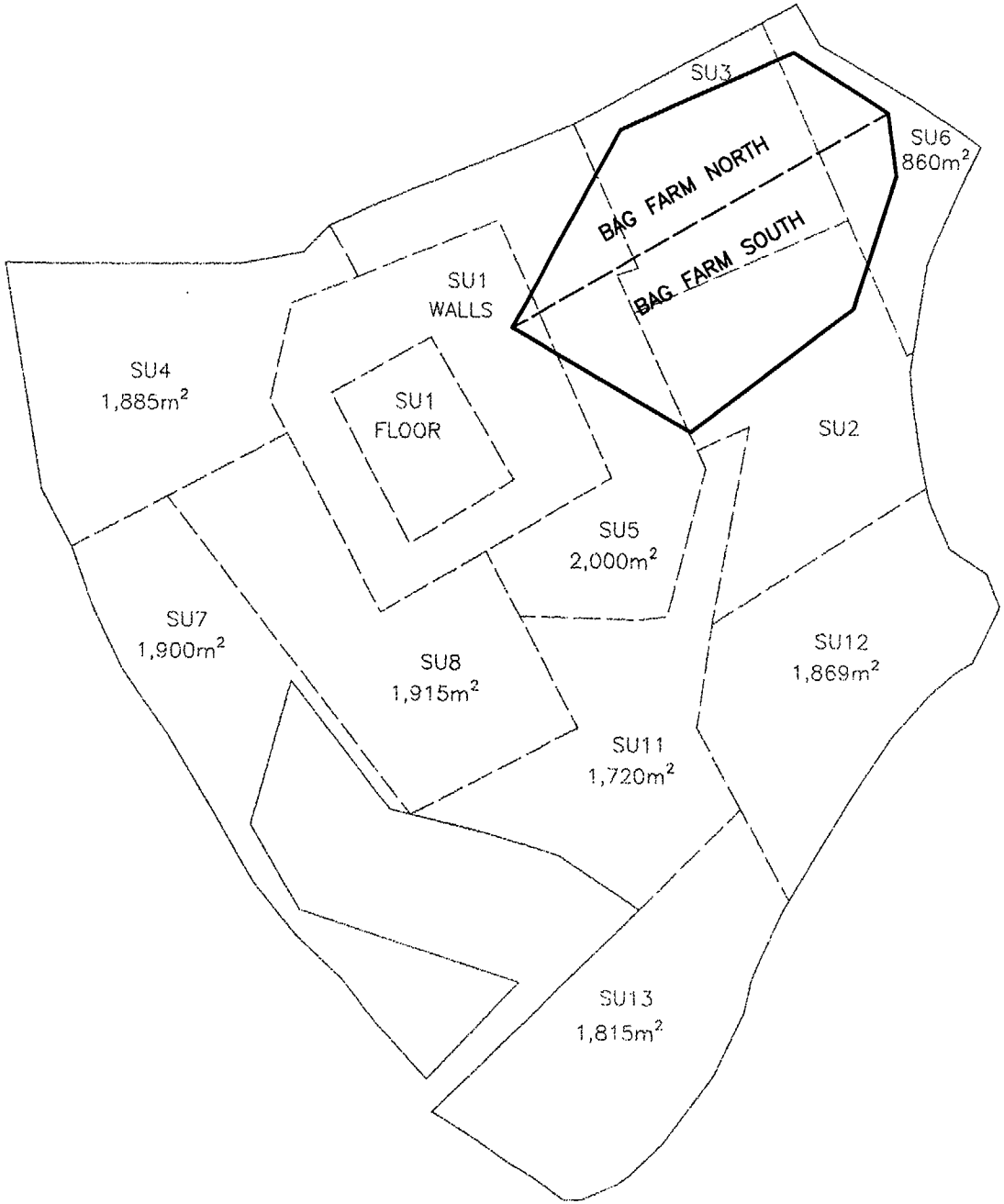

N

DRAWING NOT TO SCALE

FIGURE 6.2–104
STUDY AREA 2
LOCATION OF BAG FARM NORTH AND SOUTH
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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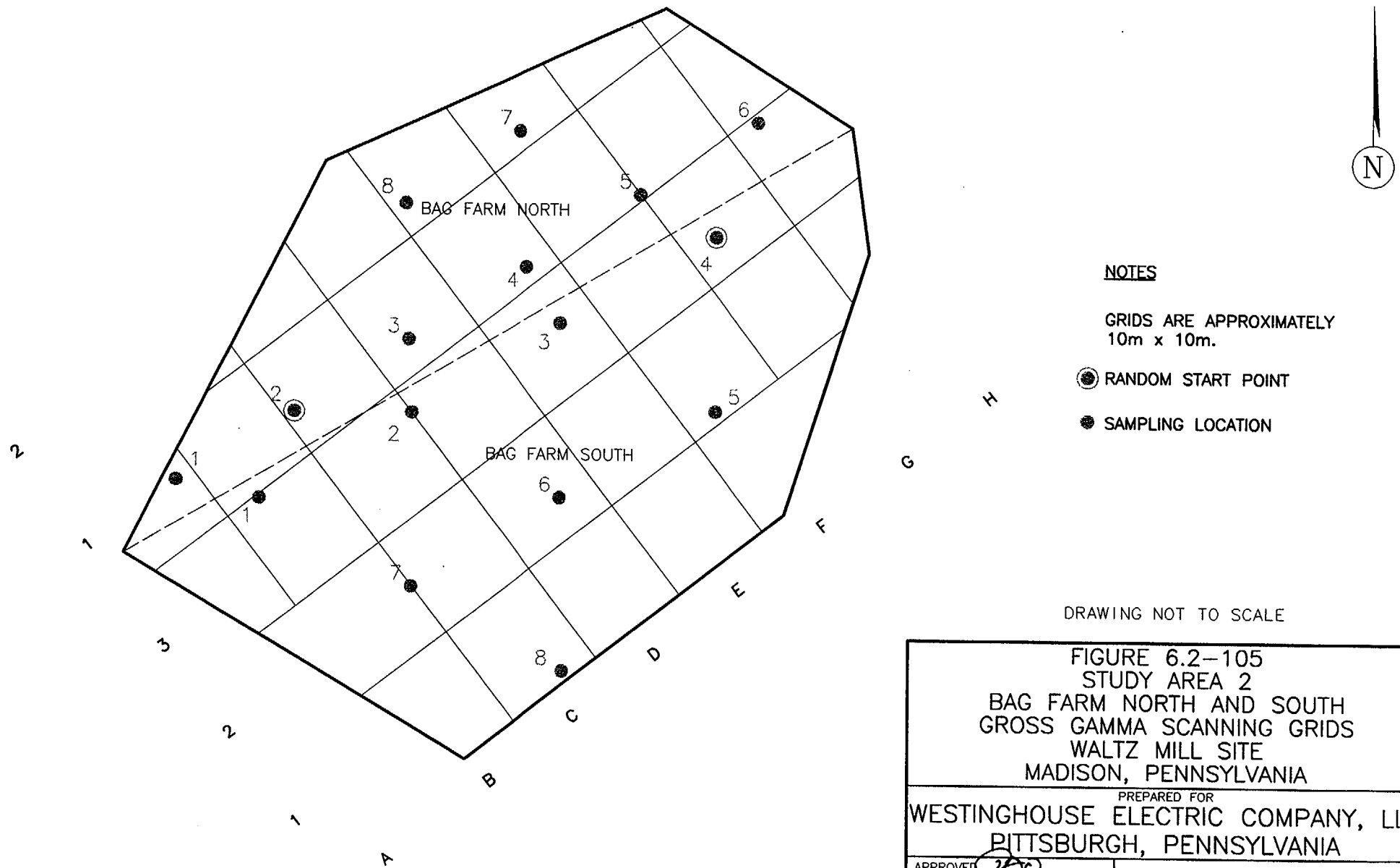

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–105
STUDY AREA 2
BAG FARM NORTH AND SOUTH
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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PITTSBURGH, PENNSYLVANIA

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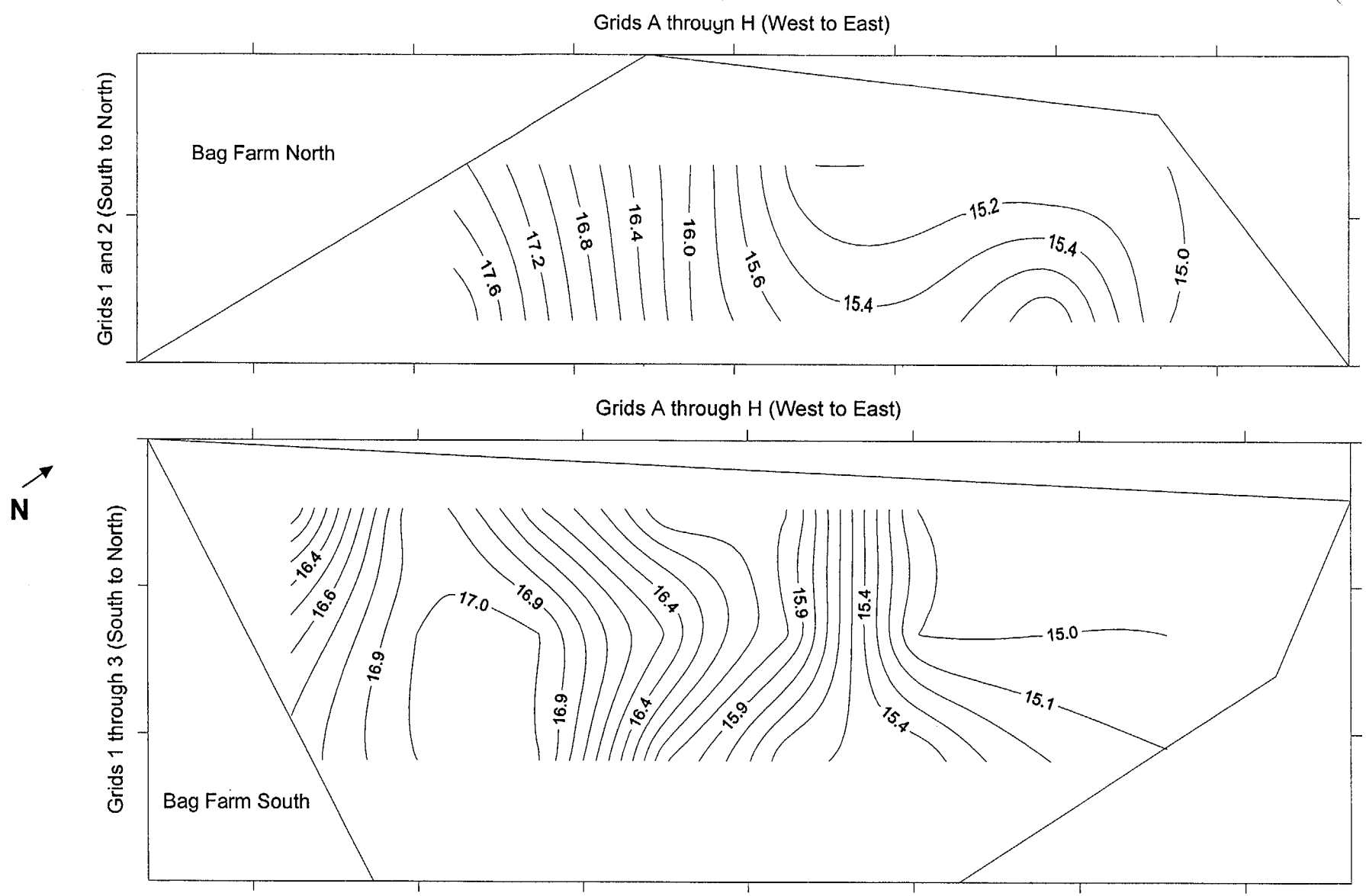


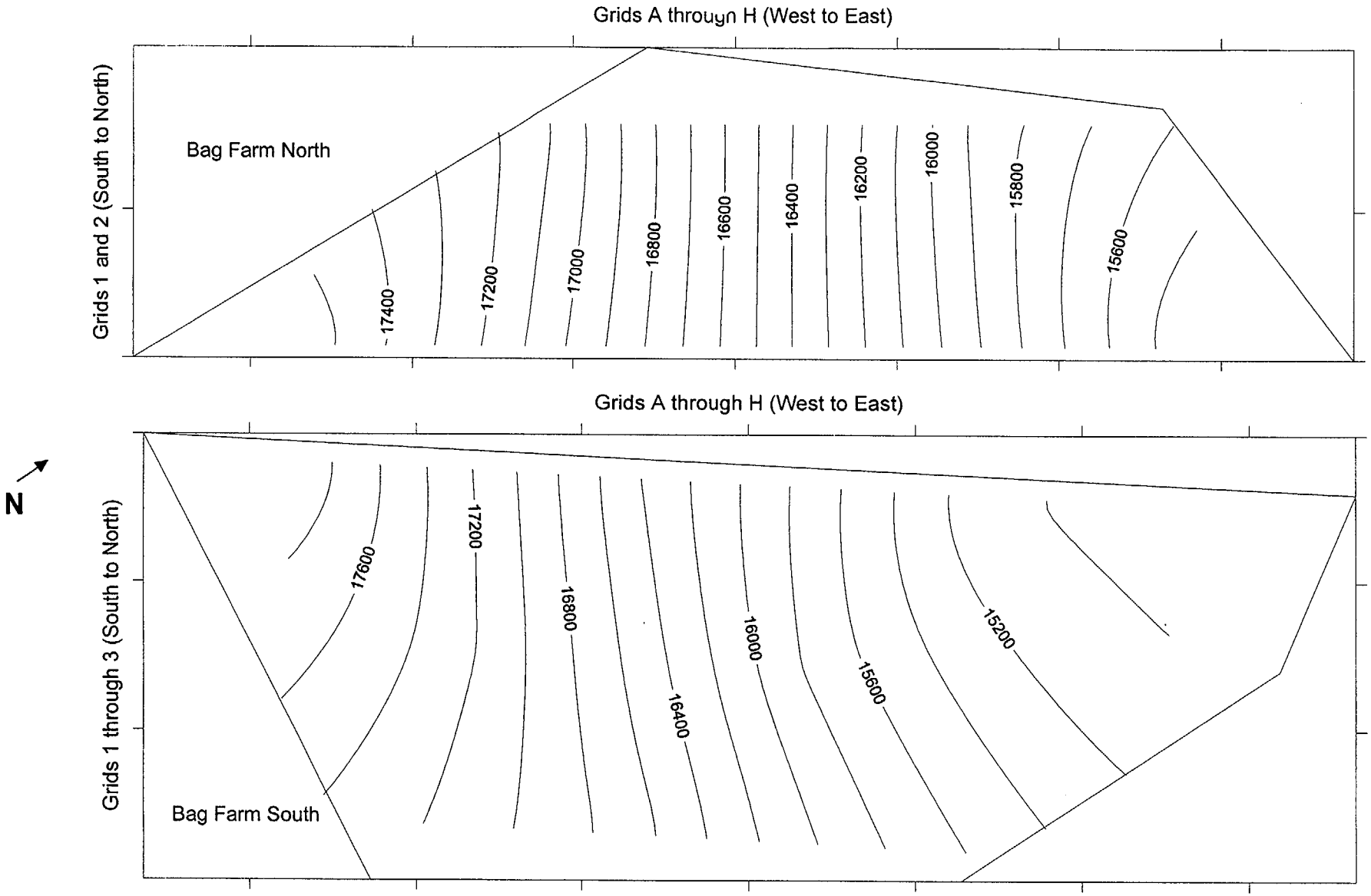
Average Gamma Scan Readings for Bag Farm North
Ranged from 15 kcpm to 18 kcpm

Average Gamma Scan Readings for Bag Farm South
Ranged from 15 kcpm to 17 kcpm

Figure 6.2-106
Study Area 2 - Bag Farm North and South
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area2/Bagfrm-a.srf



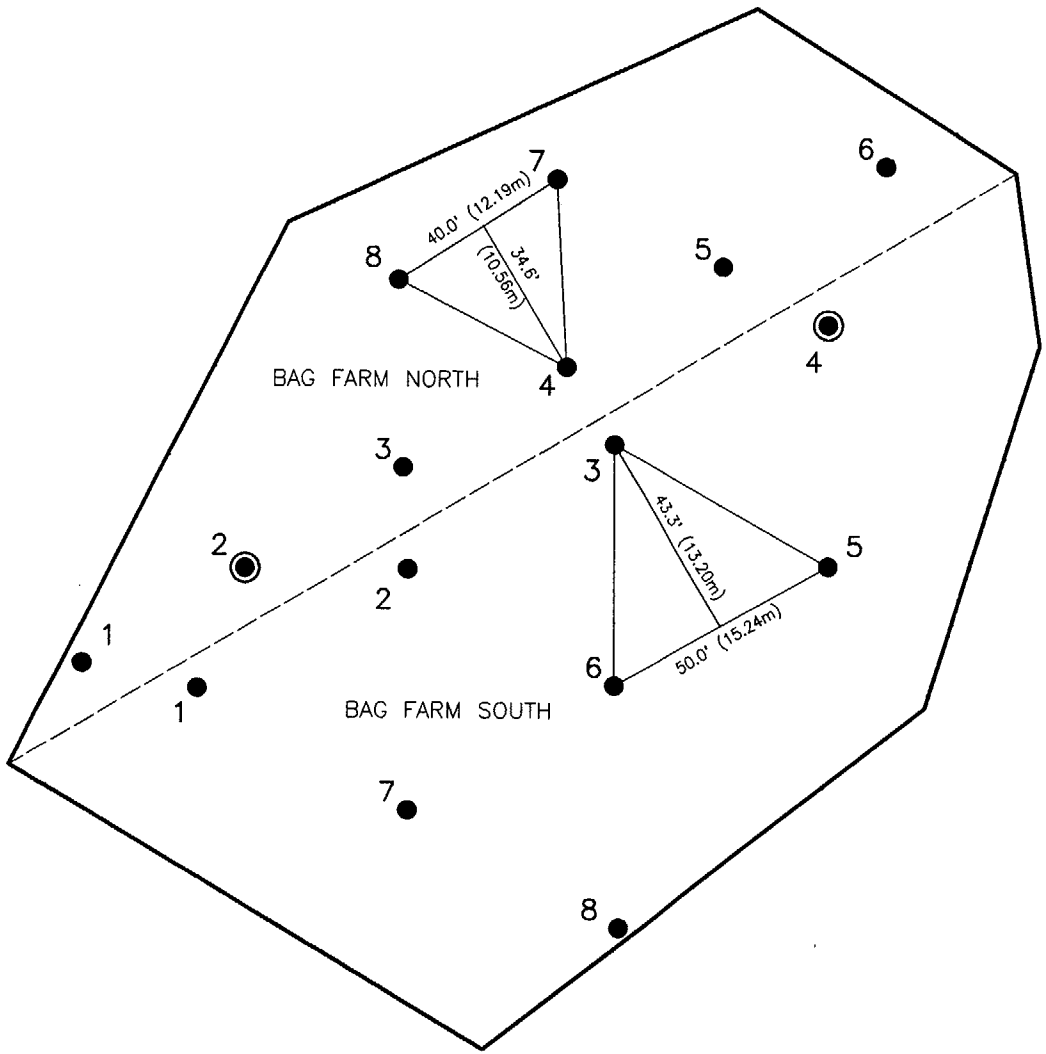
Background Measurements for Bag Farm North
Ranged from 15,412 cpm to 17,540 cpm

Background Measurements for Bag Farm South
Ranged from 15,020 cpm to 17,961 cpm

Figure 6.2-107
Study Area 2 - Bag Farm North and South
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

K:/5018/Fssr/Cas/Surfer/Area2/Bagfrm-b.srf



NOTES

BAG FARM NORTH

A ≅ 11,086 FT^2 (1,030m^2)
n = 8
L = 40.0 FEET

BAG FARM SOUTH

A ≅ 17,319 FT^2 (1,609m^2)
n = 8
L = 50.0 FEET

◉ RANDOM START POINT

N

SCALE – FEET
40 0 40
10 0 10
SCALE – METERS

FIGURE 6.2–108
STUDY AREA 2
BAG FARM NORTH AND SOUTH
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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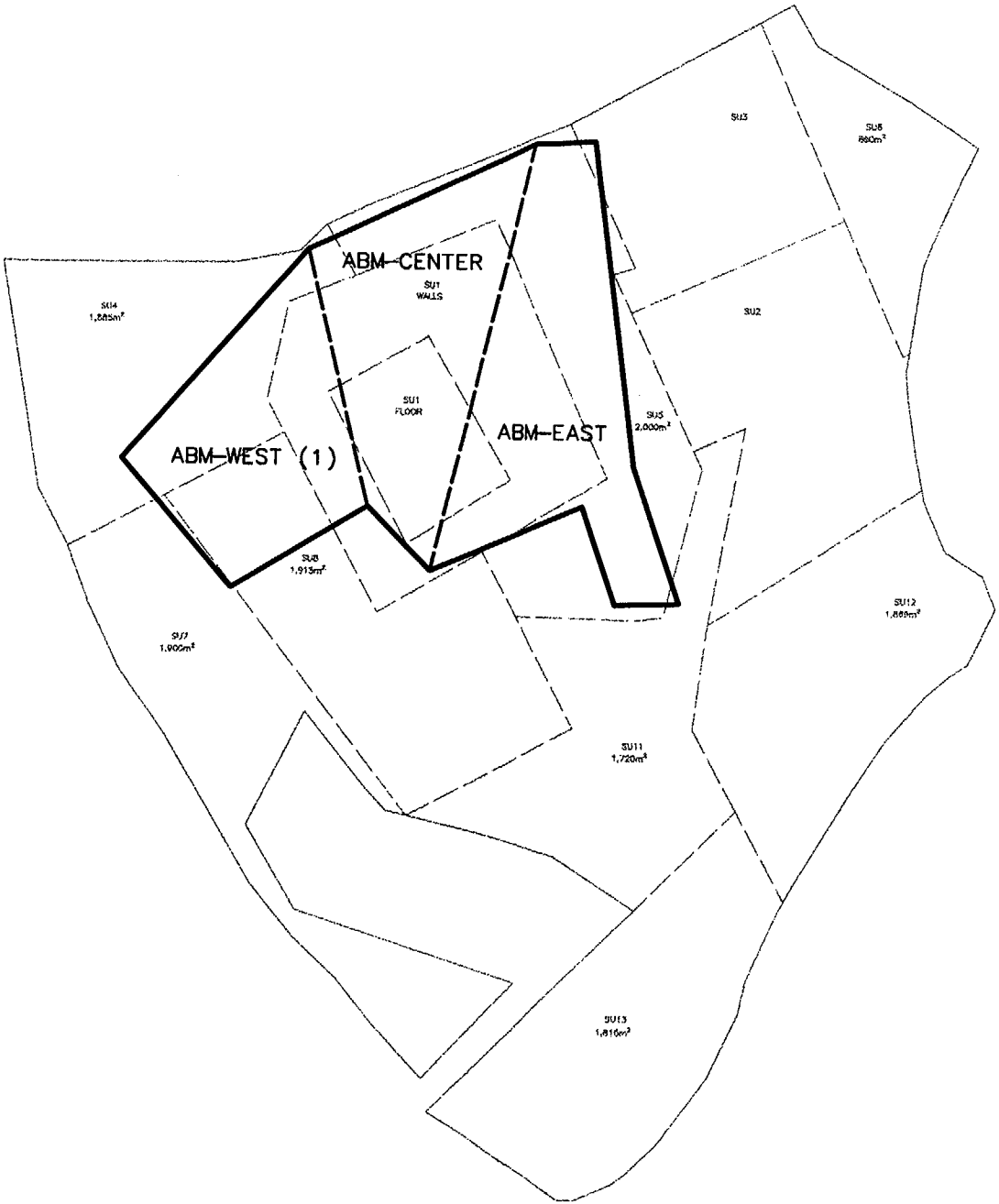

N

DRAWING NOT TO SCALE

FIGURE 6.2-109
STUDY AREA 2
LOCATION OF ABM-WEST (1),
CENTER, AND EAST
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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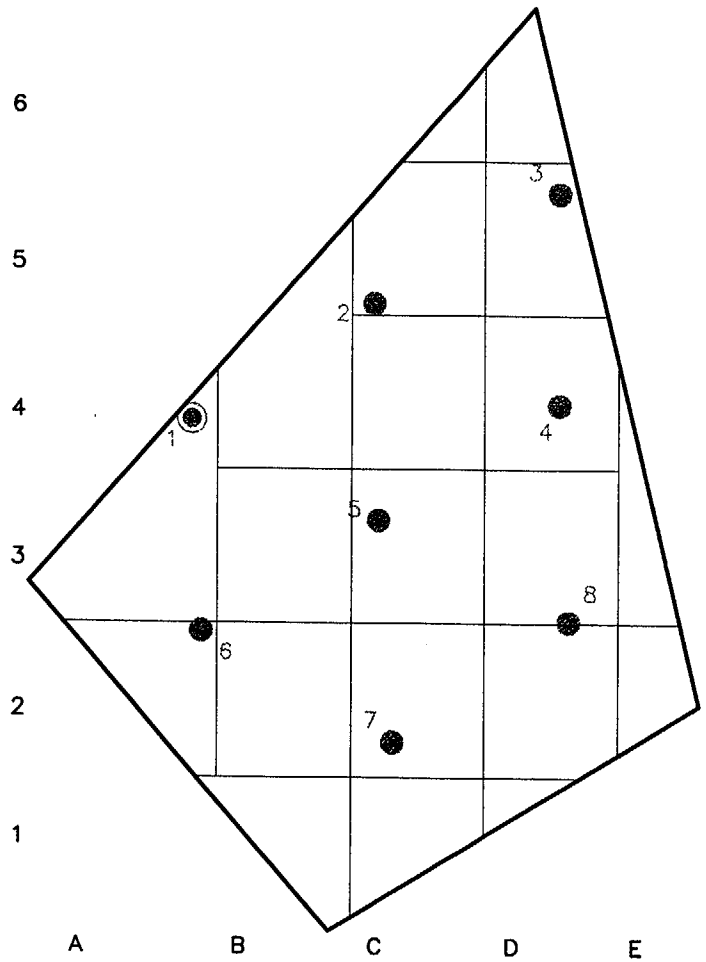

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–110
STUDY AREA 2–ABM WEST (1)
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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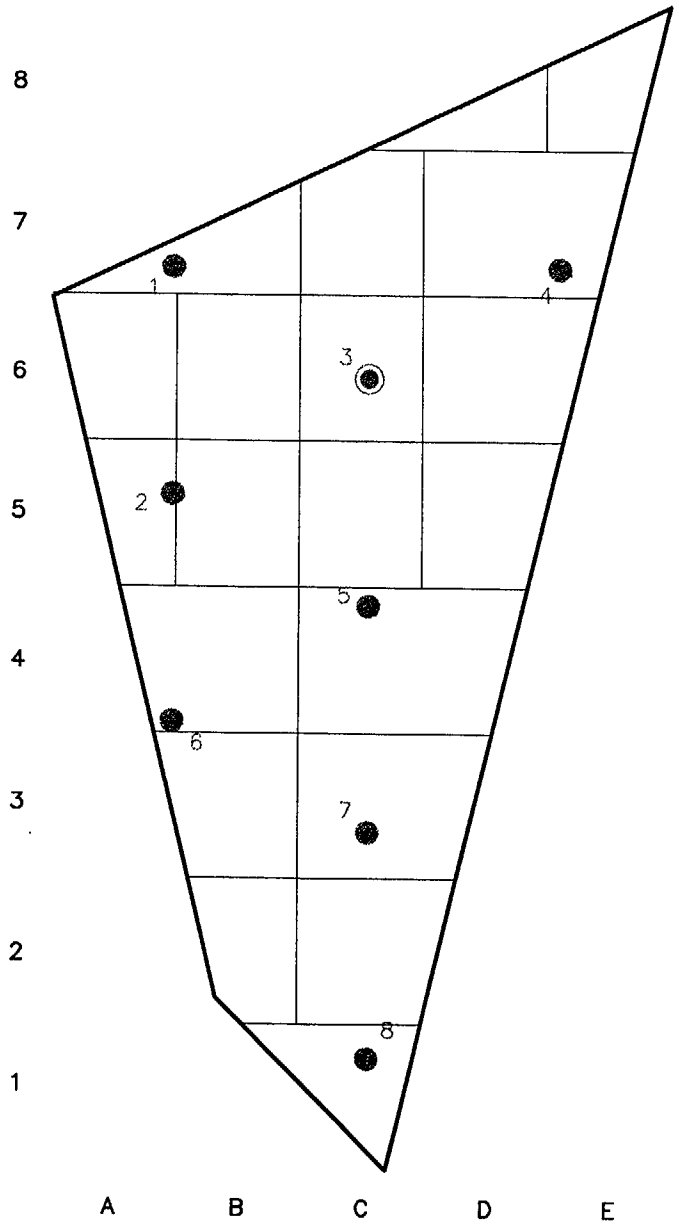

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–111
STUDY AREA 2–ABM CENTER
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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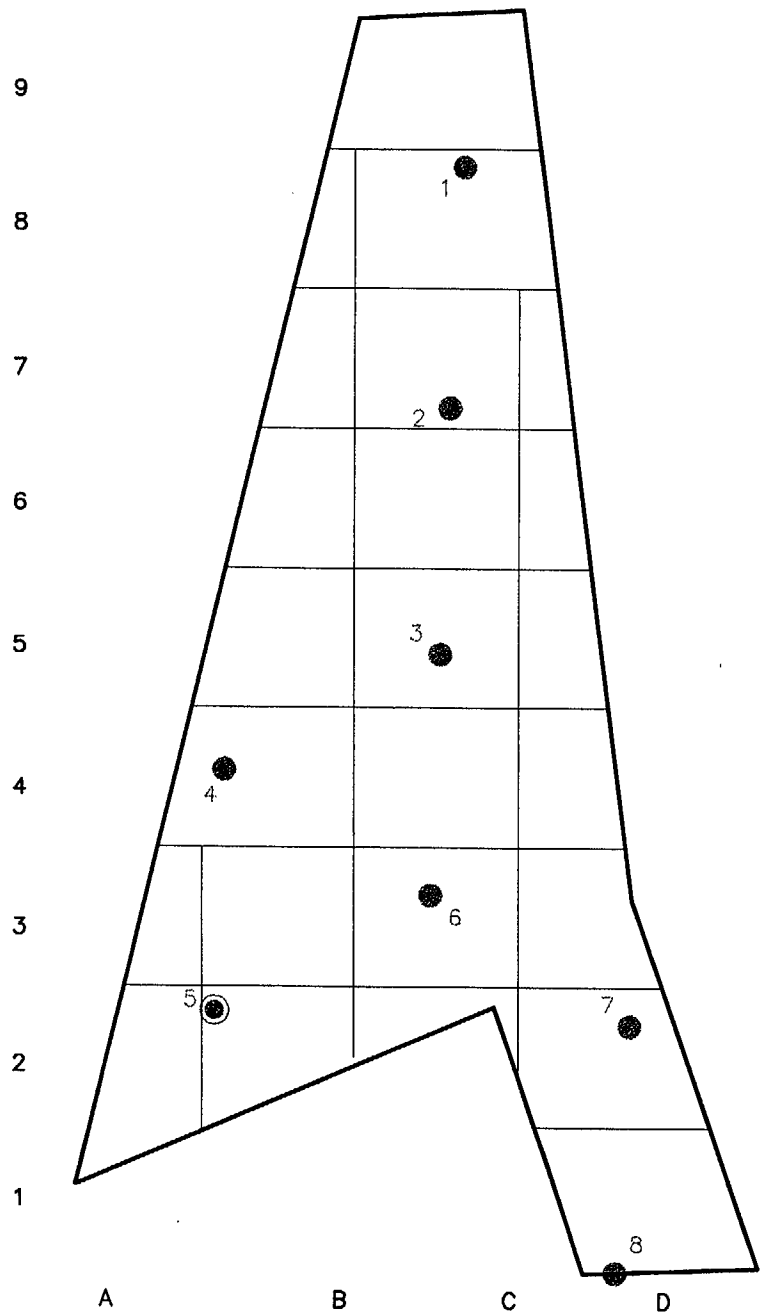

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLE LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–112
STUDY AREA 2–ABM EAST
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
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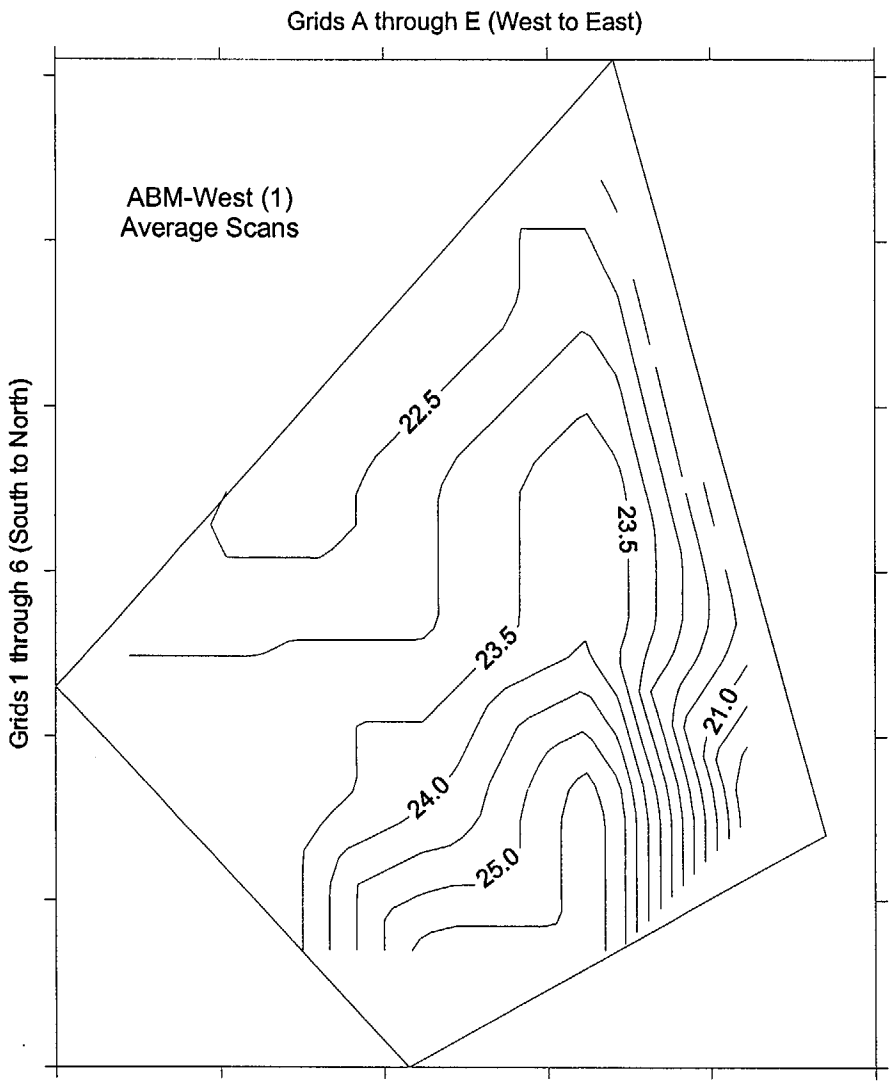

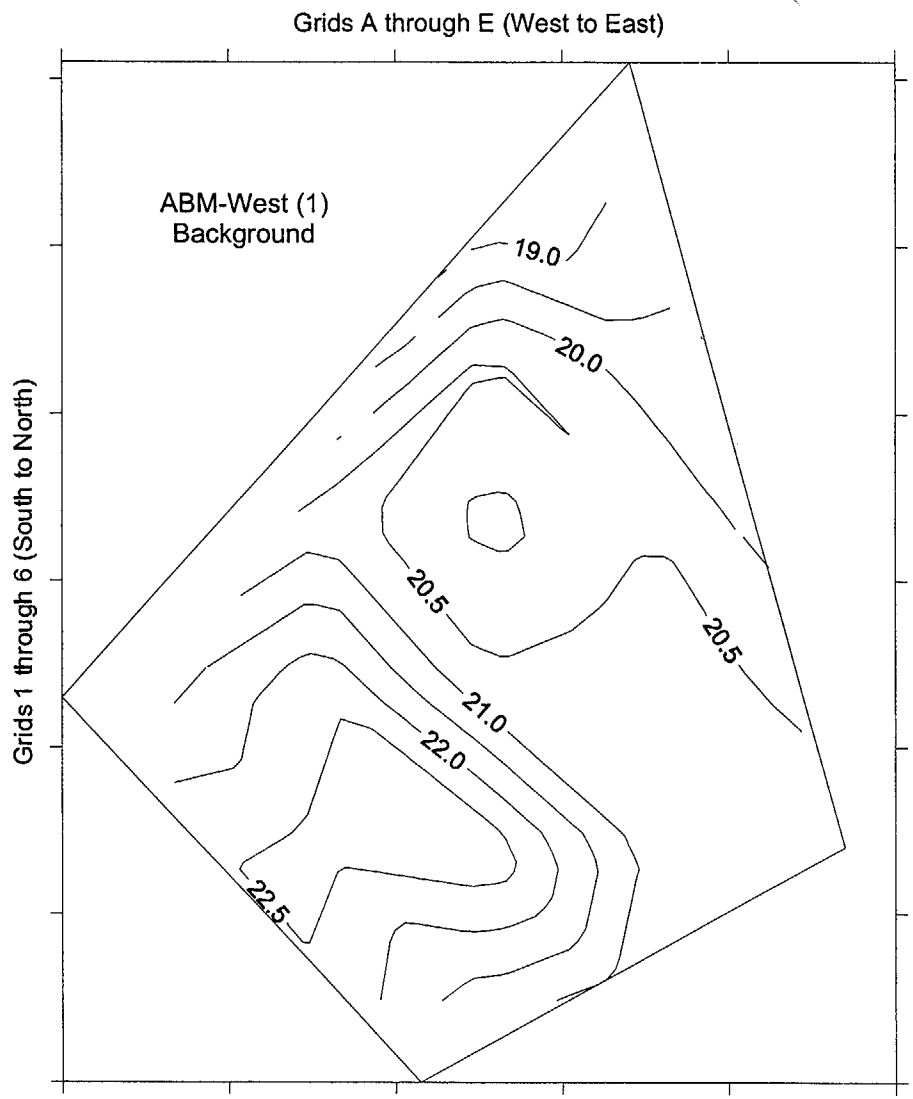

N

Average Gamma Scan Readings Ranged
from 19 kcpm to 26 kcpm

Background Measurements Ranged
from 18.4 kcpm to 22.9 kcpm

Figure 6.2-113
Study Area 2 - ABM West (1)
Average and Background Isopleths (kcpm)

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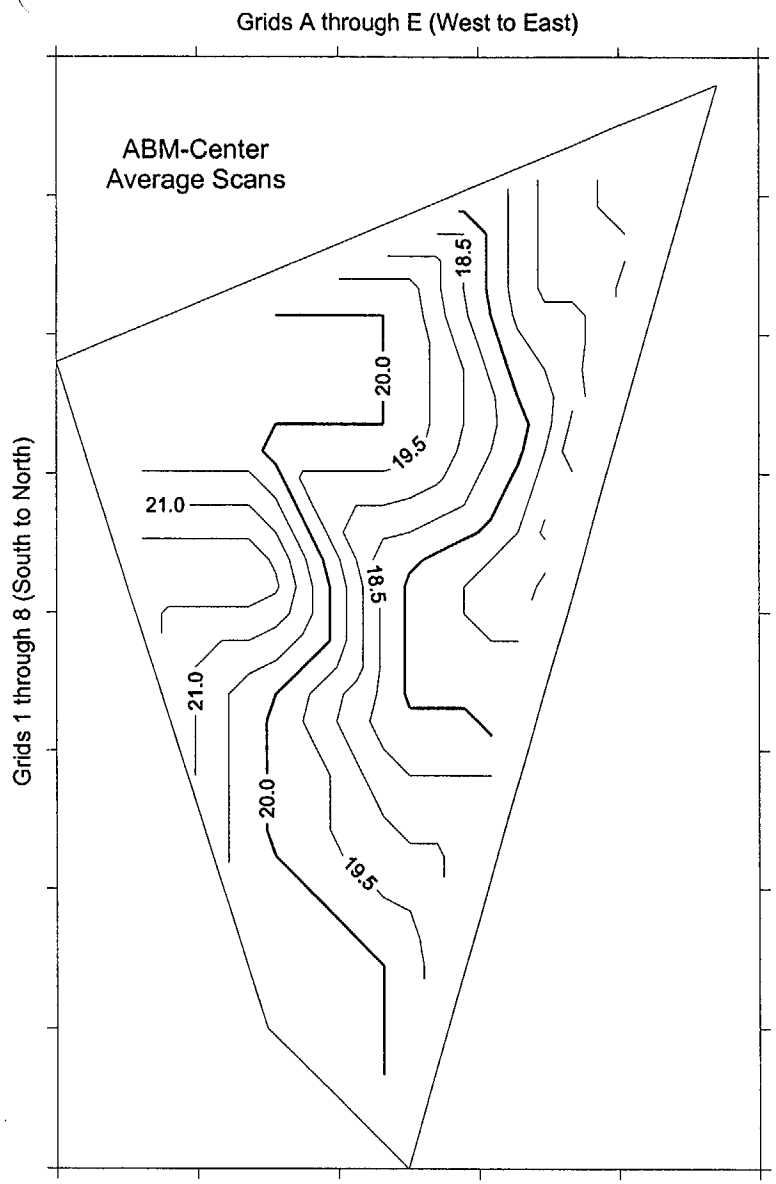

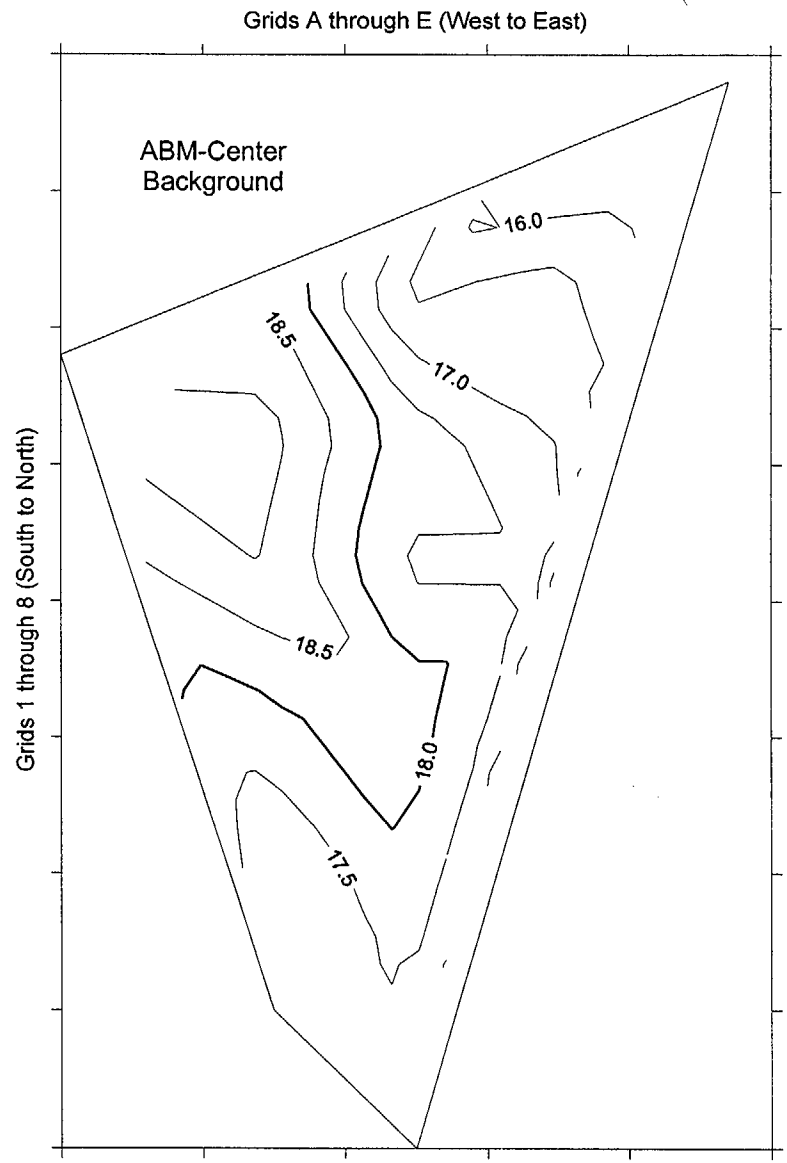

N

Average Gamma Scan Readings Ranged
from 16 kcpm to 22 kcpm

Background Measurements Ranged
from 15.4 kcpm to 19.2 kcpm

Figure 6.2-114
Study Area 2 - ABM Center
Average and Background Isopleths (kcpm)

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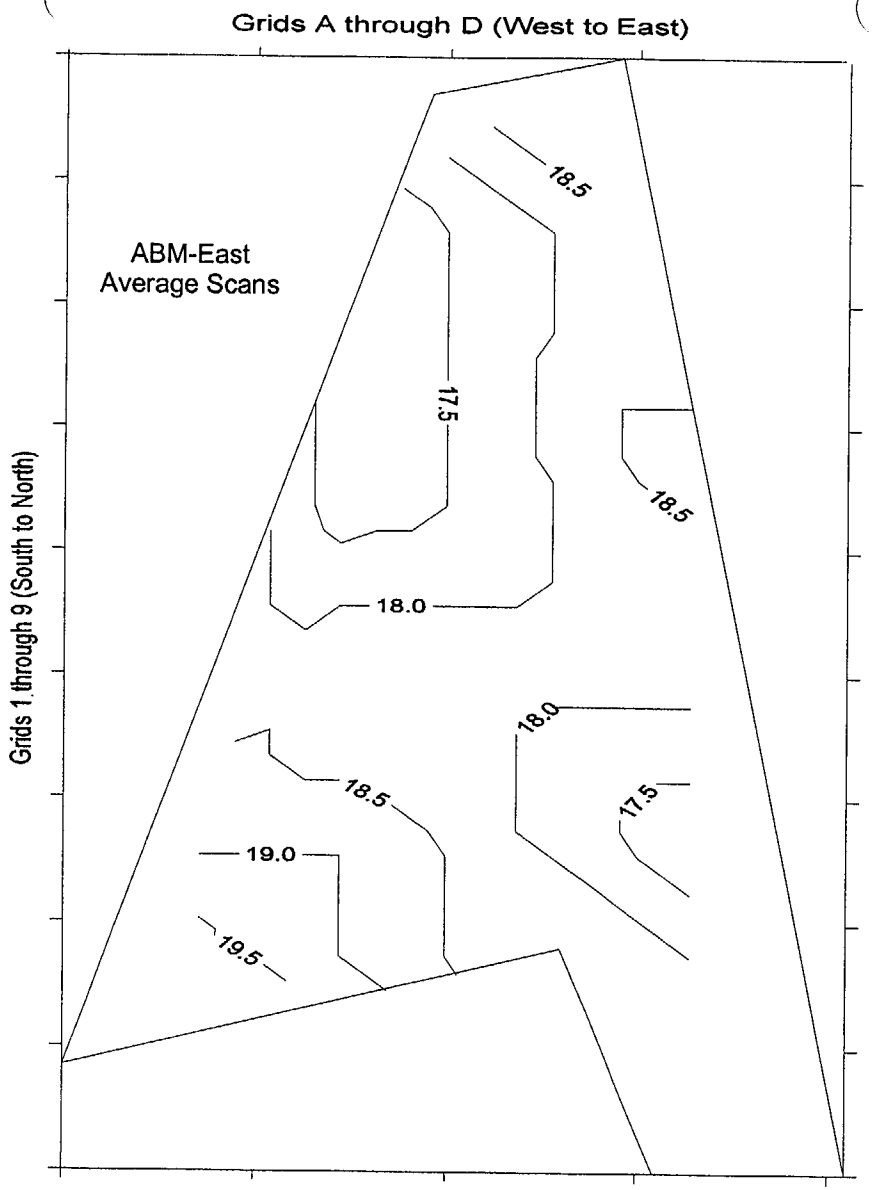
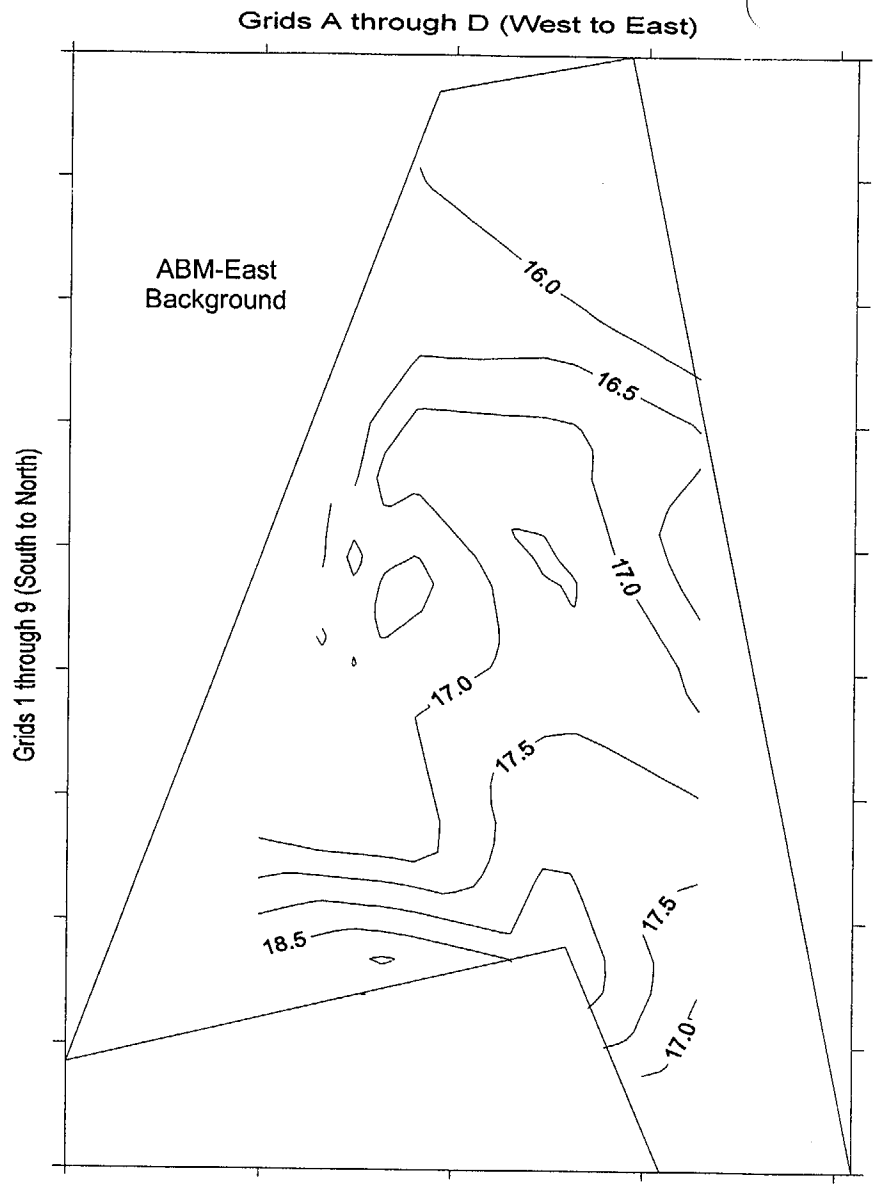
k:/5018/Fssr/Cas/Surfer/Area2/Abm-c.srf





N

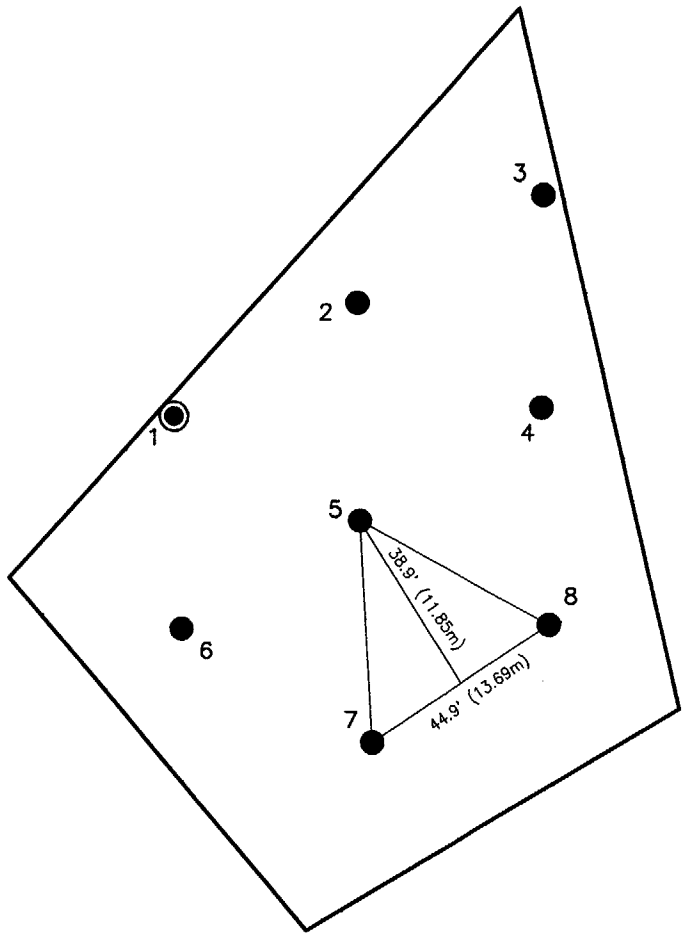
Average Gamma Scan Readings Ranged
from 17 kcpm to 20 kcpm

Background Measurements Ranged
from 15.2 kcpm to 19.3 kcpm

Figure 6.2-115
Study Area 2 - ABM East
Average and Background Isopleths (kcpm)

Earth Sciences Consultants, Inc

k:/5018/Fssr/Cas/Surfer/Area2/Abm-e.srf



N

NOTES

A ≅ 14,003 FT^2 (1,300m^2)
n = 8
L = 44.9 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40
10 0 10
SCALE – METERS

FIGURE 6.2–116
STUDY AREA 2–ABM WEST (1)
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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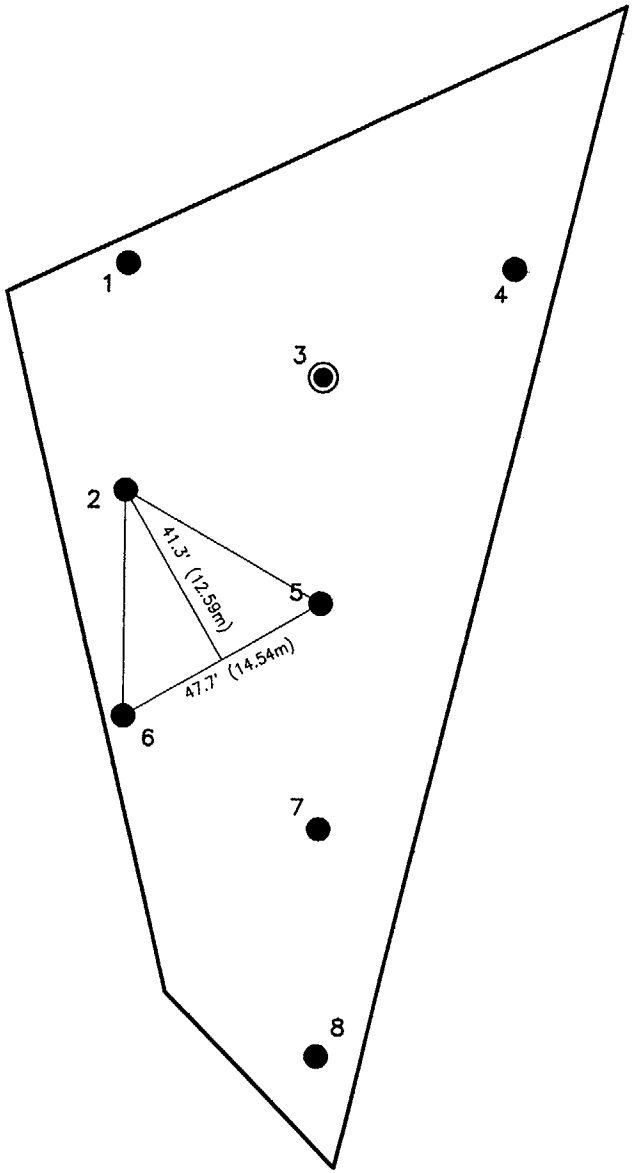

N

NOTES

A ≅ 15,778 FT^2 (1,466m^2)
n = 8
L = 47.7 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40
10 0 10
SCALE – METERS

FIGURE 6.2–117
STUDY AREA 2–ABM CENTER
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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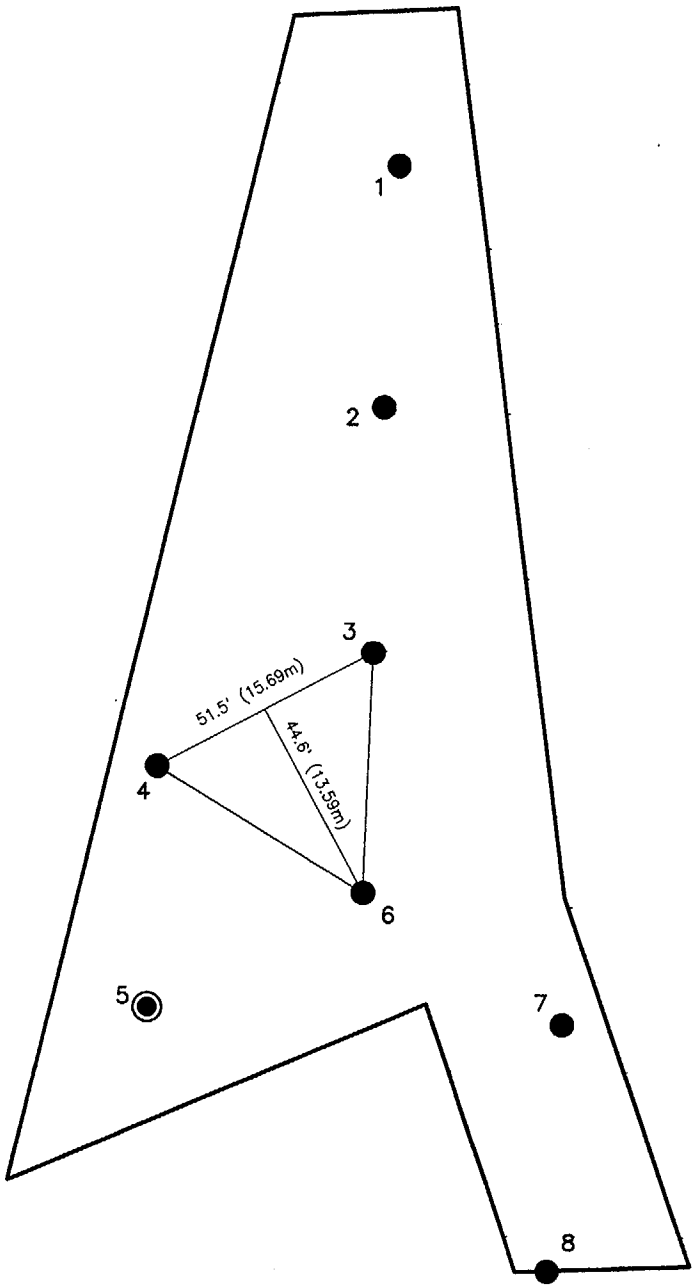

NOTES

A ≅ 18,356 FT^2 (1,705m^2)
n = 8
L = 51.5 FEET
◉ RANDOM START POINT

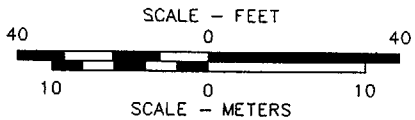

FIGURE 6.2–118
STUDY AREA 2–ABM EAST
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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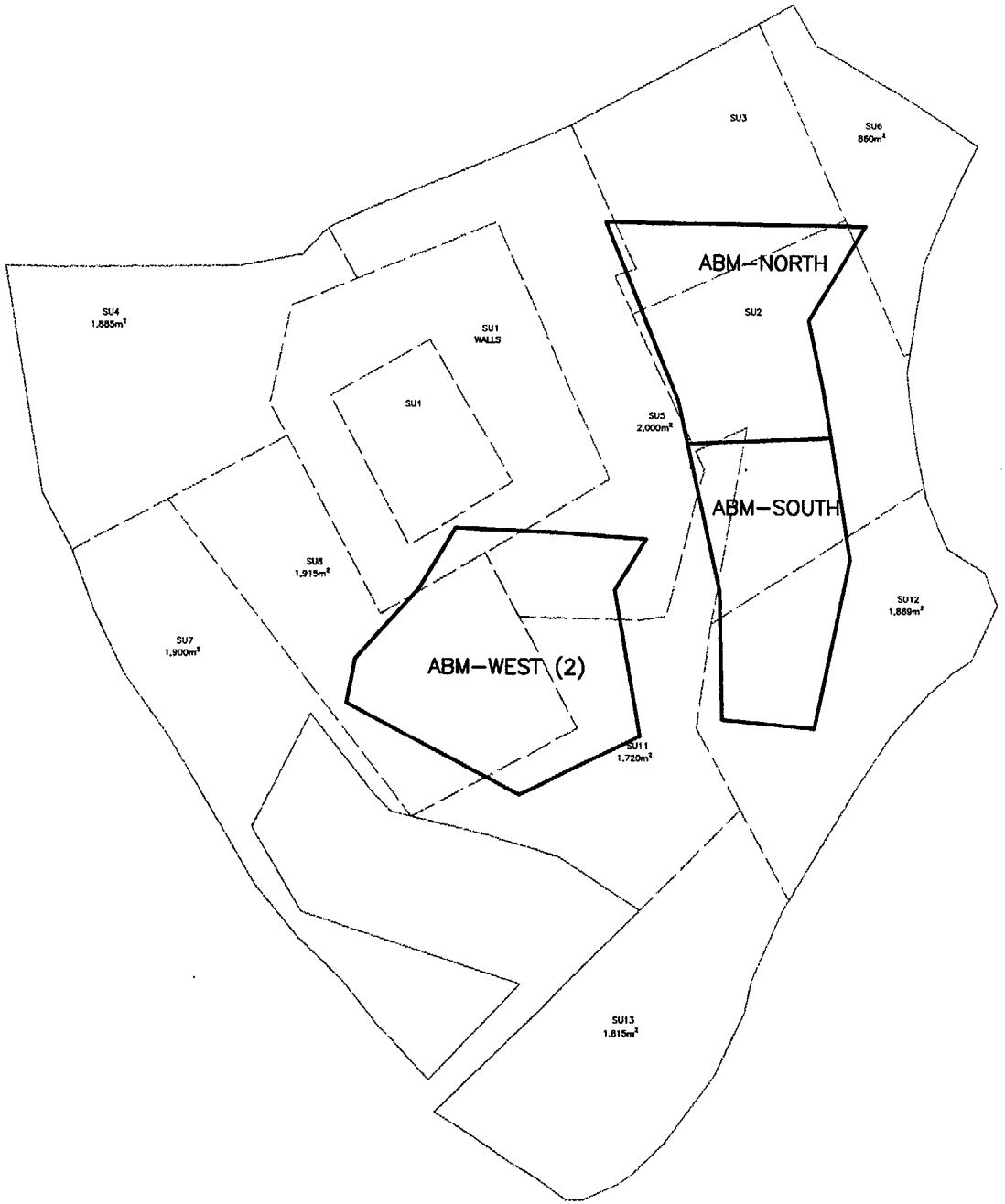

N

DRAWING NOT TO SCALE

FIGURE 6.2-119
STUDY AREA 2
LOCATION OF ABM-NORTH,
SOUTH AND WEST (2)
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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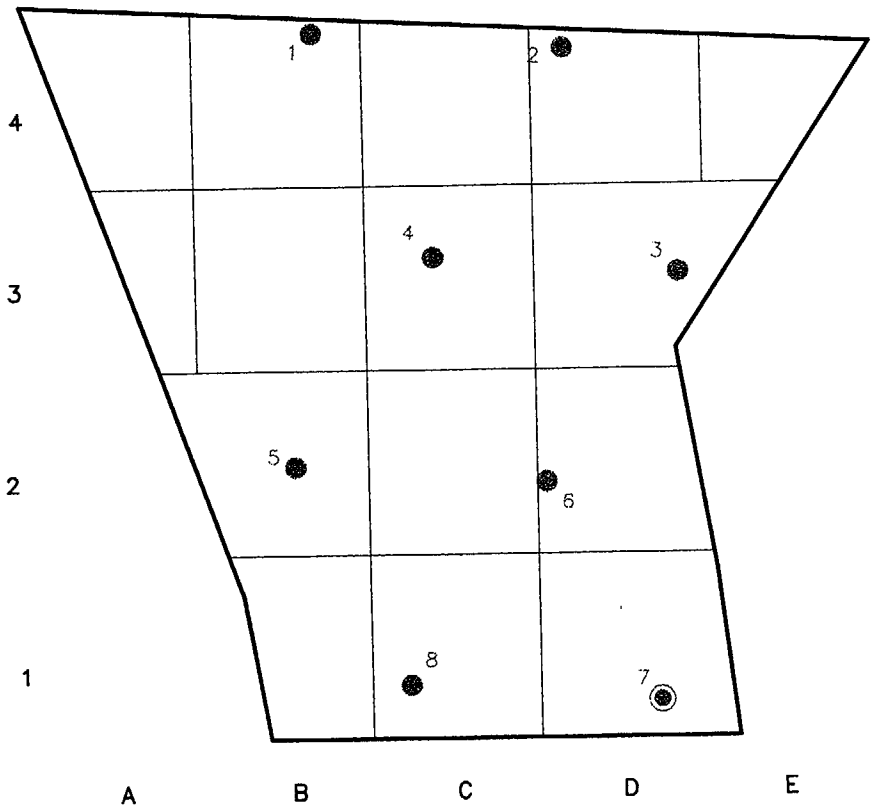

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLE LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2–120
STUDY AREA 2–ABM NORTH
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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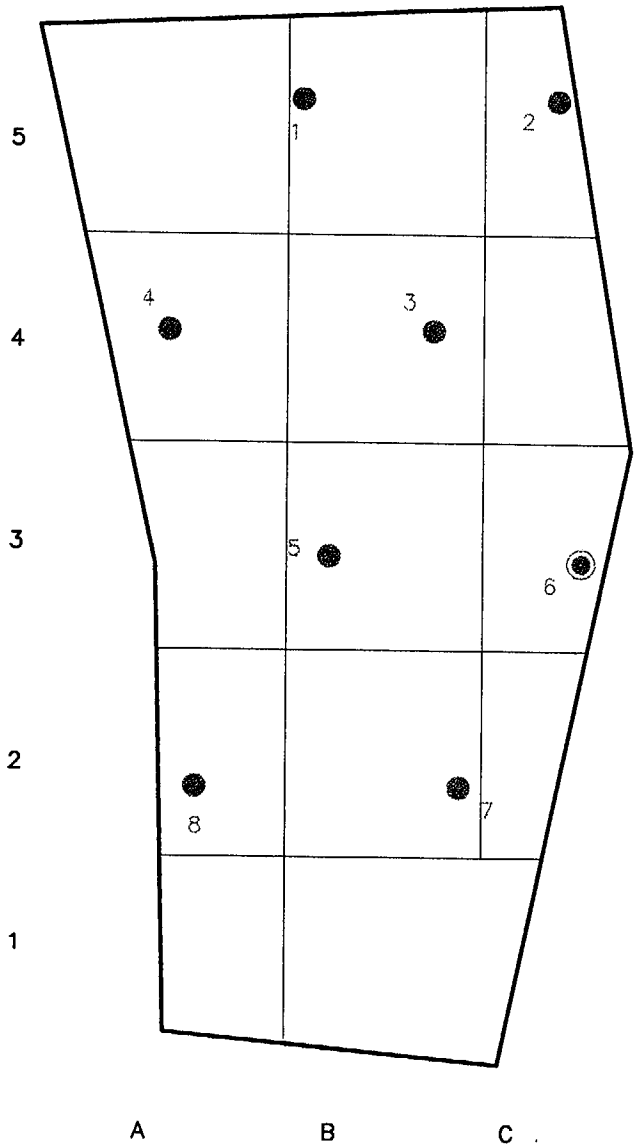

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLE LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-121
STUDY AREA 2-ABM SOUTH
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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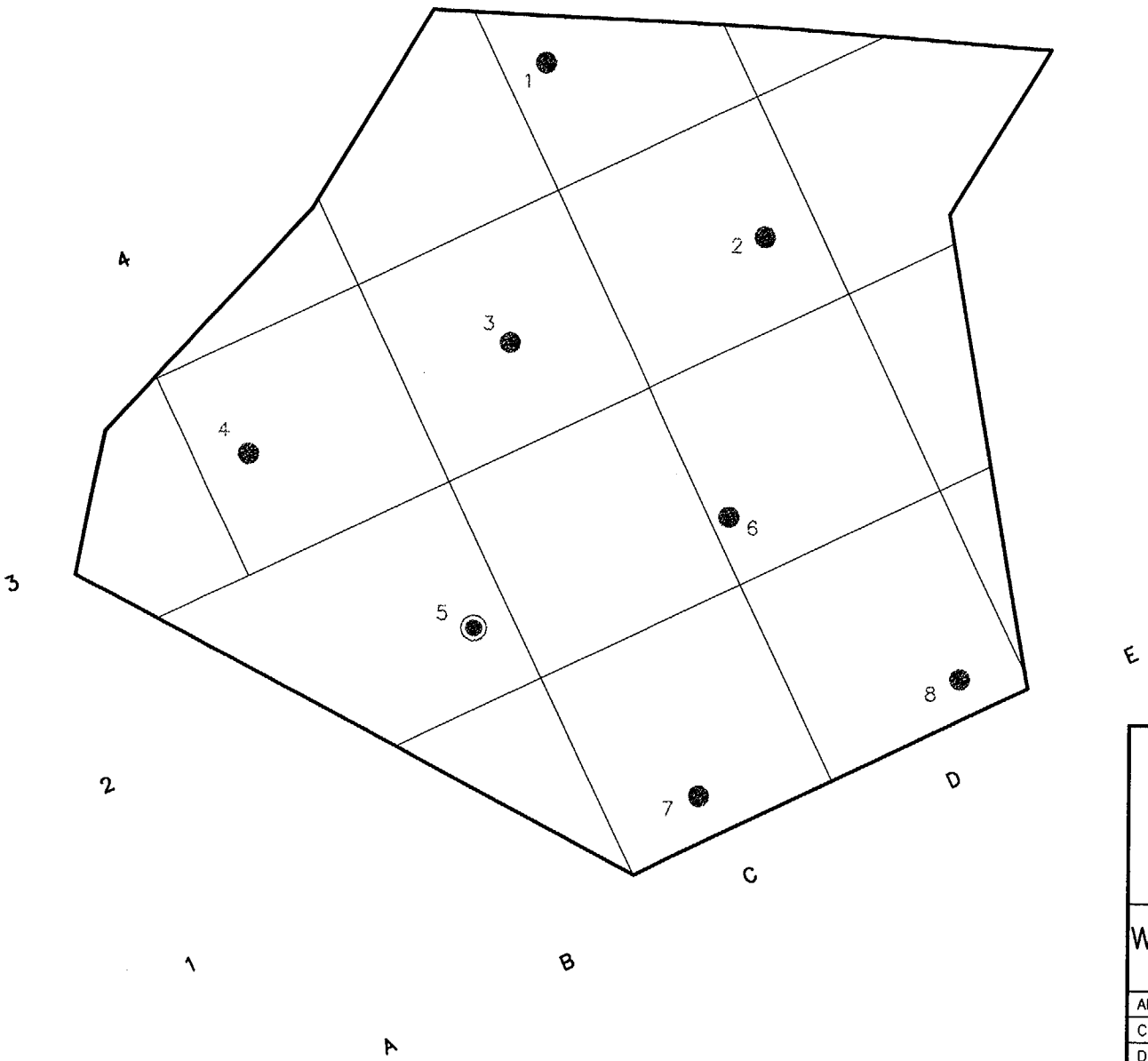

N

NOTES

GRIDS ARE APPROXIMATELY 10m x 10m.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.2-122
STUDY AREA 2-ABM WEST (2)
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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PITTSBURGH, PENNSYLVANIA

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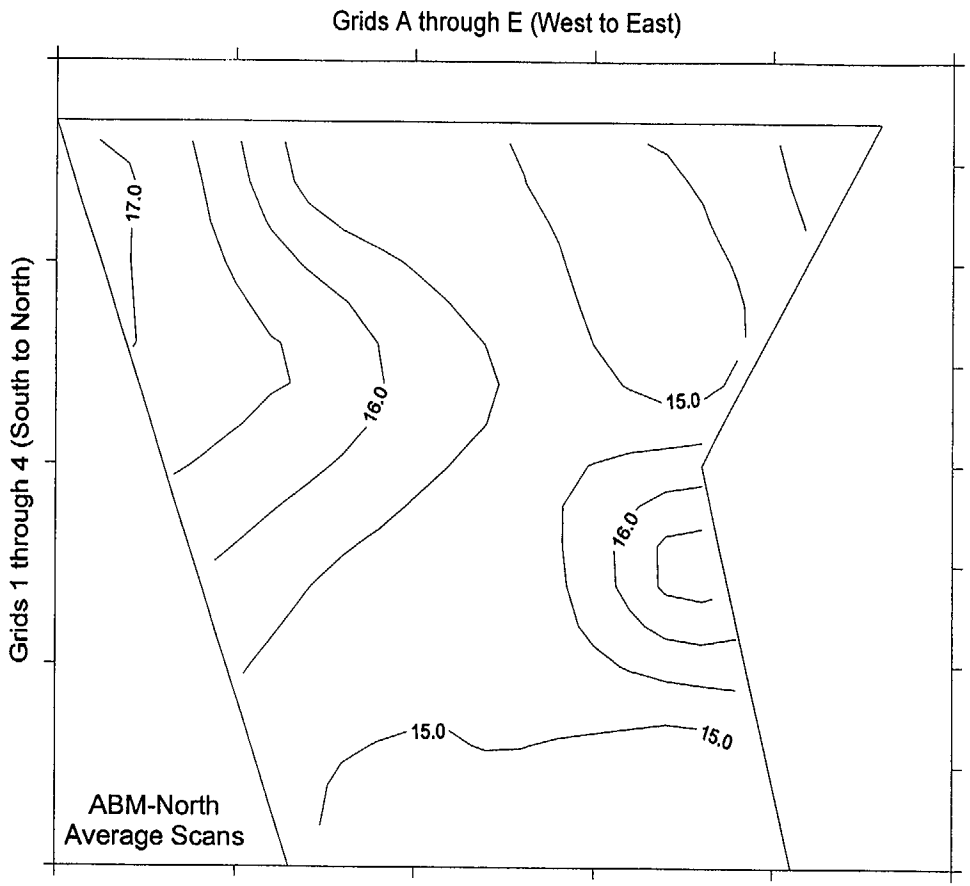

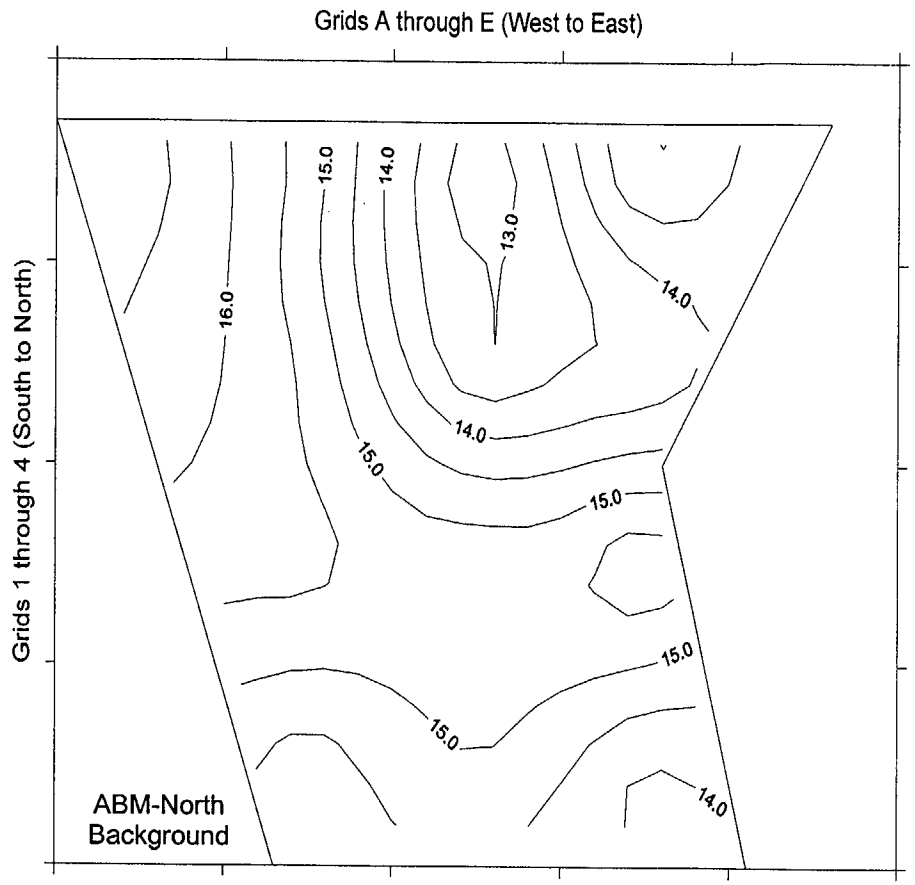

N

Average Gamma Scan Readings Ranged
from 14.5 kcpm to 17 kcpm

Background Measurements Ranged
from 12.5 kcpm to 16.7 kcpm

Figure 6.2-123
Study Area 2 - ABM North
Average and Background Isopleths (kcpm)

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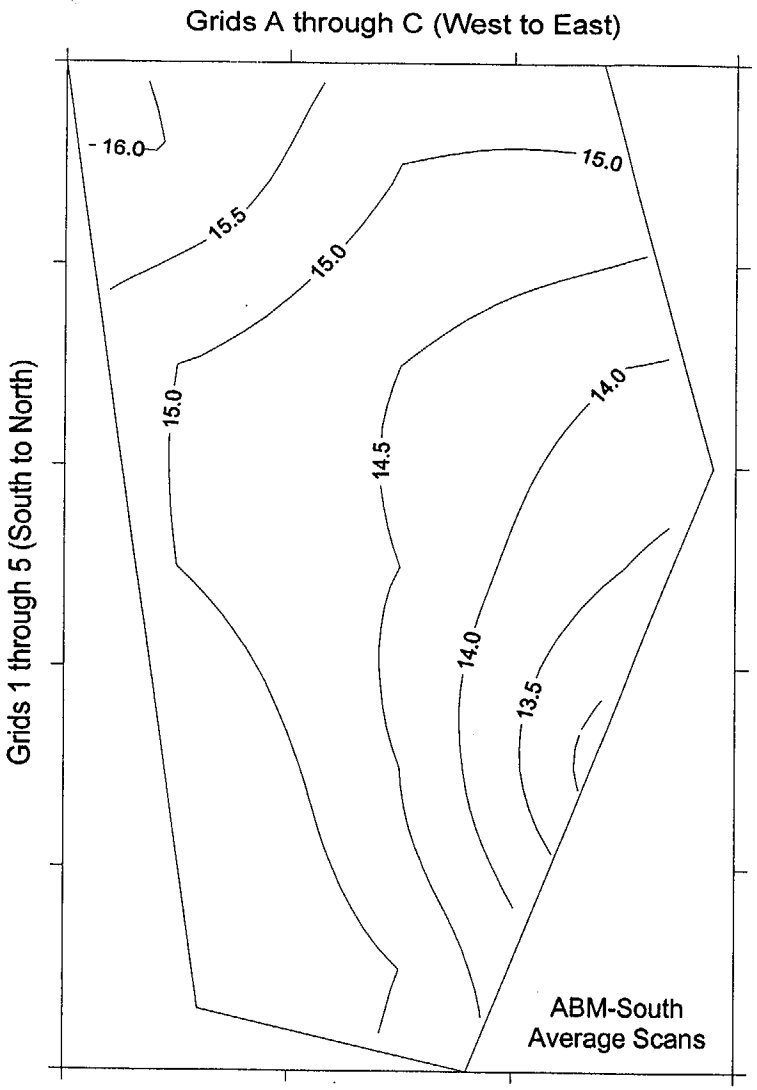
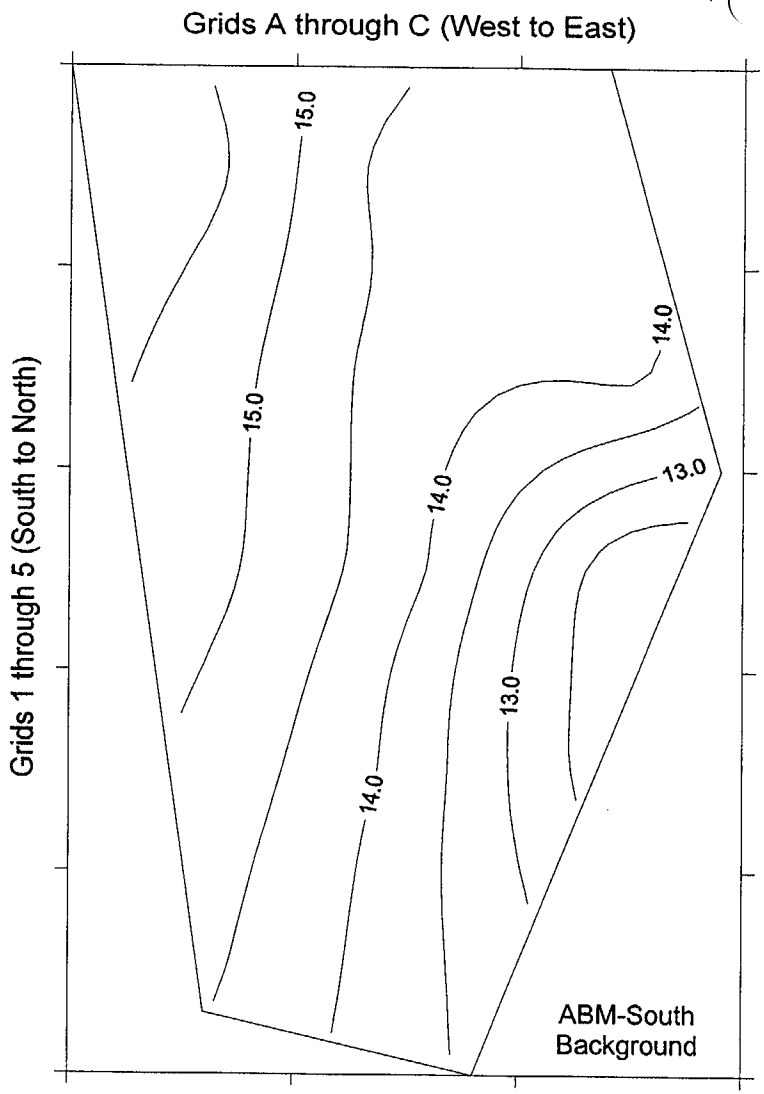
k:/5018/Fssr/Cas/Surfer/Area2/Abm-n.srf





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Average Gamma Scan Readings Ranged
from 12.5 kcpm to 16 kcpm

Background Measurements Ranged
from 12.0 kcpm to 15.8 kcpm

Figure 6.2-124
Study Area 2 - ABM South
Average and Background Isopleths (kcpm)

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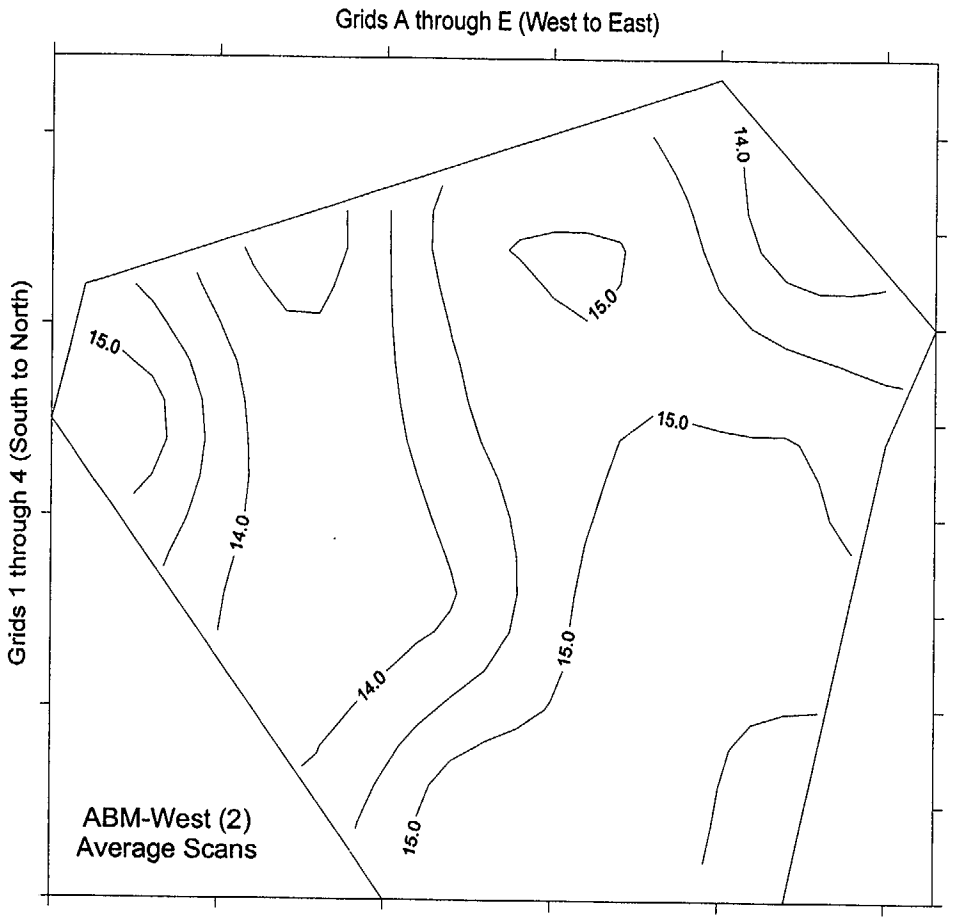
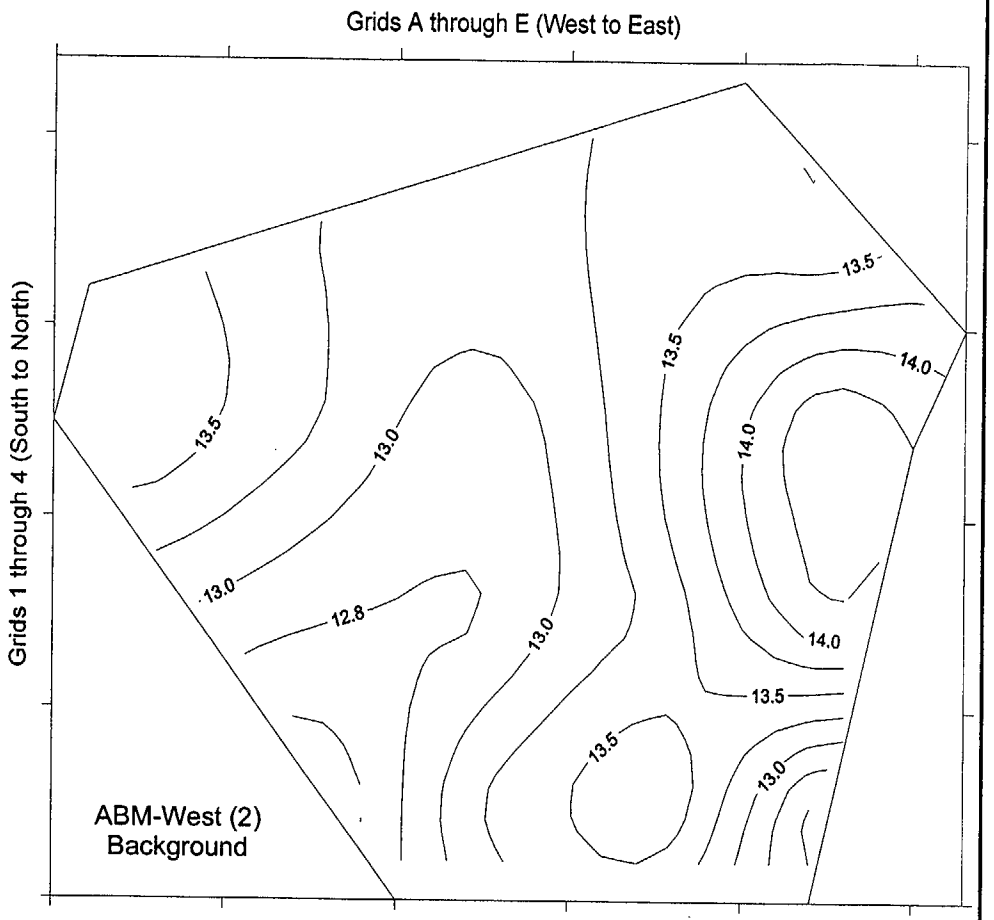
k:/5018/Essr/Cas/Surfer/Area2/Abm-s.srf





N

Average Gamma Scan Readings Ranged
from 13 kcpm to 16 kcpm

Background Measurements Ranged
from 12.2 kcpm to 14.5 kcpm

Figure 6.2-125
Study Area 2 - ABM West (2)
Average and Background Isopleths (kcpm)

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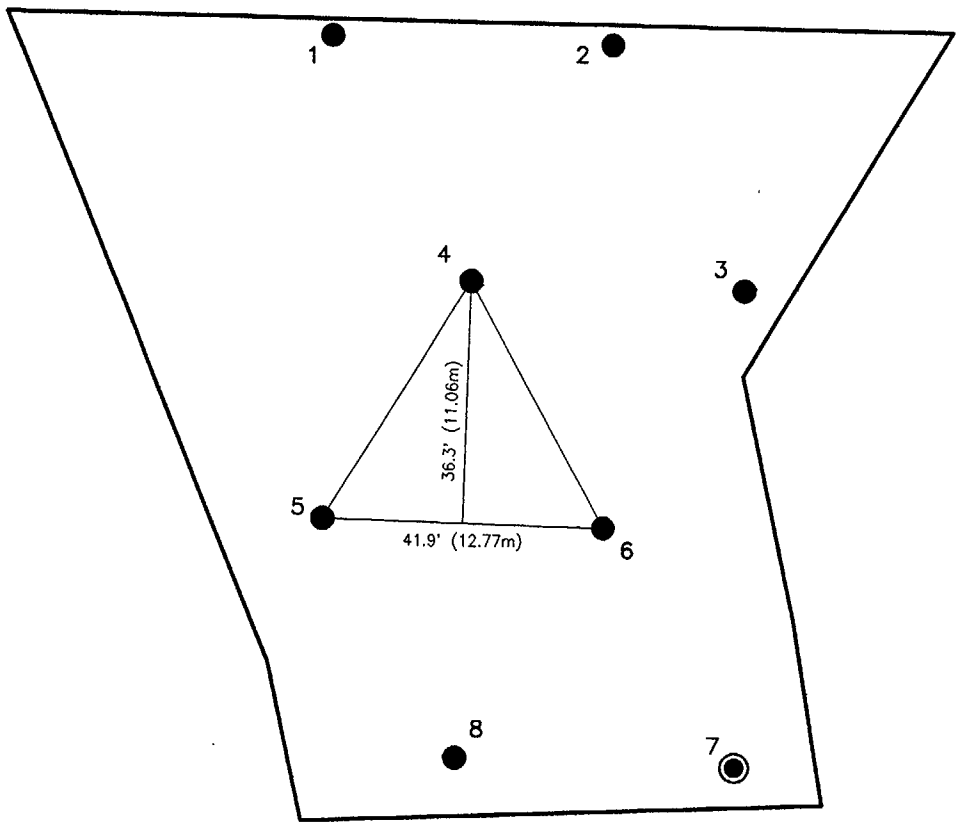
k:/5018/Fssr/Cas/Surfer/Area2/Abm-w2.srf



NOTES

A ≅ 12,160 FT^2 (1,130m^2)
n = 8
L = 41.9 FEET
◉ RANDOM START POINT

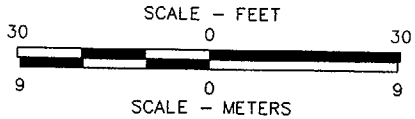


FIGURE 6.2–126
STUDY AREA 2–ABM NORTH
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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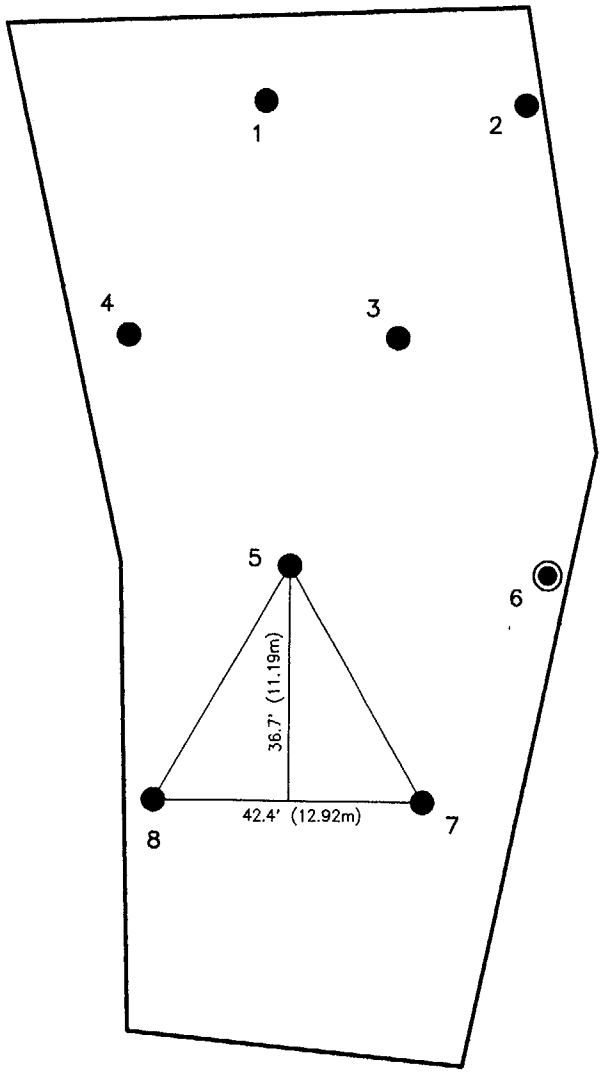

N

NOTES

A ≅ 12,443 FT^2 (1,156m^2)
n = 8
L = 42.4 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.2–127
STUDY AREA 2–ABM SOUTH
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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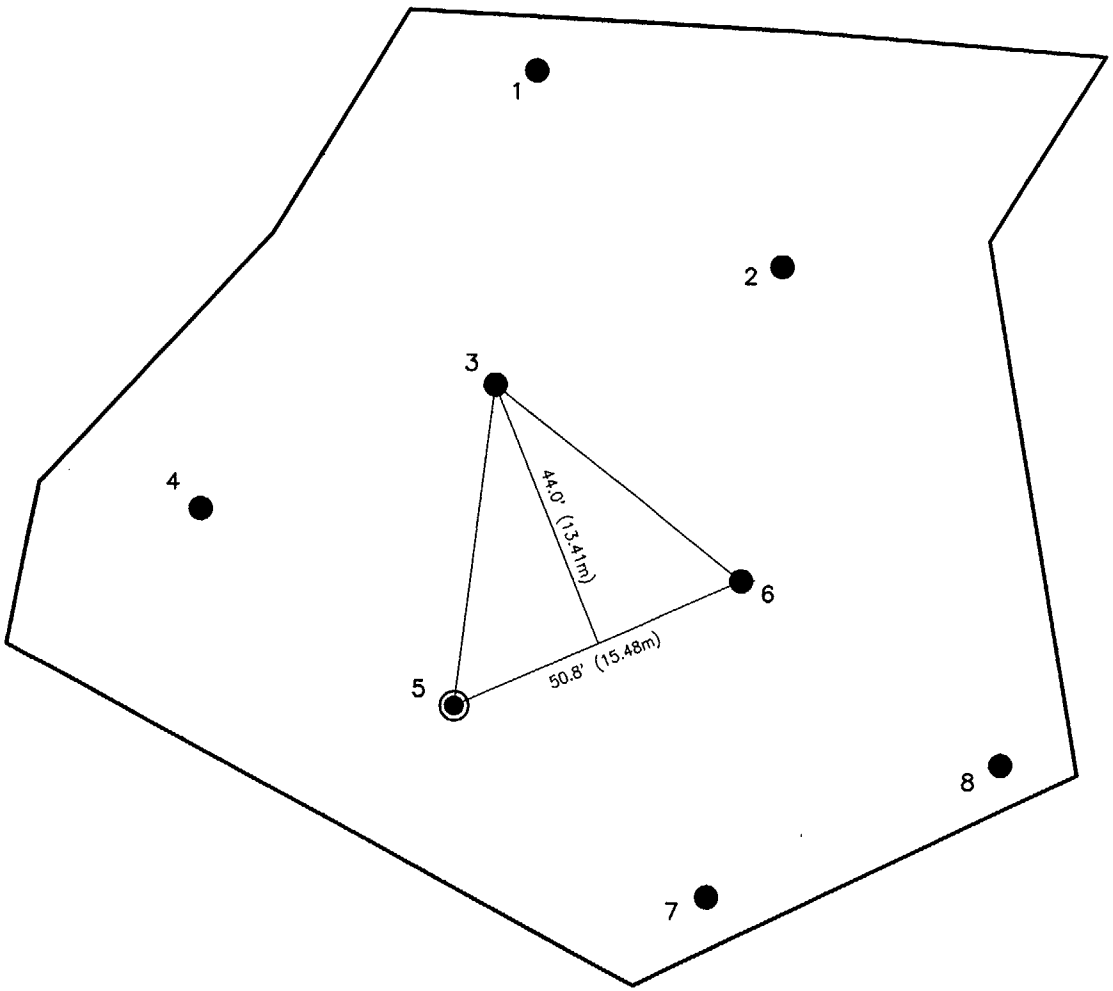

NOTES

A ≅ 17,896 FT^2 (1,663m^2)
n = 8
L = 50.8 FEET
◉ RANDOM START POINT

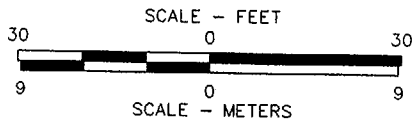

FIGURE 6.2–128
STUDY AREA 2–ABM WEST (2)
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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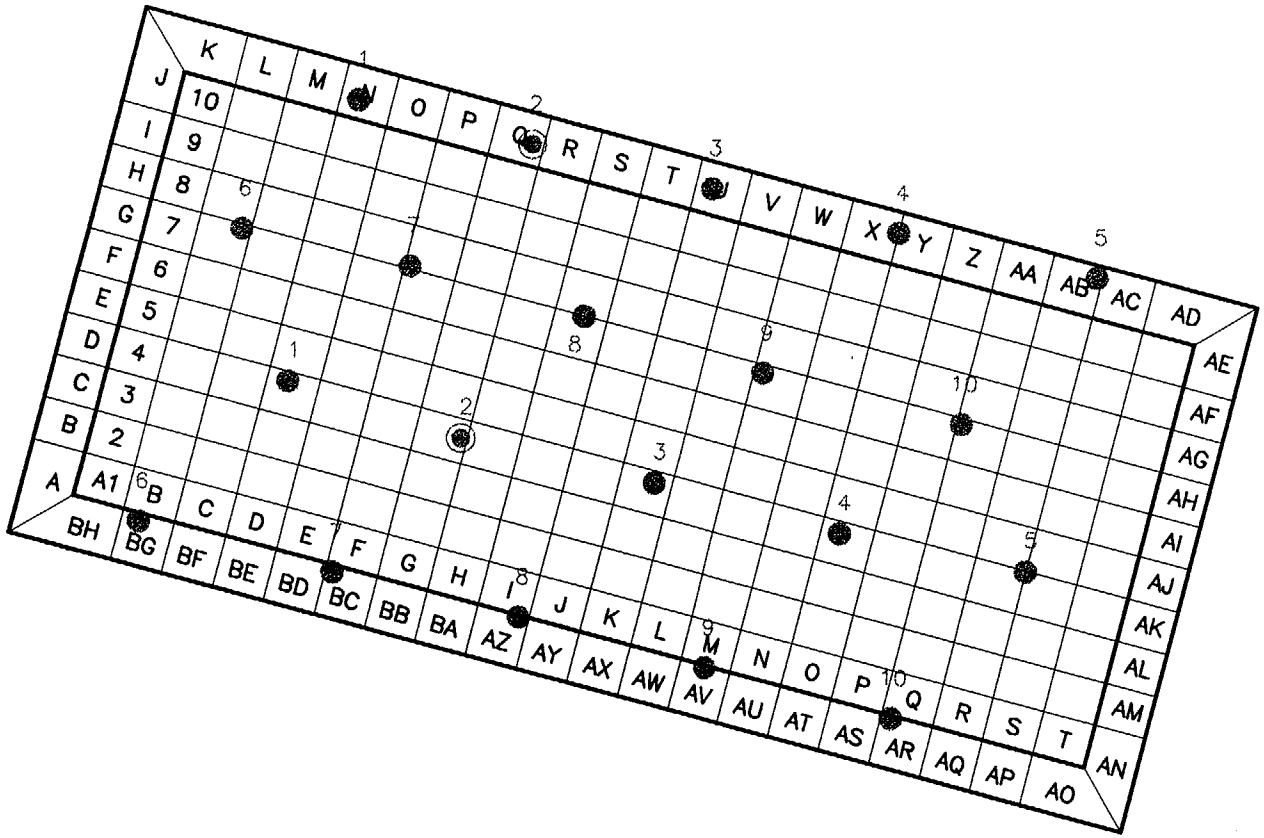

N

DRAWING NOT TO SCALE

NOTES

1. GRIDS A THROUGH BH ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH T10 REPRESENT THE EXCAVATION FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 1.2m HIGH.

◉ RANDOM START POINT

● SAMPLING LOCATION

FIGURE 6.3-1
STUDY AREA 3B-SURVEY UNITS 1 AND 2
WTR BASIN 1 EXCAVATION BOTTOM
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWN	DEB 3/18/03
DRAWING NUMBER	5018S01A

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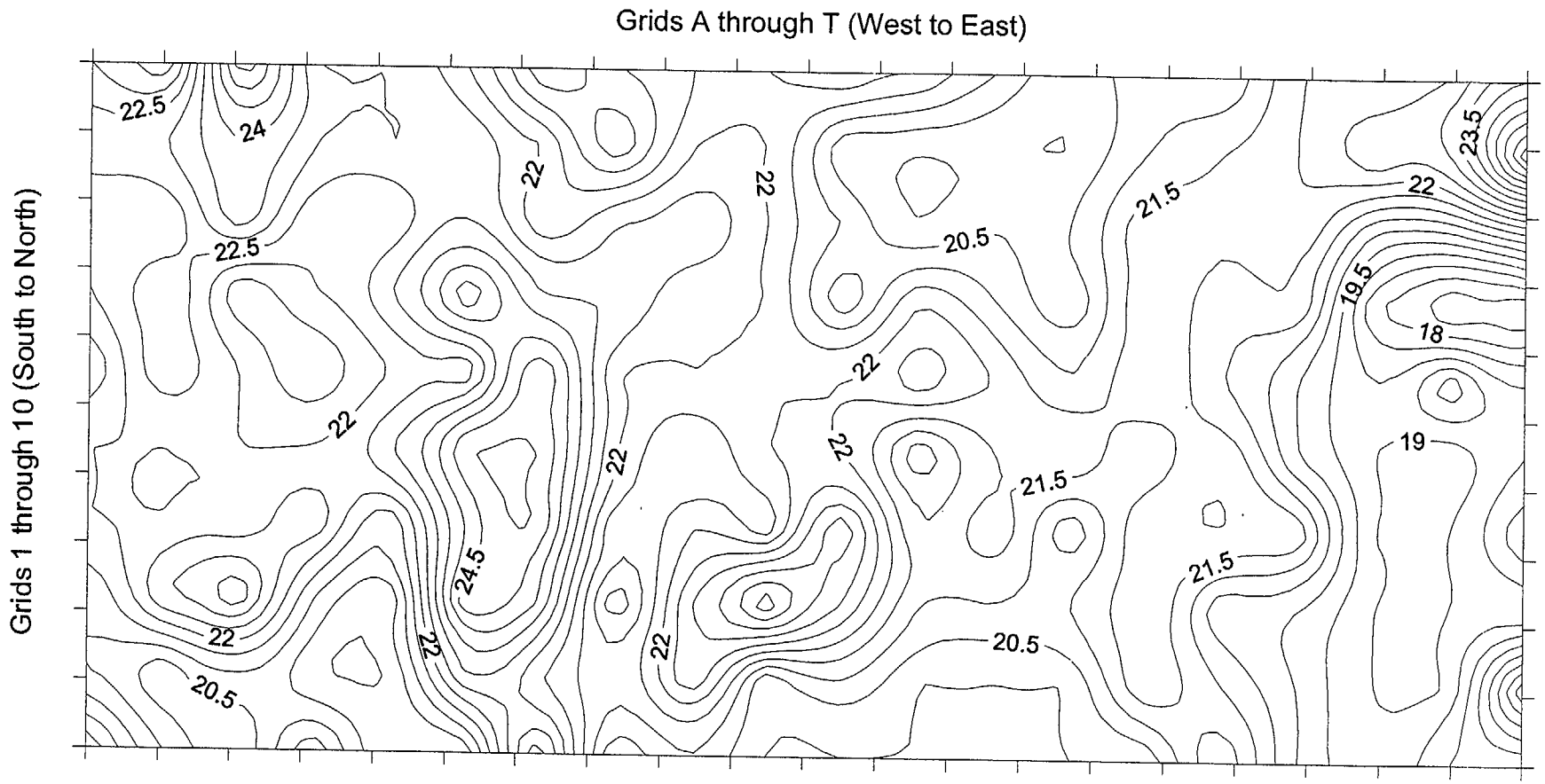


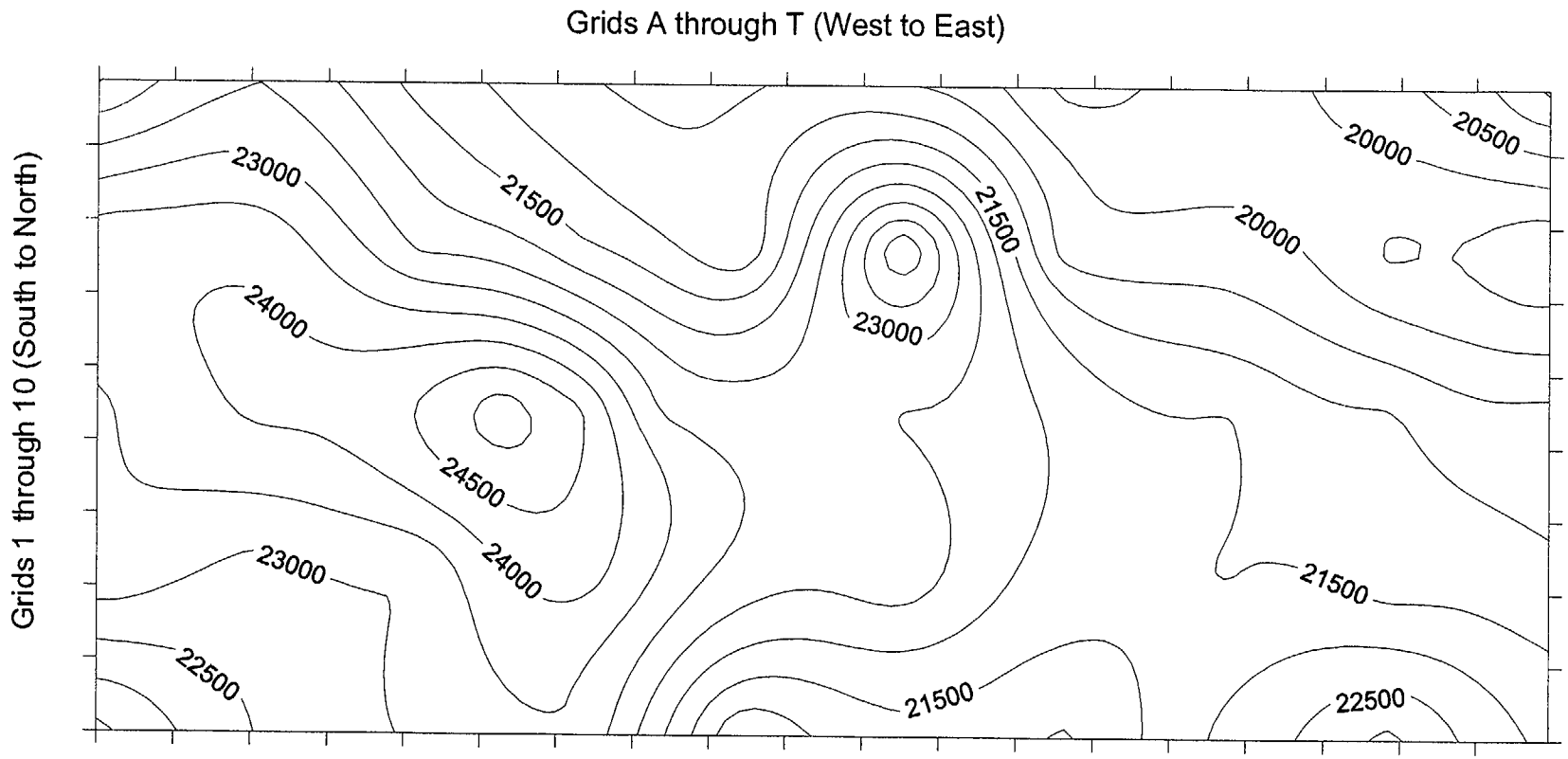
N

Average Gamma Scan Readings Ranged
From 17 kcpm to 27 kcpm

Figure 6.3-2
WTR Basin 1 Bottom
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-ba.srf



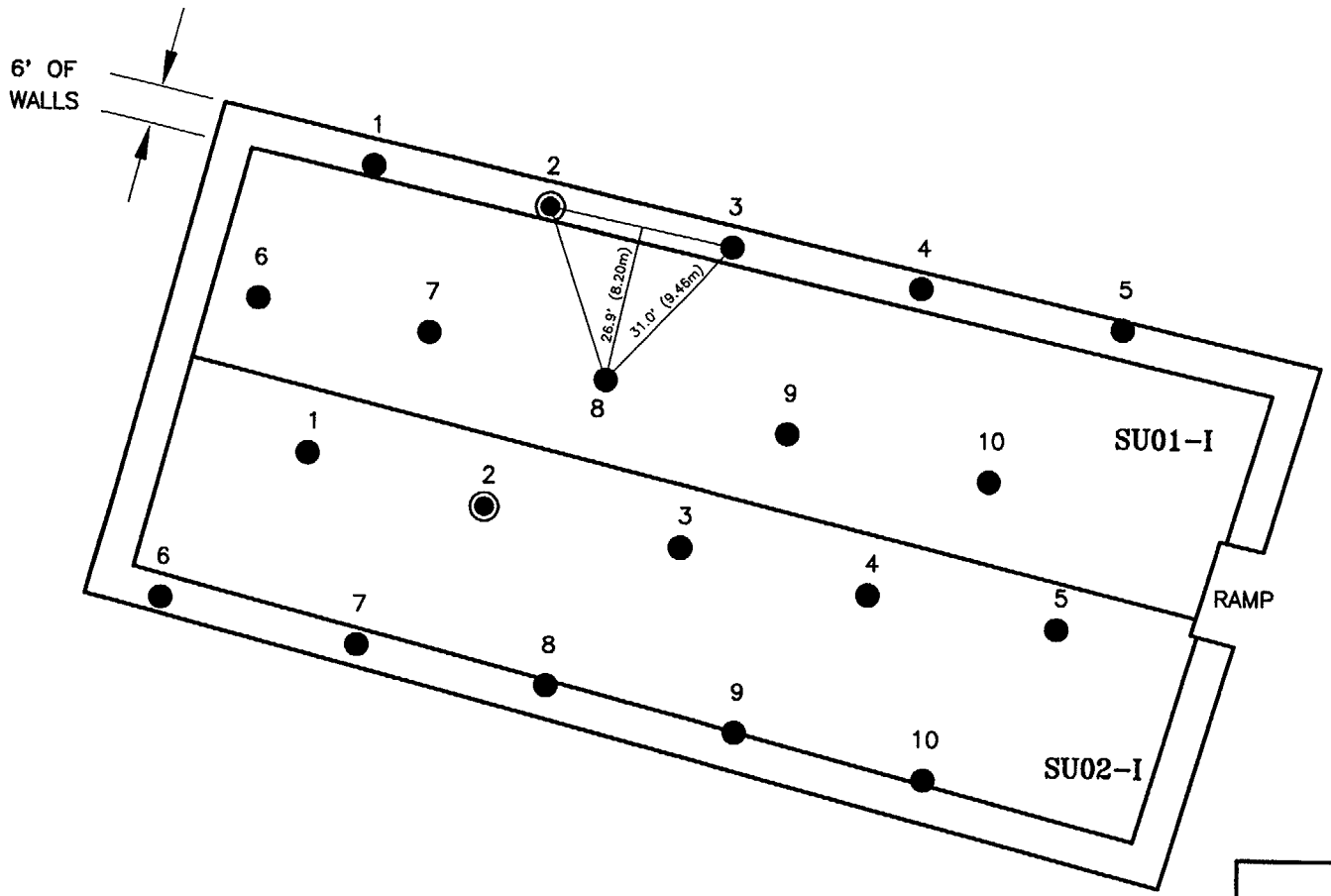
N

Background Measurements Ranged From
19,000 cpm to 25,290 cpm

Figure 6.3-3
WTR Basin 1 Bottom
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-bb.srf



NOTES

A ≅ 8348 FT^2 ($776m^2$)
(EACH UNIT)
n = 10
L = 31.0 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.3 – 4
STUDY AREA 3B–SURVEY UNITS 1 AND 2
WTR BASIN 1 EXCAVATION BOTTOM
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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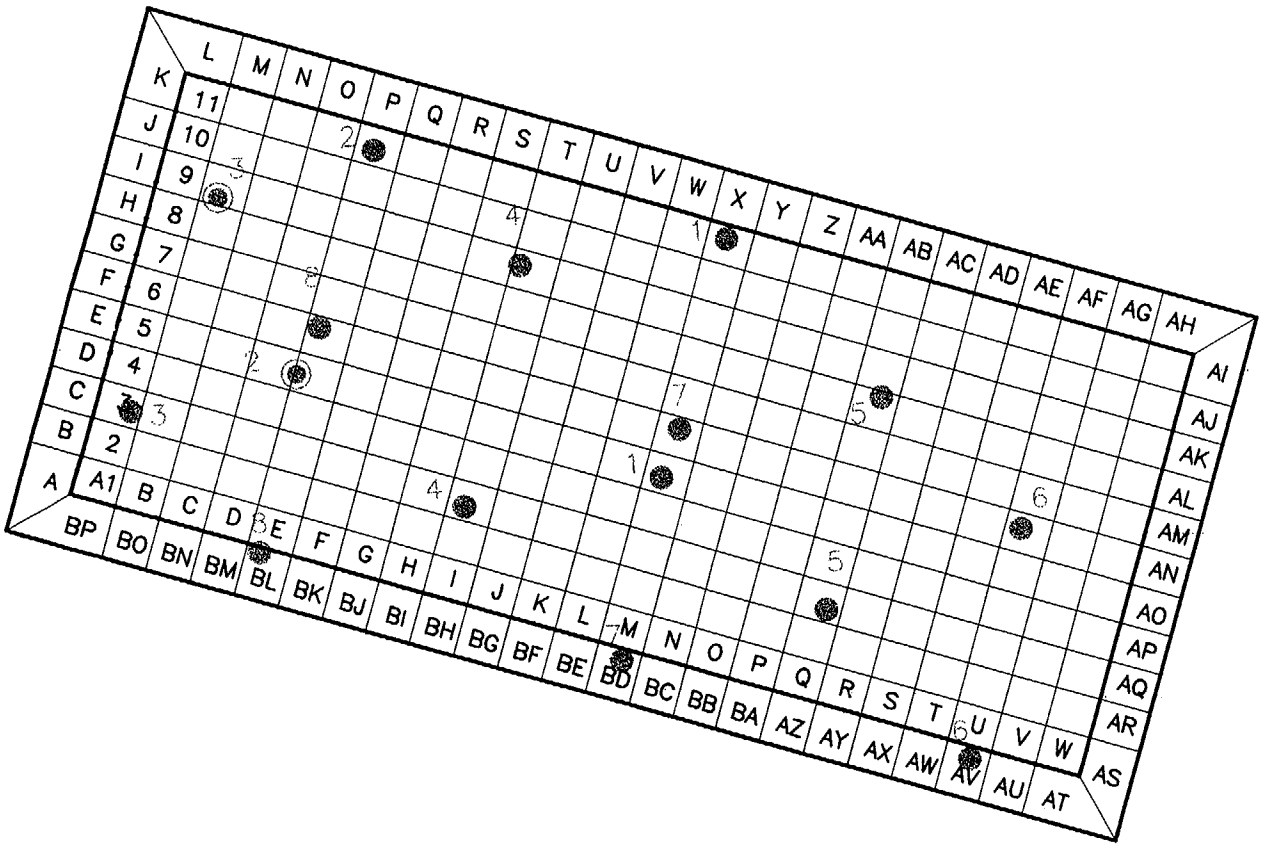

N

DRAWING NOT TO SCALE

NOTES

1. GRIDS A THROUGH BP ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH W11 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.

◎ RANDOM START POINT

● SAMPLING LOCATION

FIGURE 6.3-5
STUDY AREA 3B-SURVEY UNITS 1 AND 2
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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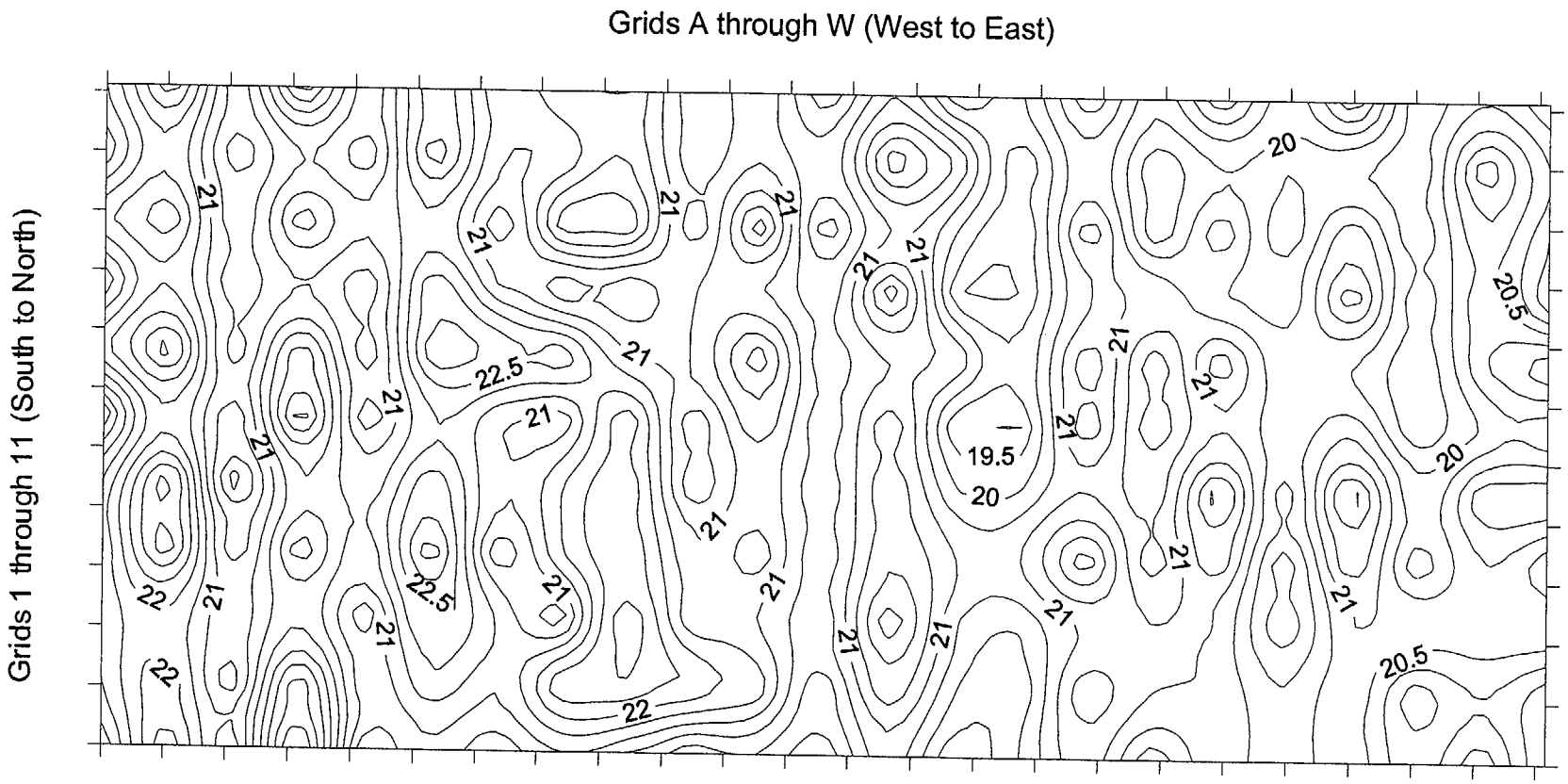


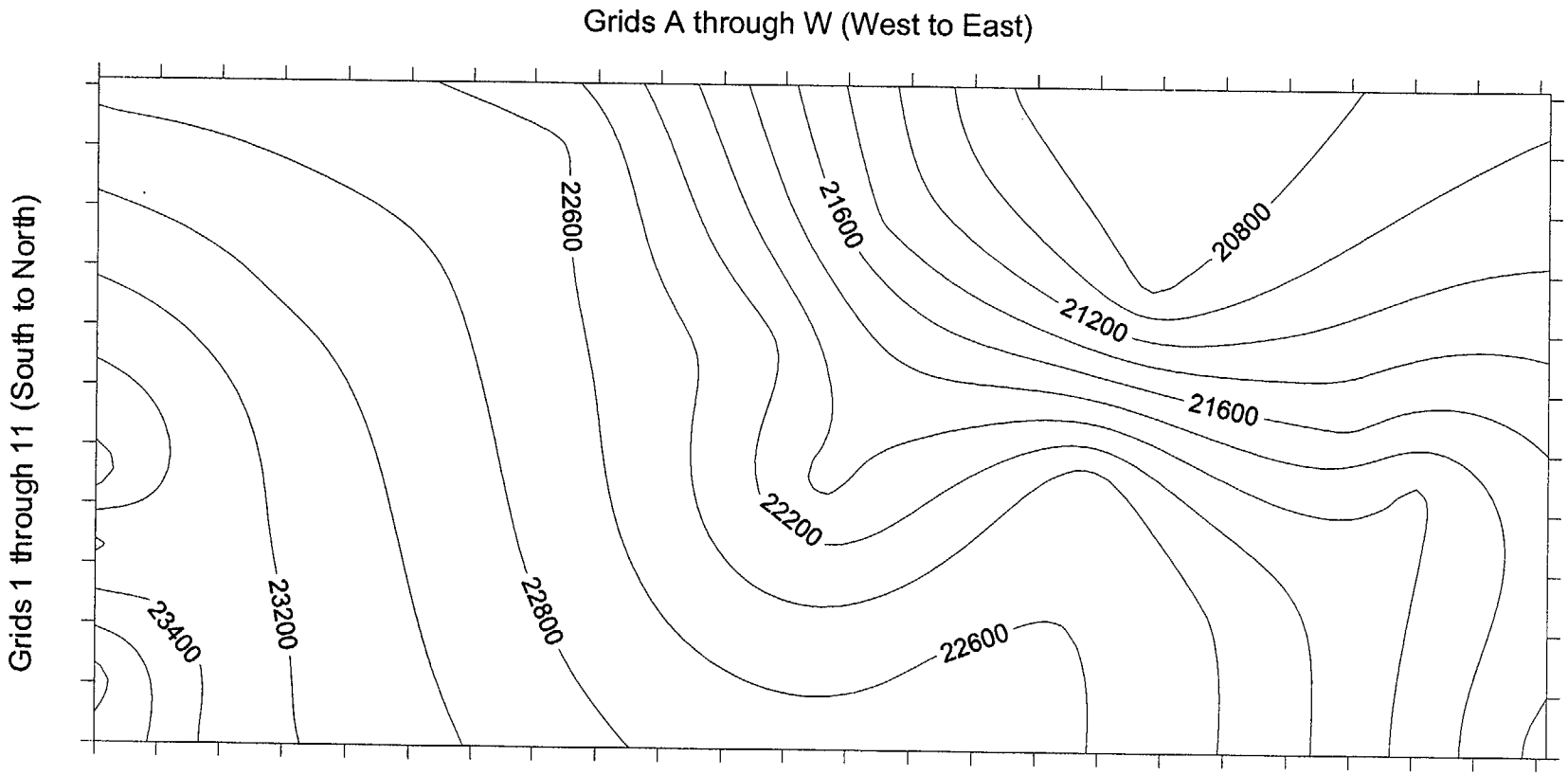
N

Average Gamma Scan Readings Ranged
From 19 kcpm to 25 kcpm

Figure 6.3-6
WTR Basin 1 - 1st Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l1a.srf



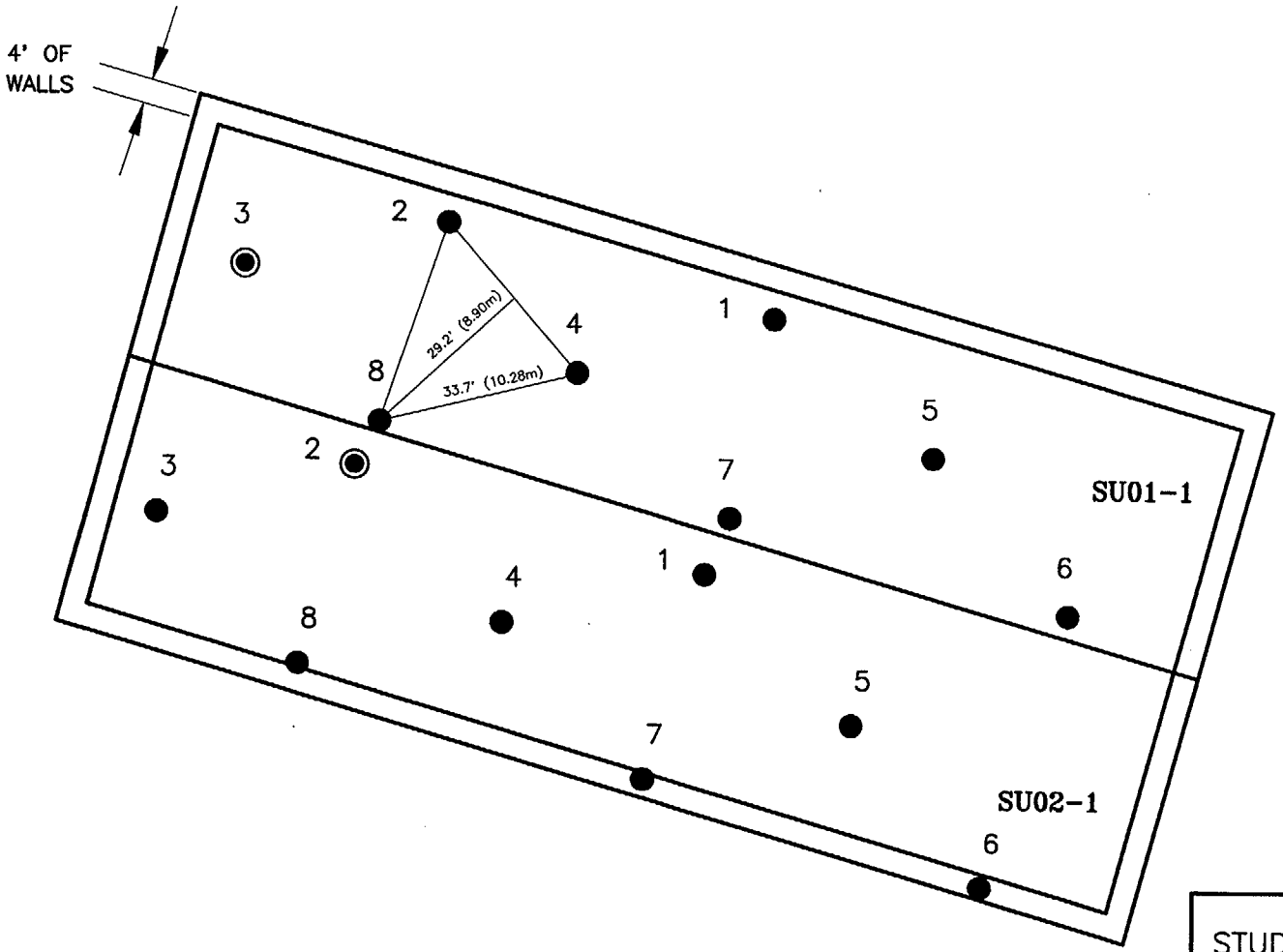
N

Background Measurements Ranged From
20,754 cpm to 23,873 cpm

Figure 6.3-7
WTR Basin 1 - 1st Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l1b.srf



NOTES

A ≅ 7876 FT^2 ($732m^2$) (EACH UNIT)
n = 8
L = 33.7 FEET
◉ RANDOM START POINT

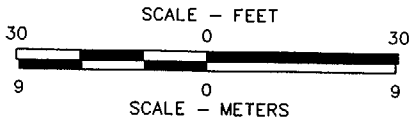


FIGURE 6.3–8
STUDY AREA 3B–SURVEY UNITS 1 AND 2
1st LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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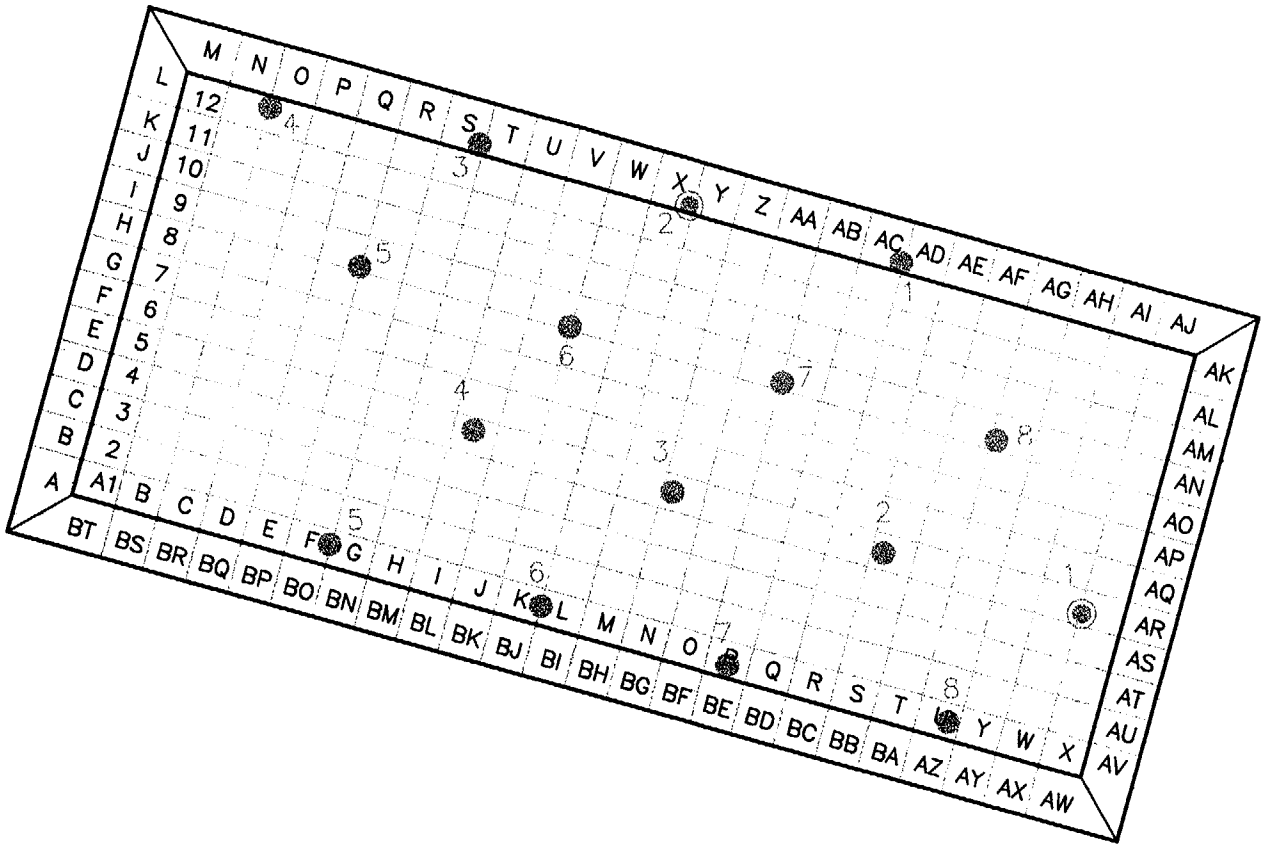

N

DRAWING NOT TO SCALE

NOTES

1. GRIDS A THROUGH BT ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH X12 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.

FIGURE 6.3-9
STUDY AREA 3B-SURVEY UNITS 1 AND 2
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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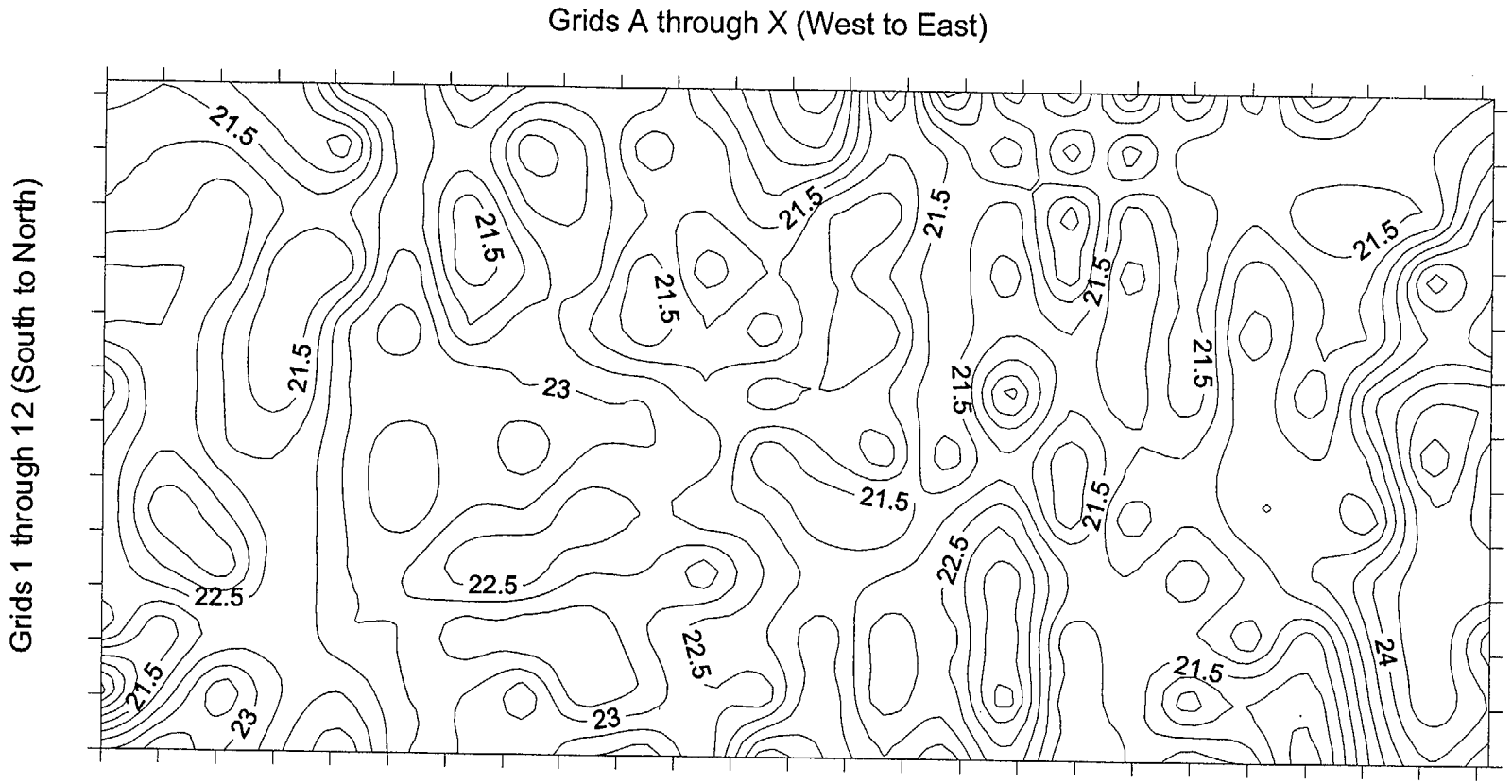


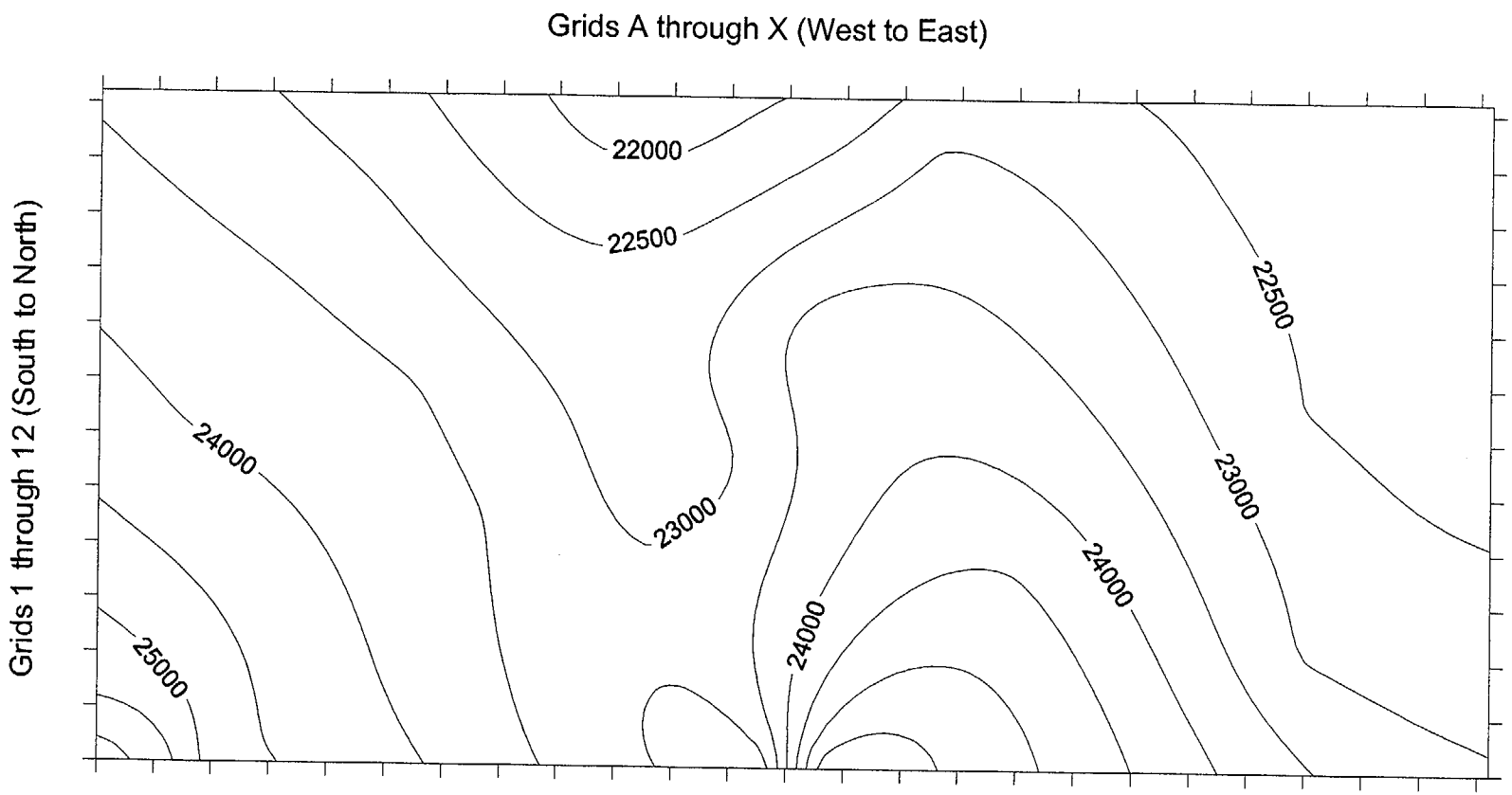
N

Average Gamma Scan Readings Ranged
From 19 kcpm to 26 kcpm

Figure 6.3-10
WTR Basin 1 - 2nd Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l2a.srf



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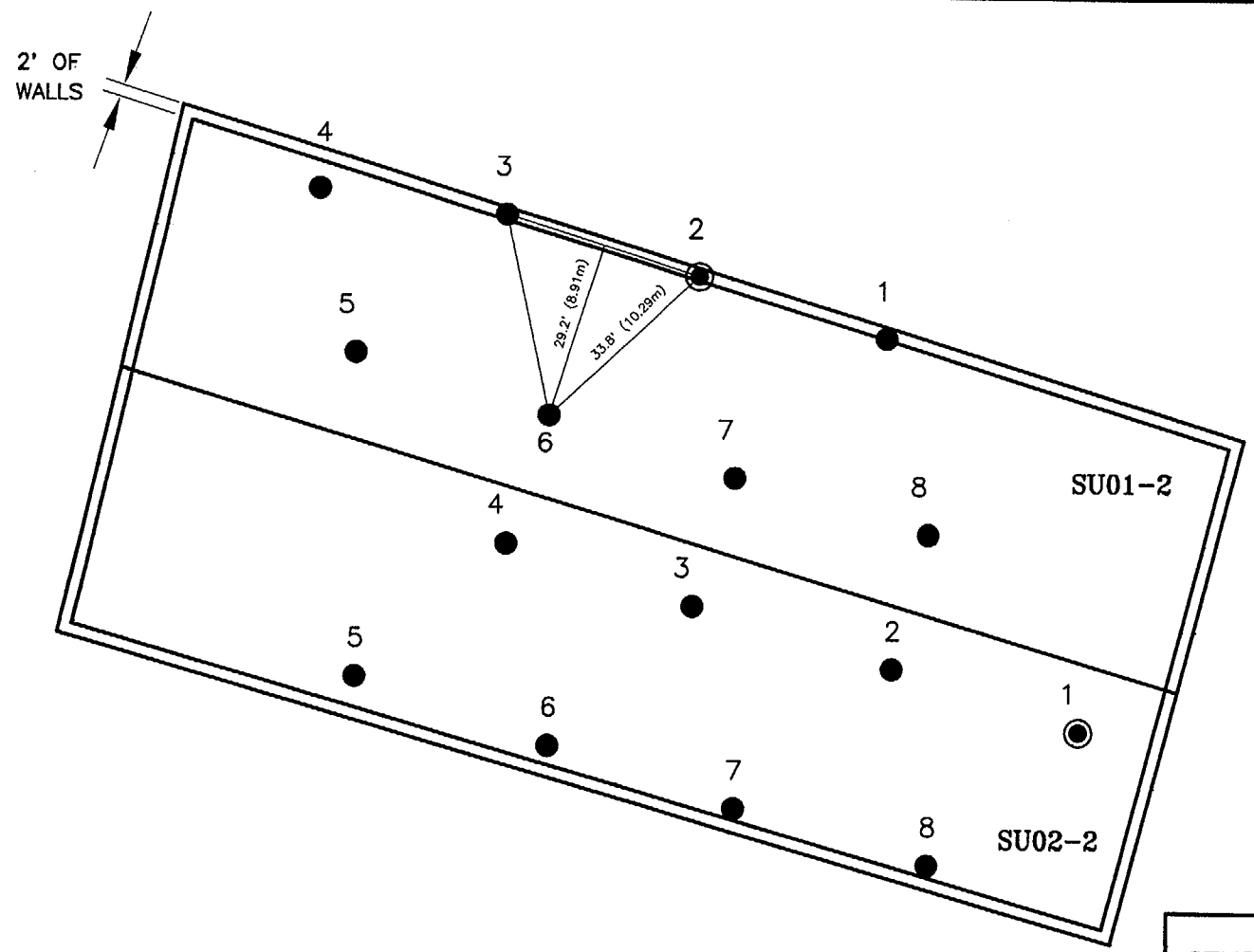
Background Measurements Ranged From
21,576 cpm to 26,297 cpm

Figure 6.3-11
WTR Basin 1 - 2nd Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l2b.srf



NOTES

A ≅ 7900 FT^2 ($734m^2$) (EACH UNIT)
n = 8
L = 33.8 FEET
◉ RANDOM START POINT

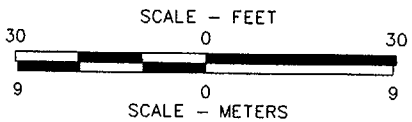


FIGURE 6.3 – 12
STUDY AREA 3B–SURVEY UNITS 1 AND 2
2nd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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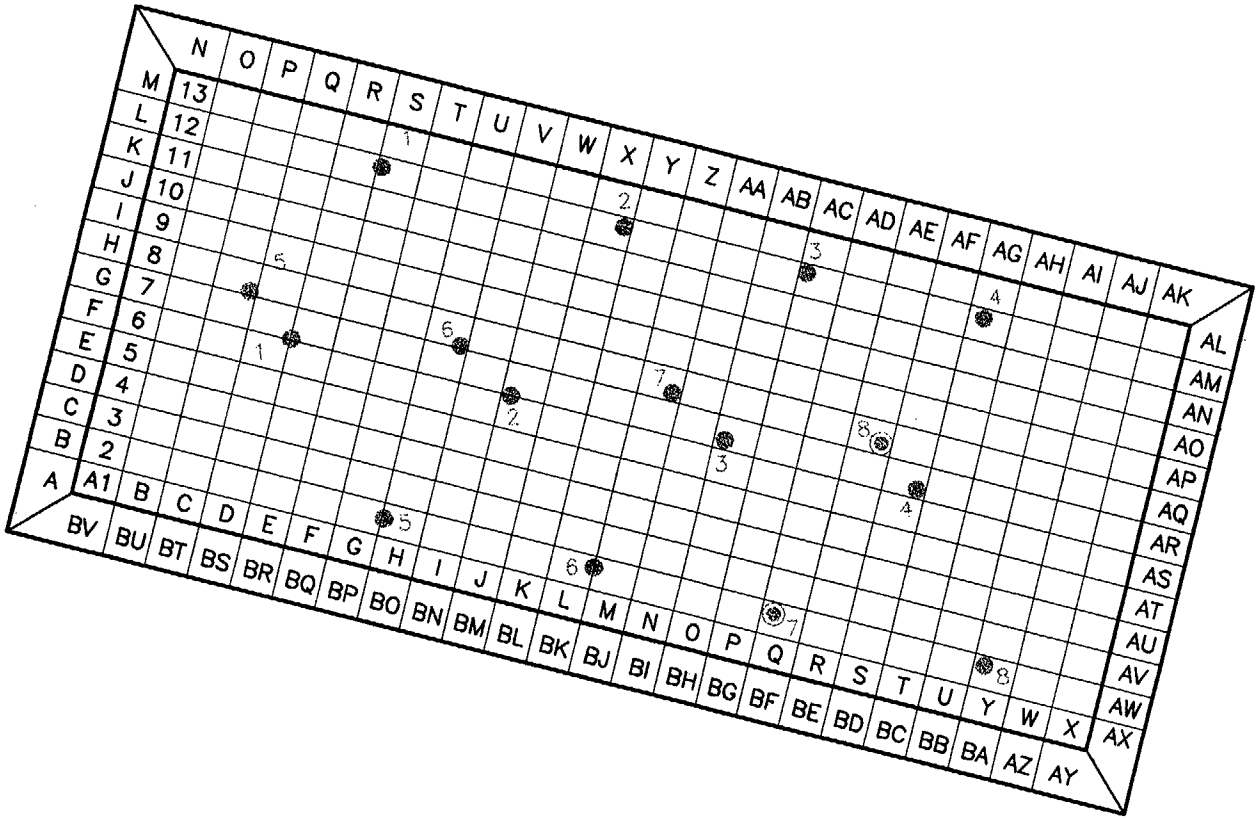

N

DRAWING NOT TO SCALE

NOTES

1. GRIDS A THROUGH BV ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH X13 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.

◉ RANDOM START POINT

● SAMPLING LOCATION

FIGURE 6.3–13
STUDY AREA 3B–SURVEY UNITS 1 AND 2
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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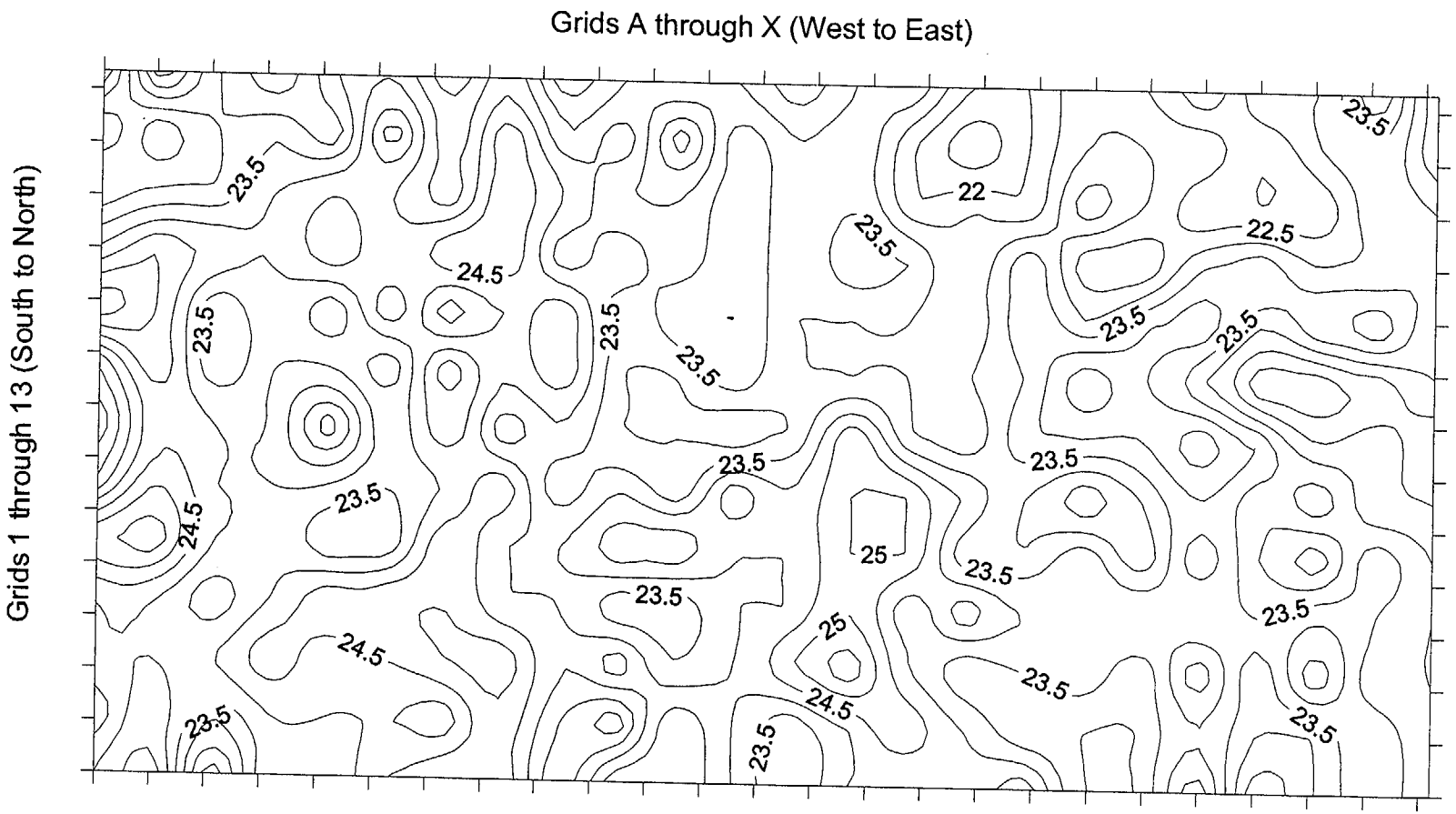
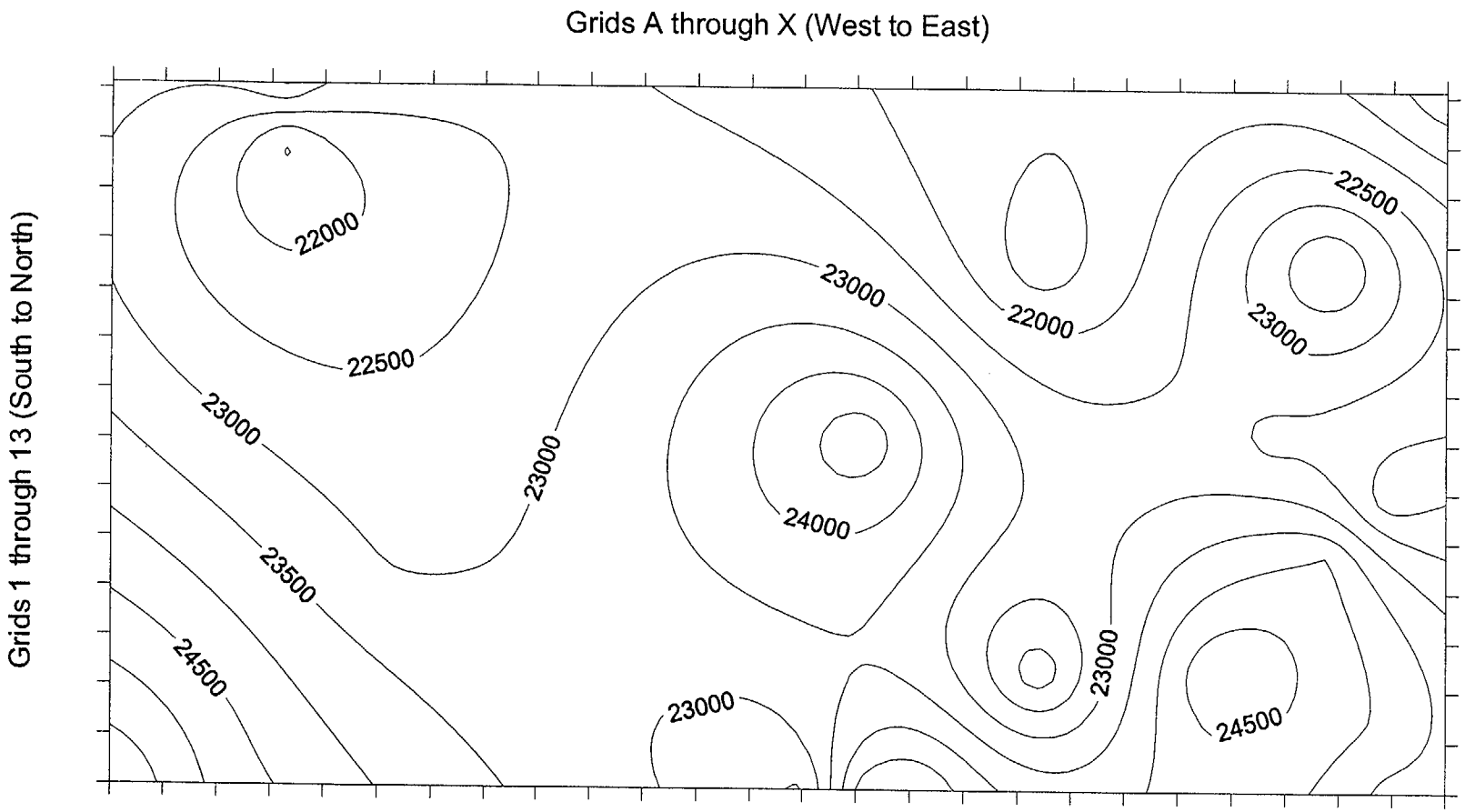


Average Gamma Scan Readings Ranged
From 21 kcpm to 26 kcpm

Figure 6.3-14
WTR Basin 1 - 3rd Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l3a.srf



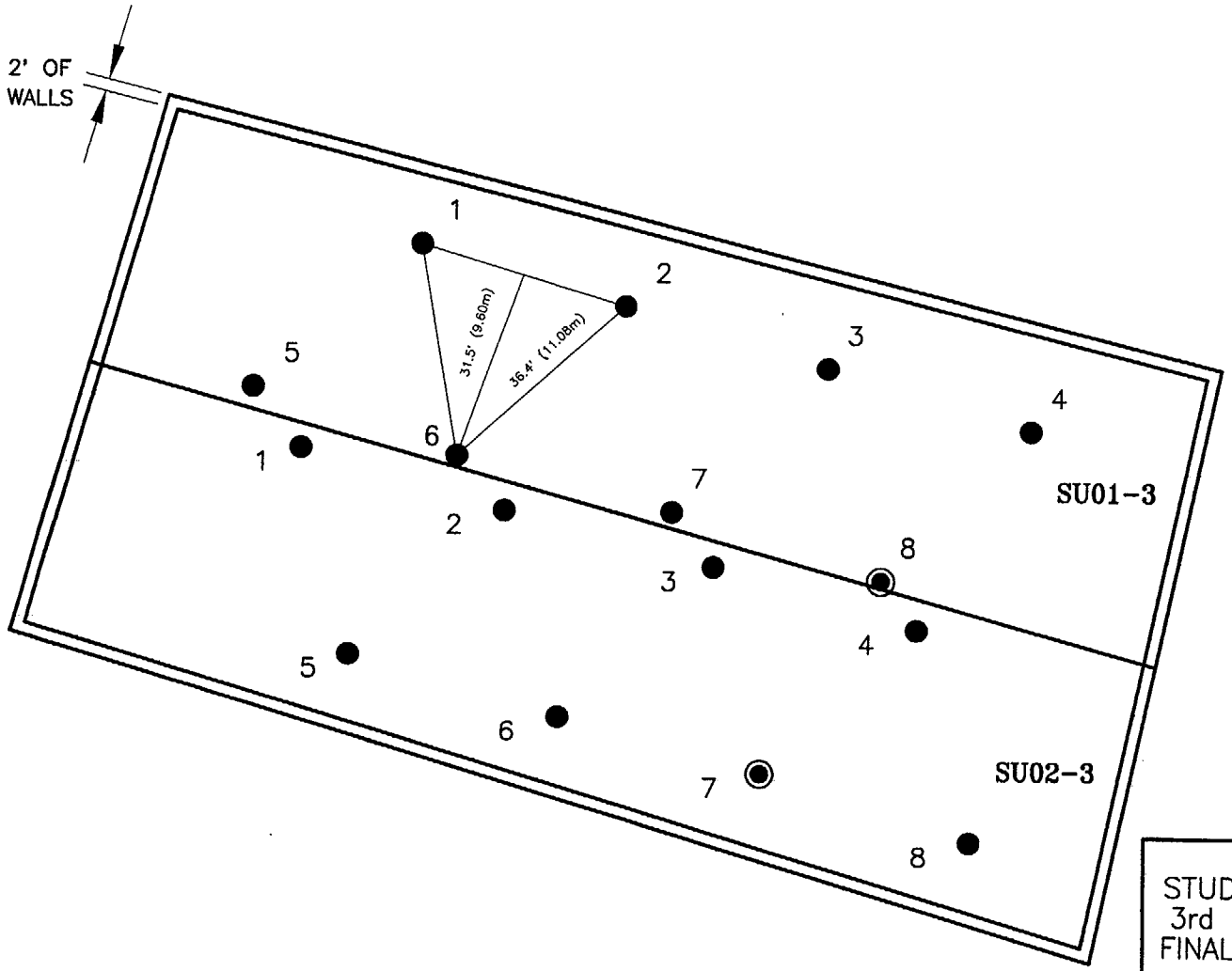
Background Measurements Ranged From
20,583 cpm to 25,998 cpm

N

Figure 6.3-15
WTR Basin 1 - 3rd Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l3b.srf



NOTES

A ≅ 9158 FT^2 ($851m^2$) (EACH UNIT)
n = 8
L = 36.4 FEET
◉ RANDOM START POINT

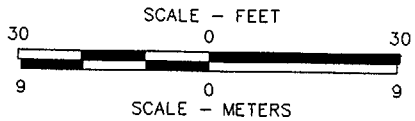


FIGURE 6.3–16
STUDY AREA 3B–SURVEY UNITS 1 AND 2
3rd LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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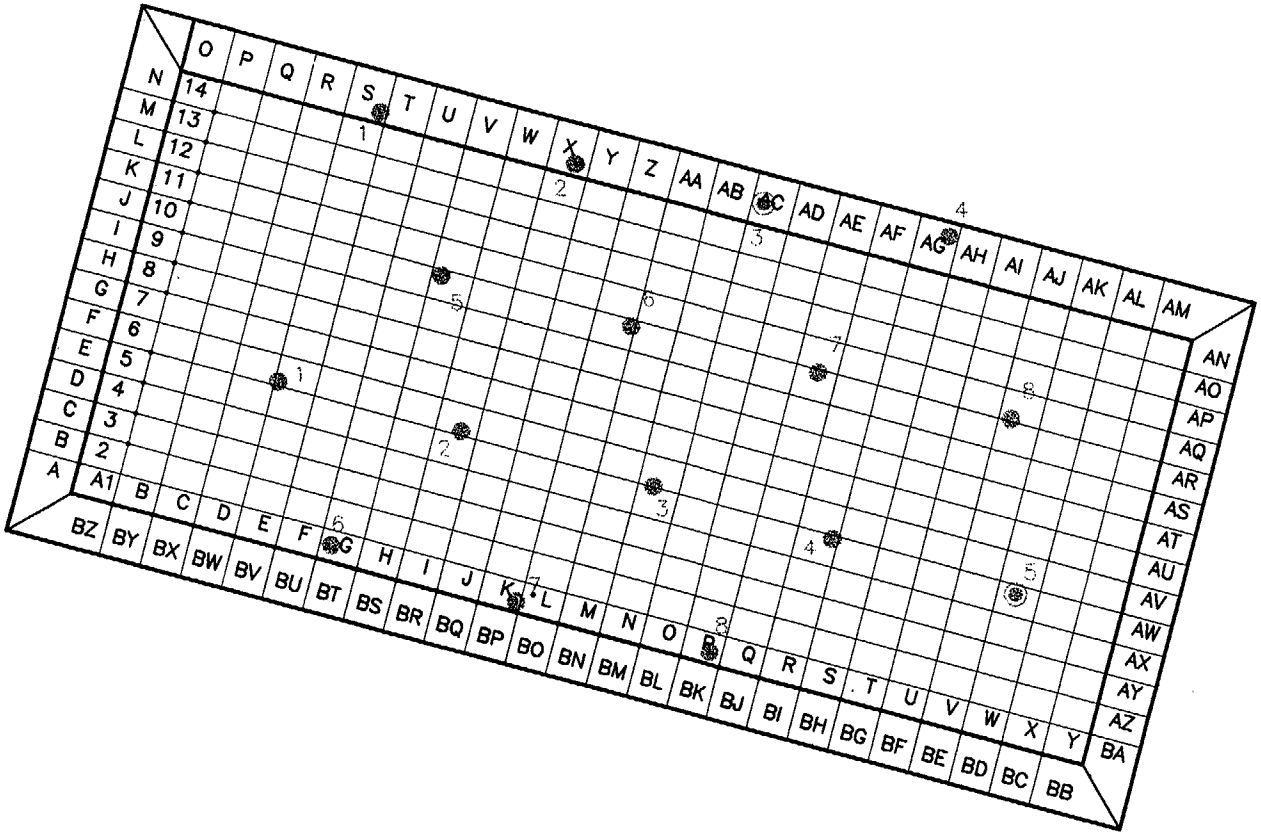

N

DRAWING NOT TO SCALE

NOTES

1. GRIDS A THROUGH BZ ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH Y14 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.

◉ RANDOM START POINT

● SAMPLING LOCATION

FIGURE 6.3-17
STUDY AREA 3B-SURVEY UNITS 1 AND 2
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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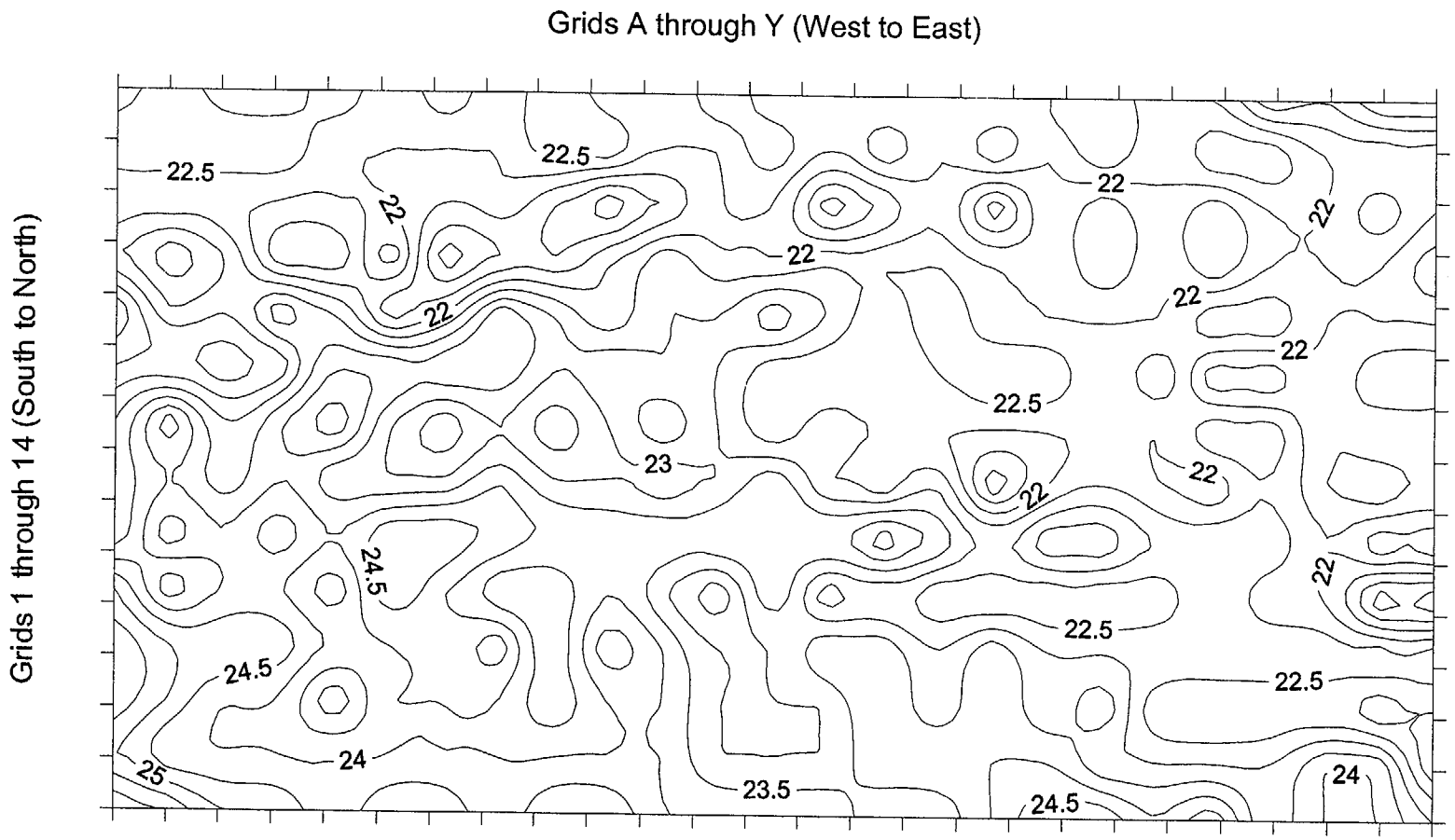


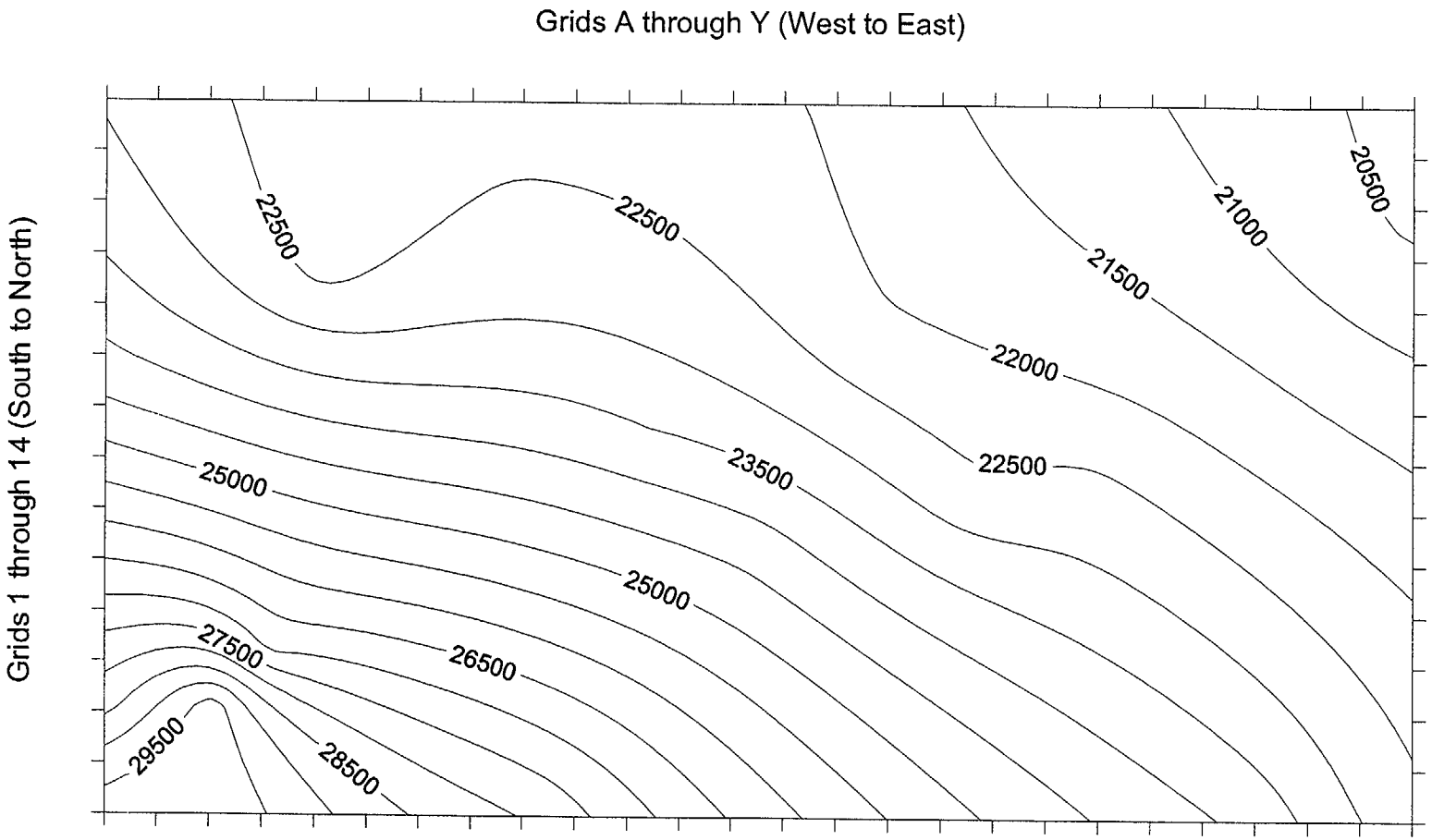
N

Average Gamma Scan Readings Ranged
From 20 kcpm to 26.5 kcpm

Figure 6.3-18
WTR Basin 1 - 4th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l4a.srf



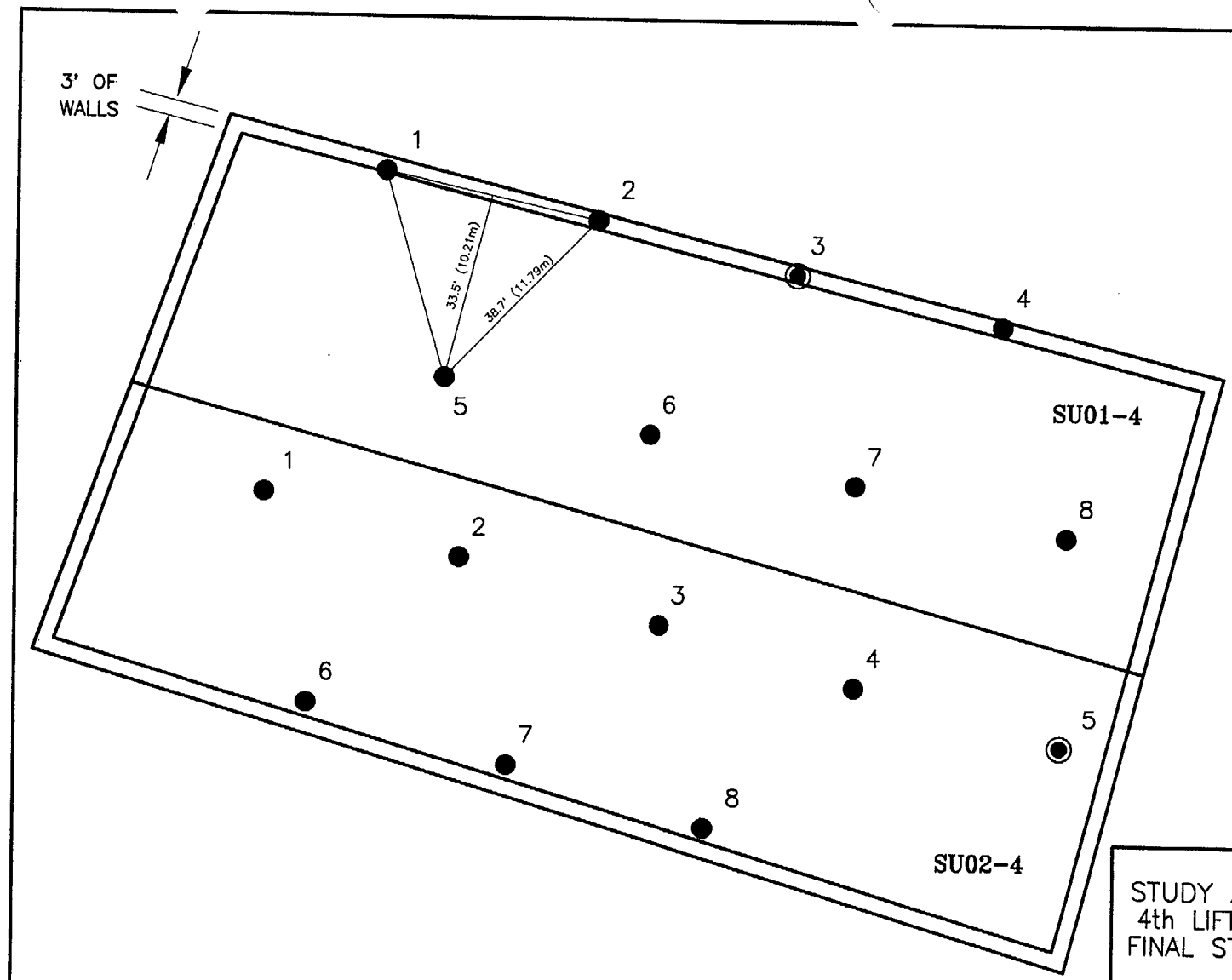
N

Background Measurements Ranged From
20,398 cpm to 29,771 cpm

Figure 6.3-19
WTR Basin 1 - 4th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l4b.srf



NOTES

A ≅ 10,370 FT^2 ($963m^2$) (EACH UNIT)
n = 8
L = 38.7 FEET
◉ RANDOM START POINT

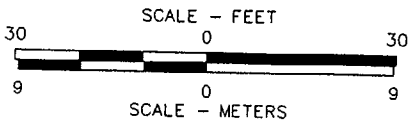


FIGURE 6.3–20
STUDY AREA 3B–SURVEY UNITS 1 AND 2
4th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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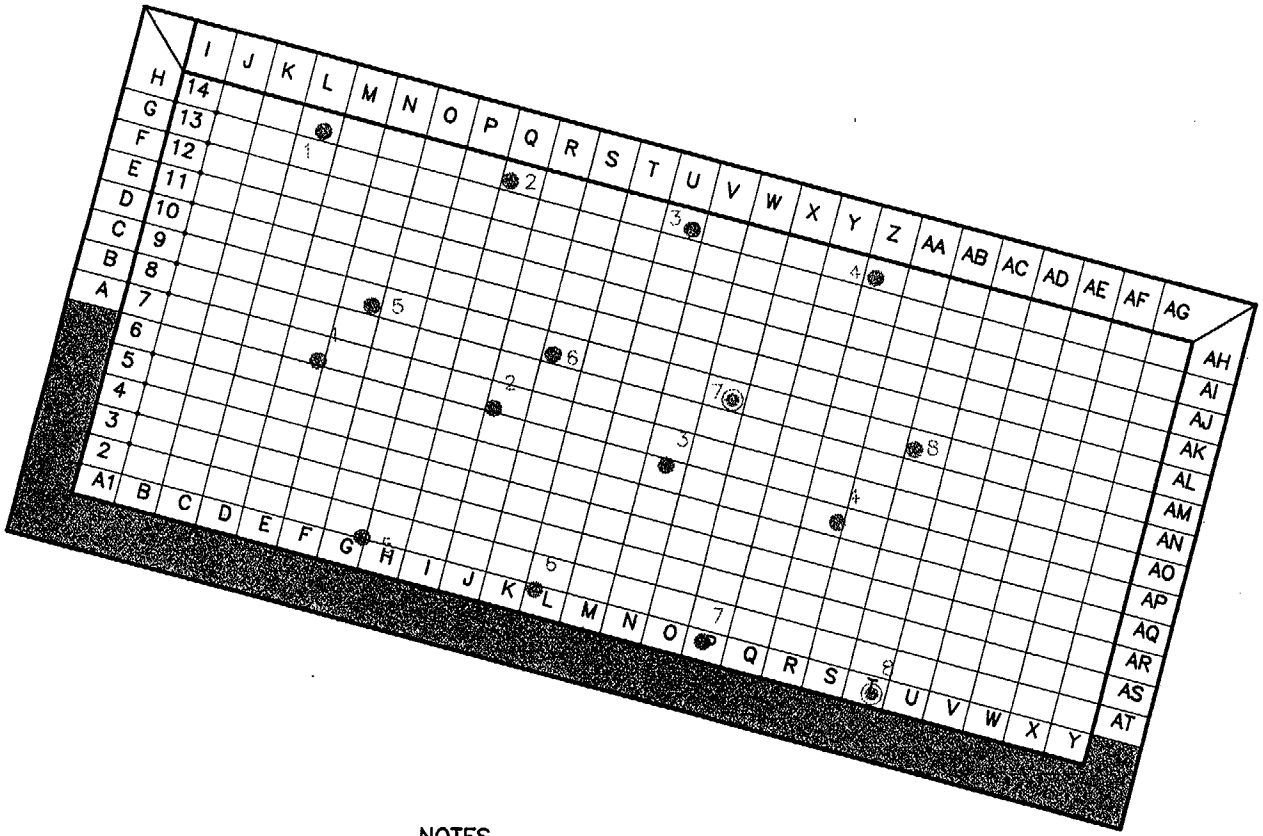

NOTES

1. GRIDS A THROUGH AT ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH Y14 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.
5. SHADED AREA INDICATES NO WALL PRESENT.

◉ RANDOM START POINT

● SAMPLING POINT

DRAWING NOT TO SCALE

FIGURE 6.3-21
STUDY AREA 3B-SURVEY UNITS 1 AND 2
5th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	5018S06A

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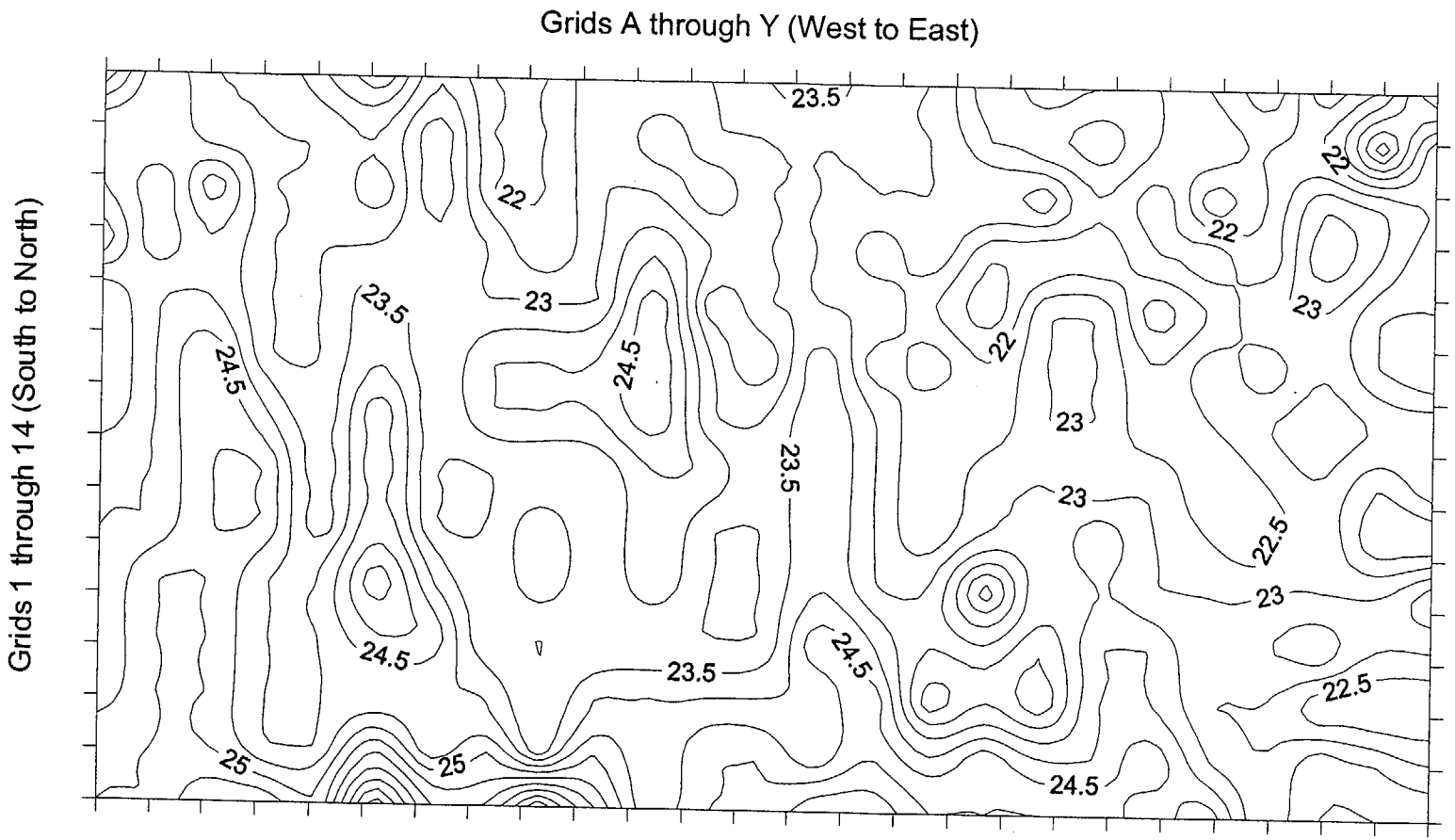


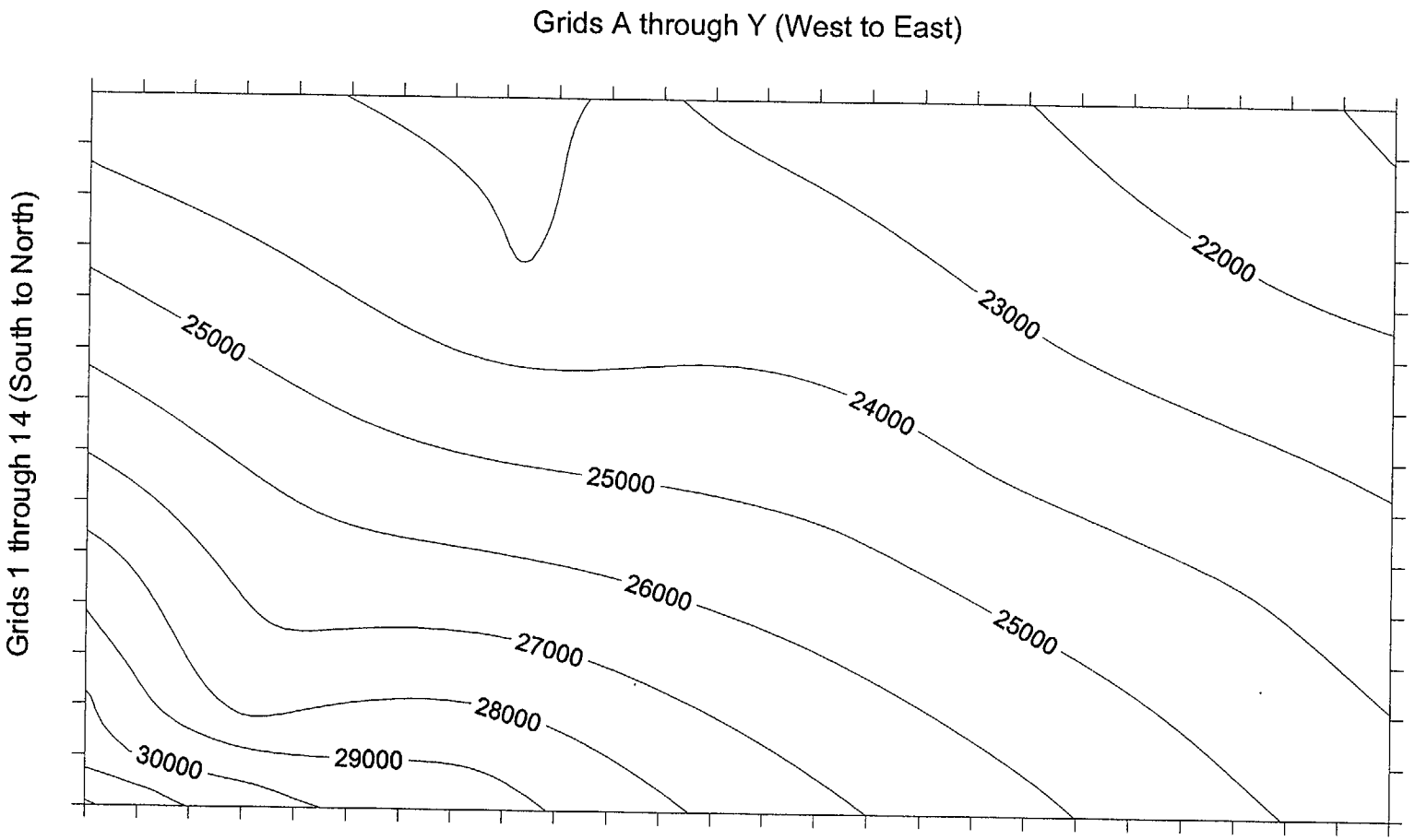
N

Average Gamma Scan Readings Ranged
From 19.5 kcpm to 28.5 kcpm

Figure 6.3-22
WTR Basin 1 - 5th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-I5a.srf



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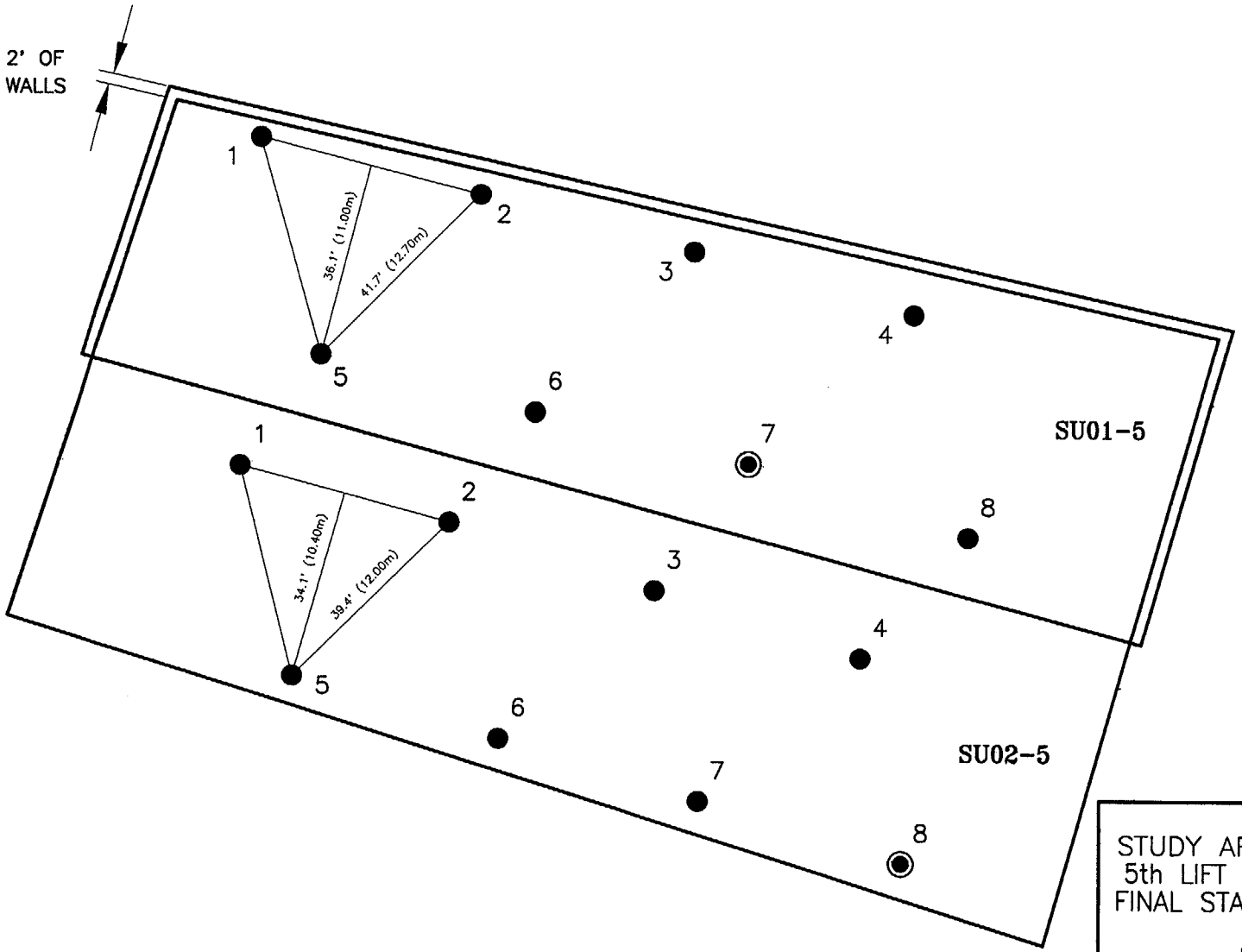
Background Measurements Ranged From
20,993 cpm to 32,155 cpm

Figure 6.3-23
WTR Basin 1 - 5th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-I5b.srf



N

NOTES

SU01-5:
A ≅ 12,021 FT^2 (1,117m^2)
n = 8
L = 41.7 FEET

SU02-5:
A ≅ 10,746 FT^2(998m^2)
n = 8
L = 39.4 FEET

◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.3-24
STUDY AREA 3B-SURVEY UNITS 1 AND 2
5th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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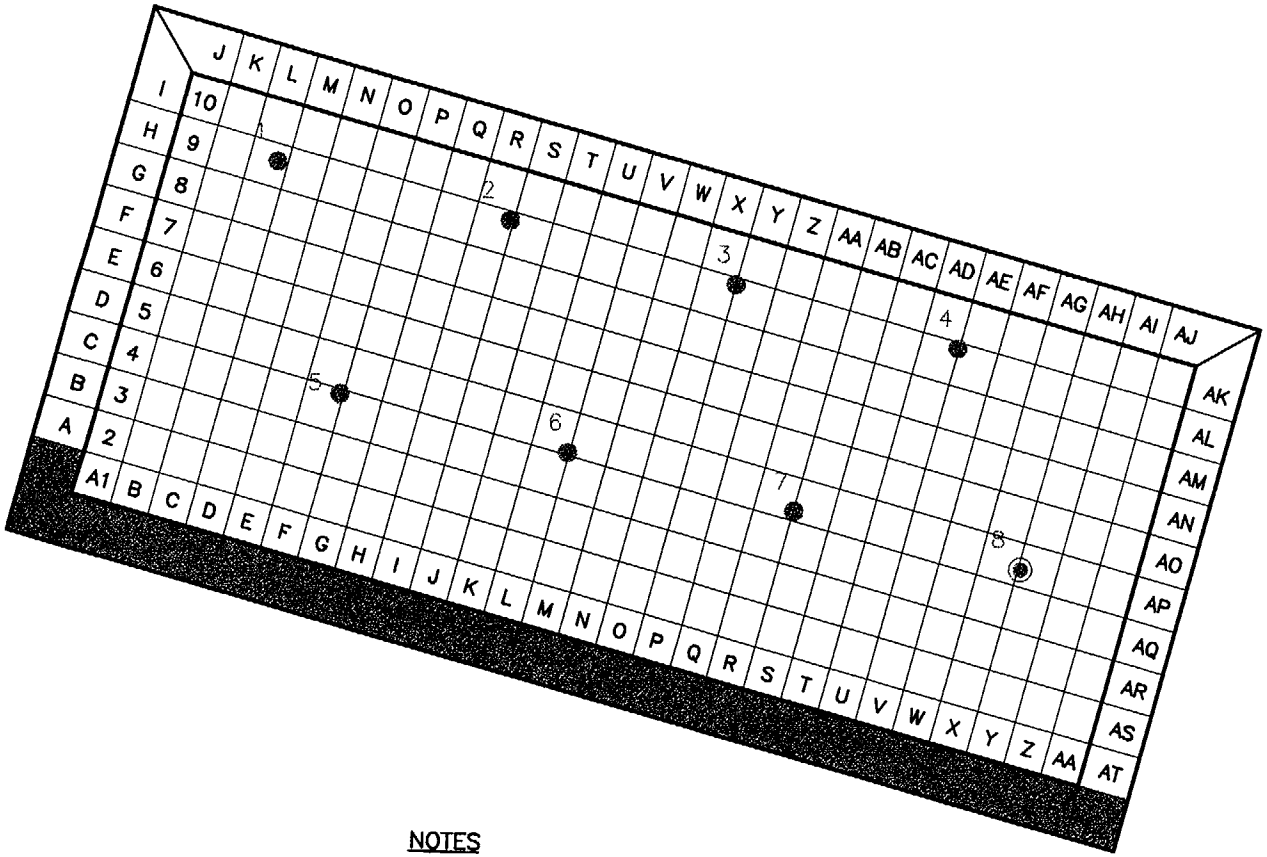

N

NOTES

1. GRIDS A THROUGH AT ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH AA10 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.
5. SHADED AREA INDICATES NO WALL PRESENT.

◉ RANDOM START POINT

● SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.3-25
STUDY AREA 3B-SURVEY UNIT 1
6th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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CHECKED	EG
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DRAWING NUMBER	5018S07A

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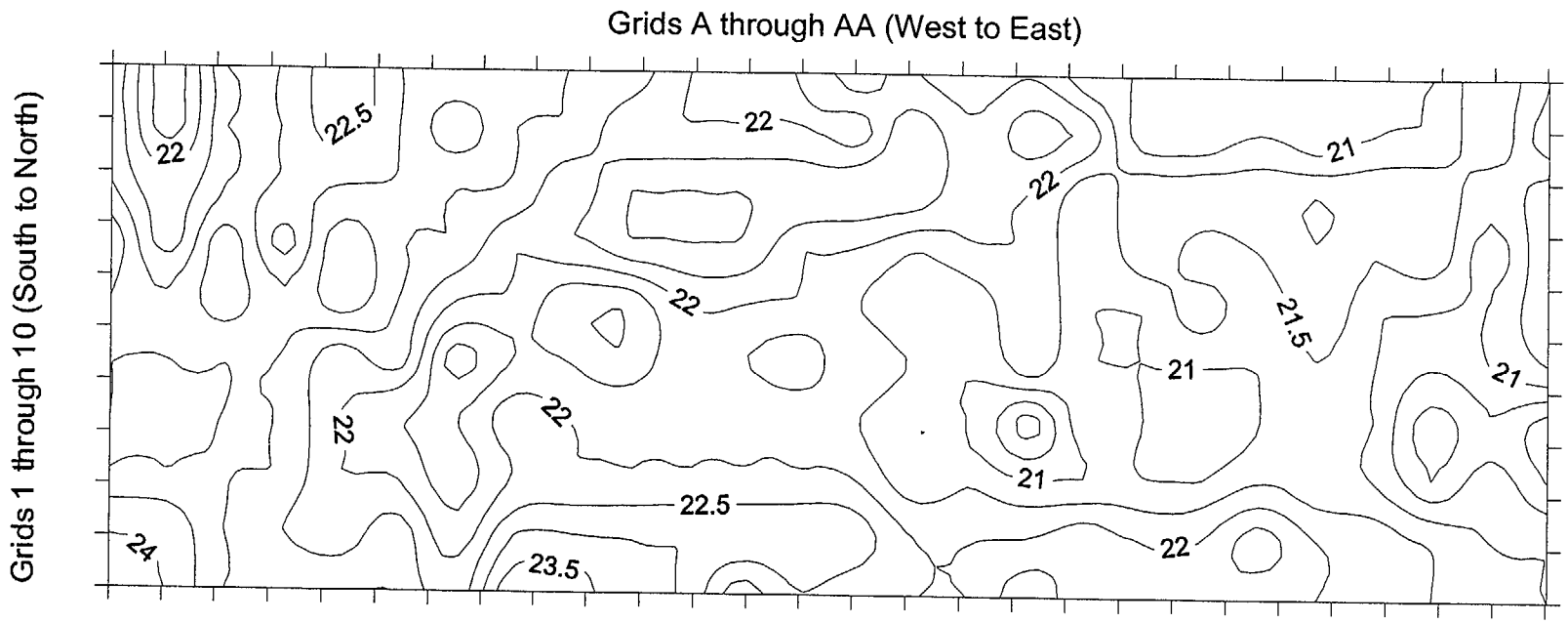


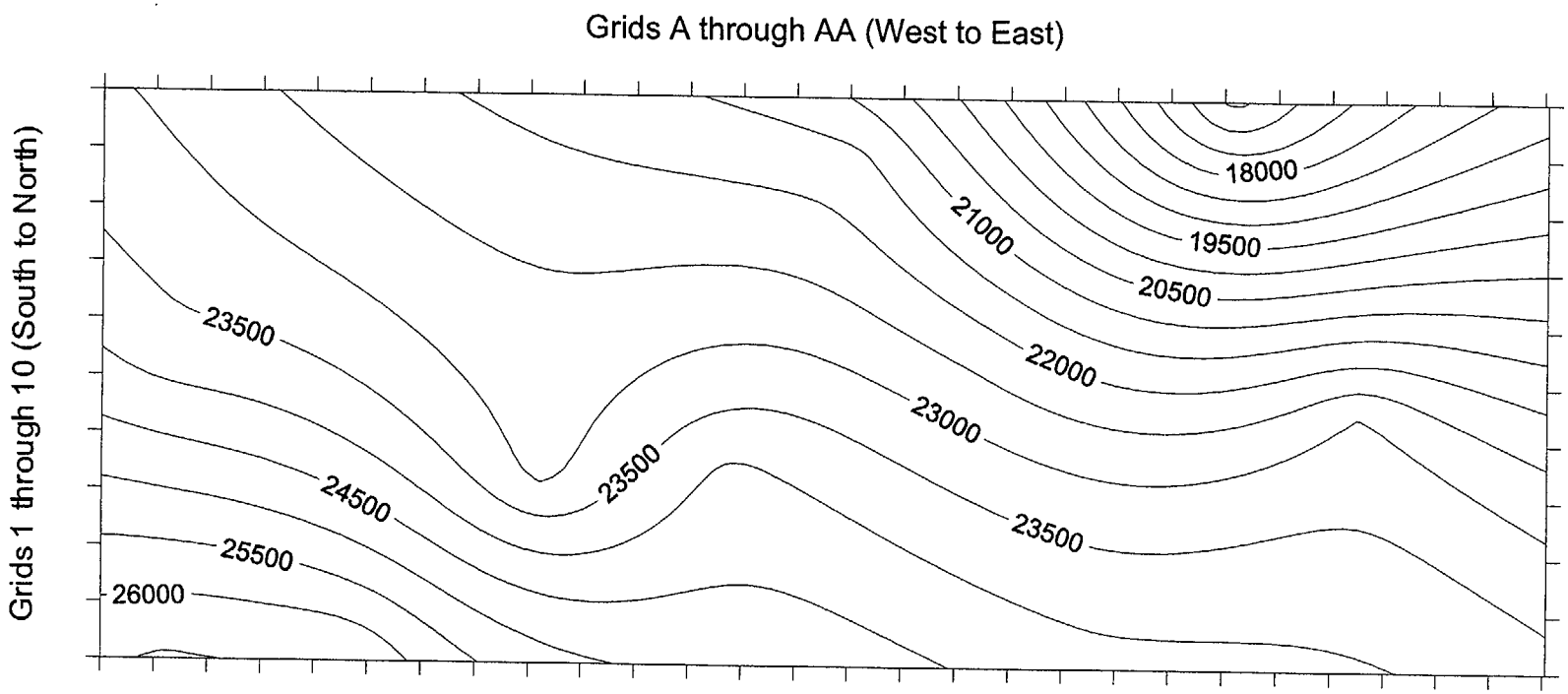
N

Average Gamma Scan Readings Ranged
From 19.5 kcpm to 24 kcpm

Figure 6.3-26
WTR Basin 1 - 6th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l6a.srf



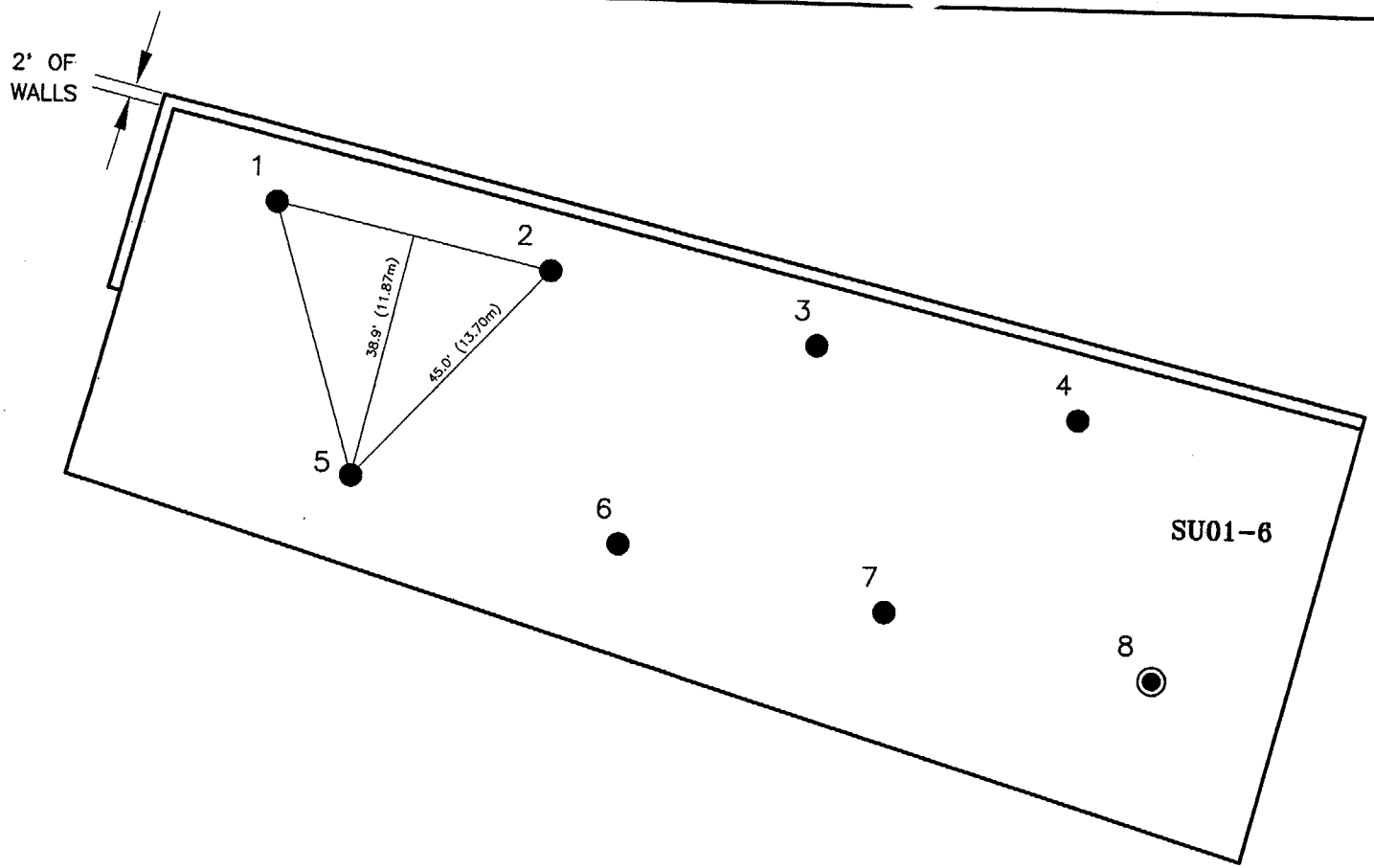
Background Measurements Ranged From
16,344 cpm to 26,568 cpm

N

Figure 6.3-27
WTR Basin 1 - 6th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-l6b.srf



NOTES

A ≅ 14,007 FT^2 (1,301m^2)
n = 8
L = 45.0 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.3-28
STUDY AREA 3B-SURVEY UNIT 1
6th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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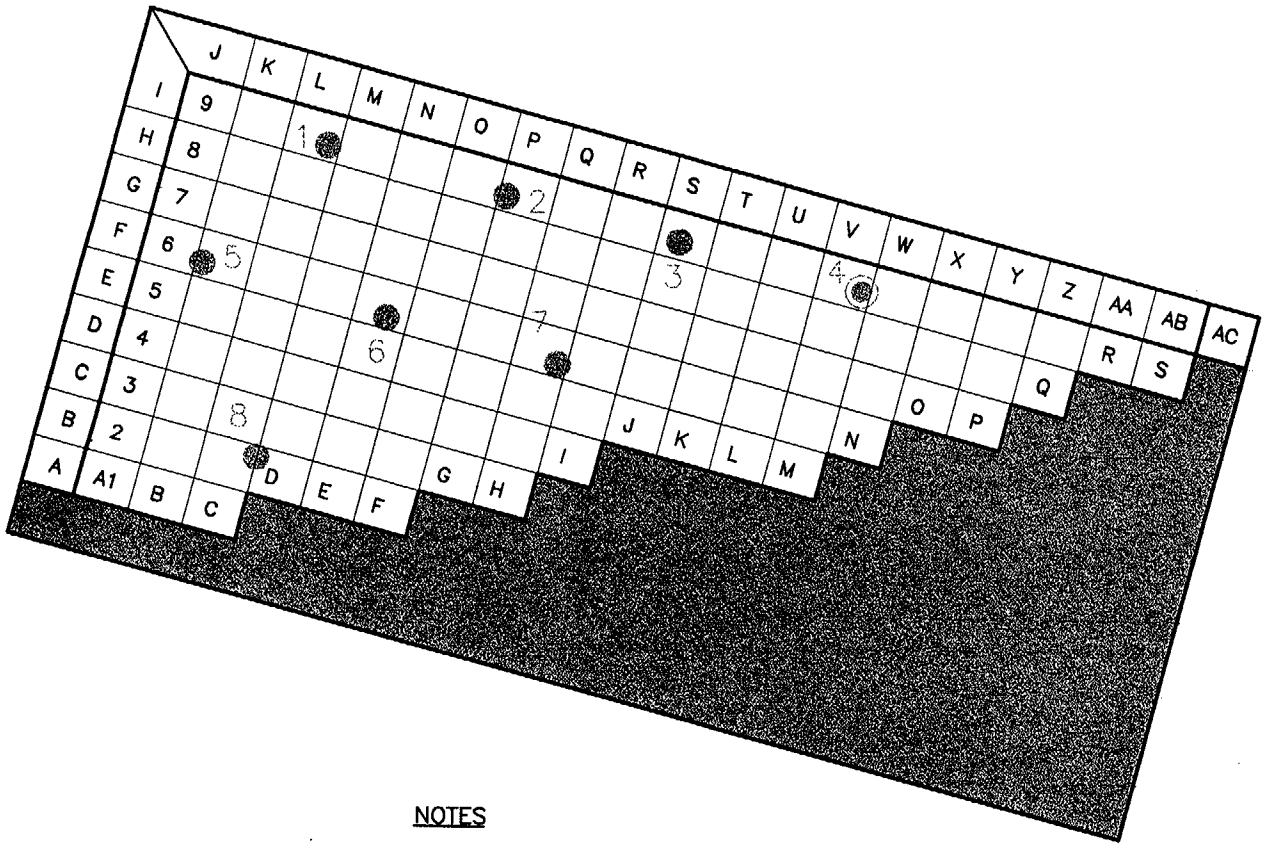
DRAWING NUMBER	5018043

Earth Sciences Consultants, Inc.



N

NOTES

1. GRIDS A THROUGH AC ALONG PERIMETER REPRESENT THE WALLS.
2. GRIDS A1 THROUGH S9 REPRESENT THE FLOOR.
3. FLOOR GRIDS ARE APPROXIMATELY 2m x 2m.
4. WALL GRIDS ARE APPROXIMATELY 2m WIDE x 0.6m HIGH.
5. SHADED AREA INDICATES NO WALL PRESENT.

RANDOM START POINT

SAMPLING LOCATION

DRAWING NOT TO SCALE

FIGURE 6.3-29
STUDY AREA 3B-SURVEY UNIT 1
7th LIFT OF ACCEPTABLE BACKFILL MATERIAL
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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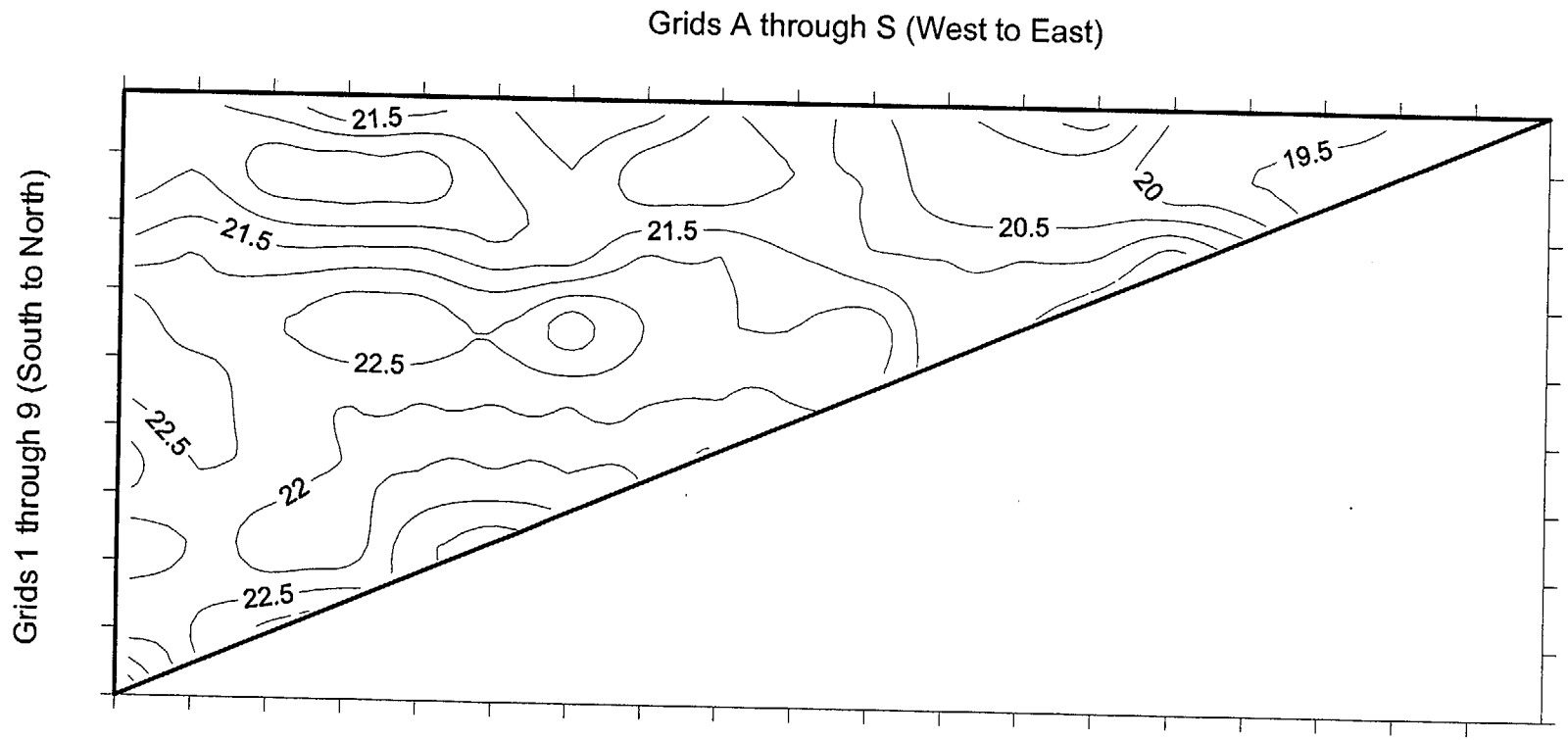


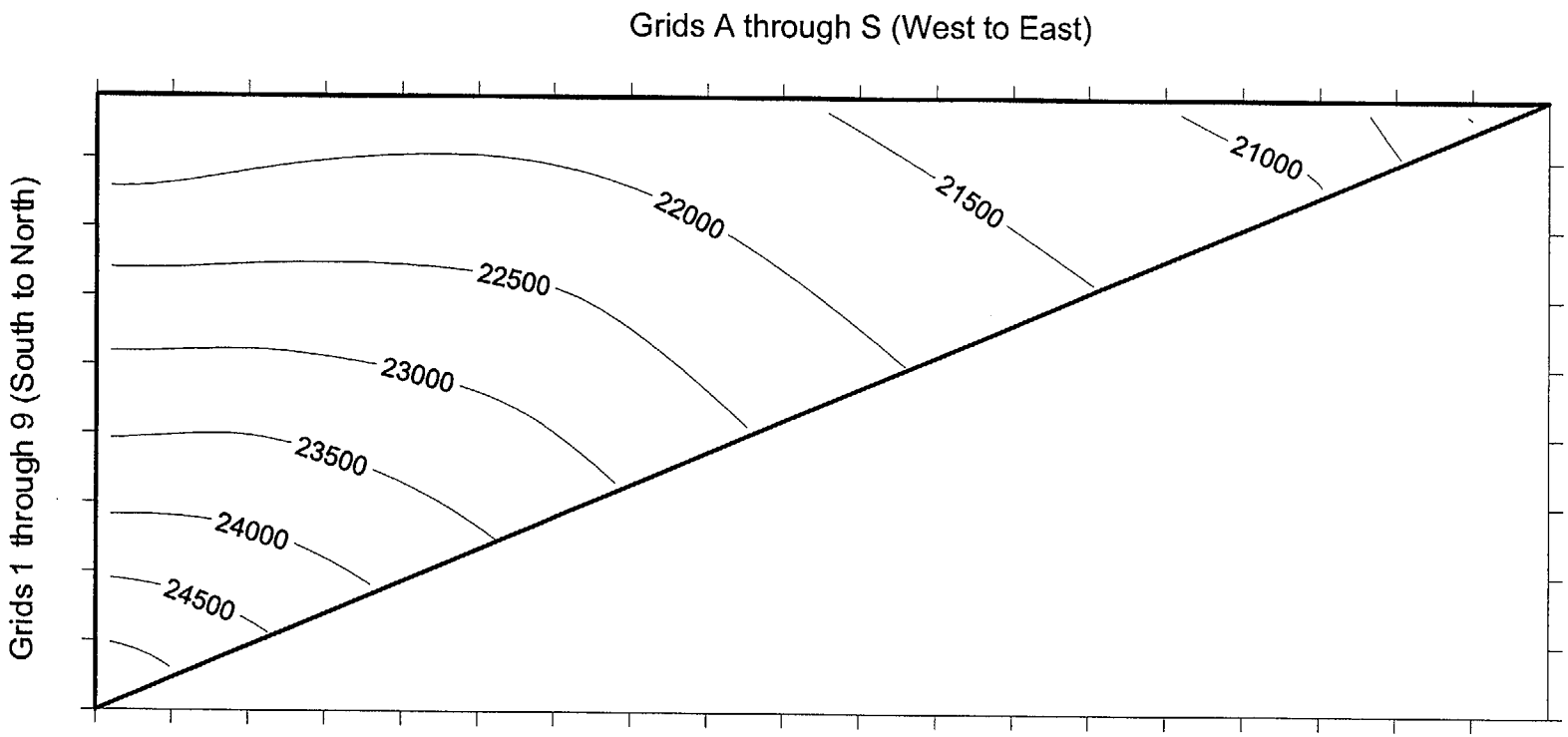
N

Average Gamma Scan Readings Ranged
From 19 kcpm to 24.5 kcpm

Figure 6.3-30
WTR Basin 1 - 7th Lift of ABM
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc

k:/5018/Fssr/Cas/Surfer/Area3/Wtr-I7a.srf



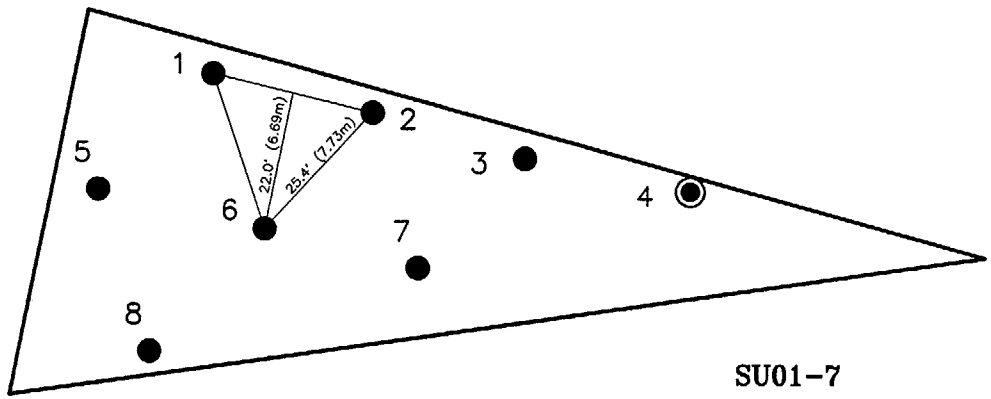
Background Measurements Ranged From
19,906 cpm to 25,538 cpm

N

Figure 6.3-31
WTR Basin 1 - 7th Lift of ABM
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Essr/Cas/Surfer/Area3/Wtr 17b.srf



N

NOTES

A ≅ 4453 FT.^{2} (414m^2)
n = 8
L = 25.4 FEET
◉ RANDOM START POINT

SCALE – FEET
30 0 30
9 0 9
SCALE – METERS

FIGURE 6.3 – 32
STUDY AREA 3B–SURVEY UNIT 1
7th LIFT OF ACCEPTABLE BACKFILL MATERIAL
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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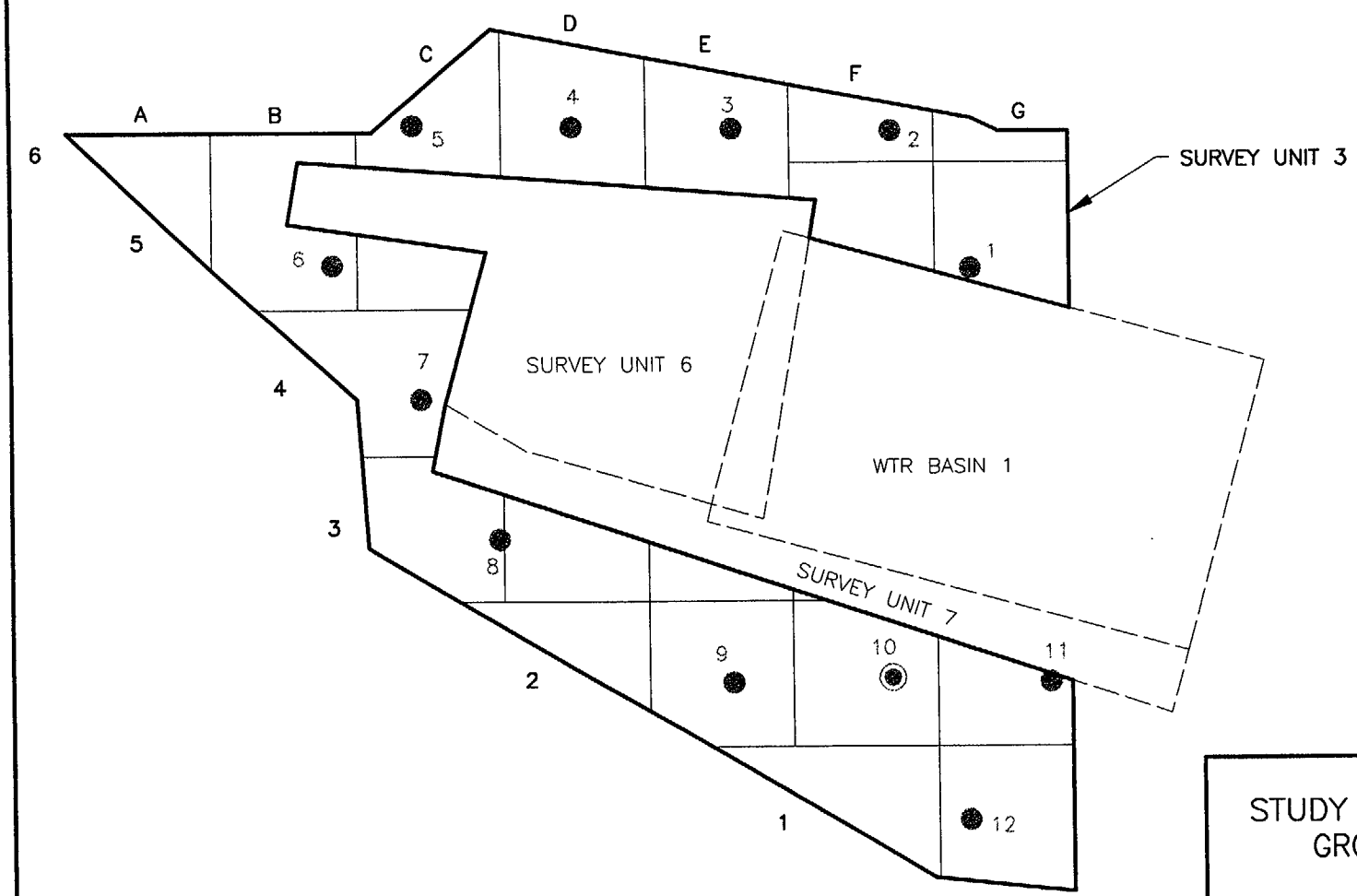

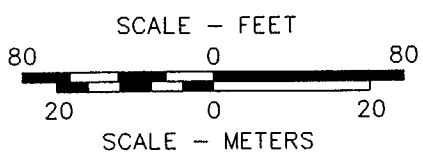

N

NOTES

GRIDS ARE APPROXIMATELY 20mx20m.

RANDOM START POINT

SAMPLING LOCATION

FIGURE 6.3–33
STUDY AREA 3B – SURVEY UNIT 3
GROSS GAMMA SCANNING GRID
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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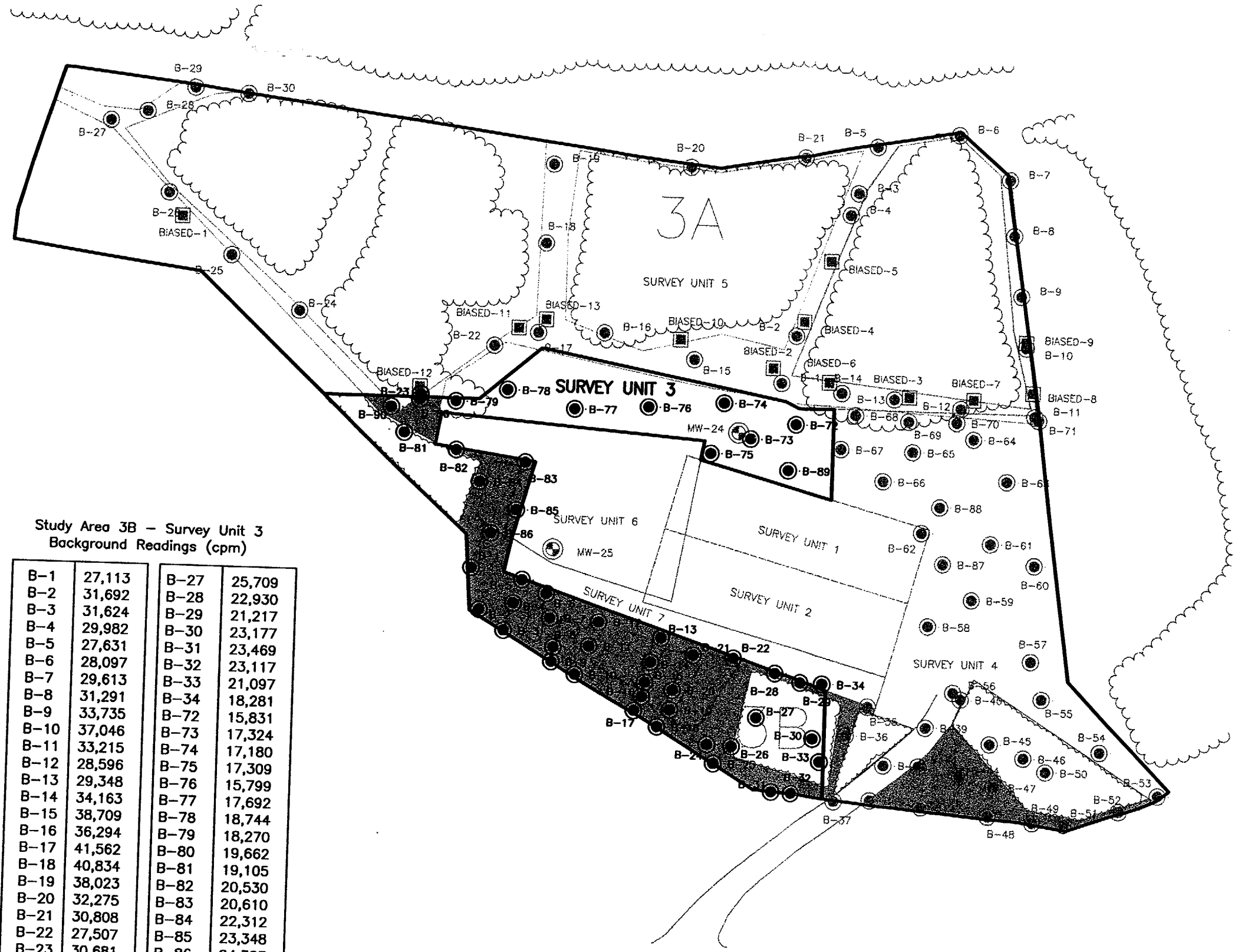

Study Area 3B – Survey Unit 3
Background Readings (cpm)

B-1	27,113	B-27	25,709
B-2	31,692	B-28	22,930
B-3	31,624	B-29	21,217
B-4	29,982	B-30	23,177
B-5	27,631	B-31	23,469
B-6	28,097	B-32	23,117
B-7	29,613	B-33	21,097
B-8	31,291	B-34	18,281
B-9	33,735	B-72	15,831
B-10	37,046	B-73	17,324
B-11	33,215	B-74	17,180
B-12	28,596	B-75	17,309
B-13	29,348	B-76	15,799
B-14	34,163	B-77	17,692
B-15	38,709	B-78	18,744
B-16	36,294	B-79	18,270
B-17	41,562	B-80	19,662
B-18	40,834	B-81	19,105
B-19	38,023	B-82	20,530
B-20	32,275	B-83	20,610
B-21	30,808	B-84	22,312
B-22	27,507	B-85	23,348
B-23	30,681	B-86	24,323
B-24	33,863	B-89	14,529
B-25	30,724	B-90	18,288
B-26	29,752		

Min = 14,529 Max = 41,562
Average = 26,354

LEGEND

CLEARED PATHWAY

BACKGROUND MEASUREMENT

SCALE – FEET
0 100

FIGURE 6.3–34
STUDY AREA 3B – SURVEY UNIT 3
LOCATION OF BACKGROUND READINGS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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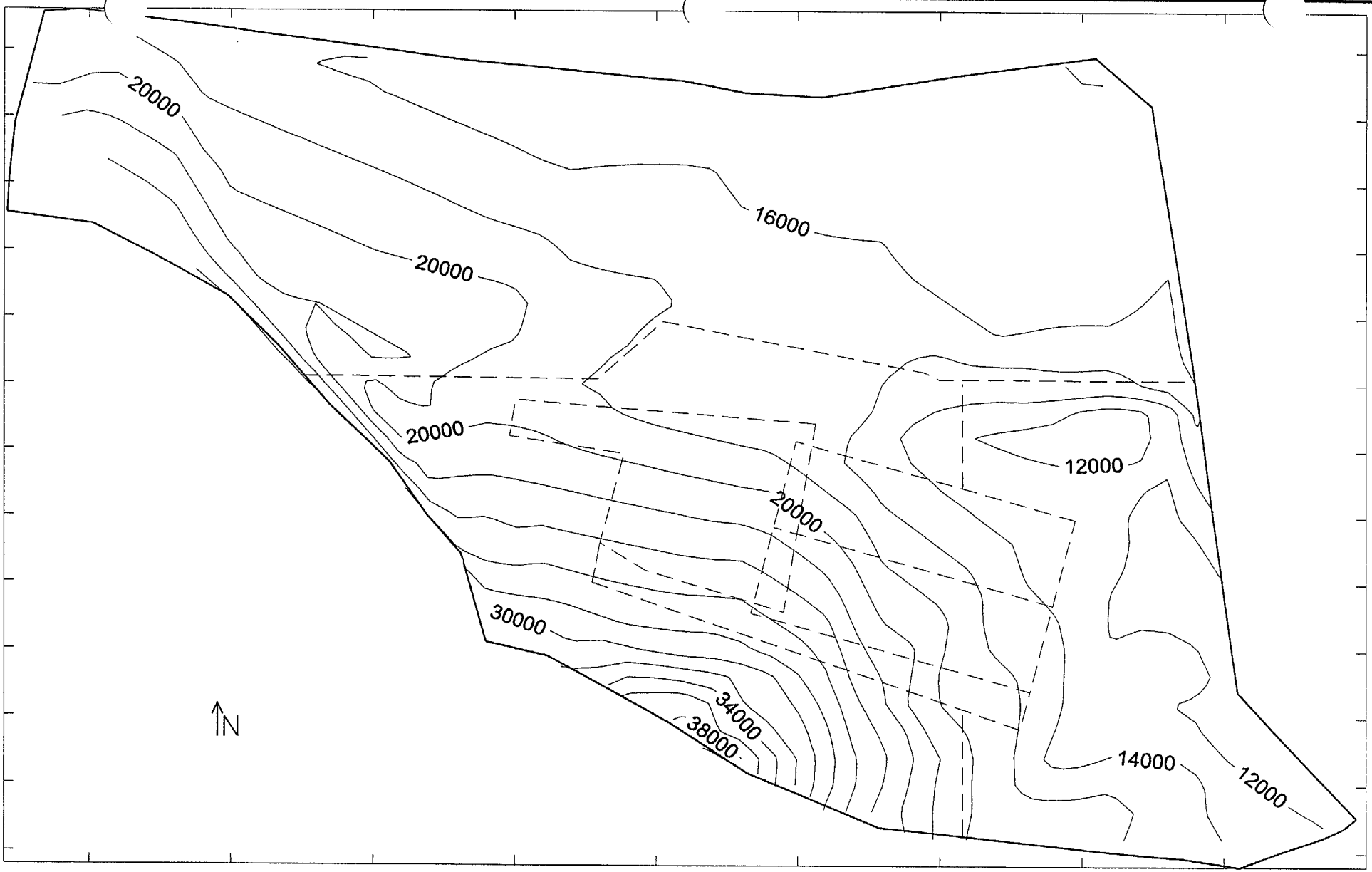
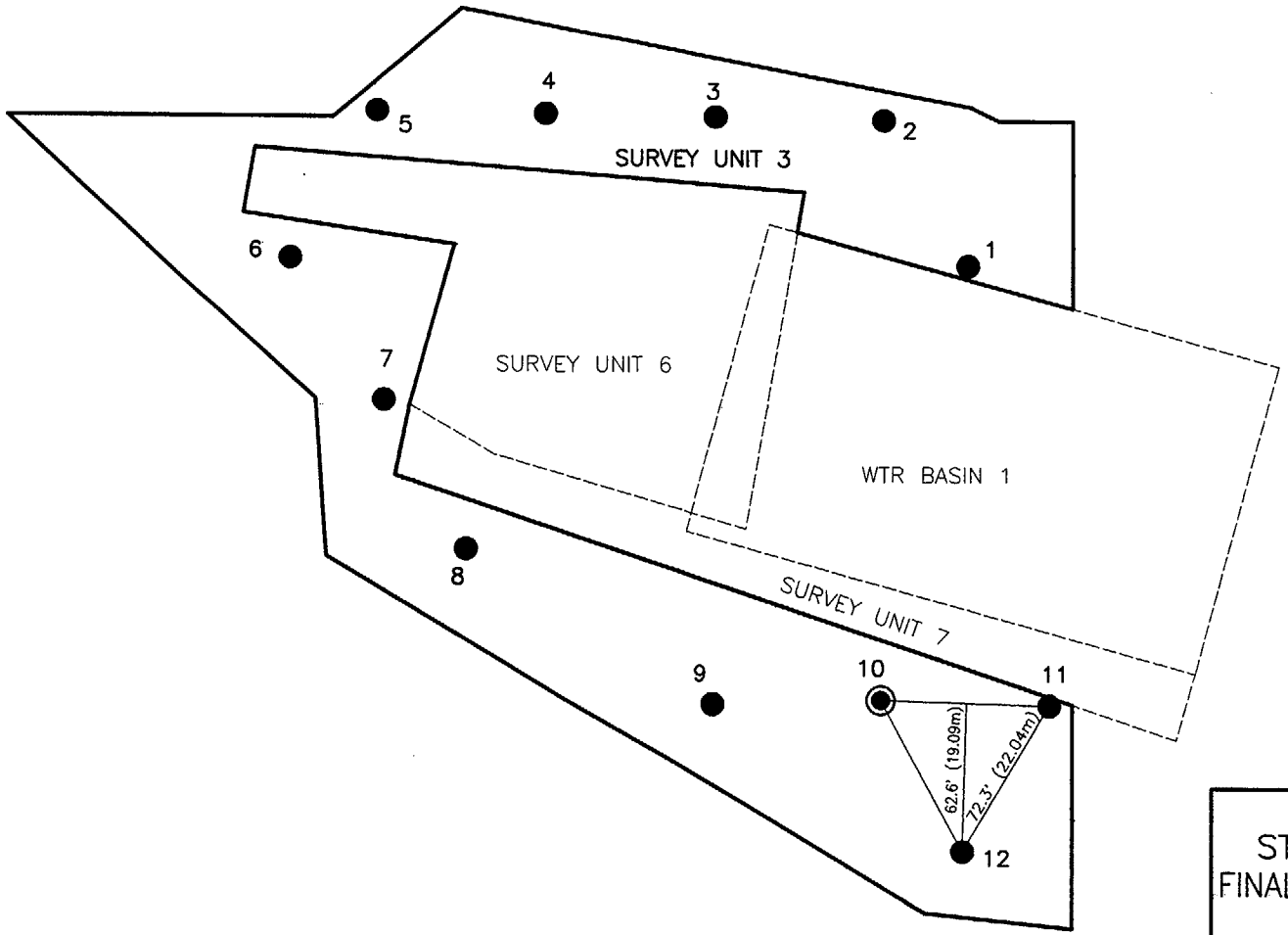


Background Readings Ranged From
10,517cpm to 41,562 cpm

Figure 6.3-35
Study Area 3
Background Gamma Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Sa3-bak1.srf



NOTES

A ≅ 54,330 FT^2 (5,047m^2)
n = 12
L = 72.3 FEET
◉ RANDOM START POINT

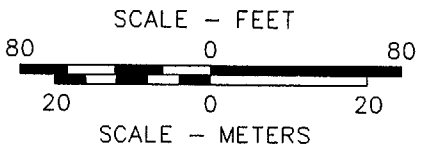


FIGURE 6.3–36
STUDY AREA 3B – SURVEY UNIT 3
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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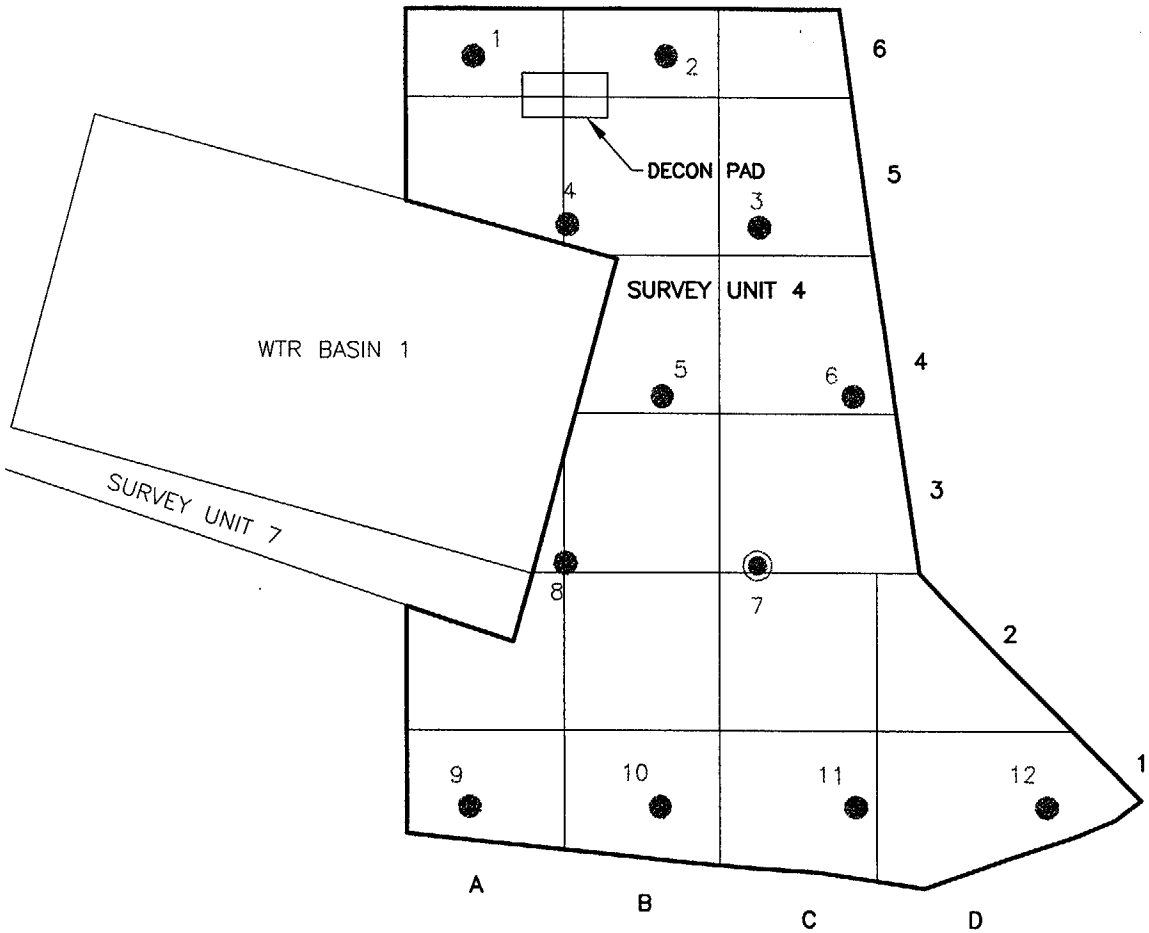

NOTES

GRIDS ARE APPROXIMATELY 20mx20m.

RANDOM START POINT

SAMPLING LOCATION

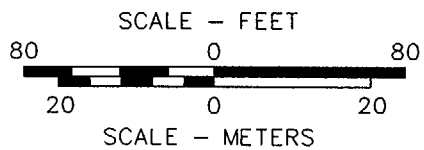

FIGURE 6.3–37
STUDY AREA 3B – SURVEY UNIT 4
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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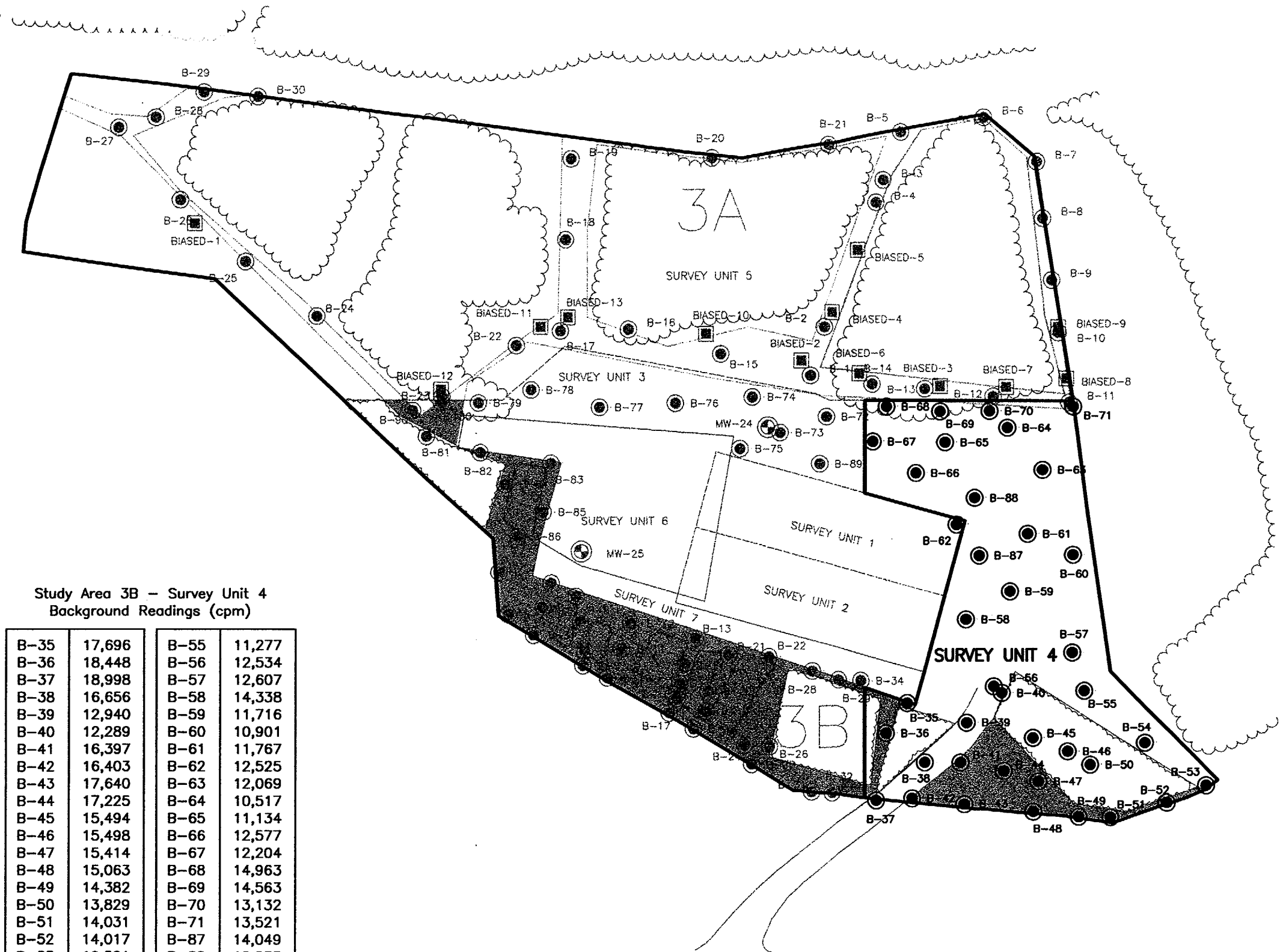

Study Area 3B – Survey Unit 4
Background Readings (cpm)

B-35	17,696	B-55	11,277
B-36	18,448	B-56	12,534
B-37	18,998	B-57	12,607
B-38	16,656	B-58	14,338
B-39	12,940	B-59	11,716
B-40	12,289	B-60	10,901
B-41	16,397	B-61	11,767
B-42	16,403	B-62	12,525
B-43	17,640	B-63	12,069
B-44	17,225	B-64	10,517
B-45	15,494	B-65	11,134
B-46	15,498	B-66	12,577
B-47	15,414	B-67	12,204
B-48	15,063	B-68	14,963
B-49	14,382	B-69	14,563
B-50	13,829	B-70	13,132
B-51	14,031	B-71	13,521
B-52	14,017	B-87	14,049
B-53	10,521	B-88	12,835
B-54	11,285		

Min = 10,517 Max = 18,998
Average = 13,935

LEGEND

CLEARED PATHWAY

BACKGROUND MEASUREMENT

SCALE – FEET
0 100

FIGURE 6.3–38
STUDY AREA 3B – SURVEY UNIT 4
LOCATION OF BACKGROUND READINGS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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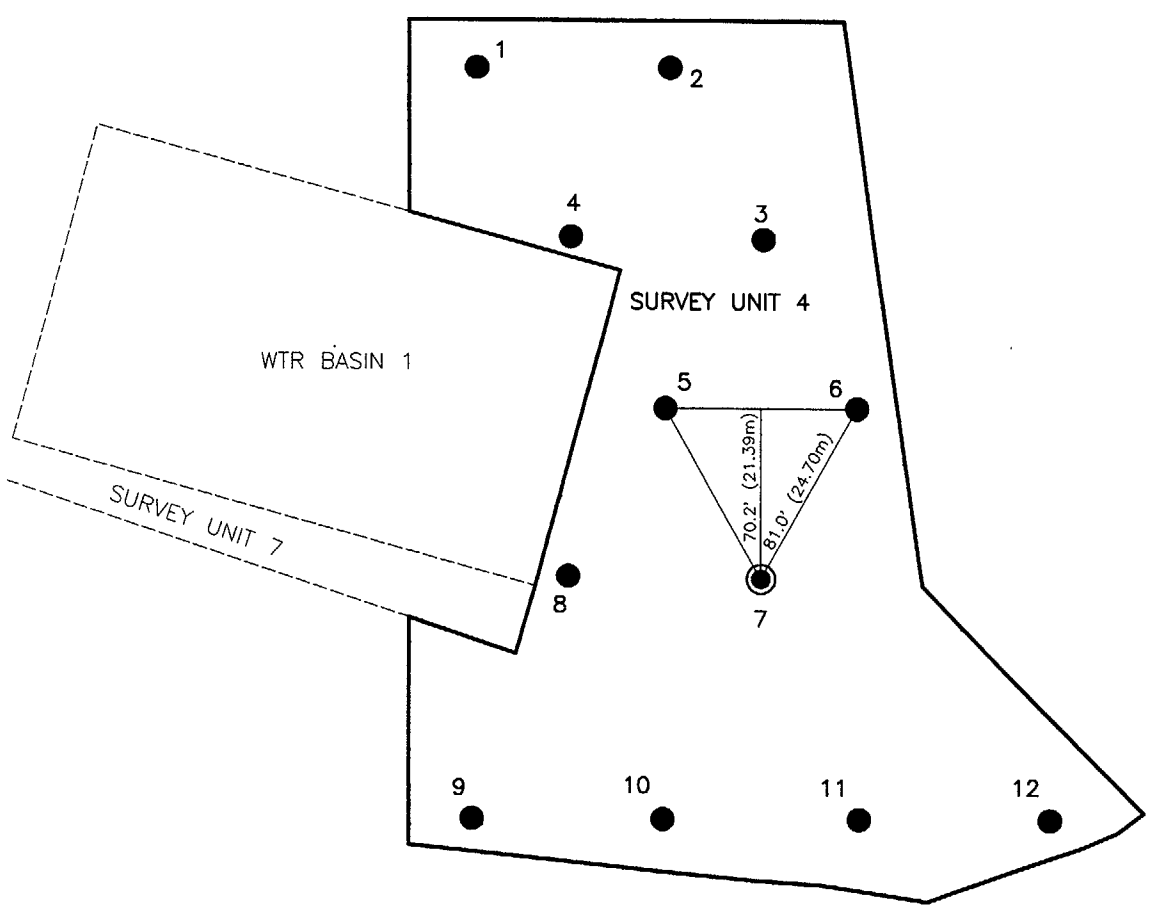

NOTES

A ≅ 68,255 FT^2 (6,341m^2)
n = 12
L = 81.0 FEET
◉ RANDOM START POINT

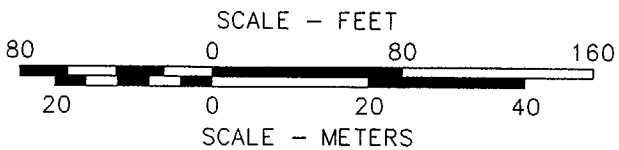

FIGURE 6.3 – 39
STUDY AREA 3B – SURVEY UNIT 4
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
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PITTSBURGH, PENNSYLVANIA

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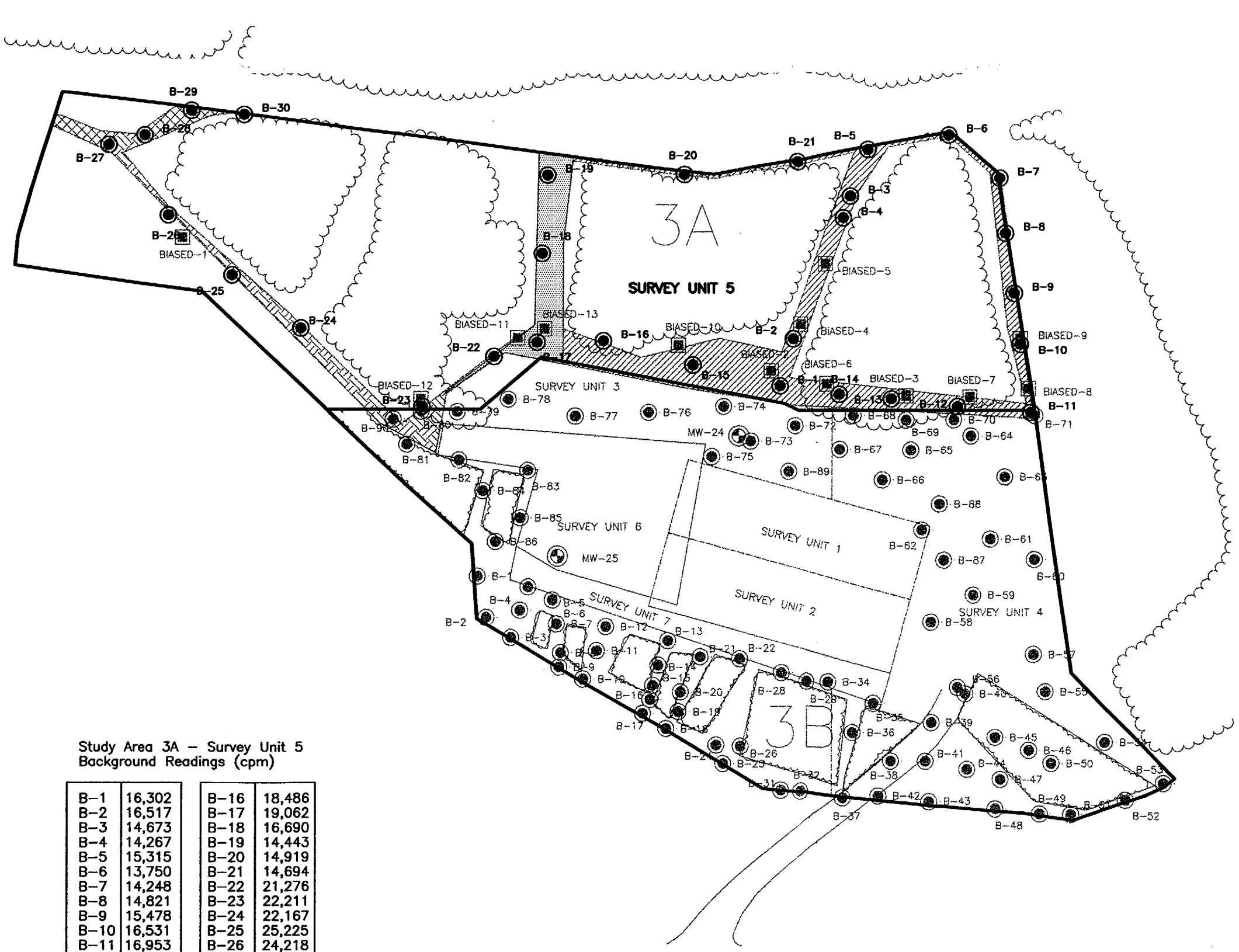

N

LEGEND

- 13–20 KCPM
- 22–30 KCPM
- 16–23 KCPM
- BACKGROUND MEASUREMENT

SCALE – FEET
0 100

Study Area 3A – Survey Unit 5
Background Readings (cpm)

B–1	16,302	B–16	18,486
B–2	16,517	B–17	19,062
B–3	14,673	B–18	16,690
B–4	14,267	B–19	14,443
B–5	15,315	B–20	14,919
B–6	13,750	B–21	14,694
B–7	14,248	B–22	21,276
B–8	14,821	B–23	22,211
B–9	15,478	B–24	22,167
B–10	16,531	B–25	25,225
B–11	16,953	B–26	24,218
B–12	16,374	B–27	19,095
B–13	16,334	B–28	18,220
B–14	15,769	B–29	18,129
B–15	17,152	B–30	16,630

Min = 13,750 Max = 25,225
Average = 17,332

FIGURE 6.3–40
STUDY AREA 3A – SURVEY UNIT 5
LOCATION OF BACKGROUND READINGS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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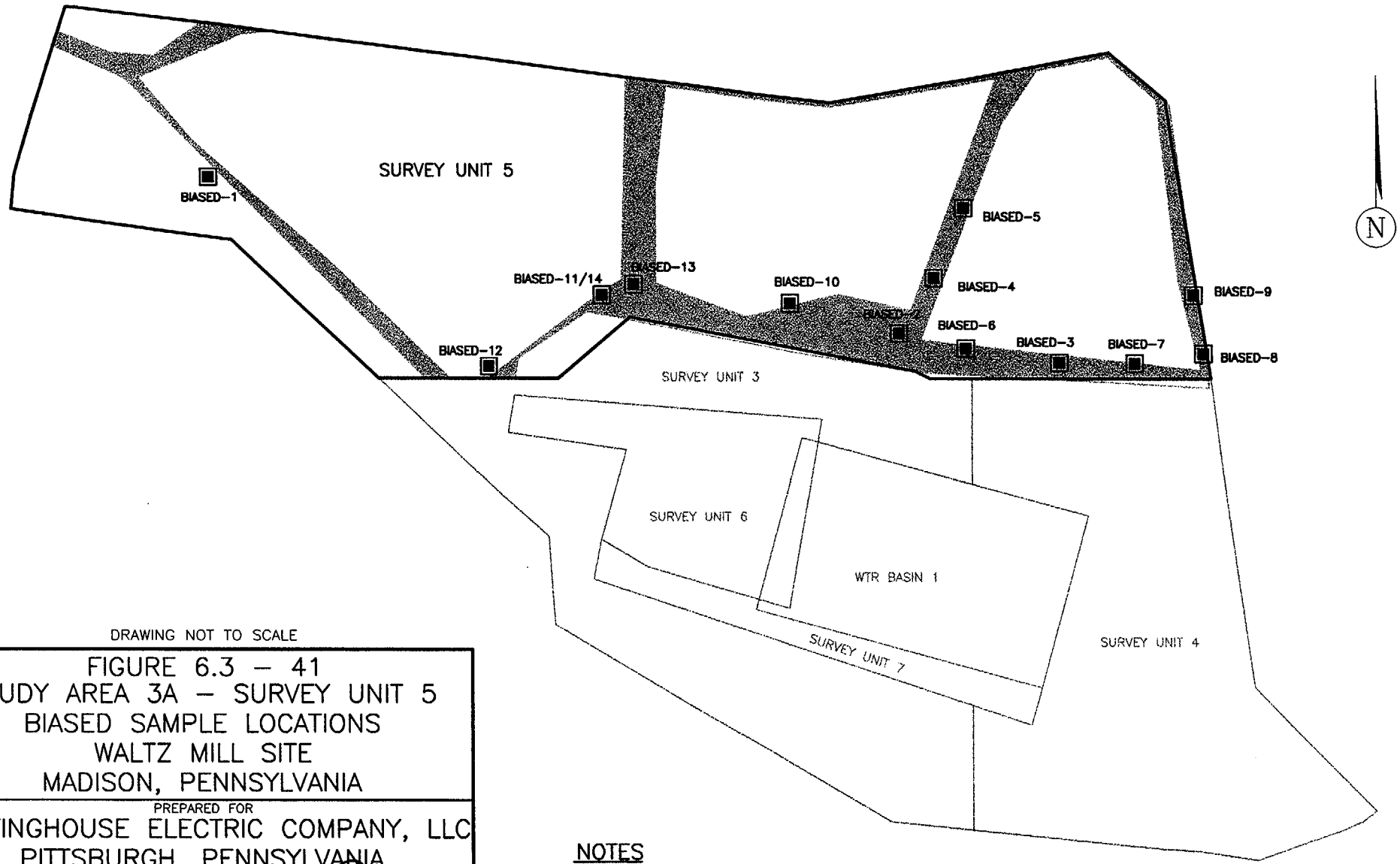

DRAWING NOT TO SCALE

FIGURE 6.3 – 41
STUDY AREA 3A – SURVEY UNIT 5
BIASED SAMPLE LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	5018089

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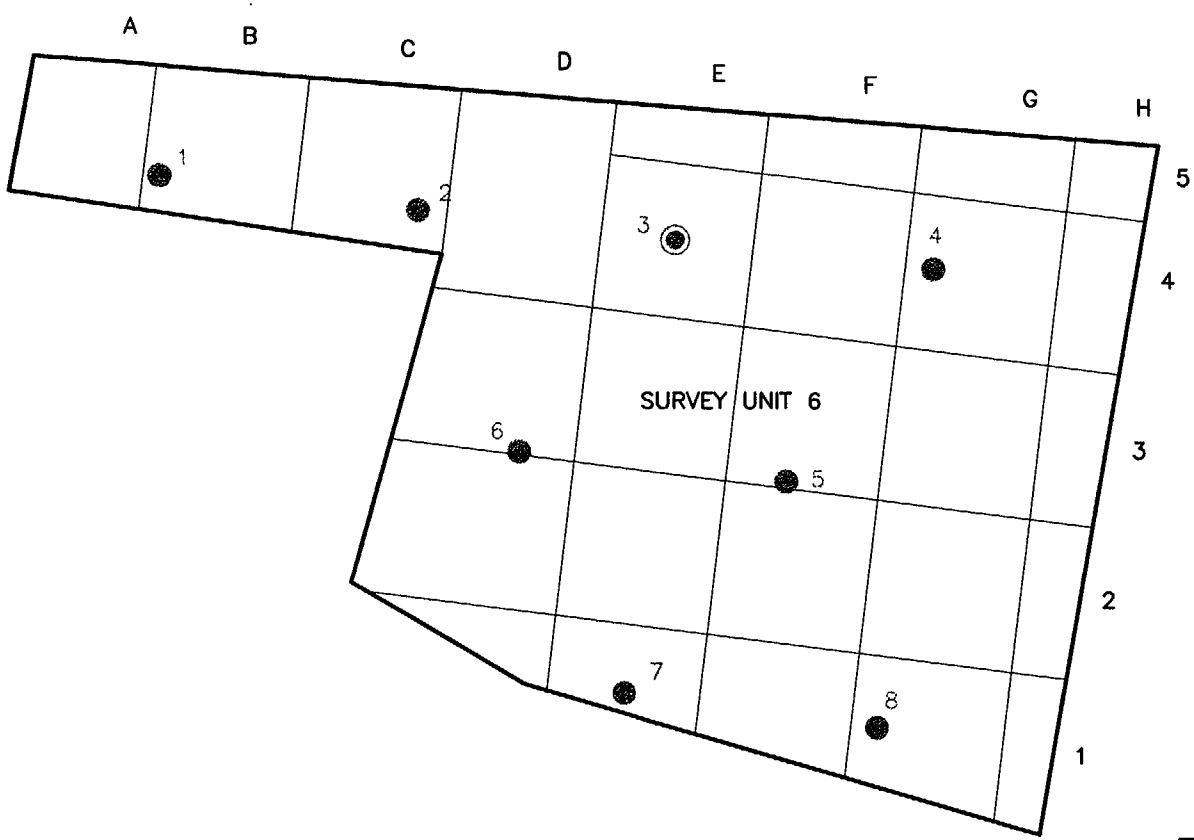
NOTES

A ≅ 182,200 FT^2 (16,926m^2)

CLEARED PATHWAYS

BIASED SAMPLE LOCATIONS



NOTES

GRIDS ARE APPROXIMATELY 10mx10m.

RANDOM START POINT

SAMPLING LOCATION

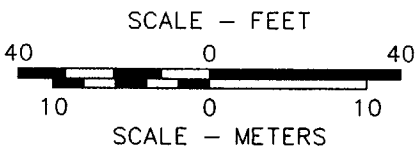


FIGURE 6.3–42
STUDY AREA 3B – SURVEY UNIT 6
GROSS GAMMA SCANNING GRIDS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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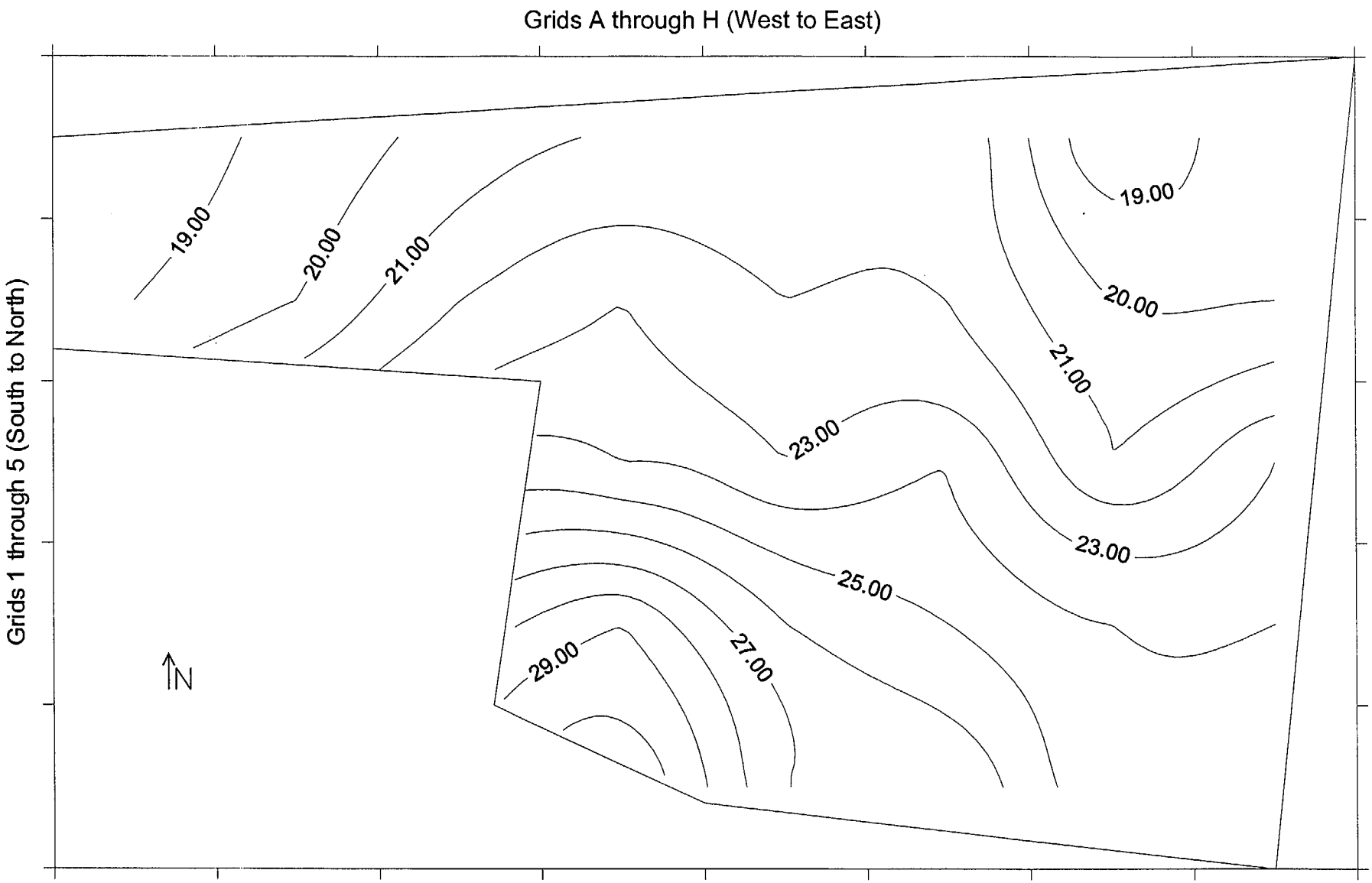
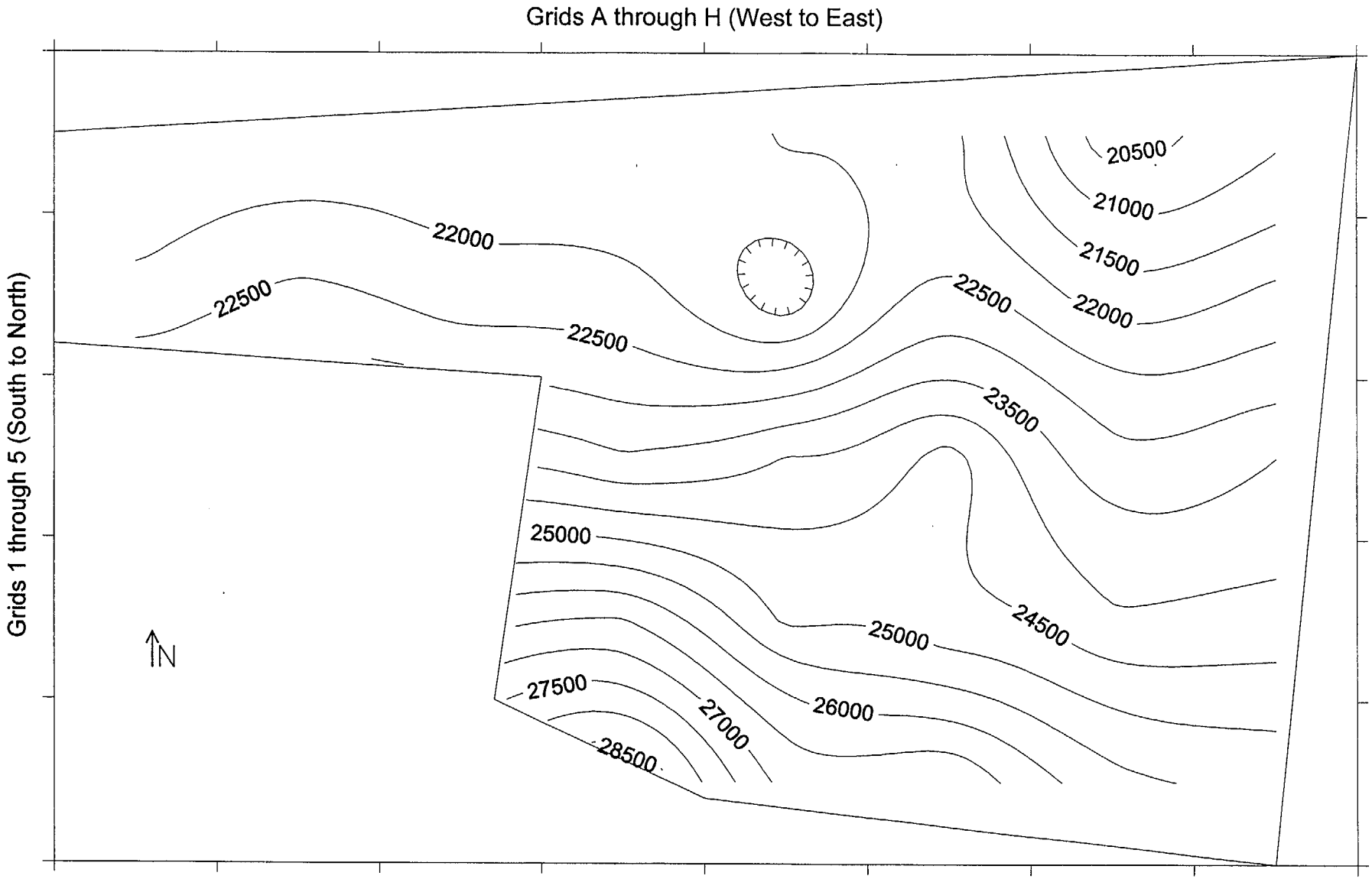


Average Gamma Scan Readings Ranged
From 18 kcpm to 31 kcpm

Figure 6.3-43
Study Area 3B - Survey Unit 6
Average Gamma Scan Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Essr/Cas/Surfer/Area3/Su06-a.srf

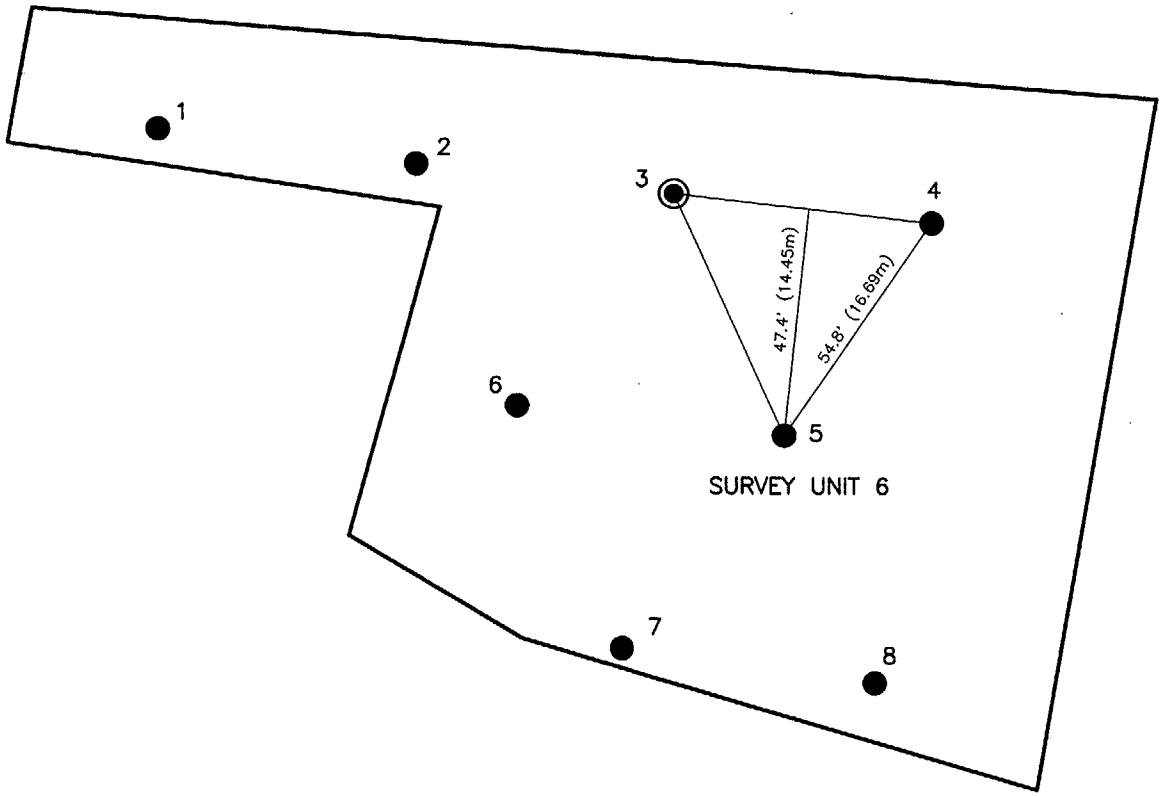


Background Readings Ranged From
20,170 cpm to 28,981 cpm

Figure 6.3-44
Study Area 3B - Survey Unit 6
Background Isopleths (cpm)

Earth Sciences Consultants, Inc.

k:/5018/Essr/Cas/Surfer/Area3/Su06.srf



N

NOTES

A ≅ 20,774 FT^2 (1,930m^2)
n = 8
L = 54.8 FEET
◉ RANDOM START POINT

SCALE – FEET
40 0 40 80
10 0 10 20
SCALE – METERS

FIGURE 6.3 – 45
STUDY AREA 3B – SURVEY UNIT 6
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

PREPARED FOR
WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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DRAWING NUMBER	5018087

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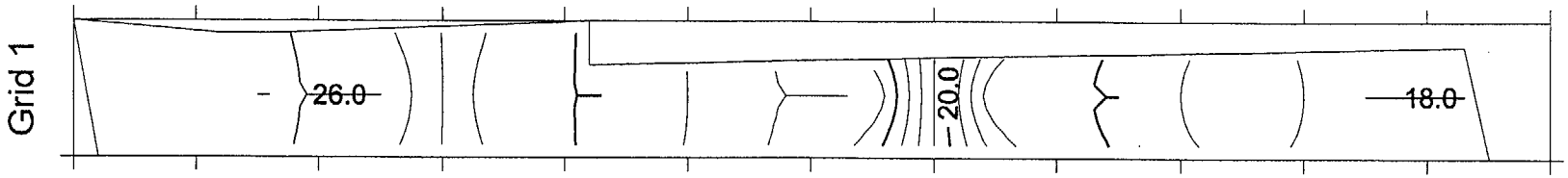
Average Gamma Scan

Grids A through L (West to East)

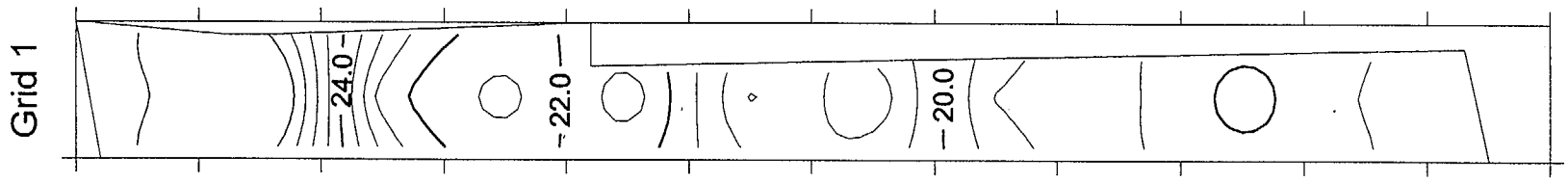


Average Gamma Scans Ranged
From 17 kcpm to 27 kcpm

N

Background Measurements

Grids A through L (West to East)

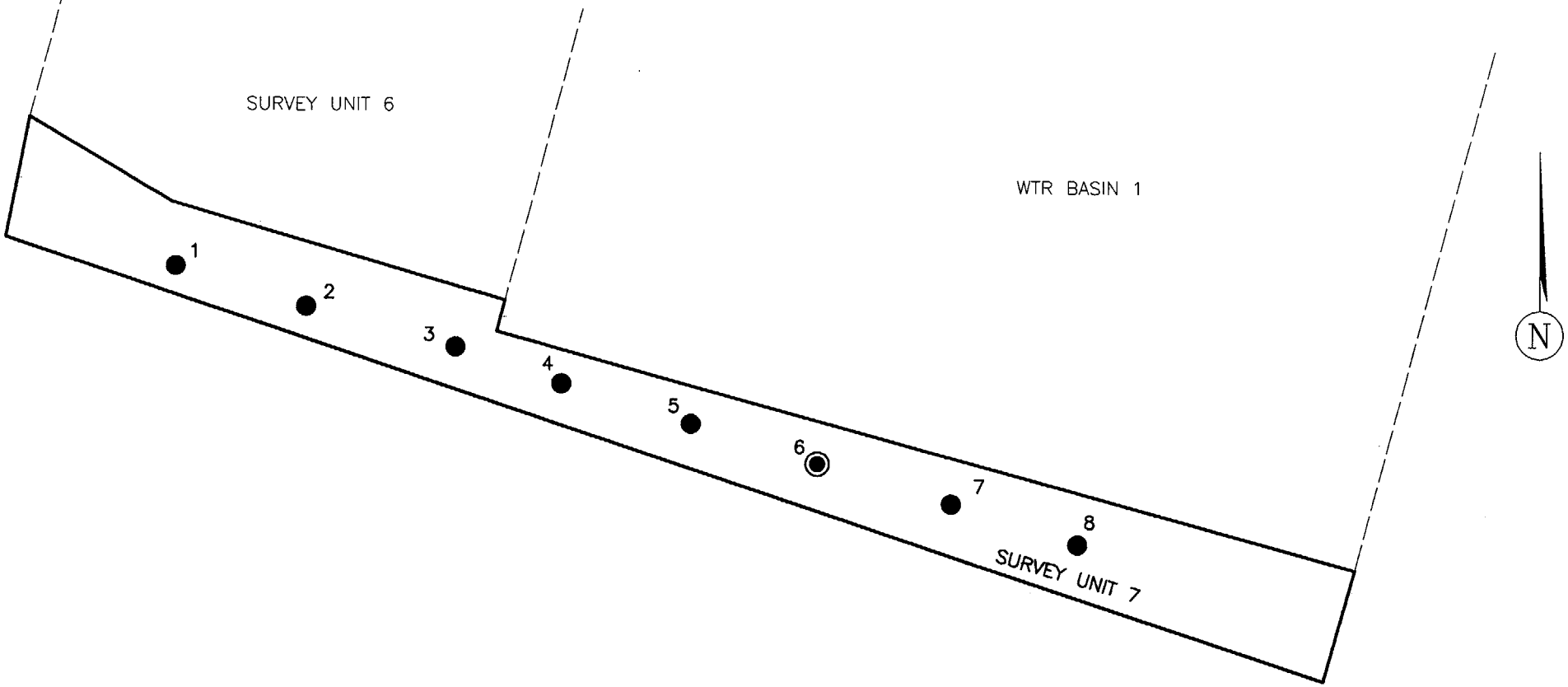


Background Measurements Ranged
From 17.8 kcpm to 27.5 kcpm

Figure 6.3-47
Study Area 3B - Survey Unit 7
Average and Background Gamma Isopleths (kcpm)

Earth Sciences Consultants, Inc.

k:/5018/Fssr/Cas/Surfer/Area3/Su07.srf



NOTES

A ≅ 8,200 FT^2 ($762m^2$)
n = 8
L = 34.4 FEET
◉ RANDOM START POINT

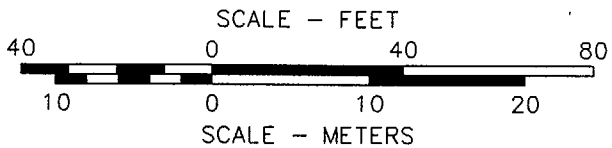


FIGURE 6.3 – 48
STUDY AREA 3B – SURVEY UNIT 7
FINAL STATUS SURVEY SAMPLING LOCATIONS
WALTZ MILL SITE
MADISON, PENNSYLVANIA

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WESTINGHOUSE ELECTRIC COMPANY, LLC
PITTSBURGH, PENNSYLVANIA

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