U.S. Army BRAC 2005
Site Investigation Report
Fort Monmouth

Final 21-July-2008

Table of Contents

Acronyms and Abbreviations xi

Executive Summary ES-1

1 Introduction and Scope of Work 1-1

1.1 Project Background 1-1
1.2 Project Objectives 1-2
1.3 Scope of Report 1-2
1.4 Report Organization 1-2
1.5 Property Description and History 1-3
1.5.1 Property Location and Description 1-3
1.5.1.1 Main Post 1-4
1.5.1.2 Charles Wood Area 1-4
1.5.2 Historic Land Use 1-5
1.5.2.1 Main Post 1-5
1.5.2.2 Charles Wood Area 1-5
1.5.3 Facility History 1-6

2 Site Investigation Methodologies 2-1

2.1 Field Investigation Methodologies 2-1
2.1.1 Geophysical Survey 2-1
2.1.1.1 Electromagnetic Induction 2-2
2.1.1.1.1 EM Survey Design 2-2
2.1.1.2 Ground-Penetrating Radar 2-5
2.1.2 Soil Sampling 2-6
2.1.2.1 Surface Soil Sampling 2-6
2.1.3 Subsurface Soil Sampling 2-7
2.1.3.1 Direct-Push Soil Sampling 2-7
2.1.3.2 Test Pit Sampling 2-7
2.1.4 Sanitary System Sampling 2-8
2.1.5 Sediment Sampling 2-8
2.1.6 Groundwater Sampling 2-9
2.1.6.1 Groundwater Sampling via a Direct-Push Rig 2-9
2.1.6.2 Groundwater Monitoring Well Sampling 2-9
2.1.7 Vapor Intrusion 2-9
2.1.7.1 Soil Gas Sampling 2-10
2.1.7.1.1 Near-Slab Soil Gas Sampling 2-10
2.1.7.1.2 Sub-Slab Soil Gas Sampling 2-11
2.1.7.2 Indoor Air Sampling 2-12
2.1.8 Decontamination Procedures for Sampling 2-13
2.1.9 Field QC Samples 2-13
2.1.10 Management of Investigation-Derived Wastes 2-13
2.1.10.1 Liquid Wastes 2-13
2.1.10.2 Soil and Sediment Wastes 2-13
2.1.10.3 Miscellaneous Wastes 2-14
2.2 Data Quality Objectives 2-14

2.3 Data Use 2-14
2.3.1 Action Levels 2-14
2.3.2 Investigation Endpoints 2-16
2.4 Sample Management and Analysis 2-17
2.4.1 Sample Containers, Preservation, and Holding Times 2-17
2.4.1.1 Containers 2-18
2.4.1.2 Sample Preservation and Holding Times 2-18
2.4.2 Sample Documentation 2-18
2.4.2.1 Field Logbook 2-18
2.4.2.2 Sample Labeling 2-19
2.4.2.3 Sample Chain-of-Custody 2-19
2.4.3 Sample Packaging and Shipment 2-19
2.4.4 Sample Receipt 2-19
2.4.5 Analytical Program 2-20
2.5 Quality Control 2-21
2.5.1 Completeness 2-21
2.5.2 Representativeness and Documentation Quality Review 2-22
2.5.3 Review of QC Samples 2-22
2.5.4 Work Plan Variances 2-23
2.5.5 Review of Tentatively Identified Compounds 2-23

3 Site-Specific Results 3-1

3.1 Parcel 13 – Former Barracks (Bldgs 2004 – 2016) 3-1
3.1.1 Site Description 3-1
3.1.2 Previous Investigations 3-1
3.1.3 Site Investigation Sampling 3-1
3.1.4 Site Investigation Results 3-3
3.1.5 Summary and Conclusions 3-4
3.2 Parcel 14 – Former Buildings and Former Residential Housing Area in Northwest Portion of CWA 3-14
3.2.1 Site Description 3-14
3.2.2 Previous Investigations 3-14
3.2.3 Site Investigation Sampling 3-14
3.2.4 Site Investigation Results 3-16
3.2.5 Summary and Conclusions 3-18
3.3 Parcel 15 – Bldg 2700 3-51
3.3.1 Site Description 3-51
3.3.2 Previous Investigations 3-52
3.3.3 Site Investigation Sampling 3-55
3.3.4 Site Investigation Results 3-59
3.3.5 Summary and Conclusions 3-62
3.4 Parcel 27 – Southwestern Corner CWA 3-87
3.4.1 Site Description 3-87
3.4.2 Previous Investigations 3-87
3.4.3 Site Investigation Sampling 3-87
3.4.4 Site Investigation Results 3-89
3.4.5 Summary and Conclusions 3-91

3.5 Parcel 28 – Former Eatontown Laboratory 3-96
3.5.1 Site Description 3-96
3.5.2 Previous Investigations 3-97
3.5.3 Site Investigation Sampling 3-97
3.5.4 Site Investigation Results 3-102
3.5.5 Summary and Conclusions 3-104
3.6 Parcel 34 – Bldg 2567 3-116
3.6.1 Site Description 3-116
3.6.2 Previous Investigations 3-116
3.6.3 Site Investigation Sampling 3-117
3.6.4 Site Investigation Results 3-118
3.6.5 Summary and Conclusions 3-118
3.7 Parcel 38 – Former Outdoor Pistol Range (1940 - 1955) 3-122
3.7.1 Site Description 3-122
3.7.2 Previous Investigations 3-122
3.7.3 Site Investigation Sampling 3-122
3.7.4 Site Investigation Results 3-123
3.7.5 Summary and Conclusions 3-123
3.8 Parcel 39 – Bldg 1150 (Vail Hall) 3-128
3.8.1 Site Description 3-128
3.8.2 Previous Investigations 3-128
3.8.3 Site Investigation Sampling 3-128
3.8.4 Site Investigation Results 3-129
3.8.5 Summary and Conclusions 3-131
3.9 Parcel 43 – Bldg 1122 (Do-It-Yourself Auto Repair) 3-136
3.9.1 Site Description 3-136
3.9.2 Previous Investigations 3-136
3.9.3 Site Investigation Sampling 3-137
3.9.4 Site Investigation Results 3-139
3.9.5 Summary and Conclusions 3-141
3.10 Parcel 49 – Former Squier Laboratory Complex, Museum Storage Facility, and MP Battery Test Facility 3-148
3.10.1 Site Description 3-148
3.10.2 Previous Investigations 3-149
3.10.3 Site Investigation Sampling 3-150
3.10.4 Site Investigation Results 3-153
3.10.5 Summary and Conclusions 3-156
3.11 Parcel 50 – IRP Sites FTMM-54, FTMM-55, and FTMM-61 3-167
3.11.1 Site Description 3-167
3.11.2 Previous Investigations 3-167
3.11.3 Site Investigation Sampling 3-168
3.11.4 Site Investigation Results 3-169
3.11.5 Summary and Conclusions 3-169
3.12 Parcel 51 – 750 Area, 500 Area, 600 Area, 1100 Area – Former Buildings 3-175
3.12.1 Site Description 3-175

3.12.2 Previous Investigations 3-175
3.12.3 Site Investigation Sampling 3-175
3.12.4 Site Investigation Results 3-178
3.12.5 Summary and Conclusions 3-180
3.13 Parcel 52 – Bldg 699 – Army/Air Force Exchange Services Gas Station 3-213
3.13.1 Site Description 3-213
3.13.2 Previous Investigations 3-213
3.13.3 Site Investigation Sampling 3-213
3.13.4 Site Investigation Results 3-214
3.13.5 Summary and Conclusions 3-214
3.14 Parcel 57 – Former Coal Storage and Railroad Unloading – 800 Area 3-218
3.14.1 Site Description 3-218
3.14.2 Previous Investigations 3-218
3.14.3 Site Investigation Sampling 3-218
3.14.4 Site Investigation Results 3-219
3.14.5 Summary and Conclusions 3-221
3.15 Parcel 61 – Bldg 1075 – Patterson Army Health Clinic 3-232
3.15.1 Site Description 3-232
3.15.2 Previous Investigations 3-232
3.15.3 Site Investigation Sampling 3-232
3.15.4 Site Investigation Results 3-234
3.15.5 Summary and Conclusions 3-235
3.16 Parcel 69 – Bldg 900 – Former Vehicle Repair/Motor Pool 3-240
3.16.1 Site Description 3-240
3.16.2 Previous Investigations 3-240
3.16.3 Site Investigation Sampling 3-240
3.16.4 Site Investigation Results 3-242
3.16.5 Summary and Conclusions 3-244
3.17 Parcel 70 – Bldg 551 – Former Photoprocessing 3-254
3.17.1 Site Description 3-254
3.17.2 Previous Investigations 3-254
3.17.3 Site Investigation Sampling 3-254
3.17.4 Site Investigation Results 3-255
3.17.5 Summary and Conclusions 3-256
3.18 Parcel 76 – 200 Area, 300 Area – Former Barracks 3-261
3.18.1 Site Description 3-261
3.18.2 Previous Investigations 3-261
3.18.3 Site Investigation Sampling 3-261
3.18.4 Site Investigation Results 3-263
3.18.5 Summary and Conclusions 3-264
3.19 Parcel 79 – 400 Area Former Buildings 3-277
3.19.1 Site Description 3-277
3.19.2 Previous Investigations 3-277
3.19.3 Site Investigation Sampling 3-277
3.19.4 Site Investigation Results 3-279
3.19.5 Summary and Conclusions 3-280

3.20 Parcel 80 – Former Bldgs 105 and 106 – Former Photoprocessing 3-291
3.20.1 Site Description 3-291
3.20.2 Previous Investigations 3-291
3.20.3 Site Investigation Sampling 3-291
3.20.4 Site Investigation Results 3-292
3.20.5 Summary and Conclusions 3-293
3.21 Parcel 83 – Northeast MP – Former Photoprocessing, Former Vehicle Maintenance, Former Coal Storage and Railroad Unloading, Maintenance Shops 3-298
3.21.1 Site Description 3-298
3.21.2 Previous Investigations 3-300
3.21.3 Site Investigation Sampling 3-300
3.21.4 Summary and Conclusions 3-305
3.22 Sanitary Sewer System 3-321
3.22.1 Site Description 3-321
3.22.2 Previous Investigations 3-321
3.22.3 Site Investigation Sampling 3-322
3.22.4 Site Investigation Results 3-323
3.22.5 Summary and Conclusions 3-323
3.23 Electrical Substations 3-328
3.23.1 Site Description 3-328
3.23.2 Previous Investigations 3-328
3.23.3 Site Investigation Sampling 3-329
3.23.4 Summary and Conclusions 3-330

4 Conclusions and Recommendations 4-1

4.1 Conclusions 4-1
4.1.1 Geophysical Surveys 4-1
4.1.2 Surface and Subsurface Soil Investigations 4-1
4.1.3 Groundwater Investigations 4-2
4.1.4 Sediment Investigations 4-3
4.1.5 Vapor Intrusion Investigations 4-4
4.1.5.1 Soil Gas 4-4
4.1.5.2 Indoor Air 4-4
4.1.6 Other Investigations 4-5
4.2 Recommendations 4-5

5 References 5-1

List of Figures

Figure ES-1 Charles Wood Area ECP Parcels Investigated ES-12
Figure ES-2 Main Post ECP Parcels Investigated ES-13
Figure 3.1-1 Parcel 13 Sample Locations 3-13
Figure 3.2-1 Parcel 14 Sample Locations 3-49
Figure 3.2-2 Parcel 14 Suspected UST Locations 3-50

Figure 3.3-1 Parcel 15 Soil, Sediment, and Groundwater Sample Locations and Constituents of Concern 3-85
Figure 3.3-2 Parcel 15 Soil Gas and Indoor Air Sample Locations and Constituents of Concern 3-86
Figure 3.4-1 Parcel 27 Sample Locations and Constituents of Concern 3-95
Figure 3.5-1 Parcel 28 Sample Locations and Constituents of Concern 3-114
Figure 3.5-2 Parcel 28 Suspected UST and GRP Scanning Results 3-115
Figure 3.6-1 Parcel 34 Sample Locations and Constituents of Concern 3-121
Figure 3.7-1 Parcel 38 Sample Locations 3-127
Figure 3.8-1 Parcel 39 Sample Locations and Constituents of Concern 3-135
Figure 3.9-1 Parcel 43 Sample Locations and Constituents of Concern 3-147
Figure 3.10-1 Parcel 49 Sample Locations and Constituents of Concern 3-166
Figure 3.11-1 Parcel 50 Sample Locations and Constituents of Concern 3-174
Figure 3.12-1 Parcel 51 Sample Locations and Constituents of Concern 3-211
Figure 3.12-2 Parcel 51 Suspected UST Locations 3-212
Figure 3.13-1 Parcel 52 Sample Locations and Constituents of Concern 3-217
Figure 3.14-1 Parcel 57 Sample Locations and Constituents of Concern 3-231
Figure 3.15-1 Parcel 61 Sample Locations and Constituents of Concern 3-239
Figure 3.16-1 Parcel 69 Sample Locations and Constituents of Concern 3-253
Figure 3.17-1 Parcel 70 Sample Locations 3-260
Figure 3.18-1 Parcel 76 Sample Locations 3-275
Figure 3.18-2 Parcel 76 Suspected UST Locations 3-276
Figure 3.19-1 Parcel 79 Sample Locations 3-289
Figure 3.19-2 Parcel 79 Suspected UST Locations 3-290
Figure 3.20-1 Parcel 80 Sample Locations and Constituents of Concern 3-297
Figure 3.21-1 Parcel 83 Sample Locations and Constituents of Concern 3-320
Figure 3.22-1 Sanitary Sample Locations Buildings 814, 1075 and Former Building 834 3-325
Figure 3.22-2 Sanitary Sample Locations Buildings 209, 283, 292 and Former Building 680 3-326
Figure 3.22-3 Sanitary Sample Locations Building 2700 3-327
Figure 3.23-1 Electrical Substation Sample Locations Building 978 3-334
Figure 3.23-2 Electrical Substation Sample Locations Building 1231 3-335
Figure 3.23-3 Electrical Substation Sample Locations Building 2700 3-336
Figure 3.23-4 Electrical Substation Sample Locations Building 2716 3-337

List of Tables

Table ES-1 Geophysical Surveys Results Summary ES-3
Table ES-2 ECP Site Investigation Results Summary ES-8
Table 2-1 Sample Containers, Preservation and Holding Times 2-17
Table 2-2 TCL+30 2-25
Table 2-3 VO+10 2-31
Table 2-4 B/N+15 2-33
Table 2-5 PCBs 2-36
Table 2-6 TPHC 2-37

Table 2-7 TAL Metals 2-38
Table 2-8 Cyanide 2-39
Table 2-9 List of Required Compounds, Molecular Weights and NJDEP Required Reporting Limits - NJDEP-SRWM USEPA Method TO-15 . 2-40
Table 2-10 Summary of Detections in Trip and Field Blanks 2-42
Table 3.1-1 Parcel 13 Sampling Location, Rationale and Analytical 3-2
Table 3.1-2 Parcel 13 Sample and Analytical Summary 3-5
Table 3.1-3 Parcel 13 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-10
Table 3.1-4 Parcel 13 Summary of TPHC Detected in Soil 3-11
Table 3.1-5 Parcel 13 Summary of Analytical Parameters Detected in Groundwater 3-12
Table 3.2-1 Parcel 14 Sampling Location, Rationale and Analytical 3-15
Table 3.2-2 Parcel 14 Sample and Analytical Summary 3-19
Table 3.2-3 Parcel 14 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-38
Table 3.2-4 Parcel 14 Summary of TPHC Detected in Soil 3-44
Table 3.2-5 Parcel 14 Summary of Analytical Parameters Detected in Soil 3-45
Table 3.2-6 Parcel 14 Summary of Analytical Parameters Detected in Groundwater 3-46
Table 3.3-1 Parcel 15 Sampling Location, Rationale and Analytical 3-57
Table 3.3-2 Parcel 15 Sample and Analytical Summary 3-64
Table 3.3-3 Parcel 15 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-75
Table 3.3-4 Parcel 15 Summary of Analytical Parameters Detected in Sediment 3-78
Table 3.3-5 Parcel 15 Summary of Analytical Parameters Detected in Soil Gas .. 3-79
Table 3.3-6 Parcel 15 Summary of Analytical Parameters Detected in Indoor Air 3-80
Table 3.3-7 Parcel 15 Summary of TPHC Detected in Soil 3-83
Table 3.3-8 Parcel 15 Summary of Analytical Parameters Detected in Groundwater 3-84
Table 3.4-1 Parcel 27 Sampling Location, Rationale and Analytical 3-89
Table 3.4-2 Parcel 27 Sample and Analytical Summary 3-92
Table 3.4-3 Parcel 27 Summary of Analytical Parameters Detected in Soil 3-93
Table 3.4-4 Parcel 27 Summary of Analytical Parameters Detected in Sediment 3-94
Table 3.5-1 Parcel 28 Sampling Location, Rationale and Analytical 3-100
Table 3.5-2 Parcel 28 Sample and Analytical Summary 3-106
Table 3.5-3 Parcel 28 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-108
Table 3.5-4 Parcel 28 Summary of Analytical Parameters Detected in Soil South of Corregidor Road 3-109
Table 3.5-5 Parcel 28 Summary of Analytical Parameters Detected in Soil North of Corregidor Road 3-111

Table 3.5-6 Parcel 28 Summary of Analytical Parameters Detected in Groundwater 3-112
Table 3.5-7 Parcel 28 Summary of Analytical Parameters Detected in Sediment 3-113
Table 3.6-1 Parcel 34 Sampling Location, Rationale and Analytical 3-117
Table 3.6-2 Parcel 34 Sample and Analytical Summary 3-119
Table 3.6-3 Parcel 34 Summary of Analytical Parameters Detected in Soil Gas 3-120
Table 3.7-1 Parcel 38 Sampling Location, Rationale and Analytical 3-123
Table 3.7-2 Parcel 38 Sample and Analytical Summary 3-124
Table 3.7-3 Parcel 38 Summary of Analytical Parameters Detected in Soil 3-125
Table 3.8-1 Parcel 39 Sampling Location, Rationale and Analytical 3-129
Table 3.8-2 Parcel 39 Sample and Analytical Summary 3-132
Table 3.8-3 Parcel 39 Summary of Analytical Parameters Detected in Soil 3-133
Table 3.8-4 Parcel 39 Summary of Analytical Parameters Detected in Sediment 3-134
Table 3.9-1 Parcel 43 Sampling Location, Rationale and Analytical 3-138
Table 3.9-2 Parcel 43 Sample and Analytical Summary 3-143
Table 3.9-3 Parcel 43 Summary of Analytical Parameters Detected in Sediment 3-144
Table 3.9-4 Parcel 43 Summary of Analytical Parameters Detected in Soil Gas 3-145
Table 3.9-5 Parcel 43 Summary of Analytical Parameters Detected in Indoor Air 3-146
Table 3.10-1 Parcel 49 Sampling Location, Rationale and Analytical 3-151
Table 3.10-2 Parcel 49 Sample and Analytical Summary 3-158
Table 3.10-3 Parcel 49 Summary of Analytical Parameters Detected in Soil 3-161
Table 3.10-4 Parcel 49 Summary of Analytical Parameters Detected in Groundwater 3-164
Table 3.10-5 Parcel 49 Summary of Analytical Parameters Detected in Sediment 3-165
Table 3.11-1 Parcel 50 Sampling Location, Rationale and Analytical 3-168
Table 3.11-2 Parcel 50 Sample and Analytical Summary 3-170
Table 3.11-3 Parcel 50 Summary of Analytical Parameters Detected in Indoor Air 3-171
Table 3.11-4 Parcel 50 Summary of Analytical Parameters Detected in Soil Gas 3-173
Table 3.12-1 Parcel 51 Sampling Location, Rationale and Analytical 3-176
Table 3.12-2 Parcel 51 Sample and Analytical Summary 3-181
Table 3.12-3 Parcel 51 – 750 Area Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-199
Table 3.12-4 Parcel 51 – 600 and 1100 Area Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-203
Table 3.12-5 Parcel 51 Summary of TPHC Detected in Soil 3-206
Table 3.12-6 Parcel 51 Summary of Analytical Parameters Detected in Soil 3-208

Table 3.12-7 Parcel 51 Summary of Analytical Parameters Detected in Groundwater 3-209
Table 3.13-1 Parcel 52 Sampling Location, Rationale and Analytical 3-214
Table 3.13-2 Parcel 52 Sample and Analytical Summary 3-215
Table 3.13-3 Parcel 52 Summary of Analytical Parameters Detected in Soil Gas 3-216
Table 3.14-1 Parcel 57 Sampling Location, Rationale and Analytical 3-219
Table 3.14-2 Parcel 57 Sample and Analytical Summary 3-222
Table 3.14-3 Parcel 57 Summary of Analytical Parameters Detected in Soil 3-226
Table 3.14-4 Parcel 57 Summary of Analytical Parameters Detected in Groundwater 3-230
Table 3.15-1 Parcel 61 Sampling Location, Rationale and Analytical 3-233
Table 3.15-2 Parcel 61 Sample and Analytical Summary 3-236
Table 3.15-3 Parcel 61 Summary of Analytical Parameters Detected in Soil 3-237
Table 3.15-4 Parcel 61 Summary of Analytical Parameters Detected in Sediment 3-238
Table 3.16-1 Parcel 69 Sampling Location, Rationale and Analytical 3-242
Table 3.16-2 Parcel 69 Sample and Analytical Summary 3-246
Table 3.16-3 Parcel 69 Summary of Analytical Parameters Detected in Soil 3-249
Table 3.16-4 Parcel 69 Summary of Analytical Parameters Detected in Groundwater 3-251
Table 3.16-5 Parcel 69 Summary of Analytical Parameters Detected in Sediment 3-252
Table 3.17-1 Parcel 70 Sampling Location, Rationale and Analytical 3-255
Table 3.17-2 Parcel 70 Sample and Analytical Summary 3-257
Table 3.17-3 Parcel 70 Summary of Analytical Parameters Detected in Soil 3-258
Table 3.17-4 Parcel 70 Summary of Analytical Parameters Detected in Sediment 3-259
Table 3.18-1 Parcel 76 Sampling Location, Rationale and Analytical 3-262
Table 3.18-2 Parcel 76 Sample and Analytical Summary 3-266
Table 3.18-3 Parcel 76 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-271
Table 3.18-4 Parcel 76 Summary of TPHC Detected in Soil 3-272
Table 3.18-5 Parcel 76 Summary of Analytical Parameters Detected in Soil 3-273
Table 3.18-6 Parcel 76 Summary of Analytical Parameters Detected in Groundwater 3-274
Table 3.19-1 Parcel 79 Sampling Location, Rationale and Analytical 3-278
Table 3.19-2 Parcel 79 Sample and Analytical Summary 3-281
Table 3.19-3 Parcel 79 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results 3-286
Table 3.19-4 Parcel 79 Summary of TPHC Detected in Soil 3-287
Table 3.19-5 Parcel 79 Summary of Analytical Parameters Detected in Groundwater 3-288
Table 3.20-1 Parcel 80 Sampling Location, Rationale and Analytical 3-292
Table 3.20-2 Parcel 80 Sample and Analytical Summary 3-294
Table 3.20-3 Parcel 80 Summary of Analytical Parameters Detected in Soil 3-295

Table 3.20-4 Parcel 80 Summary of Analytical Parameters Detected in Groundwater 3-296
Table 3.21-1 Parcel 83 Sampling Location, Rationale and Analytical 3-301
Table 3.21-2 Parcel 83 Sample and Analytical Summary 3-306
Table 3.21-3 Parcel 83 Summary of TPHC Detected in Soil 3-311
Table 3.21-4 Parcel 83 Summary of Analytical Parameters Detected in Soil 3-312
Table 3.21-5 Parcel 83 Summary of Analytical Parameters Detected in Groundwater 3-318
Table 3.22-1 Sanitary Sewer System Sampling Location, Rationale and Analytical 3-322
Table 3.22-2 Sanitary Sewer System Sample and Analytical Summary 3-324
Table 3.23-1 Electrical Substations Sampling Location, Rationale and Analytical 3-330
Table 3.23-2 Electrical Substation Sample and Analytical Summary 3-331
Table 3.23-3 Electrical Substation Summary of Analytical Parameters Detected in Soil 3-333
Table 4-1 Summary of Parcel Recommendations 4-8

List of Appendices

Appendix A – Geophysical Report for Geophysical Surveys

Appendix B – Fort Monmouth Standard Operating Procedures

Appendix C – Indoor Air Building Survey and Sampling Forms

Appendix D – Copies of Field Logbooks

Appendix E – Analytical Data Packages

Appendix F – Geotechnical Soil Boring Logs

Appendix G – Historic Figures and Aerial Photographs

Appendix H – Fort Monmouth Maximum Background Concentrations

Appendix I – Supporting Documentation for Suspected Underground Storage Tanks Associated with Listed Buildings

Acronyms and Abbreviations

Acronym	Full Title
°C	Degrees Celsius
μg/L	Micrograms per liter
$\mu g/m^3$	Micrograms per cubic meter
amsl	Above mean sea level
AOC	Area of Concern
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
B/N	Base/Neutral
bgs	Below ground surface
Bldg	Building
BRAC	Base Realignment and Closure
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
Cabrera	Cabrera Services, Inc.
CEA	Classification Exception Area
CECOM	U.S. Army Communications and Electronics Command
COC	Constituent of Concern
CWA	Charles Wood Area
CWBC	Charles Wood Background Concentration
DCE	Dichloroethene
DGPS	Differential GPS
DPW	Directorate of Public Works
DQO	Data Quality Objective
ECP	Environmental Condition of Property
EM	Electromagnetic Induction
ER-L	Effects Range – Low
ER-M	Effects Range – Medium
ETD&L	Electronics Technology Devices Laboratory
FID	Flame Ionization Detector
ft	Foot or feet
FTMM	Fort Monmouth
GC/MS	Gas Chromatography/Mass Spectroscopy
GPR	Ground-Penetrating Radar
GPS	Global Positioning System
GWQC	Groundwater Quality Criteria
GWSL	Groundwater Screening Level
GWTS	Groundwater Treatment System
HRC	Hydrogen Releasing Compound
HRR	Historical Records Review
HSA	Historical Site Assessment
HVAC	Heating, Ventilation, and Air Conditioning
IH	Industrial Hygiene
IGWSCC	Impact to Groundwater Soil Cleanup Criteria
IRP	Installation Restoration Program
kVA	Kilovolt-ampere
LEL	Lowest Effects Level

Acronym	Full Title
LOC	Level of Concern
m	Meter
MBC	Maximum Background Concentration
MC	Munitions Constituents
MDL	Method Detection Limit
MEC	Munitions and Explosives of Concern
mg/kg	Milligrams per kilogram
mmhos/m	Millimhos per meter
MMRP	Military Munitions Response Program
MP	Main Post
MPBC	Main Post Background Concentration
MTBE	Methyl tert-butyl ether
NAD	North American Datum
NFA	No Further Action
NJDEP	New Jersey Department of Environmental Protection
NRDCSCC	Non-Residential Direct Contact Soil Cleanup Criteria
NRIASL	Non-Residential Indoor Air Screening Level
NRS	Non-Residential Standard
NRSGSL	Non-Residential Soil Gas Screening Level
OQA	Office of Quality Assurance
ORC	Oxygen Release Compound
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
PID	Photoionization Detector
ppm	Parts per million
ppt	Parts per thousand
PQL	Practical Quantitation Limit
PVC	Polyvinyl Chloride
QC	Quality Control
R&D	Research and Development
RAM	Radioactive Material
RCRA	Resource Conservation and Recovery Act
RDCSCC	Residential Direct Contact Soil Cleanup Criteria
RI	Remedial Investigation
RL	Reporting Limit
RR	Railroad
Shaw	Shaw Environmental, Inc.
SEL	Severe Effects Level
SI	Site Investigation
SOP	Standard Operating Procedure
SRWM	Site Remediation Waste Management
STP	Sewage Treatment Plant
SVE	Soil Vapor Extraction
TAL	Target Analyte List
TBA	Tert-butyl alcohol
TCE	Trichloroethylene
TCL	Target Compound List
TIC	Tentatively Identified Compound

Acronym	Full Title
TPHC	Total Petroleum Hydrocarbon Content
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USAEHA	U.S. Army Environmental Hygiene Agency
USEPA	U.S. Environmental Protection Agency
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
VI	Vapor Intrusion
VO	Volatile Organic
VOA	Volatile Organic Analysis
VSI	Visual Site Inspection

Executive Summary

Fort Monmouth (FTMM) is an Army installation occupying approximately 1,126 acres in Monmouth County in central New Jersey, approximately 40 miles east of Trenton. FTMM is comprised of two operational areas known as the Main Post (MP) and Charles Wood Area (CWA). Fort Monmouth will hereafter be referred to as FTMM or the "Site" or "Property." When referred to separately, the two operational areas will be referred to as CWA or MP. The MP encompasses the 637-acre area that is generally bounded by State Highway 35 to the west, Parkers Creek to the north, the New Jersey Transit Railroad (RR) to the east, and Main Street and State Highway 71 to the south. The CWA encompasses the 489-acre area bounded by the Garden State Parkway to the west, Tinton Avenue to the north, Maxwell Place and the New Jersey Transit RR to the east, and Pine Brook to the south.

The primary mission of FTMM is to provide command, administrative, and logistical support for Headquarters, U.S. Army Communications and Electronics Command. The support provided by the Garrison is used by tenant activities in the performance of research, development, procurement, and production of prototype communications and electronics equipment for use by the U.S. Armed Forces. The MP provides supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for FTMM. These facilities are distributed across the property, with no distinct clustering of functions. The CWA is used primarily for research and development, testing, housing, and recreation. The CWA research, development, and testing facilities occupy the southwest corner of CWA. The northwest corner formerly consisted of residential units but is currently undeveloped. Residential units currently occupy the southeastern boundary and the golf course occupies the northeast corner.

FTMM was identified as a facility to be closed as part of Base Realignment and Closure (BRAC) 2005. As part of this process, it is necessary for the Army to identify and document the environmental liabilities associated with installations where the BRAC action will involve the disposal of property. The environmental condition of property (ECP) process is the mechanism to provide a summary of the current environmental condition of a property.

A Phase I ECP Assessment was conducted in 2006 and 2007. The final Phase I ECP Report for FTMM was completed on January 29, 2007 (1). The Phase I ECP evaluated the existing environmental conditions, and the property was characterized into parcels according to their environmental condition based on Department of Defense guidelines. Using the results of the Phase I ECP Report, site investigation (SI) sampling recommendations were developed for 21 specific parcels and two areas of concern where no existing data or insufficient data were present to fully evaluate the environmental condition of the property. Six parcels are located within the CWA (**Figure ES-1**), and the remaining 15 parcels are located within the MP (**Figure ES-2**).

The purpose of this SI is to move forward with the recommendations made as part of the Phase I ECP to determine whether hazardous substances or petroleum products

have been disposed or released on the property and to obtain defensible evidence that confirms or denies that releases have occurred. The goals of the SI are to further assess the level of environmental liability of each parcel and to close data gaps that were identified during the Phase I ECP.

Field activities were conducted in accordance with New Jersey Department of Environmental Protection (NJDEP) regulations and guidance to evaluate the presence/absence of contamination. Field investigations included conducting geophysical surveys and the collection of soil, sediment, groundwater, soil gas, indoor air, and aqueous sanitary samples for chemical analysis. Results of the geophysical surveys were evaluated, and the sampling data were compared against applicable NJDEP standards and background levels for the determination of constituents of concern (COCs) on a parcel-specific basis. Based on the identified COCs, parcel-specific recommendations were then developed. A summary of the field activities conducted, COCs, and recommendations for each parcel investigated are included in **Table ES-2**.

Investigations

Geophysical Surveys

The primary fuels used throughout the history of FTMM have been coal, fuel oil, diesel, and gasoline. Until the early 1990s, the primary method of heating for FTMM had been through the use of heating oil. The majority of structures at FTMM were heated by boilers fueled by heating oil stored in underground storage tanks (USTs) for that individual building. From the 1940s through the 1980s, FTMM utilized USTs/aboveground storage tanks as the primary fuel storage method. In the early 1990s, the FTMM Directorate of Public Works developed a UST program for managing approximately 474 USTs throughout the FTMM installation (MP and CWA). This program was created to work toward replacing the use of heating oil as a major energy source and to convert to natural gas.

A review of documented UST removal locations versus the location of former buildings (via historic aerial photographs and historic engineering drawings) was conducted as part of the Phase I ECP. Based on this review, it was determined that no UST removals have been documented within select parcels. In order to determine the absence/presence of formerly utilized USTs, geophysical surveys were conducted within Parcels 13, 14, 15, 28, 51, 76, and 79. Geophysical surveys were also performed within Parcel 28 to evaluate the absence/presence of septic tanks and related features identified on historic engineering drawings and a possible debris disposal area within Parcel 27 that was anecdotally identified during discussion with facility personnel.

Geophysical survey techniques included electromagnetic induction and ground-penetrating radar. Results of the geophysical surveys suggest site conditions at all of the Parcels investigated are consistent with previous historical use. The areas in which geophysical surveys were conducted have been developed for many years, and in most locations multiple generations of buildings have existed in these areas. As a result,

small pieces of metal and other small remnants from previous uses are likely to be dispersed throughout the areas. In summary, a total of 24 suspected USTs and two suspected septic features (one suspected septic tank and one suspected septic distribution box) were identified as part of the geophysical surveys and are summarized in **Table ES-1**. No anomalies indicative of burial areas were identified during the geophysical surveys. No further evaluation of the Parcels with respect to geophysical survey results is recommended.

Table ES-1
Geophysical Surveys Results Summary

Location	Parcel	Suspected USTs	Suspected Septic Tanks
CWA	13	0	NA
CWA	14	1	NA
CWA	15	0	NA
CWA	27	NA	NA
CWA	28	1	2
MP	51	11	NA
MP	76	7	NA
MP	79	4	NA

NA = Not applicable.

Vapor Intrusion Investigations

Vapor Intrusion (VI) is the migration of organic compounds from the subsurface into overlying buildings (11). Per NJDEP guidance and consistent with U.S. Environmental Protection Agency policy, the NJDEP recommends investigation of VI where structures are within 100 feet (ft) horizontally or vertically of shallow groundwater contamination in excess of groundwater screening levels (GWSLs). In the case of the presence of petroleum hydrocarbon contamination (particularly benzene, toluene, ethylbenzene, and xylenes [BTEX]), a 30-ft distance criterion is utilized (12). Groundwater has been extensively evaluated at FTMM through the FTMM Installation Restoration Program and the analysis of groundwater samples in conjunction with individual UST closures under the FTMM UST program. Based on the location of existing buildings and comparison of groundwater analytical results to the GWSL, VI was investigated at the following locations:

- CWA:
  - Parcel 15 (Building [Bldg] 2700) – Tetrachloroethylene, trichloroethylene (TCE), and dichloroethene (DCE) have been detected in groundwater above the GWSLs.
  - Parcel 34 (Bldg 2567) – Benzene, DCE, and methyl tert-butyl ether (MTBE) have been detected in groundwater above the GWSLs.

- MP:
    - Parcel 43 (Bldg 1122) – TCE has been detected in groundwater above the GWSL.
    - Parcel 50 (Bldg 283) – BTEX have been detected in groundwater above the GWSLs.
    - Parcel 52 (Bldg 699) – BTEX and MTBE have been detected in groundwater above the GWSLs.

Soil gas and indoor air samples were collected to evaluate the potential for the intrusion of COCs present in groundwater in close proximity to existing facilities. Even though the volatile organics (VOs) identified as COCs in groundwater were the targeted analytes, samples were analyzed for a comprehensive list of VO constituents, which includes the targeted compounds listed above as well as others that have not been detected in groundwater.

Soil Gas

A total of 27 soil gas samples contained one or more VOs at concentrations exceeding NJDEP Non-Residential Soil Gas Screening Levels (NRSGSLs). Parcels at which soil gas constituents were detected at concentrations greater than the NJDEP NRSGSLs are the following:

- CWA:
    - Parcel 15 – Fourteen soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
    - Parcel 34 – Two soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
- MP:
    - Parcel 43 – Five soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
    - Parcel 50 – Four soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
    - Parcel 52 – Two soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.

Indoor Air

No groundwater constituents were identified in indoor air at concentrations greater than the NJDEP Non-Residential Indoor Air Screening Levels (NRIASLs) in the buildings investigated. One indoor air sample contained two VOs at concentrations greater than the NJDEP NRIASLs. The compounds benzene and dichloromethane were detected in indoor air at Parcel 43 (Bldg 1122). Neither compound was detected above applicable criteria in soil gas or groundwater, and both are suspected to be attributable to activities within the building. No VOs were detected above Immediate Action Levels in any indoor air samples, and no VOs were detected at concentrations above the NRIASLs in indoor air samples collected in Parcel 15 (Bldg 2700) or Parcel 50 (Bldg 283). Additional indoor air sampling is recommended for Parcels 15, 34, 43, 50, and 52 to confirm constituents identified in groundwater are not present in indoor air at levels above applicable criteria.

Multi-media Sampling (Soil, Groundwater, Sediment, and Sanitary Water)

Multi-media sampling (soil, groundwater, sediment, and sanitary water) was conducted throughout numerous parcels to evaluate potential releases from previous operations at FTMM. Investigations were conducted to evaluate potential releases from historic USTs (Parcels 13, 14, 15, 28, 51, 76, and 79); historic laboratory operations (Parcels 15, 28, 49); historic coal storage areas (Parcels 57 and 83); a historic small arms firing range (Parcel 38); a medical facility (Parcel 61); historic shop, maintenance, and industrial facilities (Parcels 27, 39, 43, 57, 69, 70, 80, and 83); substations that formerly utilized polychlorinated biphenyl-containing oils; and the sanitary sewer system.

Soil

The total petroleum hydrocarbon content criteria of 10,000 milligrams per kilogram for soil is the same for residential and non-residential sites. No COCs were identified in soil at concentrations above the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC), and no further action (NFA) is recommended for soil in the following parcels:

- CWA:
  - Parcel 13
  - Parcel 14
  - Parcel 15
  - Parcel 27
  - Parcel 28
- MP:
  - Parcel 38
  - Parcel 39
  - Parcel 51
  - Parcel 69

- Parcel 70
- Parcel 76
- Parcel 79
- Parcel 80
- Substations

COCs were identified in soil at concentrations above the NJDEP NRDCSCC, and further evaluation is recommended for the following parcels on the MP:

- Parcel 49
- Parcel 57
- Parcel 61
- Parcel 83

Groundwater

No COCs were identified in groundwater at concentrations above the NJDEP Groundwater Quality Criteria, and NFA is recommended for groundwater in the following parcels:

- CWA:
  - Parcel 13
  - Parcel 14
  - Parcel 15
  - Parcel 28
- MP:
  - Parcel 76
  - Parcel 79
  - Parcel 83

Further evaluation of COCs identified in groundwater is recommended for the following parcels:

- Parcel 49
- Parcel 51
- Parcel 57
- Parcel 69
- Parcel 80

COCs identified in Parcel 49 groundwater are recommended to be captured in the existing M-18 Classification Exception Area.

Sediment

Sediment data collected from non-tidally influenced water bodies were compared to the NJDEP Freshwater Sediment Screening Values – Lowest Effects Levels and the NJDEP Freshwater Sediment Screening Values – Severe Effects Levels. Sediment data collected from tidally influenced water bodies were compared to the NJDEP Marine/Estuarine Sediment Screening Guidelines – Effects Range – Low and the NJDEP Marine/Estuarine Sediment Screening Guidelines – Effects Range – Medium.

COCs were identified in sediment above the applicable criteria and are recommended for further evaluation under a facility-wide baseline ecological evaluation within the following parcels:

- CWA:
    - Parcel 15
    - Parcel 27
    - Parcel 28
- MP:
    - Parcel 39
    - Parcel 43
    - Parcel 49
    - Parcel 61
    - Parcel 69

Table ES-2
ECP Site Investigation Results Summary

Location	Parcel Number	ECP Category	ECP Label	Size of Parcel (Acres)	Building No. / Site Name/AEDB-R Site No. (where applicable)	Data Gap Investigated	Summary of Field Activities and Samples Collected During the Final Site Investigation	Constituents of Concern (COCs) Identified Based on SI Results	Recommendations
CWA	13	(2)	PS/PR(P)	6.4	Former Barracks - Bldgs 2004 - 2016	Potential USTs associated with former barracks	30 surface soil samples 36 subsurface soil samples 6 groundwater samples Geophysical Survey	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Groundwater Samples:** No COCs **Geophysical Survey:** No suspected USTs identified	**No further action**
CWA	14	(2)	PS/PR	77.5	Former Buildings - NW Area of the CWA	Potential USTs associated with former buildings	150 surface soil samples 165 subsurface soil samples 24 groundwater samples Geophysical Survey	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Groundwater Samples:** No COCs **Geophysical Survey:** 1 Suspected UST identified	**No further action**
CWA	15	(7)	HS/HR(P)/PS/PR	38.0	2700 (Myer Center) 2705 FTMM-23 (CW-2)	Potential USTs associated with former barracks, potential historic releases from industrial and laboratory activities, vapor intrusion	Geophysical Survey 53 surface soil samples 59 subsurface soil samples 7 sediment samples 7 groundwater samples 17 indoor air samples 15 soil gas samples	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Sediment Samples:** B/Ns (acenaphthene and fluorene), Metals (chromium and copper) **Groundwater Samples:** No COCs **Indoor Air Samples:** No COCs **Soil Gas:** TCE, PCE, VC, benzene **Geophysical Survey:** No suspected USTs identified	**No further action for soil, groundwater, and former USTs** **Incorporate sediment as part of a facility-wide baseline ecological evaluation** **One additional round of indoor air sampling to confirm no constituents are present above criteria**
CWA	27	(7)	HS/HR(P)/PS/PR(P)	29.8	Southwest portion of the CWA that includes the former Pulse Power Center, Machine Shop, Paint and Fabrication Facility, Former Motor Pool	Potential impact from historic industrial and vehicle related activities and possible debris disposal area	2 surface soil samples 4 sediment samples Geophysical Survey	**Surface Soil Samples:** No COCs **Sediment Samples:** Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc) **Geophysical Survey:** No anomalies indicative of debris burial identified	**No further action for soil and possible debris burial area** **Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation**
CWA	28	(7)	HS/HR(P)/PS/PR(P)	37.8	Former Eatontown Laboratory, Battery Test Facility, Safety Calibration Laboratory Office, Former Motor Pool	Potential USTs associated with former buildings, former septic tanks and drainage fields, former open storage and possible tank pads, potential historic releases from former floor drains	5 surface soil samples 3 subsurface soil samples 4 sediment samples 4 groundwater samples 8 test pit subsurface soil samples Geophysical Survey	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Sediment Samples:** Chromium **Groundwater Samples:** No COCs **Test Pit Soil Samples:** No COCs **Geophysical Survey:** 1 suspected septic tank, 1 suspected septic distribution box and supply pipe, 1 suspected UST identified	**No further action for groundwater, soil, suspected septic tank, suspected septic distribution box and supply pipe, suspected UST** **Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation**

Table ES-2
ECP Site Investigation Results Summary

Location	Parcel Number	ECP Category	ECP Label	Size of Parcel (Acres)	Building No. / Site Name/AEDB-R Site No. (where applicable)	Data Gap Investigated	Summary of Field Activities and Samples Collected During the Final Site Investigation	Constituents of Concern (COCs) Identified Based on SI Results	Recommendations
CWA	34	(2)	PS/PR	1.3	2567 - AAFES Gasoline Station (FTMM-58)	Vapor Intrusion into existing buildings	4 soil gas samples	**Soil Gas Samples:** Benzene	**One round of indoor air sampling to determine if constituents are present above criteria**
MP	38	(7)	HR(P)/PS	0.6	Former Outdoor Firing Range (1940-1955 Pistol Range)	Potential impact from Former Outdoor Small Arms Firing Range	25 surface soil samples	**Surface Soil Samples:** No COCs	**No further action**
MP	39	(7)	HS/HR(P)	0.6	1150 - Vail Hall - Communications backup and administrative offices	Potential impact from historic film developing activities	1 surface soil sample 4 sediment samples	**Surface Soil Samples:** No COCs **Sediment Samples:** B/Ns (benzo[a]pyrene, chrysene, phenanthrene) and Metals (cadmium, chromium, lead, zinc)	**No further action for soil** **Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation**
MP	43	(7)	HS/HR(P)/PS/PR(P)	1.5	1122 - Do-it-Yourself Auto Repair and Craft Shop	Potential impact to Mill Creek from historic waste handling activities. Vapor Intrusion	6 sediment samples 5 soil gas samples 1 indoor air sample	**Sediment Samples:** B/Ns (anthracene, chrysene, phenanthrene); Metals (cadmium, chromium, copper, lead, zinc) **Soil Gas Samples:** VOs (PCE, TCE) **Indoor Air Samples:** VOs (benzene, dichloromethane)	**Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation** **One additional round of indoor air sampling to confirm no constituents associated with groundwater and/or soil gas are present in indoor air above criteria**
MP	49	(7)	HS/HR(P)/PS/PR(P)	9.1	Buildings 283, 288, 291, 292, 293, 295 - Former Squier Laboratory Complex, Museum, Battery Test Facility	Potential historic discharges related to previous laboratory and industrial use	13 surface soil samples 7 subsurface soil samples 7 sediment samples 6 groundwater samples	**Surface Soil Samples:** B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene) and PCBs (Aroclor 1260) **Subsurface Soil Samples:** No COCs **Sediment Samples:** Metals (arsenic, beryllium, cadmium, chromium, copper, lead, silver, zinc) **Groundwater Samples:** VOs (benzene, bromodichoromethane)	**Delineate constituents of concern identified in surface soil** **Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation** **Capture groundwater constituents of concern in the existing M-18 CEA**
MP	50	(2)	PS/PR	2.2	Former Fuel Distribution Facility, Former USTs FTMM-54 (Bldg 296) FTMM-55 (Bldg 290) FTMM-61 (Bldg 283)	Vapor Intrusion into existing buildings	5 soil gas samples 10 indoor air samples	**Soil Gas Samples:** Benzene, PCE **Indoor Air Samples:** No COCs	**One additional round of indoor air sampling to confirm no constituents are present above criteria**

Table ES-2
ECP Site Investigation Results Summary

Location	Parcel Number	ECP Category	ECP Label	Size of Parcel (Acres)	Building No. / Site Name/AEDB-R Site No. (where applicable)	Data Gap Investigated	Summary of Field Activities and Samples Collected During the Final Site Investigation	Constituents of Concern (COCs) Identified Based on SI Results	Recommendations
MP	51	(2)	HS/PS/PR	87.0	750 Area 787, 788, 789 500 Area 600 Area 1100 Area	Potential USTs associated with former barracks, general instrument buildings, general purpose wharehouses, administrative general purpose buildings, and signal school buildings	122 surface soil samples 136 subsurface soil samples 26 groundwater samples Geophysical Survey	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Groundwater Samples:** B/N (2-Methylnaphthalene) **Geophysical Survey:** 11 suspected USTs	**No further action for soil and suspected USTs** **Further evaluation of groundwater**
MP	52	(2)	HS/PS/PR	1.4	FTMM-53, Bldg 699 - gasoline service station	Vapor Intrusion into existing buildings	4 soil gas samples	**Soil Gas Samples:** PCE	**One additional round of indoor air sampling to confirm no constituents associated with groundwater and/or soil gas are present in indoor air above criteria**
MP	57	(7)	HS/HR(P)/PS/PR	8.7	Former Coal Storage and RR unloading area	Potential releases from former coal storage and RR unloading	15 surface soil samples 18 subsurface soil samples 6 groundwater samples	**Surface Soil Samples:** B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene) **Subsurface Soil Samples:** No COCs **Groundwater Samples:** Metals (beryllium, cadmium, cobalt, lead, nickel)	**Further evaluation of constituents of concern identified in surface soil and groundwater**
MP	61	(7)	HS/HR(P)/PS/PR	14.7	1075 - Patterson Army Health Clinic	Potential historic discharges related to medical operations	4 surface soil samples 4 sediment samples	**Surface Soil Samples:** B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene) **Sediment Samples:** B/Ns (acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, pyrene) and Metals (copper, lead)	**Further evaluation of constituents of concern identified in surface soil** **Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation**
MP	69	(7)	HS(P)/HR(P)/PS/PR	0.3	900 - Former vehicle repair/motor pool	Potential historic discharges related to vehicle repair operations	4 surface soil samples 5 subsurface soil samples 5 sediment samples 3 groundwater samples	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Sediment Samples:** B/Ns (acenaphthene, anthracene, chrysene, fluoranthene, phenanthrene, pyrene) and Metals (arsenic, cadmium, chromium, copper, lead, silver, zinc) **Groundwater Samples:** VOs (PCE)	**No further action for soil** **Address constituents of concern identified in sediment as part of a facility-wide baseline ecological evaluation** **Further evaluation of constituents of concern identified in groundwater**
MP	70	(7)	HS/HR(P)	1.7	551 - Classroom, former (early 1950s) photoprocessing	Potential historic releases related to former photoprocessing	3 surface soil samples 2 sediment samples	**Surface Soil Samples:** No COCs **Sediment Samples:** No COCs	**No further action for soil and sediment**

Table ES-2
ECP Site Investigation Results Summary

Location	Parcel Number	ECP Category	ECP Label	Size of Parcel (Acres)	Building No. / Site Name/AEDB-R Site No. (where applicable)	Data Gap Investigated	Summary of Field Activities and Samples Collected During the Final Site Investigation	Constituents of Concern (COCs) Identified Based on SI Results	Recommendations
MP	76	(2)	PS/PR	12.1	200 Area and 300 Area former barracks	Potential USTs associated with former barracks	Geophysical survey 29 surface soil samples 35 subsurface soil samples 6 groundwater samples	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Groundwater Samples:** No COCs **Geophysical Survey:** 7 suspected USTs	**No further action**
MP	79	(2)	HS/PS/PR	43.6	400 Area former buildings	Potential USTs associated with former buildings	Geophysical survey 32 surface soil samples 36 subsurface soil samples 9 groundwater samples	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Groundwater Samples:** No COCs **Geophysical Survey:** 4 suspected USTs	**No further action**
MP	80	(7)	HS/HR(P)/PS/PR	0.9	Former Buildings 105 and 106 - former photoprocessing	Potential historic releases related to former photoprocessing	4 surface soil samples 5 subsurface soil samples 3 groundwater samples	**Surface Soil Samples:** No COCs **Subsurface Soil Samples:** No COCs **Groundwater Samples:** Beryllium	**No further action for soil** **Further evaluation of constituents of concern identified in groundwater**
MP	83	(7)	HS/HR(P)/PS/PR	35.3	Portion of MP northeast of Oceanport Ave that includes vehicle maintenance (current and former), former photoprocessing, current and former maintenance shops (carpentry, plumbing, heating, HVAC, electrical), former coal storage, former transformer storage area	Potential impact from historic industrial and vehicle related activities and former coal storage area	31 surface soil samples 33 subsurface soil samples 15 groundwater samples	**Surface Soil Samples:** B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene) and Metals (lead) **Subsurface Soil Samples:** No COCs **Groundwater Samples:** No COCs	**Further evaluation of constituents of concern identified in surface soil** **No further action for groundwater**
MP and CWA	Sanitary Sewer System	NA	NA	NA	MP and CWA sanitary sewer system	Previous disposal of mercury in sanitary system	9 sanitary water samples	**Sanitary Water Samples:** No COCs	**No further action**
MP and CWA	Electrical Substations	NA	NA	NA	Electrical substations located adjacent to Bldgs 978, 1231, 2716, and the former substation east of the 2700	Previous use of PCB-containing equipment	42 surface soil samples	**Surface Soil Samples:** No COCs	**No further action**

LEGEND

Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 Areas where only release or disposal of petroleum products has occurred.

7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 300 600 1,200 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

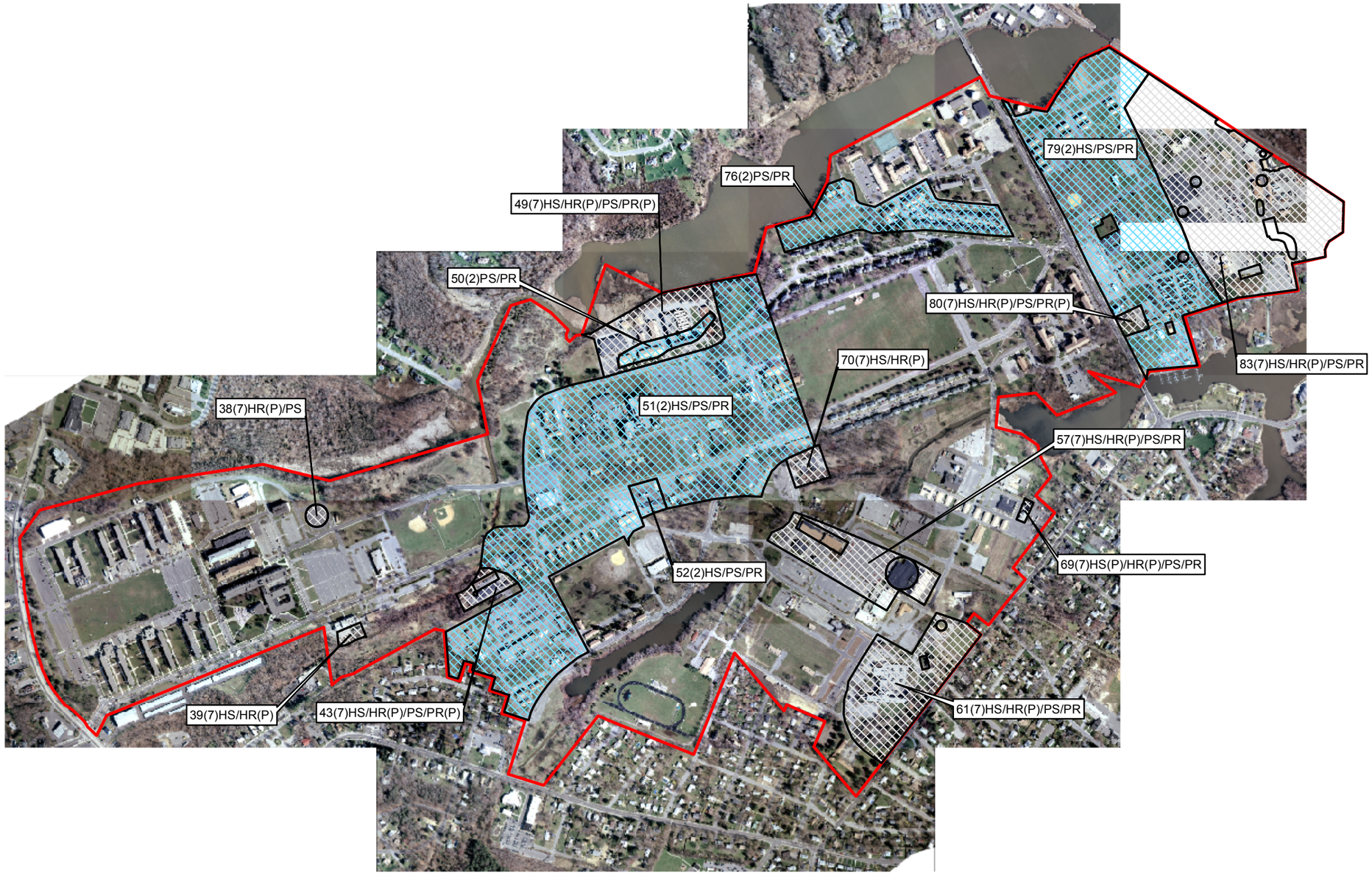
FIGURE ES-1

FORT MONMOUTH ECP SITE INVESTIGATION

CHARLES WOOD AREA ECP PARCELS INVESTIGATED

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_FigES-1_SI_ECP_Parcels_Investigated.mxd (7/14/2008 10:50:55 AM)



LEGEND

Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 Areas where only release or disposal of petroleum products has occurred.

7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 450 900 1,800 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE ES-2

FORT MONMOUTH ECP SITE INVESTIGATION

MAIN POST ECP PARCELS INVESTIGATED

MAIN POST
FORT MONMOUTH
NEW JERSEY

1 Introduction and Scope of Work

The U.S. Army Corps of Engineers (USACE), Baltimore District, tasked Shaw Environmental, Inc. (Shaw) to conduct a site investigation (SI) in support of an environmental condition of property (ECP) assessment at Fort Monmouth (FTMM). Shaw prepared a Work Plan and this SI report under USACE Architectural and Engineering Services Contract Number W912DR-05-D-0026. FTMM was selected in 2005 for closure under the Base Realignment and Closure (BRAC) program.

This SI report has been produced in accordance with the scope of work dated September 1, 2006, and modified September 15, 2006, except where modified by the Army in response to stakeholder concerns during the preliminary planning stages of this project.

1.1 Project Background

The Army's mission under BRAC 2005 is to close or realign installations and expeditiously transfer surplus properties as directed by BRAC law. As part of this process, it is necessary for the Army to identify and document the environmental liabilities associated with installations where the BRAC action will involve the disposal of property. The ECP process is the mechanism to provide a summary of the current environmental condition of a property.

The ECP process was designed to reduce or eliminate the occurrence of incomplete site characterizations and to save time and funding by reducing the need for extended or duplicative investigations, thereby aiding the Army in expediting the disposal of BRAC 2005 real property.

For FTMM, the Phase I ECP Assessment was conducted in 2006 and 2007. The final Phase I ECP Report for FTMM was completed on January 29, 2007 (1). Using the results of the Phase I ECP Report, Phase II ECP sampling recommendations for FTMM were prepared. The Phase II sampling recommendations were developed for specific areas of concern (AOCs) where no existing data or insufficient data were available to fully evaluate the environmental condition of the property. These sampling approaches were discussed with the Army at project meetings held on March 13, 2007, and March 27, 2007, and then with the New Jersey Department of Environmental Protection (NJDEP) at a meeting held on June 13, 2007. The sampling approaches were modified in light of direction provided at the meetings, and a final SI Work Plan was issued September 25, 2007 (2). The scope of the SI was limited to sites with identified data gaps; not all ECP parcels developed as part of the Phase I ECP are discussed in this document.

A Historical Site Assessment (HSA) was completed in January 2007 for FTMM by Cabrera Services, Inc. (Cabrera) (3). Recommendations for SI activity related to radioactive material (RAM) were prepared by Cabrera based on the HSA results. The Army has begun planning for the completion of these scoping surveys. A Radiological

Scoping Survey Plan was prepared and was issued under a separate cover in February 2008. Radiological scoping surveys are planned for Building (Bldg) 275, Bldg 283, Bldg 292, and Bldg 2540. The text of this report identifies buildings to be included in the radiological scoping survey where they coincide with SI activities.

1.2 Project Objectives

The purpose of the SI is to move forward with the recommendations made as part of the Phase I ECP to determine whether hazardous substances or petroleum products have been disposed or released on the property and to obtain defensible evidence that confirms that releases have or have not occurred. SI activities related to RAM will be conducted in the future upon departure of the current tenants from the FTMM property (45) and are therefore not presented within this report.

The goals of the SI are to further assess the level of environmental liability of each parcel and to close data gaps that resulted from the review of National Archives conducted as part of the Historical Records Review (HRR) and reviews of Army archives and material at FTMM conducted as part of the Phase I ECP. If contamination was not identified above the levels of concern (LOCs) identified for this project, a recommendation for no further action (NFA) was made for the parcel. Project LOCs and SI decision end points are discussed in **Section 2.3**.

The SI provides sufficient data to either render a professional opinion that there is no reasonable basis to suspect the presence of environmental contamination; or indicate that contaminants have been released or disposed at the locations identified as concerns in the Phase I ECP and are present at concentrations that require additional characterization and/or remediation. The SI provides information to obtain order of magnitude estimates of the general nature and extent of contamination and is not designed to fully satisfy the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act or the level of inquiry necessary to select remedial measures.

1.3 Scope of Report

This report contains a discussion of the field sampling procedures applicable to the SI activities conducted at FTMM and the results of the site-specific sampling conducted for sites identified in the SI Work Plan (2).

1.4 Report Organization

This report has been organized into the following sections:

- Executive Summary.
- Section 1 discusses the project scope and site background.

- Section 2 discusses the various field activities that were performed in the completion of the SI field sampling as well as the sample management and analytical methods utilized.
- Section 3 presents the site-specific field sampling conducted and results of the investigations for FTMM, including sampling tables and maps for each SI site.
- Section 4 presents the summary and recommendations.
- Section 5 presents cited references.
- **Appendix A** contains the complete geophysical report for geophysical surveys completed as part of this investigation.
- **Appendix B** contains the FTMM Standard Operating Procedures (SOPs) followed during completion of the field sampling program.
- **Appendix C** contains the Indoor Air Survey and Sampling Forms.
- **Appendix D** contains copies of field logbooks.
- **Appendix E** includes analytical data packages for all sample analyses completed in association with the SI.
- **Appendix F** contains the geotechnical soil boring logs completed during field investigations.
- **Appendix G** presents select historic figures and aerial photographs.
- **Appendix H** contains FTMM Maximum Background Concentrations (MBCs).
- **Appendix I** contains supporting documentation for the former buildings associated with suspected underground storage tanks (USTs) identified during the geophysical survey.

1.5 Property Description and History

The following sections provide summary information on past and present land use and the history of the facility.

1.5.1 Property Location and Description

FTMM is located in the central-eastern portion of New Jersey in Monmouth County, approximately 45 miles south of New York City, 70 miles northeast of Philadelphia, and 40 miles north of Trenton, the state capital. The Atlantic Ocean is approximately 3 miles to the east. FTMM falls within the Boroughs of Eatontown, Oceanport, and Tinton Falls. The areas surrounding FTMM are characterized by a mixture of residential, commercial, and light industrial uses. A review of the land use plans for the surrounding municipalities shows that land uses are compatible with those along the inside

perimeter of FTMM. FTMM occupies approximately 1,126 acres and is currently comprised of two operational areas, the Main Post (MP) and the Charles Wood Area (CWA). The two areas are located about 2 miles from one another (4).

The primary mission of FTMM is to provide command, administrative, and logistical support for the U.S. Army Communications and Electronics Command (CECOM) Headquarters (5). The support provided by the Garrison is used by tenant activities in the performance of research, development, procurement, and production of prototype communications and electronics equipment for use by the U.S. Armed Forces. The MP provides supporting administrative, training, and housing functions, as well as many of the community and industrial facilities for FTMM. These facilities are distributed across the property, with no distinct clustering of functions. The CWA is used primarily for research and development (R&D), testing, housing, and recreation. The CWA R&D and testing facilities occupy the southwest corner of the subpost. Residential areas are located along the southeastern boundary and were formerly located in the northwest corner; the golf course occupies the northeast corner (5). Currently, the workforce population at FTMM includes approximately 537 members of the active military, 8,602 civilians, 3,200 permanent contractors, 514 family members, and 30,300 retirees and family members in the area (6,7).

1.5.1.1 Main Post

The MP encompasses approximately 637 acres and contains a total of 397 buildings and structures (5). The MP is bounded by State Highway 35 to the west, Parkers Creek to the north, the New Jersey Transit Railroad (RR) to the east, and Main Street and State Highway 71 to the south. Universal Transverse Mercator (UTM) coordinate locations (North American Datum [NAD] 83, Zone 18, meters) for the MP include:

- Northeast Corner: 582178.33995, 4463977.92694
- Southeast Corner: 582755.27789, 4463525.90188
- Northwest Corner: 579532.14255, 4462789.29460
- Southwest Corner: 579698.14842, 4462269.63793

1.5.1.2 Charles Wood Area

The CWA, located 2 miles west of the MP, is composed of approximately 489 acres and contains a total of 241 buildings and structures (5). The CWA is bounded by the Garden State Parkway to the west, Tinton Avenue to the north, Maxwell Place and the New Jersey Transit RR to the east, and Pine Brook Road to the south. UTM coordinate locations for the CWA (NAD83, Zone 18, meters) include:

- Northeast Corner: 578997.83200, 4462033.09195
- Southeast Corner: 579386.98486, 4460899.58327
- Northwest Corner: 577293.44846, 4461472.84017
- Southwest Corner: 577466.30241, 4460271.56946

Prior to 1996, FTMM also included a third operational area – the Evans Area – located approximately 12 miles south of the MP. The Evans Area is excluded from this assessment due to the fact that it is being managed under the BRAC 1993 program (4).

Both the MP and the CWA are nearly level except for short, steep slopes along streams and waterways. The topographic gradient slopes gently to the east in both areas, within the drainage network of local tributaries to the Shrewsbury River. Elevations at the MP range from about 6 feet (ft) above mean sea level (amsl) at stream edges to 30 ft amsl near the center of the post. Elevations at the CWA range from about 27 to 60 ft amsl, and the lowest elevations are along Wampum Brook near the eastern property boundary (5).

1.5.2 Historic Land Use

1.5.2.1 Main Post

The original FTMM Army camp, established for signal troop training in 1917, was located at Little Silver, New Jersey. The historic land use of the area included a 1-mile horse racing track, Monmouth Park, established in 1870. The track was located in the vicinity of Patterson Army Health Clinic near the intersection of Broad Street and Park Avenue. Monmouth Park operated for 20 years. A larger Monmouth Park was reconstructed and opened on July 4, 1890. The oval track was centered on present day Greeley Field. The entire facility encompassed 640 acres (almost all of the MP area). Grandstands and a luxury hotel along Parkers Creek were part of the associated land uses. The Monmouth Park Race Track closed in 1893. Vacated buildings and structures fell into ruin and the hotel burned to the ground in 1915. The land was owned by Melvin Van Keuren when it was evaluated for use by Camp Little Silver. The Army leased 468 acres from Mr. Van Keuren on May 16, 1917. Prior to the Army's lease, the land had been farmed, producing a potato crop for approximately 4 years. The leased area was bounded on the north by the Shrewsbury River (currently referred to as Parker's Creek), on the west and south by a stone road from Eatontown, and on the east by Oceanport-Little Silver Road. The condition of the land was reported as overgrown and infested with poison ivy. The land was purchased by the government in 1919 (8,9). Historical Army uses of the FTMM MP property are well documented in "A Concise History of the U.S. Army Communications-Electronics Life Cycle Management Command and Fort Monmouth, New Jersey" (8) and "Fort Monmouth: Landmarks and Place Names" (9).

1.5.2.2 Charles Wood Area

The CWA was acquired by the Army in 1941. The CWA tract included the former Monmouth County Country Club (originally Sun Eagles Country Club), Olmstead Gardens, and areas currently occupied by the golf course and Myer Center. FTMM personnel indicated an orchard was located in the golf course area prior to Army acquisition. The Sun Eagles Country Club was constructed in the 1920s and included a clubhouse (currently Gibbs Hall), an 18-hole golf course, a polo field, and an airfield (9). A 7,000-troop cantonment area was immediately built on the land, including barracks, mess halls, a school building, an office building, a recreation hall, a Post Exchange, an

infirmary, and a Chapel (8,9). Historical Army uses of the FTMM CWA property are well documented in "A Concise History of the U.S. Army Communications-Electronics Life Cycle Management Command and Fort Monmouth, New Jersey" (8) and "Fort Monmouth: Landmarks and Place Names" (9).

1.5.3 Facility History

The MP of FTMM was established on June 17, 1917, as Camp Little Silver. The name of the Camp was changed after 3 months to Camp Alfred Vail. The initial mission of the Camp was to train Signal Corps operators for service in World War I. In the first 19 months of the Camp's existence, 129 semi-permanent structures were built, a tent camp established on the site of a former swamp, and a parade ground established on the site of a former marsh. A radio laboratory and an airfield were constructed in 1918. After the war, Camp Vail was designated as the site of the Signal Corps School, the only training area for Signal Corpsmen in the country. All but four World War I structures were demolished by 1924 (8).

In 1925, the facility became a permanent post, and its name was changed to FTMM. The primary mission of FTMM continued to be Signal Corps training and electronics research. In 1934, laboratory operations were consolidated in a new facility, Squier Laboratory (Bldg 283). Research on radios and radar continued here until the early 1950s. During World War II, the pace of training increased tremendously at FTMM. The expanded laboratory effort was accomplished by starting new laboratories at other post facilities. Squier Laboratory continued to be the principal laboratory on the MP until 1954. In 1955 and 1956, 72 World War II wooden structures were demolished to make room for permanent structures. These new buildings were used for residential, administrative, commercial, and recreational purposes. A small number of additional administrative buildings were completed during the 1970s, 1980s, and 1990s (8).

Camp Charles Wood was purchased in 1941 and opened in 1942. The eastern half of the property was formerly a golf course, and the western half was residential and farmland. During World War II, the Camp was used for training Signal Corpsmen. Antenna shelters were constructed on 26.5 acres of land and used by the Signal Corps Laboratory for R&D purposes (8).

A new R&D facility, the Myer Center (Bldg 2700), was completed in 1954. R&D activities that had formerly been conducted at Squier Laboratory and some activities from the Evans Area were transferred to the Myer Center. To this day, laboratories within the Myer Center facility continue to develop state-of-the-art electronic and communications equipment for use by the U.S. Armed Forces (8).

The presence of RAM at FTMM has been predominantly limited to certain areas and functions of the installation. Historically, laboratory R&D in the areas of radio and electronics and use of vacuum tubes, radium dials, ionizing radiation-producing machines, and military support equipment such as night vision goggles that contain radioactive commodities, have been among the activities where RAM were most commonly used. Facilities, buildings, and rooms that contain or once contained

equipment that produce X-rays via AC or DC sources of energy are not sources of radioactive contamination. This equipment, which includes medical and dental diagnostic X-ray machines, X-ray security inspection machines, X-ray diffraction, electron microscopes, X-ray fluorescence equipment, and some high-voltage electron tubes, only produce ionizing radiation when energized. Operation of this equipment will result in ionizing radiation fields being produced in and around the equipment only while activated, but will not result in radioactive contamination. Much of the activities of the past were performed as part of the Signal Corps Laboratories, first housed in the Squier Building (Bldg 283) and then in the Myer Center (Bldg 2700). Other work was performed in the Evans Area of the base, which was closed in the late 1990s due to BRAC 1993 activities, and the work transferred to the CECOM Safety Office and laboratory in the CWA.

Presently, a research laboratory in Bldg 2540 in the CWA is the only site to regularly use and store RAM as part of the R&D activities performed on site. A designated storage area is set aside for drums containing material waiting for disposal, including tritium exit signs removed from FTMM buildings, smoke alarms containing RAM, and other instruments with associated check sources. These items are periodically taken to Wright Patterson Air Force Base for disposal/recycling. The administrative arm of the CECOM Safety Office is housed in the adjacent Bldg 2539 where they maintain files pertaining to the use of any RAM on the installation, as well as active Nuclear Regulatory Commission licenses, Army Radiation Authorizations for FTMM, and information on RAM use by the Army worldwide. See Section 5.8 of the Phase I ECP for a full discussion of issues related to RAM at FTMM (1). Recommendations for SI activity related to RAM were prepared by Cabrera based on the HSA results and will be conducted upon departure of the current tenants from the FTMM property (45).

In 2006, an HRR report was published to document the condition of FTMM regarding munitions use. The HRR focused on properties eligible for action under the Military Munitions Response Program (MMRP). This includes sites classified as operational training ranges/areas, other munitions facilities, and facilities that were or are used for, or are permitted for the treatment or disposal of military munitions (29).

The purpose of the HRR was to collect the appropriate amount of information necessary to document historical information for MMRP eligible sites, operational training ranges/areas, and other munitions-related hazard sites at FTMM. The installation-wide HRR addressed munitions and explosives of concern (MEC) hazards (including unexploded ordnance [UXO]) and discarded military munitions, as well as munitions constituents (MC) (29).

There are typically three phases within the Army Range Program. The first phase involves a questionnaire called the Advanced Range Survey. This phase was not completed for FTMM. The second phase involved inventory of operational ranges and was conducted on FTMM on March 12, 2002. In 2003, the Phase 3 inventory was conducted to assess the potential for closed, transferring, and/or transferred ranges and sites with MEC (UXO or discarded military munitions) and/or MC sites that were potentially eligible for the MMRP.

2 Site Investigation Methodologies

2.1 Field Investigation Methodologies

This section describes the methods utilized in conducting the SI field activities at FTMM. This work included:

- Geophysical surveys.
- Surface and subsurface soil sampling.
- Sediment sampling.
- Groundwater sampling.
- Soil gas and indoor air sampling.
- Sanitary aqueous sampling

This section also describes the collection procedures for field quality control (QC) samples, the decontamination procedures for sampling and heavy equipment, and the management procedures for investigation-derived wastes. All field activities were conducted in accordance with NJDEP Technical Requirements for Site Remediation (10).

2.1.1 Geophysical Survey

Geophysical techniques are useful for the investigation of buried waste containers, contaminant plumes, and subsurface anomalies. These techniques provide a cost-effective, non-intrusive means of screening, which can serve to focus and refine the scope of intrusive sampling and aid site characterization. The effectiveness of a particular technique depends on such factors as the physical properties of the subsurface soils, the size and nature of the materials being investigated (i.e., buried drums, USTs, etc.), the detail of the information developed, the selection of survey parameters, and site layout.

Two geophysical survey techniques commonly used for environmental investigations include: electromagnetic induction (EM) and ground-penetrating radar (GPR). These techniques were used at FTMM for identifying subsurface anomalies which may represent USTs or other underground structures.

The geophysical surveys consisted of eight areas: Parcels 13, 14, 15, 27, and 28 located in the CWA; and Parcels 51, 76, and 79 located on the MP. The survey consisted of two phases. The first phase involved a reconnaissance-level EM survey to detect any buried metallic material within the survey boundaries. The second survey phase consisted of a follow-up GPR investigation to further characterize any anomalies detected by the EM survey. Additionally, two small areas within the Parcel 28 Survey Area were completely scanned with GPR to delineate suspected septic systems. Ground cover consisted mainly of cut grass, asphalt, and concrete. Many of the areas contained active parking lots that had to be cordoned off into smaller sections to perform the survey.

The following sections provide information concerning the geophysical techniques and associated equipment utilized and their limitations.

2.1.1.1 Electromagnetic Induction

EM involves generating a known electromagnetic field and measuring the secondary field that is thereby induced in the electrically conductive materials in the affected volume. The strength of the induced field is proportional to the electrical conductivity and may be used to detect and approximate the extent of subsurface contaminants, locate buried metal (conductive) objects, and map changes in natural hydrogeologic settings. The subsurface conductivity is most strongly affected by the presence of water and strongly conductive (metal) objects present within the sensing volume. Conductivity is also influenced by the presence of dissolved electrolytes in soil or rock pore fluids. Contaminant plumes may be mapped if there is sufficient contrast in conductivity with background conditions.

EM is very effective for many common applications and allows rapid data collection and interpretation. Data can be continuously recorded using certain instruments. Continuous data collection often permits results of higher density and higher resolution. In addition, continuous data collection may be more applicable for shallow depths up to 15 meters (m) below ground surface (bgs). EM survey data can be acquired at depths ranging from 0.75 to 60 m bgs. EM is strongly affected by aboveground metal including fences, cars, and utilities.

In order to provide detection of large subsurface metallic targets (i.e., tanks) while minimizing interference from surficial debris, EM terrain conductivity and metal detection surveys were performed using either a Geonics, Ltd. EM-31 or EM-61 instrument depending on the amount of metallic surface clutter (i.e., fences, cars, metallic debris). Both instruments were either hand-carried or towed behind a small utility vehicle. Many of the survey areas were crowded parking lots. In such cases where the entire parking lot could be scanned at one time or the survey area was clear of obstructions (Parcel 13, Parcel 14, Parcel 28, the northern two sections of Parcel 51, Parcel 76, and Parcel 79), the EM-31 was utilized, because the towing rig requires a large area in which to turn. In cases where only portions of the parking lot could be cleared or there was metallic surface clutter (Parcel 15, the motor pool section of Parcel 51, and the entrance road section of Parcel 14), the EM-61 was used due to a smaller turning radius and less sensitivity to nearby surface metal.

2.1.1.1.1 EM Survey Design

EM mapping of the survey areas was performed using a Geonics EM-31 or EM-61 instrument. The EM-31 was selected because it is sensitive to buried metal and can cover large, open areas quickly. The EM-61 was selected when the survey area included a lot of surficial metallic objects (i.e., unmoved cars, fences) or when the survey area was broken into smaller sections.

EM-31

The EM-31 employs an electromagnetic transmitter coil to induce an electric current in the earth. This current creates a secondary electromagnetic field that is measured by a receiver coil at a fixed separation of 3.7 m from the transmitter coil. The secondary electromagnetic field has two components: the quadrature component, which is proportional to the bulk electrical conductivity or terrain conductivity (in millimhos per meter or mmhos/m) of the subsurface materials, and the inphase component (in parts per thousand or ppt), which is primarily a measure of the relative concentration of metallic material in the subsurface. Note that in the presence of extremely high terrain conductivity material, the dynamic range of the EM-31 can be exceeded (or "saturated"), and the instrument will register spurious negative conductivities (a physical impossibility). These negative conductivities, therefore, actually represent very high positive conductivities. Similar saturation in the presence of significant metal can cause a spurious negative inphase response that should also be interpreted as a very high positive value.

An EM-31 in vertical dipole mode was employed for this SI. The instrument is almost completely insensitive to small/scattered material at the ground surface, and has a peak sensitivity to material at a depth of approximately 5 ft. Below 5 ft, the sensitivity diminishes approximately logarithmically. Approximately 80 percent of the signal originates at depths of less than 25 ft. Therefore, the terrain conductivity or inphase response measured by the EM-31 in vertical dipole mode represents primarily subsurface electrical properties at a depth of 5 ft (plus or minus), with little contribution from material at the ground surface, and moderate (and diminishing) contribution from materials down to approximately 25 ft. The vertical dipole EM-31 was selected to screen out the potentially time-varying effects of surficial variations in ground cover, while maintaining a significant effective survey depth.

The EM survey was completed by collecting vertical dipole mode terrain conductivity and inphase data along profiles spaced roughly 10 ft apart. Along survey profiles, measurement stations were defined by automatically triggering matching inphase and conductivity readings at five to ten readings per second as the instrument was hand-carried or towed. Based on the varying walking speed of the operator, this resulted in a station spacing along individual profiles of approximately 1 to 2 ft.

The actual location of each measurement station was digitally recorded using a backpack-mounted Topcon GMS-110 global positioning system (GPS) receiver in contact with six to eight position-fixing satellites. The GPS positions were differentially corrected using data from a U.S. Coast Guard radio beacon located in Sandy Hook, New Jersey. The resulting differential GPS (DGPS) positions have a nominal accuracy of better than 2 ft (+/-). The EM stations are depicted as small green dots in the data coverage figures (Figures 13A, 14A, 28A, 51North A, 76A, 79A) included in **Appendix A**.

The EM inphase and terrain conductivity data were contoured using minimum curvature gridding routines in Geosoft Oasis Montaj ™. The inphase response and terrain

conductivity contours area are depicted in figures included in **Appendix A**. Note that the inphase contour levels, in ppt, are presented as shades of green to red to yellow for increasing positive values and green to blue for increasingly negative values (the equivalent of very high positive values — see above). The conductivity contour levels, in mmhos/m, are presented as shades of green to yellow to orange for increasing positive values and green to blue for increasingly negative values (the equivalent of very high positive values — see above).

EM-61

A Geonics EM-61 MK2 instrument was also utilized as part of the geophysical investigations. The EM-61 uses a 1-m by ½-m coil to transmit 150 electromagnetic pulses per second into the ground at each measurement station. A second transmitter coil is used to narrowly focus the pulses, making the instrument relatively insensitive to nearby sources (greater than 5 ft away) of electromagnetic interference such as buildings, fences, surficial debris, and atmospheric electromagnetic activity. Please note that the instrument is also relatively insensitive to discrete overhead sources of interference such as low overhead power lines and pipe runs; however, low massive overhead objects such as steel roofing structures less than 10 ft away will greatly interfere with the instrument and render the data collected in that area meaningless. During the off-time between transmitted pulses, a receiver coil measures the decay of transient electrical currents induced by the transmitted pulses at three fixed time gates. Electrical currents in moderately conductive earth materials (e.g., electrolytic soils) dissipate rapidly, leaving the more prolonged currents due to buried metallic objects. The EM-61 measures the surficial electrical potential due to the prolonged subsurface currents, providing a digital read-out of the relative metallic content of the subsurface. Note that the EM-61 focusing coil minimizes (but does not entirely eliminate) the response from surficial metallic reinforcing or debris that would mask the presence of deeper metal from standard EM, magnetic, metal detector, or GPR instruments.

To complete the EM-61 survey, a system of 5-ft profiles (depicted as rows of tiny green dots in Figures 15A, 51 South A, and a small portion of 14A included in **Appendix A**) was scanned by hand- or vehicle-towing the trailer-mounted EM-61 through all accessible areas of the site. A handheld computer digitally recorded EM-61 station measurements at five to eight readings a second along each profile (for an average station spacing of approximately 8 to 10 inches). The location of each measurement was digitally recorded using a trailer-mounted Topcon GMS-110 GPS receiver in contact with six to eight position-fixing satellites. The GPS positions were differentially corrected using data from a U.S. Coast Guard radio beacon located in Sandy Hook, New Jersey. The resulting DGPS positions have a nominal accuracy of better than 2 ft. The EM-61 scanning results are depicted as contours of the individual EM-61 station measurements in Figures 15B, 51 South B and 14B&C included in **Appendix A**. The contours represent the differential coil response and therefore depict subsurface metal with positive values (in millivolts or mV), with the effect of particularly massive surficial metal targets represented by spurious negative values. The contours were calculated using the minimum curvature algorithm in Oasis Montaj™ by Geosoft, Inc.

TW-6

The Fisher TW-6 pipe and cable locator was utilized for primary scanning in locations where the GPS signal needed for proper location of the EM survey data was insufficient to provide effective location control, such as areas directly adjacent to buildings and heavily wooded areas (Parcel 27), and in order to relocate and delineate targets identified during EM scanning (see below). In pipe and cable search mode, the TW-6 is essentially a deep-sensing metal detector that detects any highly electrically conductive materials (e.g., metals) by creating an electromagnetic field with a transmitting coil. A receiving coil at a fixed separation from the transmitter measures the field strength. As the instrument is swept along the ground surface, subsurface metallic bodies distort the transmitted field. The change in field strength/orientation is sensed by the receiver, setting off an audible alarm and/or causing deflection of an analog meter. The TW-6 can nominally detect a 2-inch metal pipe to a depth of 8 ft and a 10-inch metal pipe to a depth of 14 ft.

EM Anomaly Interpretation

The EM data were inspected for anomalies with readings above the site background level, indicating higher metal concentration. Areas with numerous abandoned or active utilities (i.e., pipes and cables) were also inspected carefully to consider the possible presence of USTs adjacent to or beneath the utilities, recognized by perturbations in the anomaly caused by the utility itself. The contoured EM data was also overlain on high-resolution aerial photos to identify any obvious surficial sources for the EM anomalies, such as catch basins and manhole covers. Anomalies with no obvious source were designated as targets, and positions for these anomalies were uploaded into the GPS controller for later navigation during the GPR follow-up survey.

Electronic maps of the contoured EM data were generated and utilized in concert with GPS navigation to determine the possible sources of the target anomalies in each parcel. Each anomaly location was inspected and its source was determined. Common sources included metallic surface debris not seen on the aerial photos (i.e., metal scraps and debris, metallic equipment), subsurface utilities and associated surface objects (catch basins, manholes), and subsurface metal. The most common source of metallic surface debris was manhole covers, storm catch basins, and metal road signs. In the case of an unknown possible subsurficial source, a Fisher Labs EM TW-6 handheld metal detector was utilized to reacquire the location of that target. The TW-6 was utilized because it has a similar sensitivity and response to subsurface metal as the EM-61 and EM-31. The TW-6 has an audible alarm and visual meters that indicate the strength of the response, allowing the operator to mark the location of the EM anomaly's outer boundary.

2.1.1.2 Ground-Penetrating Radar

Following navigation to EM anomalies (using DGPS coordinates) and delineation with the TW-6 handheld metal detector, the EM targets were then scanned with GPR to identify any continuous, high-amplitude parabolic reflections of the type commonly

associated with intact USTs. GPR systems produce cross-sectional images of subsurface features and layers by continuously emitting pulses of radar-frequency energy from a scanning antenna as it is towed along a survey profile. The radar pulses are reflected by interfaces between materials with differing dielectric properties. The reflections return to the antenna and are displayed on a color monitor as a continuous cross-section in real time. Since the electrical properties of metal are distinctly different from soil and backfill materials, metallic pipes and other structures produce dramatic and characteristic reflections. Fiberglass, plastic, concrete, and terracotta pipes and structures also produce recognizable, but less dramatic reflections. Scanning was performed using a GSSI SIR-3000 GPR unit with a color display and internal hard-drive, and a 400 megaHertz antenna nominally capable of scanning to depths of up to 10 ft, depending on soil conditions. In the southern two areas of Parcel 51, much of the paved areas were underlain by fill material containing suspected slag. GPR signal penetration was limited to 3 to 5 ft in these areas.

GPR scanning was performed by hand-towing the antenna along numerous and variously-oriented profiles crossing the footprints of EM anomalies defined by the TW-6. The GPR profiles were inspected in real time to identify high-amplitude parabolic reflections of the type commonly associated with cylindrical targets like tanks.

2.1.2 Soil Sampling

2.1.2.1 Surface Soil Sampling

Soil samples were collected to evaluate the impacts of study sites on surface and subsurface soil. Surface soil samples were collected in accordance with the procedure presented in this section. Subsurface soil samples were collected using either the direct-push or test pit procedures presented in **Sections 2.1.3.1 and 2.1.3.2**, respectively.

Once collected, all surface and subsurface soil samples were handled in the same manner. The soil was field screened with a properly calibrated photoionization detector (PID)/flame ionization detector (FID) instrument. To field screen the soil sample, a decontaminated stainless-steel trowel was used to make a cross-sectional slice(s) of the soil sample, or to score a longitudinal line the length of the soil sample deep enough to expose a porous surface.

Soil sample collection for volatile organic analysis (VOA) was performed with the use of a decontaminated small diameter-coring device in accordance with FTMM SOP SAM-0207, which is presented in **Appendix B**. Once volatile organic (VO) sampling was completed, or if soil samples were only being collected for non-VO analyses, the following procedure was followed to homogenize the soil. A sufficient amount of soil from the specified sampling interval was placed on a decontaminated stainless-steel tray. After any rocks or organic matter were removed, the soil was homogenized using the coning and quartering method (American Society for Testing and Materials [ASTM] C702-98). In this method, the soil was thoroughly mixed by turning the entire sample over three times using a stainless-steel trowel. Following the last turning, the entire sample was shoveled into a conical pile in the middle of the tray. The conical pile was

then carefully flattened to a uniform thickness and diameter by pressing down the apex with the trowel. The flattened soil was divided into four equal quarters. The sampling personnel then made a determination as to whether the amount of soil on the tray was larger than the volume of the sample bottles. If the amount of soil was larger, one or two quarters were discarded. If two quarters were discarded, opposite quarters were selected. After removal of one or more quarters, the entire coning and quartering sequence was repeated until the amount of soil on the tray was approximately equal to the volume of the sample bottles to be filled. Then, the required soil volumes were placed in the sample bottles.

Surface soil samples were collected from under the vegetative mat. If the 6-inch interval closest to the ground surface was composed mostly of organic debris, it was discarded. For samples located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. The 0- to 6-inch interval was only sampled for non-VO analysis. Samples for VO analysis were collected from 18 and 24 inches bgs. All sample locations were marked on a site map and GPS located.

2.1.3 Subsurface Soil Sampling

Subsurface soil samples were collected for physical and chemical analysis from direct-push borings and test pits. Subsurface soil sampling activities proceeded as follows:

a. All boring/well drilling permits were secured, and the drillers complied with all regulations required by the NJDEP.

b. Clearance of underground utilities were obtained from the applicable facility department for all soil boring and test pit locations.

A site geologist was present during all drilling and subsurface soil sampling to maintain descriptive logs and collect appropriate samples for chemical and physical analysis. All sample locations were marked on a site map and GPS located.

2.1.3.1 Direct-Push Soil Sampling

Direct-push soil sampling was conducted utilizing the Macro Core Sampler in accordance with FTMM SOP SAM-0204, which is presented in **Appendix B**. All sample locations were marked on a site map and GPS located.

2.1.3.2 Test Pit Sampling

Test pit excavations were conducted to investigate the location of a former drainage field and septic system in the area of Bldg 2525. Subsurface soil samples were collected from the test pits to determine whether any releases may have occurred from the former structures.

Soil removed from the test pits was staged on plastic sheeting at least 3 ft from the test pit while excavating. Test pits were greater than 2 ft deep; therefore, soil samples were

collected from the backhoe bucket in an area where the sample material was not in contact with the bucket or directly from the soil horizon using a stainless steel bucket auger with extension handles. All soil samples were screened with a properly calibrated PID/FID.

When the excavation and sampling was complete, all soil was placed back into the excavation. The original grades were followed as much as possible (e.g., top soil placed at top of excavation). After the backfill and compaction were completed, the area was raked and seeded. All test pit locations were marked on a site map and GPS located.

2.1.4 Sanitary System Sampling

Sampling of the sanitary waste system was conducted from manholes. Aqueous samples were collected by submerging the sample bottles directly into the waste stream utilizing a pond sampler. The top of the bottle was immersed several inches under the water, where possible, to prevent floating debris or surface film from entering the sample container. All sample locations were marked on a site map and GPS located.

2.1.5 Sediment Sampling

Sediment samples were collected to evaluate the impact of study sites on the surrounding surface water bodies and drainage courses. To determine the impacts of a specific study site or building discharges on sediment quality, samples were collected immediately downstream of outfalls to the surface water bodies. Sediment samples were collected downstream of the outfall location in a depositional portion of the water body to determine the migration of the sediment from the discharge point. Sediment samples were collected from the farthest sample location downstream, moving upstream as the sampling progresses. All sediment samples were screened with a properly calibrated PID/FID.

Sediment sample collection for VOA was performed with the use of a decontaminated small diameter-coring device in accordance with FTMM SOP SAM-0207, which is presented in **Appendix B**. Once VO sampling was completed, or if sediment samples were only being collected for non-VO analyses, the following procedure was followed to homogenize the sediment. Rocks, twigs, and other organic matter were removed from the sample prior to homogenization if they were not considered part of the sample. Following removal of rocks, twigs, and other organic material, the sediment was homogenized using the coning and quartering method (ASTM C702-98). In this method, the sediment was thoroughly mixed by turning the entire sample over three times using a stainless-steel trowel. Following the last turning, the entire sample was shoveled into a conical pile in the middle of the pan. The conical pile was then carefully flattened to a uniform thickness and diameter by pressing down the apex with the trowel. The flattened sediment was divided into four equal quarters. The sampling personnel then made a determination as to whether the amount of sediment in the pan was larger than the volume of the sample bottles. If the amount of sediment was larger, one or two quarters were discarded. If two quarters were discarded, opposite quarters

were selected. After removal of one or more quarters, the entire coning and quartering sequence was repeated until the amount of sediment in the pan was approximately equal to the volume of the sample bottles to be filled. Then, the required sediment volumes were placed in the sample bottles. Sampling personnel avoided decanting off the excess liquid during coning and quartering. A description of properties for all sediment samples (color, texture, odor, organic content, grain size) was recorded in the field logbook immediately after sample collection.

All sediment sampling locations were marked on a site map and GPS located. A description of the sampling point was entered into the field logbook. The description was adequate for the sampling point to be located in the future.

Sediment sampling of surface water bodies was conducted from the shoreline. Sediment samples were collected from beneath the organic build-up or detritus material, and decomposed organic material was included in the sample. The decomposed organic material was retained in the sample due to the potential for this interval to be impacted due to deposition and adsorption. Typical sampling depths ranged from the top of sediment to a depth of 6 inches below the top of sediment and 1.5 to 2.0 ft bgs. Samples were collected with a decontaminated stainless-steel bucket auger. All sampling locations were marked on a map and GPS located.

2.1.6 Groundwater Sampling

2.1.6.1 Groundwater Sampling via a Direct-Push Rig

Direct-push groundwater sampling was conducted in accordance with FTMM SOP SAM-0204, which is presented in **Appendix B**. All sample locations were marked on a site map and GPS located.

2.1.6.2 Groundwater Monitoring Well Sampling

Low-flow monitoring well purging and sampling was conducted in accordance with FTMM SOP SAM-0223, which is presented in **Appendix B**.

2.1.7 Vapor Intrusion

Vapor Intrusion (VI) is the migration of organic compounds from the subsurface into overlying buildings (11). Per NJDEP guidance and consistent with U.S. Environmental Protection Agency (USEPA) policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of groundwater screening levels (GWSLs). In the case of petroleum hydrocarbon contamination (particularly benzene, toluene, ethylbenzene, and xylenes [BTEX]), a 30-ft distance criterion is utilized (12). Groundwater has been extensively evaluated at FTMM through the Installation Restoration Program (IRP) and analysis of groundwater samples in conjunction with individual UST closures under the FTMM UST program. Based on the location of existing buildings and comparison of groundwater analytical results to the GWSL, VI was determined in the Phase I ECP to be a potential concern at the following locations:

- MP:
  - FTMM-53 (Bldg 699) – BTEX and methyl tert-butyl ether (MTBE) have been detected in groundwater above the GWSLs.
  - FTMM-59 (Bldg 1122) – Trichloroethylene (TCE) has been detected in groundwater above the GWSL.
  - FTMM-61 (Bldg 283) – BTEX have been detected in groundwater above the GWSLs.
  - FTMM-64 (Bldg 812) – Benzene, xylene, tetrachloroethylene (PCE), TCE, and dichloroethene (DCE) have been detected in groundwater above the GWSLs. Upon further evaluation of the distribution of groundwater constituents in relation to existing structures at this location, VI is not a concern and further evaluation is not required at this location due to active remedial activities being conducted to address groundwater VO contamination.
- CWA:
  - FTMM-22 (CW-1, Bldg 2700) – PCE, TCE, and DCE have been detected in groundwater above the GWSLs.
  - FTMM-58 (Bldg 2567) – Benzene, DCE, and MTBE have been detected in groundwater above the GWSLs.

All sampling procedures outlined in the October 2005 NJDEP VI Guidance (12) and the 2005 NJDEP Field Sampling Procedures Manual (13) were followed for the collection of soil gas and indoor air.

2.1.7.1 Soil Gas Sampling

2.1.7.1.1 Near-Slab Soil Gas Sampling

Near-slab specifically refers to the collection of soil gas samples within 10 ft horizontally of a building's foundation. Per NJDEP VI guidance, the following requirements were followed during all near-slab sampling events:

- The near-slab soil gas samples were collected at the depth corresponding to the range between 2 ft and 5 ft below the depth of the slab (and a minimum of 5 ft bgs).
- The soil gas sample was collected in the vadose zone, at least 1 ft above the capillary fringe.
- Soil gas samples were collected at a minimum from two sides of the building being investigated (biased towards the delineated groundwater plume or soil

contaminant source) and/or were biased to the location of known groundwater constituents at concentrations above the GWSLs.

- A lab certified for an appropriate air method analyzed the samples (NJDEP – Site Remediation Waste Management [SRWM] USEPA TO-15 Method using 1-Liter stainless steel canisters).

An active soil gas collection method (i.e., the "pulling" of a vapor sample through a temporary probe to a collection device) was employed. Manually-driven soil vapor probes constructed of steel and equipped with a hardened drop-off steel tip were used. A 0.25-inch diameter teflon tube was inserted through the center of the rod and connected to the drive point. When the probe was retracted or pulled up, the probe was "open" for soil gas sampling. Soil gas sampling events were avoided after sizeable rainfall.

An annular seal was maintained by the soil against the probe rods. To verify the integrity of the seal, a tracer compound, helium, was utilized. Plastic sheeting was placed around the sample probe. Helium was released under the sheeting, and a field-screening instrument (Model MGD-2002 Multi-Gas Leak Detector) was utilized to monitor the initial soil gas samples (after purging) for elevated concentrations (>5%).

One-liter stainless steel sample canisters were utilized for the collection of near-slab samples. Prior to attaching the sample container, the vapor probes were purged by drawing 3.0 volumes of air through the probe and connecting tubing with a hand vacuum pump. The volume was calculated as follows:

$$\text{Purge volume} = 3.0\pi r^2 h$$

where r is the inner radius of the probe and connecting tubing, and h is the length of the probe and connecting tubing. A low purge rate at a maximum of 200 milliliters per minute was utilized.

The sample flow rate was at a rate of 200 milliliters per minute, which corresponds to a sample time of 5 minutes for 1-Liter canisters. The certified laboratory provided stainless steel canisters with pre-set regulators (based on the sample time prescribed by Shaw). Therefore, the sample rate was established in advance of the sampling event.

Results from near-slab soil gas investigation were compared to the NJDEP soil gas screening levels.

2.1.7.1.2 Sub-Slab Soil Gas Sampling

The collection of sub-slab soil gas typically involves drilling through the building's concrete slab and collecting a soil gas sample for analysis. However, the slabs at buildings to be investigated at FTMM are approximately 24 inches thick, and minimal disturbance to mission activities at buildings was necessary. Therefore, in lieu of drilling through building slabs, sub-slab soil gas samples were either replaced with indoor air

samples (Parcel 15, Bldg 2700); or sub-slab soil gas samples were collected through diagonal drilling from outside the building to an adequate depth underneath the slab to collect a sub-slab soil gas sample (Parcel 34 – Bldg 2567, Parcel 43 – Bldg 1122, and Parcel 52 – Bldg 699). The sub-slab soil gas samples were collected according to the procedures for near-slab soil gas sampling outlined in **Section 2.1.7.1.1**. Results from sub-slab soil gas samples were compared to the NJDEP soil gas screening levels.

2.1.7.2 Indoor Air Sampling

Indoor air samples were collected concurrently with ambient air and sub-slab soil gas samples.

A laboratory holding a current certification/accreditation from the NJDEP Office of Quality Assurance (OQA) for the NJDEP – SRWM USEPA TO-15 Method was utilized to provide the canisters and to perform the analyses.

Six-liter stainless SUMMA canisters were utilized for sample collection. Breathing zone height (3 to 5 ft) was targeted for ground floor sample collection, and basement samples were positioned as close as possible to the potential intrusion area(s) (e.g., sumps, major cracks in foundation). One ambient (outdoor) sample was collected per parcel concurrently with the indoor samples to assist in evaluating background chemical levels. This ambient air sample was taken at breathing zone height and located in a reasonably representative area (e.g., not immediately next to auto traffic or other potential sources). Air samples were collected over a 24-hour period, and air filters were utilized for each canister to prevent clogging. The certified laboratory provided stainless steel canisters with pre-set regulators (based on the sample time prescribed by Shaw).

Indoor air results were compared to the NJDEP indoor air screening levels.

A building walkthrough was conducted prior to indoor air and/or sub-slab soil gas sampling to address:

- Detection of potential background sources of VOs.
- Determination of the building construction.
- Recognition of points of VI in a structure.
- Identification of possible sample locations.
- Education of the occupants on VI and sampling procedures.

The building walkthroughs were conducted in November 2007. The *Indoor Air Building Survey and Sampling Form* (Appendix B to the NJDEP VI Guidance [12]) was completed in conjunction with the building walkthroughs and sampling event and is included in **Appendix C**.

A PID was utilized during building walkthroughs and during sampling events to identify items such as individual cans of solvents that could be potential vapor sources in order to remove them from the building in advance of the sampling event. No readings were registered on the PID detector during building walkthroughs.

The general condition of the slab and walls was documented as part of the Building Survey form. The investigators noted the presence of sumps, cleanouts, and floor drains.

2.1.8 Decontamination Procedures for Sampling

Decontamination activities for aqueous and non-aqueous sampling equipment were conducted in accordance with FTMM SOP SAM-0206, which is presented in **Appendix B**.

2.1.9 Field QC Samples

The collection of QC samples for aqueous and non-aqueous sampling was conducted in accordance with FTMM SOP SAM-0202, which is presented in **Appendix B**.

2.1.10 Management of Investigation-Derived Wastes

2.1.10.1 Liquid Wastes

Liquid wastes generated as part of the sampling process included development, purge and decontamination waters. Field instrument readings and previous analytical data were used for characterization of the liquid wastes. Water not considered contaminated was re-applied directly to the ground surface and permitted to percolate back into the ground. Care was taken to avoid nuisance situations such as pooling or runoff by monitoring the discharge rate and percolation rate. When water was considered contaminated, the water was reapplied back to the ground surface after care was used to determine all of the following conditions were met:

- The water was not permitted to migrate off site.
- There was no potential for contaminating a previously uncontaminated aquifer.
- The discharge would not cause an increase to ground surface soil contamination.

All excess liquid waste generated during this investigation was disposed on site at the time of sample collection.

2.1.10.2 Soil and Sediment Wastes

Soil and sediment wastes were generated from drilling operations and sampling activities. Where materials were known (via field instrumentation or visual observation) or suspected (historic information) to be contaminated, the soil or sediment was disposed of on site after it was determined that following conditions were met:

- The soil/sediment is considered non-hazardous.
- No potential to contaminate an uncontaminated aquifer exists.
- The disposal of soil/sediment will not erode or flow off site or on site into uncontaminated areas.
- The potential to create a health hazard to adjoining property owners through airborne exposure is nonexistent.

All excess soil and sediment generated during this investigation was disposed on site at the time of sample collection.

2.1.10.3 Miscellaneous Wastes

All disposable sampling equipment as well as personal protective equipment not considered hazardous waste was contained and disposed of as specified in FTMM SOP SAM-0223.

2.2 Data Quality Objectives

The Phase I ECP was conducted to assist potential property transferees in determining the environmental liability of the property. At the conclusion of the Phase I ECP, some data gaps regarding the environmental condition were identified. This SI was performed to close these data gaps wherever possible. As described in **Section 1.2**, the project objectives of the SI are to collect defensible chemical and physical data to provide order of magnitude estimates of the general nature and extent of contamination.

The chemical analytical data must be of sufficient quality to meet these project objectives. Data Quality Objectives (DQOs) are qualitative and quantitative statements which outline the decision-making process and specify the data required to support the field operations at FTMM. As part of the DQO process, a decision statement was developed that poses possible or potential actions to resolve problems. The decision statement for this project was to determine whether a release has occurred or potential sources remain that would result in an environmental liability.

2.3 Data Use

This section specifies the action levels used for comparison of the analytical data from the various media for the purpose of deciding whether the sample levels require further investigation, or NFA is necessary.

2.3.1 Action Levels

This section outlines the action levels used for the data comparison and decision making. Chemical analytical data were compared against NJDEP criteria and constituents of concern (COCs) were identified on a parcel-specific basis. The sampling data have been compared to the following NJDEP standards:

- Surface soil data were compared to the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC). Subsurface soil data were compared to the NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC). If no IGWSCC has been established for a constituent, subsurface data were compared to the NRDCSCC. The NRDCSCC and IGWSCC have been deemed the most appropriate criteria based on the current use at FTMM. The NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) are also presented on select soil data tables for informational purposes only.

- Groundwater data were compared to the New Jersey Groundwater Quality Standards (NJAC 7:9-6) or the Practical Quantitation Limits (PQLs), whichever was higher.

- Sediment data collected from non-tidally influenced water bodies were compared to the NJDEP Freshwater Sediment Screening Values – Lowest Effects Levels (LELs). The NJDEP Freshwater Sediment Screening Values – Severe Effects Levels (SELs) are presented on the sediment data tables for informational purposes.

- Sediment data collected from tidally influenced water bodies were compared to the NJDEP Marine/Estuarine Sediment Screening Guidelines – Effects Range – Low (ER-L). The NJDEP Marine/Estuarine Sediment Screening Guidelines – Effects Range – Medium (ER-M) are presented on the sediment data tables for informational purposes.

- Soil gas data were compared to the NJDEP Generic VI Screening Levels, Non-Residential Soil Gas Screening Levels (NRSGSLs). The NRSGSLs have been deemed the most appropriate criteria based on the current industrial land use at FTMM. The Residential Soil Gas Screening Levels are also presented on the soil gas data tables for informational purposes.

- Indoor air data were compared to the NJDEP Generic VI Screening Levels, Indoor Air Non-Residential Screening Levels and the NJDEP Rapid Action Levels. The Indoor Air Non-Residential Screening Levels have been deemed the most appropriate criteria based on the current industrial land use at FTMM. The Generic VI Screening Levels, Indoor Air Residential Screening Levels for indoor air are also presented on the indoor air data tables for informational purposes.

There are several factors both natural and anthropogenic that can have an influence on soil and groundwater chemical concentrations, specifically metals, in environmental samples collected at FTMM. The primary natural influence on the chemical characteristics of the overburden at FTMM is parent material. The parent material is glauconitic quartzose sands of the Tinton and Red Bank sands and their fluvially- and tidally-reworked equivalents (47). The mineral glauconite found in these sands is a potassium-, sodium-, calcium-, iron-, aluminum-, magnesium-rich hydrosilicate (47).

These glauconitic soils thus contain abundant iron, aluminum, calcium, magnesium, manganese, sodium, and potassium (among others).

The groundwater quality is often affected by the composition of the aquifer; in this case the Tinton and Red Bank sands. Coastal Plain aquifers are susceptible to saltwater encroachment. Aquifers under FTMM can also be influenced by saltwater intrusion, thus effecting groundwater chemistry. High concentrations of sodium are thus likely a result of saltwater intrusion. (47).

As a result of these natural influences, aluminum, calcium, iron, manganese, magnesium, potassium, and sodium are likely to be present at elevated concentrations and are not considered COCs in soil and groundwater at FTMM. All other analytical results for environmental samples collected at FTMM as part of this SI were evaluated with respect to applicable NJDEP comparison criteria and the MBCs. If concentrations exceeded NJDEP regulations, the sample concentrations were then compared to the MBC. Those compounds that exceeded the regulatory standard and established background levels were classified as COCs.

There are several natural and anthropogenic factors that can also have an influence on arsenic levels in soil at FTMM. The primary natural influence is the glauconitic parent material. Total arsenic levels in glauconitic-bearing soils in New Jersey have been documented to be present at concentrations up to 131 milligrams per kilogram (mg/kg), with a median concentration of 30 mg/kg (21). Anthropogenic influences on the arsenic levels in the soils include the routine use of pesticides. Arsenic was previously a common constituent of pesticides. Arsenic was further evaluated on a site-specific basis where it was detected above the NRDCSCC to determine if it is a COC in soil.

2.3.2 Investigation Endpoints

In order to obtain defensible data of sufficient quality to compare to the action levels, samples were analyzed by accredited laboratories certified for the project analytes. Following the data acquisition and evaluation in relation to the action levels, decision rules were derived to meet the investigation endpoints. The decision rule determines the appropriate next step based on whether the data is greater or less than the action levels. For this investigation, the following decision rules were developed and the following endpoints were recommended:

- If there are no detections above action level or no geophysical data suggestive of a potential underground source, NFA is proposed.
- If there are no detections above action level, NFA is proposed.
- If there are detections above action levels for COCs or geophysical data suggestive of a potential underground source, further evaluation is recommended.

2.4 Sample Management and Analysis

2.4.1 Sample Containers, Preservation, and Holding Times

The general analytical methods and sampling containers, preservation, and holding times utilized are provided in **Table 2-1**.

Table 2-1
Sample Containers, Preservation and Holding Times

Parameter	Analytical Method	Sample Container	Preservation	Holding Time
Aqueous Samples				
TCL+30, without Pesticides/PCBs	624 625	2 x 40 mL VO vials 1 x 1L amber	4°C, HCl to pH <2 4°C	14 days 7 days extract/40 days analysis
VO+10	624	2 x 40 mL VO vials	4°C, HCl to pH <2	14 days
B/N+15	625	1 x 1L amber	4°C	7 days extract/40 days analysis
TAL Metals	200.7	1 x 500 mL HDPE	4°C, HNO_3 to pH<2	6 months
Mercury	7470	1 x 500 mL HDPE	4°C, HNO_3 to pH<2	28 days
Cyanide	335.1 or 335.2	NA	NA	NA
Soil/Sediment Samples				
TCL+30, without Pesticides	8260 8082	1 x 2 ounce wide mouth glass 1 x 4 ounce wide mouth glass	Methanol NA	14 days 7 days extract/40 days analysis
VO+10	8260	1 x 2 ounce wide mouth glass	Methanol	14 days
PCBs	8082	1 x 4 ounce wide mouth glass	NA	7 days extract/40 days analysis
TPHC	NJDEP OQA-QAM-025	1 x 4 ounce wide mouth glass	NA	7 days extract/40 days analysis
TAL Metals	6010	1 x 4 ounce wide mouth glass	NA	6 months
Mercury	7471	1 x 4 ounce wide mouth glass	NA	28 days
Cyanide	9012	NA	NA	NA
Moisture	SW-846	1 x 4 ounce wide mouth glass	4°C	7 days

B/N	Base/Neutral	HNO_3	Nitric Acid	PCB	Polychlorinated Biphenyl
°C	degrees Celsius	H_2SO_4	Sulfuric Acid	TAL	Target Analyte List
g	gram	L	Liter	TCL	Target Compound List
HDPE	High Density Polyethylene	mL	milliliter	TPHC	Total Petroleum Hydrocarbon Content
HCl	Hydrochloric Acid	NA	Not Applicable	VO	Volatile Organic

2.4.1.1 Containers

The analytical laboratory provided sample containers based upon the sample matrix, potential contaminants, analytical methods, and the laboratory's internal quality assurance/QC requirements. They were selected upon review of the reactivity of the container material with the sample; volume required for analysis; color of container (whenever possible, amber glass is used to prevent photo-degradation); and container closures. All containers utilized had a leak-proof seal and were constructed out of material inert with respect to sampled materials. The closure may also be separated by a closure liner that is inert to sample material.

Sample containers were purchased as laboratory-cleaned. Custody documentation accompanied all sample containers to the field, during collection, during shipment to the laboratory, and during analysis.

2.4.1.2 Sample Preservation and Holding Times

Preservatives were utilized to retard hydrolysis of chemical compounds and complexes, to reduce volatility of constituents, and to retard biological action during transit and storage prior to the laboratory analysis.

Sample preservatives and holding times for methods utilized for this project are presented in **Table 2-1**. Note that all holding times expressed as 'days' refer to the *number of elapsed 24-hour periods from the time of collection, not to calendar days.*

In addition to chemical preservatives, all soil, sediment, and water samples for chemical analyses were transported to the laboratory in temperature-controlled coolers maintained at 4°C ± 2°C. Wet ice was used to maintain the internal cooler temperature required for preservation. A temperature blank (a VO sampling vial or similar-sized container filled with tap water) was included in every cooler and used to determine the internal temperature of the cooler upon receipt of the cooler at the laboratory.

2.4.2 Sample Documentation

Documentation was maintained to trace the possession and handling of the samples from the time of collection, through analysis and disposal. Documentation was conducted in accordance with FTMM SOP SAM-0202, which is presented in **Appendix B**.

2.4.2.1 Field Logbook

Every field team maintained a bound field-sampling logbook with permanent consecutively numbered pages. All entries were recorded in waterproof ink. The logbook contains sufficient information to distinguish samples from each other and permit the sampling team to locate the samples in the future. All field activities and notes were documented in the logbooks. Copies of the field logbooks are included in **Appendix D**.

2.4.2.2 Sample Labeling

All samples collected for laboratory analysis were placed in the proper sample container(s), identified through labeling, and packaged for shipment to the laboratory. The sample identification information, as well as collection details, were clearly recorded on the label and attached to the sample container. All labels included the following information:

- Field sample identification code (unique for each location, depth, and sampling event).
- Date and time of sample collection.
- Site name and/or location.
- Laboratory analysis requested.
- Preservation method (e.g., temperature, chemical pH adjustment).
- Initials of the individual(s) who collected the sample.
- Analytical laboratory.

2.4.2.3 Sample Chain-of-Custody

A Chain-of-Custody form was created at the time of sample collection for all samples collected.

The chain-of-custody is intended as a legal record of possession of the sample. The chain-of-custody accompanied the sample bottles during sample collection and transportation back to the laboratory, during analysis, and to final disposal of the sample container. During each event, the chain-of-custody bears the name of the person assuming responsibility for the samples. A copy of all chain-of-custodies used for the SI at FTMM is provided as part of the full data deliverables, which are presented in **Appendix E**.

2.4.3 Sample Packaging and Shipment

Following sample collection, each sample cooler was packed with cushioned packing material and sufficient double-bagged wet ice to make sure that an internal ambient temperature of 4°C ± 2°C was maintained from the field to the laboratory. Each sample cooler contained an associated Chain-of-Custody form.

2.4.4 Sample Receipt

Once a shipment of samples reached the laboratory, each sample container was checked against information on the Chain-of-Custody form for anomalies. For the safety of laboratory personnel, sample coolers were opened in a fume hood to prevent exposure in case there had been any breakage of containers or leakage of sample material during shipment. The condition, temperature, and appropriate preservation of samples were checked and documented on the Chain-of-Custody form or a sample receipt (log-in) form. The occurrences of any anomalies in the received samples and their resolution were documented in laboratory records.

All sample information was entered into a tracking system and unique analytical sample identifiers were assigned. A copy of this information was reviewed by the laboratory for accuracy. Sample hold-time tracking began with the collection of samples and continued until the analysis was complete. SOPs describing sample control and custody are maintained by the laboratory. Procedures for tracking the internal laboratory chain-of-custody were also implemented and documented by the laboratory. Specific instructions concerning the analysis specified for each sample were communicated to the analysts; analytical batches were created; and laboratory QC samples were introduced into each batch. Any subcontracted analyses were repackaged by the primary laboratory and shipped to the secondary laboratory using inter-laboratory Chain-of-Custody forms.

2.4.5 Analytical Program

All soil, sediment, and groundwater analyses were performed by the FTMM analytical laboratory. The laboratory is certified by NJDEP for all analyses conducted and is National Environmental Laboratory Accreditation Program approved. **Tables 2-2 through 2-8** provide the reporting limits (RLs) for all project analytes in comparison to their respective NJDEP soil and groundwater criteria.

Table 2-2 presents the target compound list (TCL)+30 list of organic compounds designated for analysis as contained in the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory is performing the analysis, and up to 30 non-targeted organic compounds (+ 30) as detected by gas chromatography/mass spectroscopy (GC/MS) analysis. A TCL+30 scan means the analysis of a sample for TCL compounds and up to 10 non-targeted VOs and up to 20 non-targeted Base/Neutrals (B/Ns) using GC/MS analytical methods. Non-targeted compound criteria are pursuant to the version of the EPA "Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory performed the analysis.

Table 2-3 presents the VO+10 list of compounds amenable to analysis by the purge and trap technique. VO+10 analysis means the analysis of a sample for those TCL compounds identified as volatiles and up to 10 non-targeted VOs pursuant to the version of the EPA “Contract Laboratory Program Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory performed the analysis.

Table 2-4 presents the B/N+15 list of semi-volatile compounds amenable to analysis by extraction of the sample with a pH neutral and a pH basic organic solvent. B/N+15 analysis means the analysis of a sample for those TCL compounds identified as semi-volatiles plus up to 15 non-targeted B/Ns, except phenol and phenolic compounds, in the version of the EPA “Contract Laboratory program Statement of Work for Organic Analysis, Multi-Media, Multi-Concentration” in effect as of the date on which the laboratory performed the analysis.

Tables 2-5 and 2-6 present the comparison criteria by media for polychlorinated biphenyl (PCB) and total petroleum hydrocarbon content (TPHC) analysis.

Table 2-7 presents the target analyte list (TAL) of inorganic compounds/elements designated for analysis as contained in the version of the EPA "Contract Laboratory Program Statement of Work for Inorganics Analysis, Multi-Media, Multi-Concentration" in effect as of the date on which the laboratory performed the analysis. A TAL scan means the analysis of a sample for TAL compounds/elements.

Table 2-8 presents the comparison criteria by media for cyanide analysis.

Soil gas and indoor air samples were analyzed by an off-site laboratory certified by the New Jersey Environmental Laboratory Certification Program in the method entitled NJDEP-SRWM USEPA Method TO-15, January 1999. The off-site laboratory is also National Environmental Laboratory Accreditation Program approved. **Table 2-9** presents the compounds analyzed and their associated RLs for the 1-Liter and 6-Liter canisters that were used for this project.

2.5 Quality Control

To ensure the quality of the data presented in this SI report, all field procedures were conducted in accordance with methodologies outlined in **Section 2.1** and SOPs included in **Appendix B**. The field sampling SOP methodologies utilized were developed based on the NJDEP Field Sampling Procedures Manual, N.J.A.C. 7:14 – Technical Requirements for Site Remediation, and N.J.A.C 7:14B – Underground Storage Tanks. All laboratory analyses were conducted by NJDEP certified and National Environmental Laboratory Accreditation Program approved laboratories.

2.5.1 Completeness

Completeness is a measure of the amount of information that must be collected during a field investigation to allow for a successful achievement of the sampling activities. Sampling completeness for this SI was assessed through the evaluation of the total number of samples proposed in the work plan versus the actual number of samples collected and analyzed. A total of 1,256 samples were proposed for collection in the work plan and 1,254 samples were collected. Thus, the resulting sampling completeness for this project was 99.8% for all matrices. A total of six additional soil samples were collected for TPHC analysis due to elevated field instrument reading. One groundwater sample from monitoring well UST-2337-65 (Parcel 15) was not collected because the well could not be located and is believed to be abandoned. One surface soil sample at the Bldg 2700 former transformer was not collected due to the adequate coverage of the other samples collected in a grid formation within the targeted area. One sanitary system aqueous sample was not collected because the manhole was sealed and capped. Four test pit soil samples were not collected due to shallow groundwater at the sampling locations.

2.5.2 Representativeness and Documentation Quality Review

Representativeness is a measure of the degree to which the results accurately reflect the media that were sampled. SOPs based on NJDEP protocol were utilized to ensure that samples collected were representative of their respective media. These SOPs contained sampling protocols (e.g., sediment sampling) and field handling protocols (e.g., storage, shipping) which were designed to protect the representativeness of the collected samples. Field activities were audited and documentation of sample collection, shipment, and receipt activities were reviewed for accuracy and completeness and to ensure the implementation of SOPs.

Review of accuracy, precision, and completeness of sample documentation and observations from field audits suggest that the designed sampling program for the SI was followed and resulted in the collection of representative samples.

2.5.3 Review of QC Samples

Standard QC checks were implemented during all field and laboratory activities. These checks included the field checks such as the collection of field/rinse blanks, trip blanks, and duplicate samples for laboratory analysis, as well as laboratory QC checks such as method blanks. Laboratory reports included in **Appendix E** contain a full description of the final results, methods of analysis, levels of detection, and method blank data.

Analytical data was evaluated against method blank, trip blank, and field blank data in order to evaluate the contribution of constituents detected in QC samples to the analytical results. Results of the analyses of field/rinse blanks were used to assess the effectiveness of equipment decontamination procedures in preventing cross-contamination between samples and to determine if compounds detected in the collected samples were attributable to the sampling equipment.

Trip blanks were used to determine if any on-site atmospheric contaminants were seeping into the sample bottles, or if cross-contamination of samples was occurring during shipment or storage of the sample containers. Trip blanks are applicable to aqueous VO samples. The trip blanks accompanied the samples into the field prior to sampling, remained with the collected samples during the sampling sequence, accompanied all aqueous VO sample bottles shipped to the laboratory, and remained with the samples at the off-site laboratory prior to analysis. In most instances, the trip blanks were demonstrated-analyte-free. Results of method blank analyses were used to determine if constituents detected in samples were introduced during sample extraction and analysis.

A summary of constituents detected in blank samples (field/rinse blanks and trip blanks) is presented in **Table 2-10**.

All of the VO and B/N compounds detected in blank samples are common laboratory contaminants and were likely introduced into the samples during laboratory

extraction/analysis. The low concentrations of constituents identified in field/rinsate blanks indicate that no significant cross-contamination occurred between samples. Full data validation was unnecessary to achieve the SI objectives.

2.5.4 Work Plan Variances

Overall, the sampling and analyses performed were sufficient to meet project objectives and comply with the work plan. However, minor variances occurred during implementation of the field and laboratory efforts. Minor variances and deficiencies are detailed within **Section 3** and summarized below.

Many soil samples were collected from borings beneath asphalt pavement. Surface soil was collected from the first native soil beneath the paving sub base. The field sampling technician recorded the sampling interval from the top of native soil, not from the top of ground surface (pavement). The analytical summary tables present the corrected sample intervals. Therefore, the analytical summary tables vary from the chain of custody in select instances.

Other variances to the planned approach include recollection of samples due to laboratory issues, the modification of soil sampling depth intervals based on visual or olfactory evidence of potential contamination, moving select sample locations due to obstacles and underground utilities, collection of indoor air in lieu of sub slab soil gas samples, and collection of fewer indoor air samples then planned after performing the building walkthrough. None of the variances resulted in non-attainment of project objectives. All variances are noted in **Section 3**.

2.5.5 Review of Tentatively Identified Compounds

The TCL+30 list of organic compounds designated for analysis included up to 30 non-targeted organic compounds (+ 30) as detected by GC/MS analysis. A TCL+30 scan means the analysis of a sample for TCL compounds and up to 10 non-targeted VOs and up to 20 non-targeted B/Ns using GC/MS analytical methods. All detected non-targeted compounds are reported as Tentatively Identified Compounds (TICs) in the laboratory deliverables included in **Appendix E**.

A qualitative review was conducted and TICs were identified at varying concentrations in one or more soil, sediment, or groundwater samples collected in Parcels 14, 15, 27, 28, 39, 43, 49, 51, 57, 61, 69, 70, 76, 79, 80, and 83. Sediment samples in Parcels 15, 27, 28, 39, 43, 49, 61 69, 70 contained numerous TICs. TICs are commonly observed in sediment samples and are likely attributable to naturally occurring organic constituents due to elevated carbon content. The majority of observed TICs are commonly detected constituents that were present at low concentrations. Elevated concentrations of TICs were observed in a small number of samples collected at Parcels 49 and 57. Locations at which TICs were identified at elevated concentrations included the following samples:

Parcel 49 – Four soil samples (49SB-5A, 49SB-5C, 49SB-6A, and 49SB-6C) each contained an unknown TIC at elevated concentrations ranging from 330 mg/kg to 460 mg/kg. The retention time for the unknown TIC ranged from 7.23 to 7.27 in the four samples; suggesting that the same unknown TIC was identified in all four samples. One or more semi-volatile constituents were identified in each of the four samples; however, no TCL organic constituents were identified at concentrations greater than the NRDCSCC.

Parcel 57 – Five soil samples contained TICs at elevated concentrations. 1,1-bis(1-methylethyl)-Hydrazine was detected at a concentration of 310 mg/kg in sample P57-A6-A and at a concentration of 330 mg/kg in the duplicate sample collected at P57-A9-C. It was not detected in sample P57-A9-C. 4-hydroxy-4-methyl 2-Pentanone was detected at concentrations of 220 mg/kg, 150 mg/kg, and 230 mg/kg in samples P57-A2-A, P57-A2-C, and P57-A4-C, respectively. Multiple semi-volatile constituents were identified in each of the five samples; however, no TCL organic constituents were identified at concentrations greater than the NRDCSCC.

Table 2-2
TCL+30

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Volatile Organics							
Acrolein	5	5	1.2	NLE	NLE	NLE	NLE
Acrylonitrile	5 (1.23)	2	1.2	1	5	1	NLE
tert-Butyl alcohol	10	100	1.2	NLE	NLE	NLE	NLE
Methyl-tert-butyl ether	2	70	0.25	NLE	NLE	NLE	NLE
Di-isopropyl ether	2	20000	0.25	NLE	NLE	NLE	NLE
Dichlorodifluoromethane	2	1000	0.25	NLE	NLE	NLE	NLE
Chloromethane	2	NLE	0.25	520	1000	10	NLE
Vinyl chloride	2 (0.23)	1	0.25	2	7	10	NLE
Bromomethane	2	10	0.25	79	1000	1	NLE
Chloroethane	2	NLE	0.25	NLE	NLE	NLE	NLE
Trichlorofluoromethane	2	2000	0.25	NLE	NLE	NLE	NLE
1,1-Dichloroethene	2 (0.19)	1	0.25	8	150	10	NLE
Acetone	2	6000	0.25	1000	1000	100	NLE
Carbon disulfide	2	700	0.25	NLE	NLE	NLE	NLE
Methylene chloride	2	3	0.25	49	210	1	NLE
trans-1,2-Dichloroethene	2	100	0.25	1000	1000	50	NLE
1,1-Dichloroethane	2	50	0.25	570	1000	10	NLE
Vinyl acetate	2	7000	0.25	NLE	NLE	NLE	NLE
2-Butanone	2	300	0.25	1000	1000	50	NLE
cis-1,2-Dichloroethene	2	70	0.25	79	1000	1	NLE
Chloroform	2	70	0.25	19	28	1	NLE
1,1,1-Trichloroethane	2	30	0.25	210	1000	50	NLE
Carbon tetrachloride	2 (0.24)	1	0.25	2	4	1	NLE
Benzene	2 (0.24)	1	0.25	3	13	1	0.34
1,2-Dichloroethane	2	2	0.25	6	24	1	NLE
Trichloroethylene	2 (0.26)	1	0.25	23	54	1	1.6

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
1,2-Dichloropropane	2 (0.24)	1	0.25	10	43	NLE	NLE
Bromodichloromethane	2 (0.22)	1	0.25	11	46	1	NLE
2-Chloroethyl vinyl ether	2	NLE	0.25	NLE	NLE	NLE	NLE
cis-1,3-Dichloropropene	2 (0.22)	1	0.25	4	5	1	NLE
4-Methyl-2-pentanone	2	NLE	0.25	1000	1000	50	NLE
Toluene	2	1000	0.25	1000	1000	500	2.5
trans-1,3-Dichloropropene	2 (0.25)	1	0.25	4	5	1	NLE
1,1,2-Trichloroethane	2	3	0.25	22	420	1	NLE
Tetrachloroethylene	2 (0.20)	1	0.25	4	6	1	0.45
2-Hexanone	2	NLE	0.25	NLE	NLE	NLE	NLE
Dibromochloromethane	2 (0.22)	1	0.25	110	1000	1	NLE
Chlorobenzene	2	50	0.25	37	680	1	NLE
Ethylbenzene	2	700	0.25	1000	1000	100	1.4
m+p Xylene	4	1000	0.5	410	1000	67	0.12
o Xylene	2	1000	0.25	410	1000	67	0.12
Styrene	2	100	0.25	23	97	100	NLE
Bromoform	2	4	0.25	86	370	1	NLE
1,1,2,2-Tetrachloroethane	2 (0.45)	1	0.25	34	70	1	NLE
1,3-Dichlorobenzene	2	600	0.25	5100	10000	100	NLE
1,4-Dichlorobenzene	2	75	0.25	570	10000	100	NLE
1,2-Dichlorobenzene	2	600	0.25	5100	10000	50	NLE
1,1,1,2-Tetrachloroethane	2	1	0.25	170	310	1	NLE
Base/Neutrals							
Pyridine	10	NLE	1	NLE	NLE	NLE	NLE
n-Nitroso-dimethylamine	10 (0.60)	0.8	1	NLE	NLE	NLE	NLE
Aniline	10 (2.38)	6	1	NLE	NLE	NLE	NLE
Phenol	10	2000	1	10000	10000	50	NLE
bis(2-Chloroethyl)ether	10 (0.71)	7	1	0.66	3	10	NLE
2-Chlorophenol	10	40	1	280	5200	10	NLE
1,3-Dichlorobenzene	10	600	1	5100	10000	100	NLE

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
1,4-Dichlorobenzene	10	75	1	570	10000	100	NLE
Benzyl alcohol	10	2000	1	10000	10000	50	NLE
1,2-Dichlorobenzene	10	600	1	5100	10000	50	NLE
2-Methylphenol	10	NLE	1	2800	10000	NLE	NLE
bis(2-Chloroisopropyl)ether	10	300	1	2300	10000	10	NLE
4-Methylphenol	10	NLE	1	2800	10000	NLE	NLE
n-Nitroso-di-n-propylamine	10	10	1	0.66	0.66	10	NLE
Hexachloroethane	10 (0.96)	7	1	6	100	100	NLE
Nitrobenzene	10 (0.86)	6	1	28	520	10	NLE
Isophorone	10	40	1	1100	10000	50	NLE
2-Nitrophenol	10	NLE	1	NLE	NLE	NLE	NLE
2,4-Dimethylphenol	10	100	1	1100	10000	10	NLE
bis(2-Chloroethoxy)methane	10	NLE	1	NLE	NLE	NLE	NLE
2,4-Dichlorophenol	10	20	1	170	3100	10	NLE
Benzoic acid	10	30000	1	NLE	NLE	NLE	NLE
1,2,4-Trichlorobenzene	10 (0.89)	9	1	68	1200	100	NLE
Naphthalene	10	300	1	230	4200	100	0.16
4-Chloroaniline	10	30	1	230	4200	NLE	NLE
Hexachlorobutadiene	10 (0.99)	1	1	1	21	100	NLE
4-Chloro-3-methylphenol	10	NLE	1	10000	10000	100	NLE
2-Methylnaphthalene	10	NLE	1	NLE	NLE	NLE	0.070
Hexachlorocyclopentadiene	10	40	1	400	7300	100	NLE
2,4,5-Trichlorophenol	10	700	1	5600	10000	50	NLE
2,4,6-Trichlorophenol	10	20	1	62	270	10	NLE
2-Chloronaphthalene	10	600	1	NLE	NLE	NLE	NLE
2-Nitroaniline	10	NLE	1	NLE	NLE	NLE	NLE
Dimethylphthalate	10	NLE	1	10000	10000	50	NLE
Acenaphthylene	10	NLE	1	NLE	NLE	NLE	0.044
2,6-Dinitrotoluene	10	10	1	1	4	10	NLE
3-Nitroaniline	10	NLE	1	NLE	NLE	NLE	NLE

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Acenaphthene	10	400	1	3400	10000	100	0.016
2,4-Dinitrophenol	10	40	1	110	2100	10	NLE
Dibenzofuran	10	NLE	1	NLE	NLE	NLE	NLE
4-Nitrophenol	10	NLE	1	NLE	NLE	NLE	NLE
2,4-Dinitrotoluene	10	10	1	1	4	10	NLE
Diethylphthalate	10	6000	1	10000	10000	50	NLE
Fluorene	10	300	1	2300	10000	100	0.190
4-Chlorophenyl-phenylether	10	NLE	1	NLE	NLE	NLE	NLE
4-Nitroaniline	10	NLE	1	NLE	NLE	NLE	NLE
n-Nitrosodiphenylamine	10	10	1	140	600	100	NLE
Azobenzene	10	NLE	1	NLE	NLE	NLE	NLE
4-Bromophenyl-phenylether	10	NLE	1	NLE	NLE	NLE	NLE
Hexachlorobenzene	10 (0.95)	0.02	1	0.66	2	100	NLE
Pentachlorophenol	10 (1.01)	0.3	1	6	24	100	NLE
Phenanthrene	10	NLE	1	NLE	NLE	NLE	0.560
Anthracene	10	2000	1	10000	10000	100	0.220
Di-n-butylphthalate	10	700	1	5700	10000	100	NLE
Fluoranthene	10	300	1	2300	10000	100	0.750
Benzidine	10	20	1	NLE	NLE	NLE	NLE
Pyrene	10	200	1	1700	10000	100	0.490
Butylbenzylphthalate	10	100	1	1100	10000	100	NLE
Benzo(a)anthracene	10 (0.82)	0.1	1	0.9	4	500	0.320
3,3'-Dichlorobenzidine	10	30	1	2	6	100	NLE
Chrysene	10 (0.77)	5	1	9	40	500	0.340
bis(2-Ethylhexyl)phthalate	10 (1.28)	3	1	49	210	100	NLE
Di-n-octylphthalate	10	100	1	100	10000	100	NLE
Benzo(b)fluoranthene	10 (0.98)	0.2	1	0.9	4	50	NLE
Benzo(k)fluoranthene	10 ((0.92)	0.5	1	0.9	4	500	0.240
Benzo(a)pyrene	10 (0.71)	0.1	1	0.66	0.66	100	0.370
Indeno(1,2,3-cd)pyrene	10 (0.76)	0.2	1	0.9	4	500	0.200

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Dibenz(a,h)anthracene	10 (0.76)	0.3	1	0.66	0.66	100	0.060
Benzo(g,h,i)perylene	10	NLE	1	NLE	NLE	NLE	0.170
Pesticides							
alpha-BHC	0.02	0.02	0.01	NLE	NLE	NLE	0.006
beta-BHC	0.02	0.04	0.01	NLE	NLE	NLE	0.005
gamma-BHC	0.02	0.03	0.01	0.52	2.2	50	0.003
delta-BHC	0.02	NLE	0.01	NLE	NLE	NLE	0.003
Heptachlor	0.02	0.05	0.01	0.15	0.65	50	NLE
Aldrin	0.02	0.04	0.01	0.040	0.17	50	0.002
Heptachlor epoxide	0.02	0.2	0.01	NLE	NLE	NLE	0.005
gamma-Chlordane	0.02	0.5	0.01	NLE	NLE	NLE	0.007
alpha-Chlordane	0.02	0.5	0.01	NLE	NLE	NLE	0.007
Endosulfan I	0.02	40	0.01	340	6200	50	NLE
4,4'-DDE	0.02	0.1	0.01	2	9	50	0.005
Dieldrin	0.02	0.03	0.01	0.042	0.18	50	0.002
Endrin	0.02	2	0.01	17	310	50	0.003
Endosulfan II	0.02	40	0.01	340	6200	50	NLE
4,4'-DDD	0.02	0.1	0.01	3	12	50	0.008
Endrin aldehyde	0.02	NLE	0.01	NLE	NLE	NLE	NLE
4,4'-DDT	0.02	0.1	0.01	2	9	500	0.008
Endosulfan sulfate	0.02	40	0.01	NLE	NLE	NLE	NLE
Endrin ketone	0.02	NLE	0.01	NLE	NLE	NLE	NLE
Methoxychlor	0.02	40	0.01	280	5200	50	NLE
Toxaphene	0.5	2	0.05	0.10	0.2	50	NLE
PCBs							
Aroclor 1016	0.5	0.5	0.05	0.49	2	50	0.007
Aroclor 1221	0.5	0.5	0.05	0.49	2	50	0.070
Aroclor 1232	0.5	0.5	0.05	0.49	2	50	0.070
Aroclor 1242	0.5	0.5	0.05	0.49	2	50	0.070
Aroclor 1248	0.5	0.5	0.05	0.49	2	50	0.030

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Aroclor 1254	0.5	0.5	0.05	0.49	2	50	0.060
Aroclor 1260	0.5	0.5	0.05	0.49	2	50	0.005

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level
µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-3
VO+10

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Acrolein	5	5	1.2	NLE	NLE	NLE	
Acrylonitrile	5 (1.23)	2	1.2	1	5	1	NLE
tert-Butyl alcohol	10	100	1.2	NLE	NLE	NLE	NLE
Methyl-tert-butyl ether	2	70	0.25	NLE	NLE	NLE	NLE
Di-isopropyl ether	2	20000	0.25	NLE	NLE	NLE	NLE
Dichlorodifluoromethane	2	1000	0.25	NLE	NLE	NLE	NLE
Chloromethane	2	NLE	0.25	520	1000	10	NLE
Vinyl chloride	2 (0.23)	1	0.25	2	7	10	NLE
Bromomethane	2	10	0.25	79	1000	1	NLE
Chloroethane	2	NLE	0.25	NLE	NLE	NLE	NLE
Trichlorofluoromethane	2	2000	0.25	NLE	NLE	NLE	NLE
1,1-Dichloroethene	2 (0.19)	1	0.25	8	150	10	NLE
Acetone	2	6000	0.25	1000	1000	100	NLE
Carbon disulfide	2	700	0.25	NLE	NLE	NLE	NLE
Methylene chloride	2	3	0.25	49	210	1	NLE
trans-1,2-Dichloroethene	2	100	0.25	1000	1000	50	NLE
1,1-Dichloroethane	2	50	0.25	570	1000	10	NLE
Vinyl acetate	2	7000	0.25	NLE	NLE	NLE	NLE
2-Butanone	2	300	0.25	1000	1000	50	NLE
cis-1,2-Dichloroethene	2	70	0.25	79	1000	1	NLE
Chloroform	2	70	0.25	19	28	1	NLE
1,1,1-Trichloroethane	2	30	0.25	210	1000	50	NLE
Carbon tetrachloride	2 (0.24)	1	0.25	2	4	1	NLE
Benzene	2 (0.24)	1	0.25	3	13	1	NLE
1,2-Dichloroethane	2	2	0.25	6	24	1	0.34
Trichloroethylene	2 (0.26)	1	0.25	23	54	1	NLE
1,2-Dichloropropane	2 (0.24)	1	0.25	10	43	NLE	1.6

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Bromodichloromethane	2 (0.22)	1	0.25	11	46	1	NLE
2-Chloroethyl vinyl ether	2	NLE	0.25	NLE	NLE	NLE	NLE
cis-1,3-Dichloropropene	2 (0.22)	1	0.25	4	5	1	NLE
4-Methyl-2-pentanone	2	NLE	0.25	1000	1000	50	NLE
Toluene	2	1000	0.25	1000	1000	500	NLE
trans-1,3-Dichloropropene	2 (0.25)	1	0.25	4	5	1	2.5
1,1,2-Trichloroethane	2	3	0.25	22	420	1	NLE
Tetrachloroethylene	2 (0.20)	1	0.25	4	6	1	NLE
2-Hexanone	2	NLE	0.25	NLE	NLE	NLE	0.45
Dibromochloromethane	2 (0.22)	1	0.25	110	1000	1	NLE
Chlorobenzene	2	50	0.25	37	680	1	NLE
Ethylbenzene	2	700	0.25	1000	1000	100	NLE
m+p Xylene	4	1000	0.5	410	1000	67	1.4
o Xylene	2	1000	0.25	410	1000	67	0.12
Styrene	2	100	0.25	23	97	100	0.12
Bromoform	2	4	0.25	86	370	1	NLE
1,1,2,2-Tetrachloroethane	2 (0.45)	1	0.25	34	70	1	NLE
1,3-Dichlorobenzene	2	600	0.25	5100	10000	100	NLE
1,4-Dichlorobenzene	2	75	0.25	570	10000	100	NLE
1,2-Dichlorobenzene	2	600	0.25	5100	10000	50	NLE
1,1,1,2-Tetrachloroethane	2	1	0.25	170	310	1	NLE

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level

µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-4
B/N+15

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Pyridine	10	NLE	1	NLE	NLE	NLE	NLE
n-Nitroso-dimethylamine	10 (0.60)	0.8	1	NLE	NLE	NLE	NLE
Aniline	10 (2.38)	6	1	NLE	NLE	NLE	NLE
Phenol	10	2000	1	10000	10000	50	NLE
bis(2-Chloroethyl)ether	10 (0.71)	7	1	0.66	3	10	NLE
2-Chlorophenol	10	40	1	280	5200	10	NLE
1,3-Dichlorobenzene	10	600	1	5100	10000	100	NLE
1,4-Dichlorobenzene	10	75	1	570	10000	100	NLE
Benzyl alcohol	10	2000	1	10000	10000	50	NLE
1,2-Dichlorobenzene	10	600	1	5100	10000	50	NLE
2-Methylphenol	10	NLE	1	2800	10000	NLE	NLE
bis(2-Chloroisopropyl)ether	10	300	1	2300	10000	10	NLE
4-Methylphenol	10	NLE	1	2800	10000	NLE	NLE
n-Nitroso-di-n-propylamine	10	10	1	0.66	0.66	10	NLE
Hexachloroethane	10 (0.96)	7	1	6	100	100	NLE
Nitrobenzene	10 (0.86)	6	1	28	520	10	NLE
Isophorone	10	40	1	1100	10000	50	NLE
2-Nitrophenol	10	NLE	1	NLE	NLE	NLE	NLE
2,4-Dimethylphenol	10	100	1	1100	1000	10	NLE
bis(2-Chloroethoxy)methane	10	NLE	1	NLE	NLE	NLE	NLE
2,4-Dichlorophenol	10	20	1	170	3100	10	NLE
Benzoic acid	10	30000	1	NLE	NLE	NLE	NLE
1,2,4-Trichlorobenzene	10 (0.89)	9	1	68	1200	100	NLE
Naphthalene	10	300	1	230	4200	100	0.16
4-Chloroaniline	10	30	1	230	4200	NLE	NLE
Hexachlorobutadiene	10 (0.99)	1	1	1	21	100	NLE
4-Chloro-3-methylphenol	10	NLE	1	10000	10000	100	NLE

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
2-Methylnaphthalene	10	NLE	1	NLE	NLE	NLE	0.070
Hexachlorocyclopentadiene	10	40	1	400	7300	100	NLE
2,4,5-Trichlorophenol	10	700	1	5600	10000	50	NLE
2,4,6-Trichlorophenol	10	20	1	62	270	10	NLE
2-Chloronaphthalene	10	600	1	NLE	NLE	NLE	NLE
2-Nitroaniline	10	NLE	1	NLE	NLE	NLE	NLE
Dimethylphthalate	10	NLE	1	10000	10000	50	NLE
Acenaphthylene	10	NLE	1	NLE	NLE	NLE	0.044
2,6-Dinitrotoluene	10	10	1	1	4	10	NLE
3-Nitroaniline	10	NLE	1	NLE	NLE	NLE	NLE
Acenaphthene	10	400	1	3400	10000	100	0.016
2,4-Dinitrophenol	10	40	1	110	2100	10	NLE
Dibenzofuran	10	NLE	1	NLE	NLE	NLE	NLE
4-Nitrophenol	10	NLE	1	NLE	NLE	NLE	NLE
2,4-Dinitrotoluene	10	10	1	1	4	10	NLE
Diethylphthalate	10	6000	1	10000	10000	50	NLE
Fluorene	10	300	1	2300	10000	100	0.190
4-Chlorophenyl-phenylether	10	NLE	1	NLE	NLE	NLE	NLE
4-Nitroaniline	10	NLE	1	NLE	NLE	NLE	NLE
n-Nitrosodiphenylamine	10	10	1	140	600	100	NLE
Azobenzene	10	NLE	1	NLE	NLE	NLE	NLE
4-Bromophenyl-phenylether	10	NLE	1	NLE	NLE	NLE	NLE
Hexachlorobenzene	10 (0.95)	0.02	1	0.66	2	100	NLE
Pentachlorophenol	10 (1.01)	0.3	1	6	24	100	NLE
Phenanthrene	10	NLE	1	NLE	NLE	NLE	0.560
Anthracene	10	2000	1	10000	10000	100	0.220
Di-n-butylphthalate	10	700	1	5700	10000	100	NLE
Fluoranthene	10	300	1	2300	10000	100	0.750
Benzidine	10	20	1	NLE	NLE	NLE	NLE
Pyrene	10	200	1	1700	10000	100	0.490

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Butylbenzylphthalate	10	100	1	1100	10000	100	NLE
Benzo(a)anthracene	10 (0.82)	0.1	1	0.9	4	500	0.320
3,3'-Dichlorobenzidine	10	30	1	2	6	100	NLE
Chrysene	10 (0.77)	5	1	9	40	500	0.340
bis(2-Ethylhexyl)phthalate	10 (1.28)	3	1	49	210	100	NLE
Di-n-octylphthalate	10	100	1	100	10000	100	NLE
Benzo(b)fluoranthene	10 (0.98)	0.2	1	0.9	4	50	NLE
Benzo(k)fluoranthene	10 ((0.92)	0.5	1	0.9	4	500	0.240
Benzo(a)pyrene	10 (0.71)	0.1	1	0.66	0.66	100	0.370
Indeno(1,2,3-cd)pyrene	10 (0.76)	0.2	1	0.9	4	500	0.200
Dibenz(a,h)anthracene	10 (0.76)	0.3	1	0.66	0.66	100	0.060
Benzo(g,h,i)perylene	10	NLE	1	NLE	NLE	NLE	0.170

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level

µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-5
PCBs

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Aroclor 1016	0.5	0.5	0.05	0.49	2	50	
Aroclor 1221	0.5	0.5	0.05	0.49	2	50	
Aroclor 1232	0.5	0.5	0.05	0.49	2	50	
Aroclor 1242	0.5	0.5	0.05	0.49	2	50	
Aroclor 1248	0.5	0.5	0.05	0.49	2	50	
Aroclor 1254	0.5	0.5	0.05	0.49	2	50	
Aroclor 1260	0.5	0.5	0.05	0.49	2	50	

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level

µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-6
TPHC

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
TPHC	5.0	NLE	300 (30)	10000	10000	10000	NLE

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level
µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
TPHC Total Petroleum Hydrocarbons
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-7
TAL Metals

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2, 6] (mg/kg)	NJDEP NRDCSCC[2, 6] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Aluminum	100	200	20	NLE	NLE	NLE	NLE
Antimony	10 (0.7)	6	2	14	340	NLE	NLE
Arsenic	5 (2)	3	1	20	20	NLE	6
Barium	5	2000	1	700	47000	NLE	NLE
Beryllium	0.5	1	0.1	16	140	NLE	NLE
Cadmium	2	4	0.4	39	100	NLE	0.6
Calcium	1000	NLE	200	NLE	NLE	NLE	NLE
Chromium	5	70	1	NLE	NLE	NLE	26
Cobalt	2	NLE	0.4	NLE	NLE	NLE	NLE
Copper	5	1300	1	3100	45000	NLE	16
Iron	500 (68)	300	100	NLE	NLE	NLE	NLE
Lead	5	5	1	400	800	NLE	31
Magnesium	1000	NLE	200	NLE	NLE	NLE	NLE
Manganese	5	50	1	NLE	NLE	NLE	NLE
Mercury	0.5	2	0.1	14	270	NLE	0.2
Nickel	5	100	1	250	2400	NLE	16
Potassium	1000	NLE	200	NLE	NLE	NLE	NLE
Selenium	20	40	2	63	3100	NLE	NLE
Silver	5	40	1	110	4100	NLE	1.0
Sodium	5000	50000	1000	NLE	NLE	NLE	NLE
Thallium	10 (1.4)	2	2	2	2	NLE	NLE
Vanadium	5	NLE	1	370	7100	NLE	NLE
Zinc	50	2000	5	1500	1500	NLE	120

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (RDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level
[6] Beryllium, copper, and lead based on NJAC 7:26D, 2008; all others based on NJAC 7:26D, 1999.

µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-8
Cyanide

Analyte	Project Aqueous RL (µg/L)	NJDEP GW Criteria[1] (µg/L)	Project Soil RL (mg/kg)	NJDEP RDCSCC[2] (mg/kg)	NJDEP NRDCSCC[3] (mg/kg)	NJDEP IGWSCC[4] (mg/kg)	NJDEP Freshwater Sediment Screening Values - LEL[5] (mg/kg)
Cyanide	0.05	100	1.0	1100	21000	NLE	NLE

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6.
[2] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[3] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D.
[4] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D.
[5] Lowest Effects Level
µg/L micrograms per liter
mg/kg milligrams per kilogram
RL Reporting Limit
GW Groundwater
NLE No Limit Established
Note: Method Detection Limits (MDLs) are listed in parenthesis.

Table 2-9
List of Required Compounds, Molecular Weights and NJDEP Required Reporting Limits - NJDEP-SRWM USEPA Method TO-15

Required Compound Name	CAS Number	Molecular Weight	6- Liter Canister Reporting Limits (ppbv)	1, 2.7 & 3.2- Liter Canister Reporting Limits (ppbv)
Acetone	67-64-1	58.08	5.0	50.0
Allyl chloride	107-05-1	76.53	0.20	2.0
Benzene	71-43-2	78.11	0.20	2.0
Bromodichloromethane	75-27-4	163.8	0.20	2.0
Bromoform	75-25-2	252.8	0.20	2.0
Bromomethane	74-83-9	94.94	0.20	2.0
1,3-Butadiene	106-99-0	54.09	0.20	2.0
Chlorobenzene	108-90-7	112.6	0.20	2.0
Chloroethane	75-00-3	64.52	0.50	50.0
Chloroform	67-66-3	119.4	0.20	2.0
Chloromethane	74-87-3	50.49	0.50	50.0
Carbon disulfide	75-15-0	76.14	0.50	5.0
Carbon tetrachloride	56-23-5	153.8	0.20	2.0
2-Chlorotoluene	95-49-8	126.6	0.20	2.0
Cyclohexane	110-82-7	84.16	0.20	2.0
Dibromochloromethane	124-48-1	208.3	0.20	2.0
1,2-Dibromoethane	106-93-4	187.9	0.20	2.0
1,2-Dichlorobenzene	95-50-1	147.0	0.20	2.0
1,3-Dichlorobenzene	541-73-1	147.0	0.20	2.0
1,4-Dichlorobenzene	106-46-7	147.0	0.20	2.0
Dichlorodifluoromethane	75-71-8	120.9	0.50	5.0
1,1-Dichloroethane	75-34-3	98.96	0.20	2.0
1,2-Dichloroethane	107-06-2	98.96	0.20	2.0
1,1-Dichloroethene	75-35-4	96.94	0.20	2.0
1,2-Dichloroethene (cis)	156-59-2	96.94	0.20	2.0
1,2-Dichloroethene (trans)	156-60-5	96.94	0.20	2.0
1,2-Dichloropropane	78-87-5	113.0	0.20	2.0
1,3-Dichloropropene (cis)	10061-01-5	111.0	0.20	2.0
1,3-Dichloropropene (trans)	10061-02-6	111.0	0.20	2.0
1,2-Dichlorotetrafluoroethane	76-14-2	170.9	0.20	2.0
1,4-Dioxane	123-91-1	88.12	5.0	50.0

Required Compound Name	CAS Number	Molecular Weight	6- Liter Canister Reporting Limits (ppbv)	1, 2.7 & 3.2- Liter Canister Reporting Limits (ppbv)
Ethanol*	64-17-5	46.07	0.20	2.0
Ethylbenzene	100-41-4	106.2	0.20	2.0
4-Ethyltoluene	622-96-8	120.2	0.20	2.0
n-Heptane	142-82-5	100.2	0.20	2.0
1,3-Hexachlorobutadiene	87-68-3	260.8	0.20	2.0
n-Hexane	110-54-3	86.17	0.20	2.0
Isopropanol*	67-63-0	60.10	0.20	2.0
Methylene chloride	75-09-2	84.94	0.50	5.0
Methyl ethyl ketone	78-93-3	72.11	0.50	5.0
Methyl isobutyl ketone	108-10-1	100.2	0.50	5.0
Methyl methacrylate	80-62-6	100.12	0.50	5.0
Methyl tert-butyl ether	1634-04-4	88.15	0.20	2.0
Styrene	100-42-5	104.1	0.20	2.0
Tert-butyl alcohol	75-65-0	74.12	5.0	50.0
1,1,2,2-Tetrachloroethane	79-34-5	167.9	0.20	2.0
Tetrachloroethylene	127-18-4	165.8	0.20	2.0
Tetrahydrofuran	109-99-9	72.11	5.0	50.0
Toluene	108-88-3	92.14	0.20	2.0
1,2,4-Trichlorobenzene	120-82-1	181.5	0.50	5.0
1,1,1-Trichloroethane	71-55-6	133.4	0.20	2.0
1,1,2-Trichloroethane	79-00-5	133.4	0.20	2.0
Trichloroethylene	79-01-6	131.4	0.20	2.0
Trichlorofluoromethane	75-69-4	137.4	0.20	2.0
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	187.4	0.20	2.0
1,2,4-Trimethylbenzene	95-63-6	120.2	0.20	2.0
1,3,5-Trimethylbenzene	108-67-8	120.2	0.20	2.0
2,2,4-Trimethylpentane	540-84-1	114.2	0.20	2.0
Vinyl bromide	593-60-2	106.9	0.20	2.0
Vinyl chloride	75-01-4	62.50	0.20	2.0
Xylenes (m&p)	1330-20-7	106.2	0.50	5.0
Xylenes (o)	95-47-6	106.2	0.20	2.0

Table 2-10
Summary of Detections in Trip and Field Blanks

Sample Date	Matrix	Anaylsis Type	Analyte	Concentration	Units
Field Blanks					
03-Oct-07	Solid	VO	Chloroform	0.9	ug/L
05-Oct-07	Solid	TPHC	TPHC	0.16	mg/L
13-Oct-07	Aqueous	VO	Chloroform	1.20	ug/L
15-Oct-07	Aqueous	VO	Chloroform	0.96	ug/L
19-Oct-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	0.75	ug/L
22-Oct-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	0.81	ug/L
31-Oct-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	3.04	ug/L
		Metals	Aluminum	40.7	ug/L
			Antimony	2.85	ug/L
			Barium	0.604	ug/L
			Cadmium	0.513	ug/L
			Calcium	176	ug/L
			Copper	1.19	ug/L
			Potassium	378	ug/L
			Selenium	5.9	ug/L
			Sodium	1290	ug/L
			Zinc	10.2	ug/L
31-Oct-07	Solid	VO	Chloroform	2	ug/L
08-Nov-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	0.79	ug/L
10-Nov-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	1.21	ug/L
17-Nov-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	4.48	ug/L
		VO	Acetone	3.02	ug/L
			Methylene Chloride	0.47	ug/L
19-Nov-07	Solid	VO	Chloroform	0.4	ug/L
20-Nov-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	7.36	ug/L
		Metals	Thallium	1.43	ug/L
21-Nov-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	2.34	ug/L
		VO	Acetone	1.97	ug/L
26-Nov-07	Solid	VO	Acetone	2	ug/L
28-Nov-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	3.65	ug/L
			Di-n-butyl phthalate	0.99	ug/L
28-Nov-07	Solid	VO	Chloroform	0.5	ug/L
01-Dec-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	2.99	ug/L
			Di-n-butyl phthalate	1.07	ug/L
			Pyridine	11.55	ug/L
		VO	Acetone	2.71	ug/L
04-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	5	ug/L
		Metals	Silver	1.85	ug/L
05-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	1	ug/L
		Metals	Magnesium	18.1	ug/L
			Silver	2.16	ug/L
			Thallium	1.83	ug/L
06-Dec-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	3.12	ug/L
			Di-n-butyl phthalate	3.12	ug/L
		Metals	Sodium	411	ug/L
		VO	Acetone	4.06	ug/L
06-Dec-07	Solid	Metals	Calcium	204	ug/L
			Magnesium	28.9	ug/L

Table 2-10
Summary of Detections in Trip and Field Blanks

Sample Date	Matrix	Anaylsis Type	Analyte	Concentration	Units
07-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	0.6	ug/L
		Metals	Barium	2.25	ug/L
			Copper	4.09	ug/L
			Lead	2.34	ug/L
			Silver	0.832	ug/L
			Zinc	20.6	ug/L
08-Dec-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	4.65	ug/L
		Metals	Sodium	297	ug/L
		VO	Acetone	8.79	ug/L
08-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	2	ug/L
		Metals	Aluminum	34.7	ug/L
			Barium	2.22	ug/L
			Calcium	199	ug/L
			Magnesium	20.5	ug/L
			Zinc	33.9	ug/L
10-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	1	ug/L
		Metals	Barium	2.01	ug/L
			Calcium	132	ug/L
			Lead	1.99	ug/L
			Thallium	1.68	ug/L
			Zinc	26.5	ug/L
11-Dec-07	Aqueous	Metals	Calcium	99.1	ug/L
			Selenium	3.66	ug/L
			Sodium	692	ug/L
		VO	Acetone	41.04	ug/L
11-Dec-07	Solid	Metals	Aluminum	22.5	ug/L
			Barium	2.63	ug/L
			Calcium	200	ug/L
			Copper	3.08	ug/L
			Iron	110	ug/L
			Lead	1.76	ug/L
			Magnesium	23.2	ug/L
			Thallium	2.3	ug/L
			Zinc	34.4	ug/L
13-Dec-07	Solid	Metals	Barium	2.18	ug/L
			Cadmium	0.734	ug/L
			Calcium	111	ug/L
			Magnesium	19.6	ug/L
			Silver	1.57	ug/L
			Thallium	3.21	ug/L
14-Dec-07	Aqueous	Metals	Calcium	99.2	ug/L
			Manganese	1.34	ug/L
			Selenium	3.83	ug/L
			Sodium	762	ug/L

Table 2-10
Summary of Detections in Trip and Field Blanks

Sample Date	Matrix	Anaylsis Type	Analyte	Concentration	Units
14-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	2	ug/L
		Metals	Aluminum	25.5	ug/L
			Barium	2.23	ug/L
			Copper	6.57	ug/L
			Iron	178	ug/L
			Magnesium	17.3	ug/L
			Potassium	290	ug/L
			Silver	0.979	ug/L
			Zinc	31.7	ug/L
15-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	2	ug/L
		Metals	Aluminum	31.4	ug/L
			Barium	3.1	ug/L
			Cadmium	0.226	ug/L
			Calcium	224	ug/L
			Copper	67.8	ug/L
			Iron	121	ug/L
			Magnesium	25.9	ug/L
			Nickel	42.4	ug/L
			Potassium	105	ug/L
			Silver	0.944	ug/L
			Thallium	2.1	ug/L
			Zinc	178	ug/L
17-Dec-07	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	1	ug/L
			Di-n-butyl phthalate	0.5	ug/L
		Metals	Calcium	136	ug/L
			Copper	1.29	ug/L
			Selenium	5.47	ug/L
			Zinc	7.51	ug/L
17-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	2	ug/L
		Metals	Aluminum	45.7	ug/L
			Barium	3.36	ug/L
			Cadmium	0.344	ug/L
			Calcium	161	ug/L
			Copper	6.91	ug/L
			Iron	169	ug/L
			Magnesium	38.8	ug/L
			Nickel	42.4	ug/L
			Potassium	545	ug/L
			Silver	1.52	ug/L
			Thallium	1.76	ug/L
			Zinc	24.9	ug/L
18-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	1	ug/L
		Metals	Aluminum	23	ug/L
			Barium	2.09	ug/L
			Calcium	189	ug/L
			Copper	5.13	ug/L
			Iron	85.5	ug/L
			Magnesium	18.8	ug/L
			Potassium	182	ug/L
			Silver	1.51	ug/L
			Zinc	26.1	ug/L

Table 2-10
Summary of Detections in Trip and Field Blanks

Sample Date	Matrix	Anaylsis Type	Analyte	Concentration	Units
19-Dec-07	Solid	B/N	bis(2-Ethylhexyl)phthalate	0.9	ug/L
			Di-n-butyl phthalate	0.5	ug/L
		Metals	Barium	3.11	ug/L
			Calcium	131	ug/L
			Copper	3.04	ug/L
			Iron	84.8	ug/L
			Silver	1.53	ug/L
			Vanadium	0.869	ug/L
			Zinc	18.6	ug/L
20-Dec-07	Aqueous	VO	Acetone	6.31	ug/L
21-Dec-07	Solid	Metals	Potassium	207	ug/L
08-Jan-08	Solid	B/N	bis(2-Ethylhexyl)phthalate	1	ug/L
		Metals	Copper	3.24	ug/L
			Iron	86.9	ug/L
			Nickel	3.22	ug/L
18-Jan-08	Aqueous	B/N	bis(2-Ethylhexyl)phthalate	1	ug/L
		VO	Acetone	34	ug/L
Trip Blanks					
13-Oct-07	Aqueous	VO	Chloroform	1.42	ug/L
15-Oct-07	Aqueous	VO	Chloroform	1.29	ug/L
17-Nov-07	Aqueous	VO	Acetone	3.05	ug/L
			Methylene Chloride	0.52	ug/L
19-Nov-07	Solid	VO	Acetone	0.450	mg/kg
21-Nov-07	Aqueous	VO	Acetone	1.17	ug/L
			Carbon disulfide	0.17	ug/L
			Methylene Chloride	0.43	ug/L
26-Nov-07	Solid	VO	Acetone	0.530	mg/kg
28-Nov-07	Solid	VO	Acetone	0.410	mg/kg
01-Dec-07	Aqueous	VO	Acetone	2.6	ug/L
04-Dec-07	Solid	VO	Acetone	0.420	mg/kg
05-Dec-07	Solid	VO	Acetone	0.290	mg/kg
06-Dec-07	Aqueous	VO	Acetone	4.47	ug/L
06-Dec-07	Solid	VO	Acetone	0.570	mg/kg
08-Dec-07	Aqueous	VO	Acetone	9.85	ug/L
10-Dec-07	Solid	VO	Acetone	0.240	mg/kg
11-Dec-07	Aqueous	VO	Acetone	35.06	ug/L
11-Dec-07	Solid	VO	Acetone	0.610	mg/kg
			Vinyl Acetate	0.210	mg/kg
13-Dec-07	Solid	VO	Acetone	0.430	mg/kg
15-Dec-07	Solid	VO	Acetone	0.930	mg/kg
17-Dec-07	Solid	VO	Acetone	2.600	mg/kg
			Methylene Chloride	0.075	mg/kg
17-Dec-07	Solid	VO	Acetone	0.310	mg/kg
18-Dec-07	Solid	VO	Acetone	0.084	mg/kg
20-Dec-07	Aqueous	VO	Acetone	5.08	ug/L
18-Jan-08	Aqueous	VO	Acetone	41	ug/L

3 Site-Specific Results

This section outlines the parcel-specific results of the Phase II ECP SI. The field sampling methodologies referenced herein (i.e., surface soil sampling, sediment sampling, geophysical surveys, etc.) as well as details pertaining to the analytical program are summarized in **Section 2.0**. All relevant FTMM SOPs for sample handling are provided in **Appendix B**. Copies of the soil and groundwater sampling Chain-of-Custody forms are presented in **Appendix E**, along with the complete laboratory analytical reports. Soil boring logs for each location are included in **Appendix F**. The water, soil, and sediment analytical programs for individual parcels are comprised of various combinations of VO+10, B/N+15, TPHC, TCL+30 for organics, and TAL metals, depending on site-specific history. All figures within this report utilize aerial photographs from 2002 as a backdrop. These photographs are high resolution and geo-referenced; however, in some cases site features have changed since 2002. In most cases, the general land use depicted on figures is consistent with current features and land use.

3.1 Parcel 13 – Former Barracks (Bldgs 2004 – 2016)

3.1.1 Site Description

Parcel 13 is located in the northeast portion of CWA and is currently a paved parking lot and open space adjacent to Parkers Creek. This area was identified on historic aerial photographs as formerly occupied by barracks. Based on review of aerial photographs, the barracks were demolished before 1963 (14). Plan No. 520, “Gas Distribution, Gasoline and Fuel Storage, CWA,” dated January 16, 1956 (**Appendix G**), was reviewed for the CWA as part of the Phase I ECP. The plan depicts numerous fuel oil USTs that existed within Parcel 13 in 1956 in association with the former barracks. It is not known if these USTs have been removed. Additional information can be found in Section 5.4 of the Phase I ECP (1).

3.1.2 Previous Investigations

No previous investigations were identified within this parcel.

3.1.3 Site Investigation Sampling

A review of documented UST removal locations versus the location of former buildings within Parcel 13 was conducted. Based on this review, it was determined that no UST removals have been documented at the locations of the former barracks within Parcel 13. In order to determine the absence/presence of formerly utilized USTs and the potential release from the USTs to the environment, the following geophysical surveys, soil sampling, and groundwater sampling activities were conducted throughout Parcel 13.

Geophysical Survey Investigation

An EM survey was conducted throughout the entire parcel to determine if USTs are present. Follow-up GPR surveys were conducted at anomalies identified from the EM surveys. **Section 2.1** summarizes the methodologies utilized during the geophysical surveys.

Geoprobe® Investigation

Geoprobe® soil samples were collected in September 2007 and groundwater samples were collected in October 2007 to investigate potential releases from historic heating oil USTs associated with the former barracks area. A total of 30 surface soil samples and 36 subsurface soil samples (including 4 duplicate samples) were collected from 30 distinct Geoprobe® borings. Soil boring locations were spaced on 100-ft centers in and around a current paved parking lot and golf course, which was once the location of the former barracks. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table from each boring. Field screening of the soil boring core was conducted using a PID/FID meter. Olfactory evidence of impacted soil was noted at the 18- to 24-inch interval bgs at boring location P13-A1, and one additional subsurface sample was collected based on elevated field screening results.

A total of six groundwater samples (including one duplicate sample) were collected from five distinct temporary wells that were installed with the Geoprobe® rig. Temporary wells were installed along the downgradient boundary of the soil boring grid conducted on 200-ft centers and were constructed of polyvinyl chloride (PVC) and 5 ft of factory-slotted screen.

Table 3.1-1 presents a summary of field activities, and sample locations are provided on **Figure 3.1-1**. A summary of the analytical and sampling program, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.1-2**.

Table 3.1-1
Parcel 13 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
300-ft x 950-ft former barracks area	A geophysical survey was conducted over the 300-ft x 950-ft former barracks area. The geophysical investigation consisted of an EM survey throughout the parcel followed by a targeted GPR survey of anomalies identified by the EM survey.		

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
P13-A1 through P13-C10 (30 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (if TPHC > 1,000 mg/kg)
P13-A1 through P13-C10 (35 samples – includes 4 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 6 to 12 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (if TPHC > 1,000 mg/kg)
13GW-C2, C4, C6, C8, C10 (6 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings in the grid to investigate the potential release from former heating oil USTs associated with the former barracks. Groundwater samples were collected on 200-ft centers in the downgradient portion of the sampling grid.	VO+10, B/N+15

3.1.4 Site Investigation Results

Geophysical Survey Results

The EM survey identified a total of 19 target EM anomalies. The survey area is presented on **Figure 3.1-1**. The inphase and terrain conductivity results are depicted in Figures 13B and 13C of **Appendix A**. This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. No metallic anomalies interpreted to be a UST were delineated.

Four large linear anomalies (suspected utilities) were delineated within this area. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.1-3**, and full results of the geophysical surveys are included in **Appendix A**. In summary, GPR scanning of the 19 targets revealed:

- Eight targets that were associated with surface metal/debris (previously unaccounted for).
- Seven targets that could not be relocated with the TW-6 because the targets were too small to be re-occupied, and therefore are most likely scrap metallic debris, not USTs.

- Two targets with high-amplitude near-surface reflections indicative of areas containing numerous small, scattered pieces of buried debris not indicative of a UST.
- One target with the characteristics of an abandoned-in-place utility.
- One moderate-amplitude point target/anomaly, possible debris small in size and not indicative of a UST.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis by USEPA Method 8260. If TPHC results were greater than 1,000 mg/kg, VO+10 analysis was conducted. Groundwater samples were analyzed for VO+10 and B/N+15.

Soil

In addition to the subsurface soil samples collected from the interval directly above the water table, one supplementary subsurface soil sample, P13-A1-B, was collected for TPHC analysis based on an elevated field screening measurement with a PID (27 parts per million [ppm]). No additional VO sample was collected as the elevated PID measurement was collocated with the 18- to 24-inch bgs interval collected for surface soil VO analysis. As shown in **Table 3.1-4**, TPHC was detected in five of the 30 surface soil samples and in two of the 35 subsurface soil samples. Only one sample, surface soil sample P13-B4-A (1,796 mg/kg), exceeded a concentration of 1,000 mg/kg and was subsequently analyzed for VO+10. There were no detectable concentrations of VOs in sample P13-B4-A. There were no exceedances of NJDEP NRDCSCC or RDCSCC in any of the surface or subsurface soil samples collected at Parcel 13.

Groundwater

A total of four VOs were detected in Parcel 13 groundwater samples. As shown in **Table 3.1-5**, all VOs (acetone, carbon disulfide, chloroform, and toluene) were detected at concentrations below respective NJDEP Groundwater Quality Criteria (GWQC).

3.1.5 Summary and Conclusions

No anomalies indicative of a potential UST were identified by the geophysical investigation, and no constituents were identified above applicable NJDEP criteria in soil and groundwater. NFA is recommended for Parcel 13.

Table 3.1-2
Parcel 13 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P13-A1-A	24-Sep-07	10:42	0.0	0.5	X								
SOIL	GEOPROBE	P13-A1-B	24-Sep-07	10:30	1.5	2.0	X								TPHC collected due to elevated field screening results.
SOIL	GEOPROBE	P13-A1-C	24-Sep-07	12:00	12.0	12.5	X								
SOIL	GEOPROBE	P13-A2-A	24-Sep-07	13:27	0.0	0.5	X								
SOIL	GEOPROBE	P13-A2-B	24-Sep-07	13:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A2-C	24-Sep-07	14:00	12.0	12.5	X								
SOIL	GEOPROBE	P13-A3-A	24-Sep-07	14:30	0.0	0.5	X								
SOIL	GEOPROBE	P13-A3-B	24-Sep-07	14:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A3-C	24-Sep-07	15:10	12.0	12.5	X								
SOIL	GEOPROBE	P13-A3-C DUPLICATE	24-Sep-07	15:10	12.0	12.5	X								
SOIL	GEOPROBE	P13-A4-A	24-Sep-07	15:35	0.0	0.5	X								
SOIL	GEOPROBE	P13-A4-B	24-Sep-07	15:35	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A4-C	24-Sep-07	15:55	10.0	10.5	X								
BLANK	TRIP	TRIP BLANK	24-Sep-07	16:00	--	--	NA								
BLANK	FIELD	FIELD BLANK	24-Sep-07	16:30	--	--	X								
SOIL	GEOPROBE	P13-A5-A	25-Sep-07	7:30	0.0	0.5	X								
SOIL	GEOPROBE	P13-A5-B	25-Sep-07	7:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A5-C	25-Sep-07	7:48	11.0	11.5	X								
SOIL	GEOPROBE	P13-A6-A	25-Sep-07	8:30	0.0	0.5	X								
SOIL	GEOPROBE	P13-A6-B	25-Sep-07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A6-C	25-Sep-07	8:50	10.0	10.5	X								
SOIL	GEOPROBE	P13-A7-A	25-Sep-07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P13-A7-B	25-Sep-07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A7-C	25-Sep-07	9:45	9.0	9.5	X								
SOIL	GEOPROBE	P13-A8-A	25-Sep-07	10:05	0.0	0.5	X								
SOIL	GEOPROBE	P13-A8-B	25-Sep-07	10:05	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A8-C	25-Sep-07	10:30	11.0	11.5	X								
SOIL	GEOPROBE	P13-A9-A	25-Sep-07	10:55	0.0	0.5	X								
SOIL	GEOPROBE	P13-A9-B	25-Sep-07	10:55	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A9-C	25-Sep-07	11:10	11.0	11.5	X								
SOIL	GEOPROBE	P13-A10-A	25-Sep-07	11:30	0.0	0.5	X								

Table 3.1-2
Parcel 13 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P13-A10-B	25-Sep-07	11:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-A10-C	25-Sep-07	11:50	11.0	11.5	X								
SOIL	GEOPROBE	P13-B1-A	25-Sep-07	13:15	0.0	0.5	X								
SOIL	GEOPROBE	P13-B1-B	25-Sep-07	13:15	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B1-C	25-Sep-07	13:40	9.0	9.5	X								
SOIL	GEOPROBE	P13-B2-A	25-Sep-07	14:10	0.5	1.0	X								
SOIL	GEOPROBE	P13-B2-B	25-Sep-07	14:10	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B2-C	25-Sep-07	14:30	9.5	10.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P13-B3-A	25-Sep-07	15:00	0.5	1.0	X								
SOIL	GEOPROBE	P13-B3-B	25-Sep-07	15:00	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B3-C	25-Sep-07	15:15	10.0	10.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P13-B4-A	25-Sep-07	15:50	0.5	1.0	X								
SOIL	GEOPROBE	P13-B4-B	25-Sep-07	15:50	1.5	2.0		X							
SOIL	GEOPROBE	P13-B4-C	25-Sep-07	16:10	11.0	11.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P13-B4-C DUPLICATE	25-Sep-07	16:10	11.0	11.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK	25-Sep-07	15:30	--	--	X								
BLANK	TRIP	TRIP BLANK	25-Sep-07	16:10	--	--		X							
SOIL	GEOPROBE	P13-B5-A	26-Sep-07	9:25	0.0	0.5	X								
SOIL	GEOPROBE	P13-B5-B	26-Sep-07	9:25	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B5-C	26-Sep-07	9:55	12.0	12.5	X								
SOIL	GEOPROBE	P13-B6-A	26-Sep-07	10:25	0.0	0.5	X								
SOIL	GEOPROBE	P13-B6-B	26-Sep-07	10:25	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B6-C	26-Sep-07	10:40	9.0	9.5	X								
SOIL	GEOPROBE	P13-B7-A	26-Sep-07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P13-B7-B	26-Sep-07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B7-C	26-Sep-07	11:30	8.5	9.0	X								
SOIL	GEOPROBE	P13-C10-A	26-Sep-07	11:48	0.0	0.5	X								

Table 3.1-2
Parcel 13 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P13-C10-B	26-Sep-07	11:48	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C10-C	26-Sep-07	11:57	9.0	9.5	X								
SOIL	GEOPROBE	P13-C8-A	26-Sep-07	13:30	0.0	0.5	X								
SOIL	GEOPROBE	P13-C8-B	26-Sep-07	13:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C8-C	26-Sep-07	13:40	7.0	7.5	X								
SOIL	GEOPROBE	P13-C6-A	26-Sep-07	14:15	0.0	0.5	X								
SOIL	GEOPROBE	P13-C6-B	26-Sep-07	14:15	1.5	2.5	NA								
SOIL	GEOPROBE	P13-C6-C	26-Sep-07	14:45	8.5	9.0	X								
SOIL	GEOPROBE	P13-C6-C DUPLICATE	26-Sep-07	14:45	8.5	9.0	X								
SOIL	GEOPROBE	P13-C4-A	26-Sep-07	15:20	0.5	1.0	X								
SOIL	GEOPROBE	P13-C4-B	26-Sep-07	15:20	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C4-C	26-Sep-07	15:30	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P13-C2-A	26-Sep-07	16:20	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P13-C2-B	26-Sep-07	16:20	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C2-C	26-Sep-07	16:30	9.0	9.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	RINSE BLANK	26-Sep-07	16:10	--	--	X								
BLANK	TRIP	TRIP BLANK	26-Sep-07	16:40	--	--	NA								
SOIL	GEOPROBE	P13-C1-A	27-Sep-07	7:43	0.0	0.5	X								
SOIL	GEOPROBE	P13-C1-B	27-Sep-07	7:43	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C1-C	27-Sep-07	8:10	8.5	9.0	X								
SOIL	GEOPROBE	P13-C3-A	27-Sep-07	9:00	0.5	1.0	X								
SOIL	GEOPROBE	P13-C3-B	27-Sep-07	9:00	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C3-C	27-Sep-07	9:20	9.0	9.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P13-C5-A	27-Sep-07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P13-C5-B	27-Sep-07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C5-C	27-Sep-07	11:00	9.0	9.5	X								
SOIL	GEOPROBE	P13-C7-A	27-Sep-07	11:20	0.0	0.5	X								

Table 3.1-2
Parcel 13 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P13-C7-B	27-Sep-07	11:20	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C7-C	27-Sep-07	11:35	6.5	7.0	X								
SOIL	GEOPROBE	P13-C9-A	27-Sep-07	13:20	0.0	0.5	X								
SOIL	GEOPROBE	P13-C9-B	27-Sep-07	13:20	1.5	2.0	NA								
SOIL	GEOPROBE	P13-C9-C	27-Sep-07	13:46	6.0	6.5	X								
SOIL	GEOPROBE	P13-B8-A	27-Sep-07	14:03	0.0	0.5	X								
SOIL	GEOPROBE	P13-B8-B	27-Sep-07	14:03	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B8-C	27-Sep-07	14:20	9.5	10.0	X								
SOIL	GEOPROBE	P13-B9-A	27-Sep-07	14:42	0.0	0.5	X								
SOIL	GEOPROBE	P13-B9-B	27-Sep-07	14:42	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B9-C	27-Sep-07	15:00	10.0	10.5	X								
SOIL	GEOPROBE	P13-B9-CDUPLICATE	27-Sep-07	15:00	12.0	12.5	X								
SOIL	GEOPROBE	P13-B10-A	27-Sep-07	15:20	0.0	0.5	X								
SOIL	GEOPROBE	P13-B10-B	27-Sep-07	15:20	1.5	2.0	NA								
SOIL	GEOPROBE	P13-B10-C	27-Sep-07	15:55	8.0	8.5	X								
BLANK	FIELD	FIELD BLANK-SO	27-Sep-07	15:47	--	--	X								
BLANK	TRIP	TRIP BLANK-SO	27-Sep-07	15:55	--	--	NA								
GW	GEOPROBE	PARCEL13-C-10	27-Sep-07	12:30	7.0	12									Sample cancelled for matrix interference and high sediment levels. Recollected 10/15/07.
GW	GEOPROBE	PARCEL13-C-8	27-Sep-07	14:30	7.0	12									Sample cancelled for matrix interference and high sediment levels. Recollected 10/15/07.
GW	GEOPROBE	PARCEL13-C-6	27-Sep-07	13:30	7.0	12									Sample cancelled for matrix interference and high sediment levels. Recollected 10/15/07.
GW	GEOPROBE	PARCEL13-C-4	27-Sep-07	13:00	7.0	12									Sample cancelled for matrix interference and high sediment levels. Recollected 10/15/07.
GW	GEOPROBE	PARCEL13-C-2	27-Sep-07	14:00	7.0	12									Sample cancelled for matrix interference and high sediment levels. Recollected 10/15/07.
BLANK	TRIP	TRIP BLANK-AQ	27-Sep-07	10:30	NA	NA									Blank cancelled.
BLANK	FIELD	FIELD BLANK-AQ	27-Sep-07	12:00	NA	NA									Blank cancelled.
GW	GEOPROBE	DUPLICATE-AQ	27-Sep-07	-	-	-									Sample cancelled for matrix interference and high sediment levels. Recollected 10/15/07.
BLANK	TRIP	TRIP BLANK-AQ	15-Oct-07	8:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	15-Oct-07	11:00	--	--		X	X						
GW	GEOPROBE	P13-C-10	15-Oct-07	11:30	7.0	12.0		X	X						

Table 3.1-2
Parcel 13 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
GW	GEOPROBE	P13-C-8	15-Oct-07	12:00	7.0	12.0		X	X						
GW	GEOPROBE	P13-C-6	15-Oct-07	12:30	7.0	12.0		X	X						
GW	GEOPROBE	P13-C-4	15-Oct-07	13:00	7.0	12.0		X	X						
GW	GEOPROBE	P13-C-4DUPLICATE	15-Oct-07	13:00	7.0	12.0		X	X						
GW	GEOPROBE	P13-C-2	15-Oct-07	13:30	7.0	12.0		X	X						

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg.
TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.
X = Sample analyzed for the indicated analytical parameter suite

Table 3.1-3
Parcel 13 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P13_1	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611157	535936
P13_2	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611191	535953
P13_3	Inphase	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	611203	535904
P13_4	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611269	535975
P13_5	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611308	535985
P13_6	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611342	535994
P13_7	Conductivity	N/A	N/A	N/A	Surface metal.	611492	536079
P13_8	Inphase	N/A	N/A	N/A	Surface metal.	611629	536023
P13_9	Inphase	N/A	N/A	N/A	Surface metal.	611642	535991
P13_10	Inphase	N/A	N/A	N/A	Surface metal.	611649	536020
P13_11	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611732	536133
P13_12	Conductivity	N/A	N/A	N/A	Surface metal.	611827	536265
P13_13	Conductivity	Yes	N/A	N/A	Possible abandoned utility.	611871	536271
P13_14	Inphase	Yes	10 x 10	see notes	Near-surface scattered metallic debris.	611892	536237
P13_15	Inphase	No	N/A	N/A	Surface metal.	611930	536278
P13_16	Inphase	Yes	5 x 5	see notes	Near-surface scattered metallic debris.	611937	536227
P13_17	Inphase	N/A	N/A	N/A	Surface metal.	611941	536174
P13_18	Inphase	N/A	N/A	N/A	Surface metal.	611950	536265
P13_19	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	611962	536236

Table 3.1-4
Fort Monmouth Phase II Site Investigation, Parcel 13
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP RDCSCC[1] (mg/kg)	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P13-A3-A	7035209	09/24/07	0.0-0.5	101	69	10000	10000	10000
P13-A3-C DUP	7035202	09/24/07	12.0-12.5	114	79	10000	10000	10000
P13-A4-A	7035212	09/24/07	0.0-0.5	616	65	10000	10000	10000
P13-B4-A	7035330	09/25/07	0.5-1.0	1796	68	10000	10000	10000
P13-B9-A	7035821	09/27/07	0.0-0.5	127	74	10000	10000	10000
P13-C3-A	7035806	09/27/07	0.5-1.0	106	67	10000	10000	10000
P13-C9-C	7035817	09/27/07	6.0-6.5	292	69	10000	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.1-5
Fort Monmouth Phase II Site Investigation, Parcel 13
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results				
	Sample ID:	P13-C4	P13-C4 DUP	P13-C6	P13-C8	P13-C10
	Lab ID:	7039407	7039403	7039406	7039405	7039404
	Date Sampled:	10/15/2007	10/15/2007	10/15/2007	10/15/2007	10/15/2007
	Screened Interval (ft. bgs):	7-12'	7-12'	7-12'	7-12'	7-12'
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result
Volatiles						
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	**4.41**
Carbon disulfide	700	0.44 U	0.44 U	**0.51**	0.44 U	**0.35 J**
Chloroform	70	**0.46**	**0.39**	0.32 U	0.32 U	0.32 U
Toluene	600	0.27 U	0.27 U	0.27 U	**0.22 J**	0.27 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Former Buildings Area Targeted By Geophysical Survey (Electromagnetic followed by Ground Penetrating Radar of Anomalies)
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 — Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3.1-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 13 SAMPLE LOCATIONS
CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_1-1_SI_P13_SampleLocations.mxd (7/14/2008 3:56:00 PM)

3.2 Parcel 14 – Former Buildings and Former Residential Housing Area in Northwest Portion of CWA

3.2.1 Site Description

Parcel 14 is located in the northwest portion of CWA and is currently undeveloped. This area was identified on historic aerial photographs as formerly occupied by buildings and residential housing. The buildings identified within this parcel were in place in aerial photographs from 1947 and 1957 (**Appendix G**). Based on the time at which these previous buildings existed, it is likely that fuel oil was the primary heating fuel and individual USTs were likely utilized for the storage of fuel oil at each individual building. It is not known if the USTs associated with the buildings were ever removed. Housing had replaced the original buildings within the parcel by 1963 (14). The housing was in place until 2002 and was identified on Plan No. 520, "Gas Distribution, Gasoline and Fuel Storage, CWA," dated January 16, 1956 (**Appendix G**), as being supplied by gas distribution lines. The housing was demolished between 2001 and 2003, and the area has been undeveloped since 2004. Additional information pertaining to this parcel can be found in Section 3.3, Section 5.4, and Appendix G of the Phase I ECP (1).

3.2.2 Previous Investigations

No previous investigations have been conducted to investigate possible fuel oil USTs associated with the former buildings.

3.2.3 Site Investigation Sampling

A review of documented UST removal locations versus the location of former buildings within Parcel 14 was conducted. Based on this review, it was determined that few UST removals have been documented at the locations of the former buildings that existed within Parcel 14 in the 1940s and early 1950s. In order to determine the absence/presence of formerly utilized USTs and the potential release from the USTs, geophysical surveys, soil sampling, and groundwater sampling were conducted throughout Parcel 14.

Geophysical Survey Investigation

An EM survey was conducted throughout the area of the parcel where former buildings were identified to determine if USTs are present. Follow-up GPR surveys were conducted at anomalies identified from the EM surveys. **Section 2.1** summarizes the methodologies utilized during the geophysical surveys.

Geoprobe® Investigation

Geoprobe® soil samples were collected in September and October 2007 in Parcel 14, and groundwater samples were collected in October 2007 to investigate potential releases from historic heating oil USTs potentially associated with the former buildings

area. Groundwater samples were collected from temporary wells (and two existing monitoring wells) installed along the downgradient boundary of the soil boring grid. A total of 150 surface soil samples, 165 subsurface soil samples (including 14 duplicate samples), and 22 groundwater samples (including three duplicate samples) were collected from 150 distinct Geoprobe® borings. Soil boring locations were spaced on 100-ft centers. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table from each boring. Field screening of the soil boring core was conducted using a PID/FID meter. Visible staining and olfactory evidence of impacted soil was noted at the 18- to 24-inch interval bgs at boring location P14-F5, and one additional subsurface soil sample was collected based on the results of field screening.

A total of 22 groundwater samples (including three duplicate samples) were collected from 19 distinct temporary wells that were installed with the Geoprobe® rig. Temporary wells were installed along the downgradient boundary of the soil boring grid conducted on 200-ft centers and were constructed of PVC and 5 to 10 ft of factory-slotted screen. Two existing FTMM monitoring wells (B9MW09B; B10MW10B) were also sampled.

Table 3.2-1 presents a summary of field activities, and sample locations are provided on **Figure 3.2-1**. An analytical summary of soil and groundwater sampling activities, including sample IDs, collection dates, analytical parameters, and methods of analysis, are provided in **Table 3.2-2**.

Table 3.2-1
Parcel 14 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
Entire Parcel (approximately 77 acres)	A geophysical survey was conducted over the entire parcel. The geophysical investigation consisted of an EM survey followed by targeted GPR of anomalies identified by the EM survey.		
P14-A1 through P14-O23 (150 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former buildings. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
P14-A1 through P14-O23 (165 samples – includes 14 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 2.5 to 12 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former buildings. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
14GW-B22, D14, D16, D18, D20, D22, L19, L21, L23, M17, O2, O4, O6, O8, O10, O11, O13, O15, O17 (19 samples – includes 3 duplicate samples)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings in the grid to investigate the potential release from former heating oil USTs associated with the former buildings. Where applicable, groundwater samples were collected on 200-ft centers in the downgradient portion of the sampling grid.	VO+10, B/N+15
B10MW10B, B9MW09B (2 samples)	Groundwater	Groundwater samples were collected from existing monitoring wells to investigate the potential release from former heating oil USTs associated with the former buildings.	VO+10, B/N+15

3.2.4 Site Investigation Results

Geophysical Survey Results

The EM survey identified a total of 137 target EM anomalies. The inphase and terrain conductivity results are depicted in Figures 14B and 14C, respectively, of the Enviroscan report (**Appendix A**). The survey area is presented on **Figure 3.2-2**. The majority of the area was scanned with the EM-31. The entrance road, security checkpoint, and adjacent areas were scanned with the EM-61 due to the amount of surface metal and tight confines. This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. One suspected UST was identified; the location of the suspected UST is presented on **Figure 3.2-2**. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.2-3** and full results of the geophysical surveys are included in **Appendix A**. In summary, GPR scanning of these 137 targets revealed:

- Ninety-four targets that were associated with surface metal/debris (previously unaccounted for).
- Nine targets that could not be relocated with the TW-6 because the targets were too small to be re-occupied, and therefore are most likely scrap metallic debris, not USTs.
- Six targets with the characteristics of an abandoned-in-place utility.

- Nine targets with moderate-amplitude scattered reflections indicative of areas containing numerous small pieces of scattered buried debris; not indicative of a UST.
- Eighteen targets with small TW-6 footprints and no associated GPR anomalies; not indicative of a UST.
- One target with the low-amplitude parabolic reflections that could be a possible UST. The location of the suspected UST matches up with former Bldg 2116. Bldg 2116 served as a mess hall, a non-housing structure, until the end of its life cycle. Supporting real property records are included in **Appendix I**.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis. If TPHC results were greater than 1,000 mg/kg, VO+10 analysis was conducted. In addition to the subsurface soil samples collected from the interval directly above the water table, one supplementary subsurface soil sample, P14-F5-B, was collected for TPHC analysis based on an elevated field screening measurement with a PID (7.1 ppm). No additional VO sample was collected as the elevated PID measurement was collocated with the 18- to 24-inch bgs interval collected for surface soil VO analysis. Groundwater samples were analyzed for VO+10 and B/N+15.

Soil

As shown in **Table 3.2-4**, TPHC were detected in four surface soil samples and in three subsurface soil samples. Only one sample, subsurface soil sample P14-F5-B (the supplementary soil sample collected based on field screening), exceeded a concentration of 1,000 mg/kg for contingency VO analysis. Two VOs (ethylbenzene and methylene chloride) were detected in sample P14-F5-B (**Table 3.2-5**). There were no exceedances of NJDEP NRDCSCC or RDCSCC in any of the surface soil or subsurface soil samples collected at Parcel 14. No COCs were identified in soil at Parcel 14.

Groundwater

A total of four VOs were detected in Parcel 14 groundwater samples. As shown in **Table 3.2-6**, all four VOs (acetone, MTBE, toluene, and trichlorofluoromethane) were detected at concentrations below the respective GWQC.

A total of two B/Ns were detected in Parcel 14 groundwater samples (bis[2-ethylhexyl] phthalate and diethyl phthalate). As shown in **Table 3.2-6**, bis(2-ethylhexyl)phthalate was detected in P14-O10 at a concentration of 16.67 micrograms per liter (μg/L), which exceeds the NJDEP GWQC of 3 μg/L. A commonly used plasticizer, bis(2-ethylhexyl) phthalate, is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected at a low concentration in the method and

field blanks associated with P14-O10. Therefore, it is not considered a COC in groundwater at Parcel 14. Diethyl phthalate was detected below the respective NJDEP GWQC. No COCs were identified in groundwater for Parcel 14.

3.2.5 Summary and Conclusions

One suspected UST was identified from the geophysical investigation conducted at Parcel 14. No COCs were identified above applicable NJDEP criteria in soil or groundwater.

Soil and groundwater analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for soil, groundwater, and the suspected UST in Parcel 14 is recommended.

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-O2-A	29-Sep-07	7:26	0.5	1.0	X								
SOIL	GEOPROBE	P14-O2-B	29-Sep-07	7:26	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O2-C	29-Sep-07	7:50	9.0	9.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P14-O4-A	29-Sep-07	8:15	0.5	1.0	X								
SOIL	GEOPROBE	P14-O4-B	29-Sep-07	8:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O4-C	29-Sep-07	8:35	9.5	10.0	X								
SOIL	GEOPROBE	P14-O6-A	29-Sep-07	9:05	0.5	1.0	X								
SOIL	GEOPROBE	P14-O6-B	29-Sep-07	9:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O6-C	29-Sep-07	9:20	10.5	11.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P14-O8-A	29-Sep-07	9:43	0.5	1.0	X								
SOIL	GEOPROBE	P14-O8-B	29-Sep-07	9:43	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O8-C	29-Sep-07	10:00	9.5	10.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P14-O10-A	29-Sep-07	10:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-O10-B	29-Sep-07	10:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O10-C	29-Sep-07	10:55	12.0	12.5	X								
SOIL	GEOPROBE	P14-O10-C DUPLICATE	29-Sep-07	10:55	12.0	12.5	X								
BLANK	FIELD	RINSE BLANK	29-Sep-07	11:05	--	--	X								Analyzed out of holding time.
SOIL	GEOPROBE	P14-O9-A	29-Sep-07	11:52	0.0	0.5	X								
SOIL	GEOPROBE	P14-O9-B	29-Sep-07	11:52	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O9-C	29-Sep-07	12:10	9.0	9.5	X								
SOIL	GEOPROBE	P14-O7-A	29-Sep-07	12:30	0.5	1.0	X								
SOIL	GEOPROBE	P14-O7-B	29-Sep-07	12:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O7-C	29-Sep-07	12:40	9.0	9.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P14-O5-A	29-Sep-07	13:05	0.5	1.0	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-O5-B	29-Sep-07	13:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O5-C	29-Sep-07	13:15	9.0	9.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P14-O3-A	29-Sep-07	13:30	0.5	1.0	X								
SOIL	GEOPROBE	P14-O3-B	29-Sep-07	13:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O3-C	29-Sep-07	13:40	9.5	10.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK	29-Sep-07	14:00	--	--	NA								
BLANK	TRIP	TRIP BLANK-SO	1-Oct-07	16:05	--	--	NA								
SOIL	GEOPROBE	P14-E1-A	1-Oct-07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-E1-B	1-Oct-07	8:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E1-C	1-Oct-07	8:50	7.5	8.0	X								
SOIL	GEOPROBE	P14-E2-A	1-Oct-07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-E2-B	1-Oct-07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E2-C	1-Oct-07	9:30	9.5	10.0	X								
SOIL	GEOPROBE	P14-E3-A	1-Oct-07	9:55	0.5	1.0	X								
SOIL	GEOPROBE	P14-E3-B	1-Oct-07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E3-C	1-Oct-07	10:25	9.5	10.0	X								
SOIL	GEOPROBE	P14-E3-C DUPLICATE	1-Oct-07	10:25	9.5	10	X								
SOIL	GEOPROBE	P14-E4-A	1-Oct-07	10:42	0.5	1.0	X								
SOIL	GEOPROBE	P14-E4-B	1-Oct-07	10:42	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E4-C	1-Oct-07	11:20	9.5	10.0	X								
BLANK	FIELD	RINSE BLANK-SO	1-Oct-07	12:45	--	--	X								Analyzed out of holding time.
SOIL	GEOPROBE	P14-E5-A	1-Oct-07	13:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-E5-B	1-Oct-07	13:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E5-C	1-Oct-07	13:30	8.0	8.5	X								
SOIL	GEOPROBE	P14-E6-A	1-Oct-07	13:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-E6-B	1-Oct-07	13:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E6-C	1-Oct-07	14:05	7.5	8.0	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-E7-A	1-Oct-07	14:35	0.5	1.0	X								
SOIL	GEOPROBE	P14-E7-B	1-Oct-07	14:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E7-C	1-Oct-07	14:45	5.5	6.0	X								
SOIL	GEOPROBE	P14-E8-A	1-Oct-07	15:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-E8-B	1-Oct-07	15:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E8-C	1-Oct-07	15:25	9.5	10.0	X								
SOIL	GEOPROBE	P14-E9-A	1-Oct-07	15:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-E9-B	1-Oct-07	15:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E9-C	1-Oct-07	16:00	5.5	6.0	X								
BLANK	TRIP	TRIP BLANK-AQ	1-Oct-07	8:30	NA	NA									Blank cancelled.
BLANK	FIELD	FIELD BLANK-AQ	1-Oct-07	10:00	NA	NA									Blank cancelled.
GW	GEOPROBE	DUPLICATE-AQ	1-Oct-07	-	-	-									Sample cancelled for matrix interference and high sediment levels. Recollected 10/22/07.
GW	GEOPROBE	P14-O-2	1-Oct-07	14:30	9.0	14.0									Sample cancelled for matrix interference and high sediment levels. Recollected 10/22/07.
GW	GEOPROBE	P14-O-4	1-Oct-07	14:00	9.0	14.0									Sample cancelled for matrix interference and high sediment levels. Recollected 10/22/07.
GW	GEOPROBE	P14-O-6	1-Oct-07	15:00	10.0	15.0									Sample cancelled for matrix interference and high sediment levels. Recollected 10/22/07.
GW	GEOPROBE	P14-O-8	1-Oct-07	12:30	9.0	14.0									Sample cancelled for matrix interference and high sediment levels. Recollected 10/22/07.
GW	GEOPROBE	P14-O-10	1-Oct-07	11:30	11.0	16.0									Sample cancelled for matrix interference and high sediment levels. Recollected 10/22/07.
SOIL	GEOPROBE	P14-E10-A	2-Oct-07	8:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-E10-B	2-Oct-07	8:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E10-C	2-Oct-07	8:15	6.0	6.5	X								
SOIL	GEOPROBE	P14-D3-A	2-Oct-07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-D3-B	2-Oct-07	8:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D3-C	2-Oct-07	8:45	7.0	7.5	X								
SOIL	GEOPROBE	P14-D4-A	2-Oct-07	9:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-D4-B	2-Oct-07	9:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D4-C	2-Oct-07	9:30	7.5	8.0	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-D5-A	2-Oct-07	10:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-D5-B	2-Oct-07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D5-C	2-Oct-07	10:05	7.0	7.5	X								
SOIL	GEOPROBE	P14-D6-A	2-Oct-07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-D6-B	2-Oct-07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D6-C	2-Oct-07	10:40	4.5	5.0	X								
SOIL	GEOPROBE	P14-D7-A	2-Oct-07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-D7-B	2-Oct-07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D7-C	2-Oct-07	11:25	6.0	6.5	X								
SOIL	GEOPROBE	P14-D7-C DUPLICATE	2-Oct-07	11:25	6.0	6.5	X								
BLANK	FIELD	FIELD BLANK	2-Oct-07	13:00	--	--	X								Analyzed out of holding time.
SOIL	GEOPROBE	P14-D8-A	2-Oct-07	13:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-D8-B	2-Oct-07	13:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D8-C	2-Oct-07	13:45	6.0	6.5	X								
SOIL	GEOPROBE	P14-D9-A	2-Oct-07	14:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-D9-B	2-Oct-07	14:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D9-C	2-Oct-07	14:20	7.0	7.5	X								
SOIL	GEOPROBE	P14-D10-A	2-Oct-07	14:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-D10-B	2-Oct-07	14:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D10-C	2-Oct-07	14:55	5.0	5.5	X								
SOIL	GEOPROBE	P14-C10-A	2-Oct-07	15:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-C10-B	2-Oct-07	15:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C10-C	2-Oct-07	15:20	5.5	6.0	X								
SOIL	GEOPROBE	P14-C9-A	2-Oct-07	15:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-C9-B	2-Oct-07	15:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C9-C	2-Oct-07	15:45	5.0	5.5	X								
BLANK	TRIP	TRIP BLANK	2-Oct-07	15:50	--	--	NA								
SOIL	GEOPROBE	P14-F1-A	3-Oct-07	8:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-F1-B	3-Oct-07	8:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F1-C	3-Oct-07	9:15	6.5	7.0	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-F2-A	3-Oct-07	9:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-F2-B	3-Oct-07	9:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F2-C	3-Oct-07	10:05	7.0	7.5	X								
SOIL	GEOPROBE	P14-F3-A	3-Oct-07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-F3-B	3-Oct-07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F3-C	3-Oct-07	10:40	5.5	6.0	X								
SOIL	GEOPROBE	P14-F4-A	3-Oct-07	10:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-F4-B	3-Oct-07	10:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F4-C	3-Oct-07	11:05	7.0	7.5	X								
SOIL	GEOPROBE	P14-F5-A	3-Oct-07	11:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-F5-B	3-Oct-07	11:20	1.5	2.0	X	X							TPHC collected due to elevated field screening results.
SOIL	GEOPROBE	P14-F5-C	3-Oct-07	11:40	5.0	5.5	X								
SOIL	GEOPROBE	P14-F6-A	3-Oct-07	13:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-F6-B	3-Oct-07	13:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F6-C	3-Oct-07	13:20	6.0	6.5	X								
SOIL	GEOPROBE	P14-F6-C DUPLICATE	3-Oct-07	13:20	6.0	6.5	X								
BLANK	FIELD	RINSE BLANK	3-Oct-07	12:40	--	--	X	X							Analyzed out of holding time.
SOIL	GEOPROBE	P14-F7-A	3-Oct-07	13:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-F7-B	3-Oct-07	13:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F7-C	3-Oct-07	13:50	5.5	6.0	X								
SOIL	GEOPROBE	P14-F8-A	3-Oct-07	14:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-F8-B	3-Oct-07	14:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F8-C	3-Oct-07	14:40	5.0	5.5	X								
SOIL	GEOPROBE	P14-F9-A	3-Oct-07	14:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-F9-B	3-Oct-07	14:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F9-C	3-Oct-07	15:00	5.5	6.0	X								
SOIL	GEOPROBE	P14-F10-A	3-Oct-07	15:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-F10-B	3-Oct-07	15:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F10-C	3-Oct-07	15:30	5.0	5.5	X								
BLANK	TRIP	TRIP BLANK	3-Oct-07	15:40	--	--		X							

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK	4-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-G1-A	4-Oct-07	9:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-G1-B	4-Oct-07	9:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G1-C	4-Oct-07	9:20	8.0	8.5	X								
SOIL	GEOPROBE	P14-G2-A	4-Oct-07	9:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-G2-B	4-Oct-07	9:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G2-C	4-Oct-07	9:45	6.5	7.0	X								
SOIL	GEOPROBE	P14-G3-A	4-Oct-07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-G3-B	4-Oct-07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G3-C	4-Oct-07	10:05	5.5	6.0	X								
SOIL	GEOPROBE	P14-G4-A	4-Oct-07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-G4-B	4-Oct-07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G4-C	4-Oct-07	11:30	5.5	6.0	X								
SOIL	GEOPROBE	P14-G5-A	4-Oct-07	11:45	0.0	0.5	X								
SOIL	GEOPROBE	P14-G5-B	4-Oct-07	11:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G5-C	4-Oct-07	11:45	3.5	4.0	X								
SOIL	GEOPROBE	P14-G5-C DUPLICATE	4-Oct-07	11:45	3.5	4.0	X								
SOIL	GEOPROBE	P14-G6-A	4-Oct-07	13:10	0.5	1.0	X								
SOIL	GEOPROBE	P14-G6-B	4-Oct-07	13:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G6-C	4-Oct-07	13:10	3.0	3.5	X								
SOIL	GEOPROBE	P14-G7-A	4-Oct-07	13:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-G7-B	4-Oct-07	13:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G7-C	4-Oct-07	13:40	2.5	3.0	X								
SOIL	GEOPROBE	P14-G8-A	4-Oct-07	14:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-G8-B	4-Oct-07	14:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G8-C	4-Oct-07	14:15	2.5	3.0	X								
SOIL	GEOPROBE	P14-G9-A	4-Oct-07	14:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-G9-B	4-Oct-07	14:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G9-C	4-Oct-07	14:30	3.5	4.0	X								
SOIL	GEOPROBE	P14-G10-A	4-Oct-07	14:50	0.0	0.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-G10-B	4-Oct-07	14:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G10-C	4-Oct-07	14:50	3.5	4.0	X								
BLANK	FIELD	RINSE BLANK	4-Oct-07	15:00	--	--	X								
BLANK	TRIP	TRIP BLANK	5-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-H1-A	5-Oct-07	7:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-H1-B	5-Oct-07	7:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H1-C	5-Oct-07	7:55	10.0	10.5	X								
SOIL	GEOPROBE	P14-H2-A	5-Oct-07	8:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-H2-B	5-Oct-07	8:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H2-C	5-Oct-07	8:15	5.5	6.0	X								
SOIL	GEOPROBE	P14-H3-A	5-Oct-07	8:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-H3-B	5-Oct-07	8:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H3-C	5-Oct-07	8:45	7.0	7.5	X								
SOIL	GEOPROBE	P14-H4-A	5-Oct-07	9:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-H4-B	5-Oct-07	9:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H4-C	5-Oct-07	9:10	5.0	5.5	X								
SOIL	GEOPROBE	P14-H5-A	5-Oct-07	9:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-H5-B	5-Oct-07	9:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H5-C	5-Oct-07	9:45	5.0	5.5	X								
SOIL	GEOPROBE	P14-H6-A	5-Oct-07	10:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-H6-B	5-Oct-07	10:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H6-C	5-Oct-07	10:25	3.5	4.0	X								
SOIL	GEOPROBE	P14-H7-A	5-Oct-07	10:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-H7-B	5-Oct-07	10:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H7-C	5-Oct-07	10:40	3.5	4.0	X								
SOIL	GEOPROBE	P14-H8-A	5-Oct-07	11:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-H8-B	5-Oct-07	11:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H8-C	5-Oct-07	11:20	2.5	3.0	X								
SOIL	GEOPROBE	P14-H8-C DUPLICATE	5-Oct-07	11:20	2.5	3.5	X								
SOIL	GEOPROBE	P14-H9-A	5-Oct-07	11:40	0.0	0.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-H9-B	5-Oct-07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H9-C	5-Oct-07	11:50	4.0	4.5	X								
SOIL	GEOPROBE	P14-H10-A	5-Oct-07	13:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-H10-B	5-Oct-07	13:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H10-C	5-Oct-07	13:05	3.5	4.0	X								
BLANK	FIELD	RINSE BLANK	5-Oct-07	13:15	--	--	X								
SOIL	GEOPROBE	P14-I1-A	9-Oct-07	8:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-I1-B	9-Oct-07	8:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I1-C	9-Oct-07	8:20	7.0	7.5	X								
SOIL	GEOPROBE	P14-I2-A	9-Oct-07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-I2-B	9-Oct-07	8:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I2-C	9-Oct-07	9:00	0.5	7.0	X								
SOIL	GEOPROBE	P14-I3-A	9-Oct-07	9:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-I3-B	9-Oct-07	9:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I3-C	9-Oct-07	9:30	5.5	6.0	X								
SOIL	GEOPROBE	P14-I4-A	9-Oct-07	10:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-I4-B	9-Oct-07	10:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I4-C	9-Oct-07	10:40	5.5	6.0	X								
SOIL	GEOPROBE	P14-I5-A	9-Oct-07	11:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-I5-B	9-Oct-07	11:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I5-C	9-Oct-07	11:25	2.5	3.0	X								
SOIL	GEOPROBE	P14-I6-A	9-Oct-07	11:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-I6-B	9-Oct-07	11:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I6-C	9-Oct-07	12:00	0.0	6.5	X								
SOIL	GEOPROBE	P14-I7-A	9-Oct-07	13:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-I7-B	9-Oct-07	13:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I7-C	9-Oct-07	13:25	4.5	5.0	X								
BLANK	FIELD	FIELD BLANK	9-Oct-07	13:30	--	--	X								
BLANK	TRIP	TRIP BLANK	9-Oct-07	13:30	--	--	NA								
SOIL	GEOPROBE	P14-I8-A	9-Oct-07	13:55	0.0	0.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-I8-B	9-Oct-07	13:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I8-C	9-Oct-07	14:10	6.0	6.5	X								
SOIL	GEOPROBE	P14-I9-A	9-Oct-07	15:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-I9-B	9-Oct-07	15:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I9-C	9-Oct-07	15:30	5.0	5.5	X								
SOIL	GEOPROBE	P14-I10-A	9-Oct-07	15:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-I10-B	9-Oct-07	15:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I10-C	9-Oct-07	14:00	4.5	5.0	X								
SOIL	GEOPROBE	P14-I10-C DUPLICATE	9-Oct-07	14:00	4.5	5.0	X								
BLANK	TRIP	TRIP BLANK	10-Oct-07	8:00	--	--	NA								
SOIL	GEOPROBE	P14-C11-A	10-Oct-07	8:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-C11-B	10-Oct-07	8:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C11-C	10-Oct-07	8:35	7.0	7.5	X								
SOIL	GEOPROBE	P14-C12-A	10-Oct-07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-C12-B	10-Oct-07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C12-C	10-Oct-07	9:40	8.0	8.5	X								
SOIL	GEOPROBE	P14-C13-A	10-Oct-07	10:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-C13-B	10-Oct-07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C13-C	10-Oct-07	10:10	7.5	8.0	X								
SOIL	GEOPROBE	P14-C14-A	10-Oct-07	11:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-C14-B	10-Oct-07	11:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C14-C	10-Oct-07	11:30	5.5	6.0	X								
SOIL	GEOPROBE	P14-C15-A	10-Oct-07	11:45	0.0	0.5	X								
SOIL	GEOPROBE	P14-C15-B	10-Oct-07	11:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C15-C	10-Oct-07	11:55	6.0	6.5	X								
SOIL	GEOPROBE	P14-C16-A	10-Oct-07	13:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-C16-B	10-Oct-07	13:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C16-C	10-Oct-07	14:00	4.5	5.0	X								
SOIL	GEOPROBE	P14-C17-A	10-Oct-07	14:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-C17-B	10-Oct-07	14:15	1.5	2.0	NA								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-C17-C	10-Oct-07	14:25	6.5	7.0	X								
BLANK	FIELD	FIELD BLANK	10-Oct-07	14:20	--	--	X								
SOIL	GEOPROBE	P14-C18-A	10-Oct-07	14:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-C18-B	10-Oct-07	14:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C18-C	10-Oct-07	15:10	5.5	6.0	X								
SOIL	GEOPROBE	P14-C19-A	10-Oct-07	15:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-C19-B	10-Oct-07	15:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C19-C	10-Oct-07	15:45	4.5	5.0	X								
SOIL	GEOPROBE	P14-C20-A	10-Oct-07	16:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-C20-B	10-Oct-07	16:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C20-C	10-Oct-07	16:10	6.5	7.0	X								
SOIL	GEOPROBE	P14-C20-C DUPLICATE	10-Oct-07	16:10	6.5	7.0	X								
BLANK	TRIP	TRIP BLANK	11-Oct-07	7:45	--	--	NA								
SOIL	GEOPROBE	P14-C21-A	11-Oct-07	7:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-C21-B	11-Oct-07	7:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C21-C	11-Oct-07	8:20	5.0	5.5	X								
SOIL	GEOPROBE	P14-C22-A	11-Oct-07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-C22-B	11-Oct-07	8:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-C22-C	11-Oct-07	8:50	7.5	8.0	X								
SOIL	GEOPROBE	P14-B14-A	11-Oct-07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-B14-B	11-Oct-07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B14-C	11-Oct-07	9:40	9.0	9.5	X								
SOIL	GEOPROBE	P14-B15-A	11-Oct-07	10:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-B15-B	11-Oct-07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B15-C	11-Oct-07	10:10	6.0	6.5	X								
SOIL	GEOPROBE	P14-B16-A	11-Oct-07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-B16-B	11-Oct-07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B16-C	11-Oct-07	11:00	6.0	6.5	X								
SOIL	GEOPROBE	P14-B17-A	11-Oct-07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-B17-B	11-Oct-07	11:15	1.5	2.0	NA								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-B17-C	11-Oct-07	11:30	7.0	7.5	X								
SOIL	GEOPROBE	P14-B18-A	11-Oct-07	13:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-B18-B	11-Oct-07	13:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B18-C	11-Oct-07	13:35	5.5	6.0	X								
BLANK	FIELD	FIELD BLANK	11-Oct-07	13:40	--	--	X								
SOIL	GEOPROBE	P14-B19-A	11-Oct-07	14:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-B19-B	11-Oct-07	14:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B19-C	11-Oct-07	14:15	4.0	4.5	X								
SOIL	GEOPROBE	P14-B20-A	11-Oct-07	14:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-B20-B	11-Oct-07	14:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B20-C	11-Oct-07	14:35	3.5	4.0	X								
SOIL	GEOPROBE	P14-B21-A	11-Oct-07	14:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-B21-B	11-Oct-07	14:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B21-C	11-Oct-07	15:05	5.5	6.0	X								
SOIL	GEOPROBE	P14-B21-C DUPLICATE	11-Oct-07	15:05	5.5	6.0	X								
BLANK	TRIP	TRIP BLANK	12-Oct-07	7:45	--	--	NA								
SOIL	GEOPROBE	P14-A20-A	12-Oct-07	7:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-A20-B	12-Oct-07	7:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-A20-C	12-Oct-07	8:15	8.0	8.5	X								
SOIL	GEOPROBE	P14-A21-A	12-Oct-07	8:45	0.0	0.5	X								
SOIL	GEOPROBE	P14-A21-B	12-Oct-07	8:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-A21-C	12-Oct-07	9:05	10.0	10.5	X								
SOIL	GEOPROBE	P14-A22-A	12-Oct-07	9:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-A22-B	12-Oct-07	9:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-A22-C	12-Oct-07	10:00	8.5	9.0	X								
SOIL	GEOPROBE	P14-B22-A	12-Oct-07	10:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-B22-B	12-Oct-07	10:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-B22-C	12-Oct-07	10:25	7.0	7.5	X								
SOIL	GEOPROBE	P14-D22-A	12-Oct-07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-D22-B	12-Oct-07	11:00	1.5	2.0	NA								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-D22-C	12-Oct-07	11:15	5.0	5.5	X								
SOIL	GEOPROBE	P14-D20-A	12-Oct-07	13:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-D20-B	12-Oct-07	13:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D20-C	12-Oct-07	13:50	9.0	9.5	X								
SOIL	GEOPROBE	P14-D18-A	12-Oct-07	14:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-D18-B	12-Oct-07	14:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D18-C	12-Oct-07	14:45	9.5	10.0	X								
SOIL	GEOPROBE	P14-D16-A	12-Oct-07	15:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-D16-B	12-Oct-07	15:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D16-C	12-Oct-07	15:20	8.5	9.0	X								
SOIL	GEOPROBE	P14-D16-C DUPLICATE	12-Oct-07	15:20	8.5	9.0	X								
BLANK	FIELD	FIELD BLANK	12-Oct-07	15:30	--	--	X								
SOIL	GEOPROBE	P14-D14-A	13-Oct-07	7:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-D14-B	13-Oct-07	7:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D14-C	13-Oct-07	8:05	7.0	7.5	X								
SOIL	GEOPROBE	P14-D14-C DUPLICATE	13-Oct-07	8:05	7.0	7.5	X								
BLANK	TRIP	TRIP BLANK-SO	13-Oct-07	8:00	--	--	NA								
BLANK	FIELD	FIELD BLANK-SO	13-Oct-07	8:30	--	--	X								
BLANK	TRIP	TRIP BLANK-AQ	13-Oct-07	7:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	13-Oct-07	9:20	--	--		X	X						
GW	GEOPROBE	P14-B22	13-Oct-07	9:30	7.0	12.0		X	X						
GW	GEOPROBE	P14-D22	13-Oct-07	10:00	5.0	10.0		X	X						
GW	GEOPROBE	P14-D20	13-Oct-07	10:30	7.0	12.0		X	X						
GW	GEOPROBE	P14-D18	13-Oct-07	12:00	10.0	15.0		X	X						
GW	GEOPROBE	P14-D16	13-Oct-07	12:30	7.0	12.0		X	X						
GW	GEOPROBE	P14-D16 DUPLICATE	13-Oct-07	12:30	7.0	12.0		X	X						
GW	GEOPROBE	P14-D14	13-Oct-07	14:00	7.0	12.0		X	X						
BLANK	TRIP	TRIP BLANK-SO	15-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-D11-A	15-Oct-07	7:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-D11-B	15-Oct-07	9:00	1.5	2.0	NA								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-D11-C	15-Oct-07	9:10	6.5	7.0	X								
SOIL	GEOPROBE	P14-D12-A	15-Oct-07	9:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-D12-B	15-Oct-07	9:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D12-C	15-Oct-07	9:35	6.0	6.5	X								
SOIL	GEOPROBE	P14-D13-A	15-Oct-07	10:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-D13-B	15-Oct-07	10:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D13-C	15-Oct-07	10:25	7.0	7.5	X								
SOIL	GEOPROBE	P14-D15-A	15-Oct-07	10:45	0.0	0.5	X								
SOIL	GEOPROBE	P14-D15-B	15-Oct-07	10:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D15-C	15-Oct-07	10:50	6.0	6.5	X								
SOIL	GEOPROBE	P14-D17-A	15-Oct-07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-D17-B	15-Oct-07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D17-C	15-Oct-07	11:25	6.0	6.5	X								
SOIL	GEOPROBE	P14-D17-C DUPLICATE	15-Oct-07	11:25	6.0	6.5	X								
SOIL	GEOPROBE	P14-D19-A	15-Oct-07	11:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-D19-B	15-Oct-07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D19-C	15-Oct-07	11:45	7.0	7.5	X								
SOIL	GEOPROBE	P14-D21-A	15-Oct-07	13:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-D21-B	15-Oct-07	13:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-D21-C	15-Oct-07	13:25	6.5	7.0	X								
BLANK	FIELD	FIELD BLANK-SO	15-Oct-07	13:15	--	--	X								
SOIL	GEOPROBE	P14-E11-A	15-Oct-07	13:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-E11-B	15-Oct-07	13:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-E11-C	15-Oct-07	13:50	7.5	8.0	X								
SOIL	GEOPROBE	P14-F11-A	15-Oct-07	14:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-F11-B	15-Oct-07	14:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-F11-C	15-Oct-07	14:20	7.5	8.0	X								
SOIL	GEOPROBE	P14-G11-A	15-Oct-07	14:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-G11-B	15-Oct-07	14:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-G11-C	15-Oct-07	15:00	7.0	7.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK	16-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-H11-A	16-Oct-07	7:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-H11-B	16-Oct-07	7:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-H11-C	16-Oct-07	7:50	7.5	8.0	X								
SOIL	GEOPROBE	P14-I11-A	16-Oct-07	8:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-I11-B	16-Oct-07	8:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-I11-C	16-Oct-07	8:15	5.5	6.0	X								
SOIL	GEOPROBE	P14-J11-A	16-Oct-07	8:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-J11-B	16-Oct-07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-J11-C	16-Oct-07	8:40	5.5	6.0	X								
SOIL	GEOPROBE	P14-K11-A	16-Oct-07	8:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-K11-B	16-Oct-07	8:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-K11-C	16-Oct-07	9:10	5.0	5.5	X								
SOIL	GEOPROBE	P14-K12-A	16-Oct-07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-K12-B	16-Oct-07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-K12-C	16-Oct-07	9:30	6.0	6.5	X								
SOIL	GEOPROBE	P14-K13-A	16-Oct-07	10:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-K13-B	16-Oct-07	10:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-K13-C	16-Oct-07	10:45	9.5	10.0	X								
SOIL	GEOPROBE	P14-K13-C DUPLICATE	16-Oct-07	10:45	9.5	10.0	X								
SOIL	GEOPROBE	P14-K14-A	16-Oct-07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-K14-B	16-Oct-07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-K14-C	16-Oct-07	11:10	5.5	6.0	X								
SOIL	GEOPROBE	P14-K15-A	16-Oct-07	13:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-K15-B	16-Oct-07	13:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-K15-C	16-Oct-07	13:45	7.5	8.0	X								
SOIL	GEOPROBE	P14-K16-A	16-Oct-07	14:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-K16-B	16-Oct-07	14:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-K16-C	16-Oct-07	14:20	6.5	7.0	X								
BLANK	FIELD	FIELD BLANK	16-Oct-07	10:05	--	--	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-L11-A	16-Oct-07	14:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-L11-B	16-Oct-07	14:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L11-C	16-Oct-07	14:50	6.0	6.5	X								
BLANK	TRIP	TRIP BLANK	17-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-L12-A	17-Oct-07	8:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-L12-B	17-Oct-07	8:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L12-C	17-Oct-07	8:35	5.5	6.0	X								
SOIL	GEOPROBE	P14-L13-A	17-Oct-07	9:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-L13-B	17-Oct-07	9:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L13-C	17-Oct-07	9:50	6.0	6.5	X								
SOIL	GEOPROBE	P14-L14-A	17-Oct-07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P14-L14-B	17-Oct-07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L14-C	17-Oct-07	11:00	5.5	6.0	X								
SOIL	GEOPROBE	P14-L15-A	17-Oct-07	11:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-L15-B	17-Oct-07	11:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L15-C	17-Oct-07	11:25	5.5	6.0	X								
SOIL	GEOPROBE	P14-L16-A	17-Oct-07	11:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-L16-B	17-Oct-07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L16-C	17-Oct-07	11:50	5.0	5.5	X								
SOIL	GEOPROBE	P14-L17-A	17-Oct-07	13:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-L17-B	17-Oct-07	13:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L17-C	17-Oct-07	13:10	7.0	7.5	X								
SOIL	GEOPROBE	P14-L17-C DUPLICATE	17-Oct-07	13:10	7.0	7.5	X								
SOIL	GEOPROBE	P14-L18-A	17-Oct-07	13:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-L18-B	17-Oct-07	13:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L18-C	17-Oct-07	13:45	4.5	5.0	X								
BLANK	FIELD	FIELD BLANK	17-Oct-07	13:20	--	--	X								
SOIL	GEOPROBE	P14-L20-A	17-Oct-07	14:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-L20-B	17-Oct-07	14:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L20-C	17-Oct-07	14:15	6.0	6.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-L22-A	17-Oct-07	14:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-L22-B	17-Oct-07	14:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L22-C	17-Oct-07	14:45	7.5	8.0	X								
SOIL	GEOPROBE	P14-M12-A	17-Oct-07	15:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-M12-B	17-Oct-07	15:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-M12-C	17-Oct-07	15:15	6.0	6.5	X								
BLANK	TRIP	TRIP BLANK	18-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-L19-A	18-Oct-07	8:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-L19-B	18-Oct-07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L19-C	18-Oct-07	8:50	8.0	8.5	X								
SOIL	GEOPROBE	P14-L21-A	18-Oct-07	9:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-L21-B	18-Oct-07	9:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L21-C	18-Oct-07	9:20	6.0	6.5	X								
SOIL	GEOPROBE	P14-L23-A	18-Oct-07	10:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-L23-B	18-Oct-07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-L23-C	18-Oct-07	10:25	11.5	12.0	X								
SOIL	GEOPROBE	P14-M17-A	18-Oct-07	10:45	0.0	0.5	X								
SOIL	GEOPROBE	P14-M17-B	18-Oct-07	10:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-M17-C	18-Oct-07	10:55	6.0	6.5	X								
SOIL	GEOPROBE	P14-O11-A	18-Oct-07	11:20	0.0	0.5	X								
SOIL	GEOPROBE	P14-O11-B	18-Oct-07	11:20	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O11-C	18-Oct-07	11:30	6.5	7.0	X								
SOIL	GEOPROBE	P14-O13-A	18-Oct-07	11:50	0.5	1.0	X								
SOIL	GEOPROBE	P14-O13-B	18-Oct-07	11:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O13-C	18-Oct-07	14:05	3.0	3.5	X								
SOIL	GEOPROBE	P14-O13-C DUPLICATE	18-Oct-07	11:55	3.0	3.5	X								
SOIL	GEOPROBE	P14-O15-A	18-Oct-07	14:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-O15-B	18-Oct-07	14:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O15-C	18-Oct-07	14:35	5.5	6.0	X								
SOIL	GEOPROBE	P14-O17-A	18-Oct-07	14:35	0.0	0.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-O17-B	18-Oct-07	14:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O17-C	18-Oct-07	12:50	7.0	7.5	X								
BLANK	FIELD	FIELD BLANK	18-Oct-07	15:15	--	--	X								
SOIL	GEOPROBE	P14-M13-A	18-Oct-07	15:15	0.0	0.5	X								
SOIL	GEOPROBE	P14-M13-B	18-Oct-07	15:15	1.5	2.0	NA								
SOIL	GEOPROBE	P14-M13-C	18-Oct-07	15:20	6.5	7.0	X								
SOIL	GEOPROBE	P14-M14-A	18-Oct-07	15:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-M14-B	18-Oct-07	15:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-M14-C	18-Oct-07	15:40	4.5	5.0	X								
BLANK	TRIP	TRIP BLANK-SO	19-Oct-07	7:00	--	--	NA								
SOIL	GEOPROBE	P14-M15-A	19-Oct-07	8:05	0.0	0.5	X								
SOIL	GEOPROBE	P14-M15-B	19-Oct-07	8:05	1.5	2.0	NA								
SOIL	GEOPROBE	P14-M15-C	19-Oct-07	8:10	3.0	3.5	X								
SOIL	GEOPROBE	P14-M16-A	19-Oct-07	8:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-M16-B	19-Oct-07	8:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-M16-C	19-Oct-07	8:35	5.5	6.0	X								
SOIL	GEOPROBE	P14-N11-A	19-Oct-07	8:55	0.0	0.5	X								
SOIL	GEOPROBE	P14-N11-B	19-Oct-07	8:55	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N11-C	19-Oct-07	9:15	9.5	10.0	X								
SOIL	GEOPROBE	P14-N12-A	19-Oct-07	9:35	0.0	0.5	X								
SOIL	GEOPROBE	P14-N12-B	19-Oct-07	9:35	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N12-C	19-Oct-07	9:55	7.0	7.5	X								
SOIL	GEOPROBE	P14-N12-C DUPLICATE	19-Oct-07	9:55	7.0	7.5	X								
SOIL	GEOPROBE	P14-N13-A	19-Oct-07	10:40	0.0	0.5	X								
SOIL	GEOPROBE	P14-N13-B	19-Oct-07	10:40	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N13-C	19-Oct-07	10:40	3.0	3.5	X								
SOIL	GEOPROBE	P14-N14-A	19-Oct-07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-N14-B	19-Oct-07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N14-C	19-Oct-07	11:30	5.0	5.5	X								
SOIL	GEOPROBE	P14-N15-A	19-Oct-07	11:50	0.0	0.5	X								

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P14-N15-B	19-Oct-07	11:50	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N15-C	19-Oct-07	12:00	5.0	5.5	X								
SOIL	GEOPROBE	P14-N16-A	19-Oct-07	14:30	0.0	0.5	X								
SOIL	GEOPROBE	P14-N16-B	19-Oct-07	14:30	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N16-C	19-Oct-07	14:50	8.5	9.0	X								
BLANK	FIELD	FIELD BLANK-SO	19-Oct-07	14:30	--	--	X								
SOIL	GEOPROBE	P14-N17-A	19-Oct-07	15:10	0.0	0.5	X								
SOIL	GEOPROBE	P14-N17-B	19-Oct-07	15:10	1.5	2.0	NA								
SOIL	GEOPROBE	P14-N17-C	19-Oct-07	15:20	4.5	5.0	X								
SOIL	GEOPROBE	P14-O12-A	19-Oct-07	15:45	0.0	0.5	X								
SOIL	GEOPROBE	P14-O12-B	19-Oct-07	15:45	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O12-C	19-Oct-07	15:50	7.0	7.5	X								
SOIL	GEOPROBE	P14-O14-A	19-Oct-07	16:00	0.0	0.5	X								
SOIL	GEOPROBE	P14-O14-B	19-Oct-07	16:00	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O14-C	19-Oct-07	16:10	4.5	5.0	X								
SOIL	GEOPROBE	P14-O16-A	19-Oct-07	16:25	0.0	0.5	X								
SOIL	GEOPROBE	P14-O16-B	19-Oct-07	16:25	1.5	2.0	NA								
SOIL	GEOPROBE	P14-O16-C	19-Oct-07	16:35	5.0	5.5	X								
BLANK	TRIP	TRIP BLANK-AQ	19-Oct-07	10:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	19-Oct-07	10:30	--	--		X	X						
GW	GEOPROBE	P14-L23	19-Oct-07	11:00	11.0	16.0		X	X						
GW	GEOPROBE	P14-L21	19-Oct-07	11:30	7.0	12.0		X	X						
GW	GEOPROBE	P14-L19	19-Oct-07	12:00	7.0	12.0		X	X						
GW	GEOPROBE	P14-M17	19-Oct-07	12:30	7.0	12.0		X	X						
GW	GEOPROBE	P14-O17	19-Oct-07	13:00	7.0	12.0		X	X						
GW	GEOPROBE	P14-O17 DUPLICATE	19-Oct-07	13:00	7.0	12.0		X	X						
GW	GEOPROBE	P14-O15	19-Oct-07	13:30	5.0	10.0		X	X						
GW	GEOPROBE	P14-O13	19-Oct-07	14:00	3.0	8.0		X	X						
GW	GEOPROBE	P14-O11	19-Oct-07	14:30	7.0	12.0		X	X						
GW	MONITORING WELL	P14-B9MW09B	19-Oct-07	15:30	3.9	13.9		X	X						

Table 3.2-2
Parcel 14 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-AQ	22-Oct-07	12:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	22-Oct-07	14:00	--	--		X	X						
GW	GEOPROBE	P14-O2	22-Oct-07	14:30	14.0	19.0		X	X						
GW	GEOPROBE	P14-O4	22-Oct-07	15:00	11.0	16.0		X	X						
GW	GEOPROBE	P14-O6	22-Oct-07	15:30	14.0	19.0		X	X						
GW	GEOPROBE	P14-O6 DUPLICATE	22-Oct-07	15:30	14.0	19.0		X	X						
GW	GEOPROBE	P14-O8	22-Oct-07	16:00	14.0	19.0		X	X						
GW	GEOPROBE	P14-O10	22-Oct-07	16:30	15.0	20.0		X	X						
GW	MONITORING WELL	P14-B10MW10B	22-Oct-07	17:00	6.7	16.7		X	X						

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg. TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.
X = Sample analyzed for the indicated analytical parameter suite

Table 3.2-3
Parcel 14 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P14_1	Inphase	N/A	N/A	N/A	Surface metal.	606500	534229
P14_2	Both	N/A	N/A	N/A	Surface metal.	606508	534024
P14_3	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	606508	534463
P14_4	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	606509	534138
P14_5	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	606519	534410
P14_6	Both	N/A	N/A	N/A	Surface metal.	606685	534447
P14_7	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	606727	534352
P14_8	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	606768	534051
P14_9	Inphase	N/A	N/A	N/A	Surface metal.	606816	534138
P14_10	Inphase	N/A	N/A	N/A	Surface metal.	606823	534188
P14_11	Both	Yes	N/A	N/A	Possible abandoned utility.	606826	534270
P14_12	Both	N/A	N/A	N/A	Surface metal.	606849	534508
P14_13	Both	Yes	N/A	N/A	Possible abandoned utility.	606868	534274
P14_14	Inphase	N/A	N/A	N/A	Surface metal.	606960	534353
P14_15	Inphase	N/A	N/A	N/A	Surface metal.	606960	534335
P14_16	Inphase	N/A	N/A	N/A	Surface metal.	606965	534339
P14_17	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	607011	534017
P14_18	Inphase	N/A	N/A	N/A	Surface metal.	607017	533929
P14_19	Both	N/A	N/A	N/A	Surface metal.	607057	534528
P14_20	Inphase	N/A	N/A	N/A	Surface metal.	607062	534494
P14_21	Inphase	N/A	N/A	N/A	Surface metal.	607077	534367

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P14_22	Both	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	607091	534326
P14_23	Inphase	N/A	N/A	N/A	Surface metal.	607102	534223
P14_24	Both	N/A	N/A	N/A	Surface metal.	607107	534544
P14_25	Both	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	607119	534310
P14_26	Inphase	N/A	N/A	N/A	Surface metal.	607123	534174
P14_27	Both	Yes	N/A	N/A	Possible abandoned utility.	607147	534505
P14_28	Both	N/A	N/A	N/A	Surface metal.	607169	534320
P14_29	Both	N/A	N/A	N/A	Surface metal.	607181	534554
P14_30	Both	N/A	N/A	N/A	Surface metal.	607186	534384
P14_31	Both	N/A	N/A	N/A	Surface metal.	607187	534373
P14_32	Both	N/A	N/A	N/A	Surface metal.	607188	534364
P14_33	Inphase	N/A	N/A	N/A	Surface metal.	607194	534519
P14_34	Inphase	N/A	N/A	N/A	Surface metal.	607212	534688
P14_35	Inphase	N/A	N/A	N/A	Surface metal.	607218	534632
P14_36	Both	N/A	N/A	N/A	Surface metal.	607225	534553
P14_37	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	607256	534567
P14_38	Both	Yes	N/A	N/A	Possible abandoned utility.	607283	534535
P14_39	Inphase	N/A	N/A	N/A	Surface metal.	607307	534666
P14_40	Both	N/A	N/A	N/A	Surface metal.	607307	534575
P14_41	Inphase	N/A	N/A	N/A	Surface metal.	607333	534647
P14_42	Both	N/A	N/A	N/A	Surface metal.	607341	534348
P14_43	Both	Yes	N/A	N/A	Possible abandoned utility.	607360	534241
P14_44	Inphase	Yes	N/A	N/A	Possible abandoned utility.	607411	534284
P14_45	EM-61	N/A	N/A	N/A	Surface metal.	607452	534588
P14_46	EM-61	N/A	N/A	N/A	Surface metal.	607455	534549
P14_47	EM-61	N/A	N/A	N/A	Surface metal.	607462	534463

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P14_48	EM-61	N/A	N/A	N/A	Surface metal.	607481	534390
P14_49	Inphase	N/A	N/A	N/A	Surface metal.	607598	534422
P14_50	Inphase	N/A	N/A	N/A	Surface metal.	607620	533744
P14_51	Inphase	N/A	N/A	N/A	Surface metal.	607702	533653
P14_52	Both	N/A	N/A	N/A	Surface metal.	607829	534592
P14_53	Inphase	N/A	N/A	N/A	Surface metal.	607851	534450
P14_54	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	607877	534561
P14_55	Inphase	Yes	< 1 X 2	see notes	No associated GPR anomaly, possible debris.	607886	534166
P14_56	Both	N/A	N/A	N/A	Surface metal.	607888	534133
P14_57	Inphase	N/A	N/A	N/A	Surface metal.	607891	534106
P14_58	Inphase	N/A	N/A	N/A	Surface metal.	607893	534032
P14_59	Both	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	607931	534470
P14_60	Inphase	Yes	2 X 2	2 X 2	Possible buried catch basin.	607940	533643
P14_61	Both	N/A	N/A	N/A	Surface metal.	607969	534347
P14_62	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	607973	534422
P14_63	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608125	534836
P14_64	Both	N/A	N/A	N/A	Surface metal.	608165	534161
P14_65	Both	Yes	< 1 X 1	see notes	No associated GPR anomaly, possible debris.	608170	534213
P14_66	Both	N/A	N/A	N/A	Surface metal.	608175	534134
P14_67	Both	N/A	N/A	N/A	Surface metal.	608190	534166
P14_68	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608197	534810
P14_69	Both	N/A	N/A	N/A	Surface metal.	608203	534888

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P14_70	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608213	533729
P14_71	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608213	534129
P14_72	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608223	534133
P14_73	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608242	534813
P14_74	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608255	534475
P14_75	Inphase	N/A	N/A	N/A	Surface metal.	608297	534902
P14_76	Inphase	N/A	N/A	N/A	Surface metal.	608304	534826
P14_77	Both	N/A	N/A	N/A	Surface metal.	608329	534405
P14_78	Both	N/A	N/A	N/A	Surface metal.	608335	534163
P14_79	Inphase	N/A	N/A	N/A	Surface metal.	608356	534524
P14_80	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608372	534848
P14_81	Inphase	N/A	N/A	N/A	Surface metal.	608379	534052
P14_82	Both	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608384	534923
P14_83	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608391	534469
P14_84	Inphase	See P14_84				608411	534855
P14_85	Inphase	Yes	5 X 5	4 X 6	Possible UST	608412	534855
P14_86	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608429	534855
P14_87	Inphase	N/A	N/A	N/A	Surface metal.	608436	534086
P14_88	Inphase	N/A	N/A	N/A	Surface metal.	608437	534189
P14_89	Inphase	N/A	N/A	N/A	Surface metal.	608442	534163
P14_90	Both	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608456	534430

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P14_91	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608478	534320
P14_92	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608494	534542
P14_93	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608613	534257
P14_94	Both	N/A	N/A	N/A	Surface metal.	608628	534685
P14_95	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608628	534389
P14_96	Both	N/A	N/A	N/A	Surface metal.	608638	534708
P14_97	Inphase	N/A	N/A	N/A	Surface metal.	608649	534564
P14_98	Both	N/A	N/A	N/A	Surface metal.	608658	534962
P14_99	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608675	533946
P14_100	Inphase	N/A	N/A	N/A	Surface metal.	608681	534567
P14_101	Both	N/A	N/A	N/A	Surface metal.	608697	534630
P14_102	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608702	534282
P14_103	Inphase	N/A	N/A	N/A	Surface metal.	608719	534140
P14_104	Inphase	N/A	N/A	N/A	Surface metal.	608808	534222
P14_105	Inphase	N/A	N/A	N/A	Surface metal.	608824	534999
P14_106	Inphase	Yes	< 3 X 3	< 3 X 3	Moderate-amplitude scattered anomalies, possible debris.	608831	535109
P14_107	Inphase	N/A	N/A	N/A	Surface metal.	608856	534281
P14_108	Inphase	N/A	N/A	N/A	Surface metal.	608865	534944
P14_109	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608956	534626
P14_110	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608983	534667
P14_111	Inphase	Yes	< 2 X 2	see notes	No associated GPR anomaly, possible debris.	608995	534617

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P14_112	EM-61	N/A	N/A	N/A	Surface metal.	607418	534816
P14_113	EM-61	N/A	N/A	N/A	Surface metal.	607422	534783
P14_114	EM-61	N/A	N/A	N/A	Surface metal.	607449	534746
P14_115	EM-61	N/A	N/A	N/A	Surface metal.	607455	534603
P14_116	EM-61	N/A	N/A	N/A	Surface metal.	607461	534538
P14_117	EM-61	N/A	N/A	N/A	Surface metal.	607467	534466
P14_118	EM-61	N/A	N/A	N/A	Surface metal.	607487	534439
P14_119	EM-61	N/A	N/A	N/A	Surface metal.	607482	534390
P14_120	EM-61	N/A	N/A	N/A	Surface metal.	607493	534326
P14_121	EM-61	N/A	N/A	N/A	Surface metal.	607512	534295
P14_122	EM-61	N/A	N/A	N/A	Surface metal.	607538	534291
P14_123	EM-61	N/A	N/A	N/A	Surface metal.	607514	534265
P14_124	EM-61	N/A	N/A	N/A	Surface metal.	607512	534242
P14_125	EM-61	N/A	N/A	N/A	Surface metal.	607512	534202
P14_126	EM-61	N/A	N/A	N/A	Surface metal.	607553	534212
P14_127	EM-61	N/A	N/A	N/A	Surface metal.	607519	534111
P14_128	EM-61	N/A	N/A	N/A	Surface metal.	607540	534100
P14_129	EM-61	N/A	N/A	N/A	Surface metal.	607530	534048
P14_130	EM-61	N/A	N/A	N/A	Surface metal.	607547	533969
P14_131	EM-61	N/A	N/A	N/A	Surface metal.	607479	533863
P14_132	EM-61	N/A	N/A	N/A	Surface metal.	607537	533863
P14_133	EM-61	N/A	N/A	N/A	Surface metal.	607542	533939
P14_134	EM-61	N/A	N/A	N/A	Surface metal.	607557	533939
P14_135	EM-61	N/A	N/A	N/A	Surface metal.	607570	533781
P14_136	EM-61	N/A	N/A	N/A	Surface metal.	607572	533701
P14_137	EM-61	N/A	N/A	N/A	Surface metal.	607522	533781

Table 3.2-4
Fort Monmouth Phase II Site Investigation, Parcel 14
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP RDCSCC[1] (mg/kg)	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P14-B22-A	7038912	10/12/07	0.0-0.5	676	73	10000	10000	10000
P14-C9-A	7036633	10/02/07	0.0-0.5	84	73	10000	10000	10000
P14-F5-B	7037014	10/03/07	1.5-2.0	4050	69	10000	10000	10000
P14-G1-A	7037203	10/04/07	0.0-0.5	79	68	10000	10000	10000
P14-I2-A	7037504	10/09/07	0.0-0.5	284	66	10000	10000	10000
P14-I10-C	7037532	10/09/07	4.5-5.0	258	83	10000	10000	10000
P14-O2-C	7036103	09/29/07	9.0-9.5	142	71	10000	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.2-5
Fort Monmouth Phase II Site Investigation, Parcel 14
Summary of Analytical Parameters Detected in Soil (mg/kg)

				Analytical Results
			Sample ID:	P14-F5-B
			Lab ID:	7037014
			Date Sampled:	10/3/2007
			Depth (ft. bgs):	1.5-2.0'
Chemical	RDCSCC[1]	NRDCSCC[2]	IGWSCC[3]	Result
Volatiles				
Ethylbenzene	1,000	1,000	100	**0.330 J**
Methylene Chloride	49	210	1	**0.170 JB**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.2-6
Fort Monmouth Phase II Site Investigation, Parcel 14
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results						
	Sample ID:	B10MW10B	B9MW09B	P14-D16	P14-D16 DUP	P14-D22	P14-L21	P14-L23
	Lab ID:	7041909	7040712	7039108	7039103	7039105	7040705	7040704
	Date Sampled:	10/22/2007	10/19/2007	10/13/2007	10/13/2007	10/13/2007	10/19/2007	10/19/2007
	Screened Interval (ft. bgs):	6.7-16.7	3.9-13.9	7-12	7-12	5-10	7-12	11-16
Chemical	Quality Criteria[1]	Results	Results	Results	Results	Results	Results	Results
Volatiles								
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	**14.39**	0.85 U	0.85 U
Methyl tertiary butyl ether (MTBE)	70	0.23 U	0.23 U	**0.88**	**1.34**	0.23 U	0.23 U	0.23 U
Toluene	600	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Trichlorofluoromethane	2000	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Semi-Volatiles								
bis(2-Ethylhexyl)phthalate	3	**1.67 B**	**1.04 JB**	1.28 U	1.28 U	1.28 U	**1.41 B**	**0.81 JB**
Diethyl phthalate	6000	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	**0.60 J**	**0.62 J**

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

Table 3.2-6
Fort Monmouth Phase II Site Investigation, Parcel 14
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results						
	Sample ID:	P14-M17	P14-O10	P14-O11	P14-O13	P14-O15	P14-O17	P14-O17 DUP
	Lab ID:	7040707	7041908	7040711	7040710	7040709	7040708	7040703
	Date Sampled:	10/19/2007	10/22/2007	10/19/2007	10/19/2007	10/19/2007	10/19/2007	10/19/2007
	Depth (ft. bgs):	7-12	15-20	7-12	3-8	5-10	7-12	7-12
Chemical	Quality Criteria[1]	Results	Results	Results	Results	Results	Results	Results
Volatiles								
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Methyl tertiary butyl ether (MTBE)	70	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	**2.12**	**1.83**
Toluene	600	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	**0.30**	**0.52**
Trichlorofluoromethane	2000	**2.34**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Semi-Volatiles								
bis(2-Ethylhexyl)phthalate	3	**1.39 B**	**16.67 B**	**1.03 JB**	**0.89 JB**	**1.36 B**	**1.70 B**	**1.37 B**
Diethyl phthalate	6000	0.96 U	0.96 U	**0.81 J**	0.96 U	0.96 U	0.96 U	0.96 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

Table 3.2-6
Fort Monmouth Phase II Site Investigation, Parcel 14
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results			
	Sample ID:	P14-O2	P14-O6	P14-O6 DUP	P14-O8
	Lab ID:	7041904	7041906	7041903	7041907
	Date Sampled:	10/22/2007	10/22/2007	10/22/2007	10/22/2007
	Depth (ft. bgs):	14-19	14-19	14-19	14-19
Chemical	Quality Criteria[1]	Results	Results	Results	Results
Volatiles					
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U
Methyl tertiary butyl ether (MTBE)	70	0.23 U	**4.41**	**4.17**	0.23 U
Toluene	600	**0.55**	**0.67**	**0.54**	**0.56**
Trichlorofluoromethane	2000	0.50 U	0.50 U	0.50 U	0.50 U
Semi-Volatiles					
bis(2-Ethylhexyl)phthalate	3	**0.83 JB**	1.28 U	**0.70 JB**	**0.96 JB**
Diethyl phthalate	6000	**5.07**	0.96 U	0.96 U	0.96 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Groundwater Sample at Existing Monitoring Well Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Former Buildings Area Targeted By Geophysical Survey (Electromagnetic followed by Ground Penetrating Radar of anomalies)
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 — Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 125 250 500 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.2-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 14 SAMPLE LOCATIONS

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_2-1_SI_P14_SampleLocations.mxd (7/14/2008 11:58:39 AM)

LEGEND

- Subsurface Metallic Object (Suspected UST)
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Former Buildings Area Targeted By Geophysical Survey (Electromagnetic followed by Ground Penetrating Radar of anomalies)
- Building
- Installation Boundary

N

SCALE:

0 125 250 500 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.2-2

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 14
SUSPECTED UST LOCATIONS

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_2-2_SI_P14_Geophysics.mxd (7/14/2008 12:06:56 PM)

3.3 Parcel 15 – Bldg 2700

3.3.1 Site Description

The Myer Center facility (Bldg 2700) is located in the CWA of FTMM at the intersection of Pearl Harbor Avenue and Corregidor Road. Bldg 2700 is a four-story building with a basement approximately 673,000 square feet in size. The building footprint totals approximately 171,000 square feet. It was built in 1954 and has an extensive history of laboratory operations, photoprocessing, and paint spraying booths. Various laboratory processes were noted in a 1955 Industrial Hygiene (IH) Survey, following the construction of the Myer Center. Operations included electrochemical research, growing and shaping of crystals, various plating operations, mixing of magnetic powders, machining, welding, spray painting, use of solvents for equipment cleaning, and other miscellaneous laboratory operations utilizing standard laboratory chemicals (15). By 1959, additional operations included shock and vibration testing of certain components; glass blowing; a plastics laboratory which made plastic castings, laminates, and forms sprayed with polyester resins; and a ceramics laboratory (16). A satellite dispensary and dental clinic was present in 1972 that serviced 2,610 employees (17). During the 2006 Visual Site Inspection (VSI) performed as part of the Phase I ECP, the Dental Clinic was no longer operational at Bldg 2700. According to FTMM personnel, no chemical wastes have been discharged to the sanitary sewer since the mid-1980s. Activities at Bldg 2700 have since been converted primarily to administrative functions. Current waste management practices prohibit the discharge of any materials, other than water and biodegradable soaps, into the sanitary sewer system. Additional information pertaining to this parcel can be found in Section 4.3.1, Section 4.3.2.1.4, Section 4.3.2.1.6, Section 4.3.2.2.2, Section 4.3.2.2.5, Section 4.3.2.2.6, Table 4-3, Table 5-1, Section 5.13.3, and Table 5-19 of the Phase I ECP (1).

Concurrent with the performance of the ECP, an HSA was conducted to evaluate the historical use of RAM at FTMM (3). The presence of RAM at FTMM has been predominantly limited to certain areas and functions of the installation. Historically, laboratory R&D in the areas of radio and electronics use of vacuum tubes and radium dials, the use of ionizing radiation-producing machines, and military support equipment such as night vision goggles that contain radioactive commodities, have been among the most common uses of RAM. Facilities, buildings, and rooms that contain or once contained equipment that produce X-rays via AC or DC sources of energy are not sources of radioactive contamination. This equipment, which includes medical and dental diagnostic X-ray machines, X-ray security inspection machines, X-ray diffraction, electron microscopes, X-ray fluorescence equipment, and some high voltage electron tubes, only produce ionizing radiation when energized. Operation of this equipment will result in ionizing radiation fields being produced in and around the equipment only while activated, but will not result in radioactive contamination. Much of the activities of the past were performed as part of the Signal Corps Laboratories, first housed in the Squier Building (Bldg 283) and then in the Myer Center (Bldg 2700). Other work was performed in the Evans Area of the base, which was closed in the late 1990s due to BRAC 1993 and the work transferred to the CECOM Safety Office and laboratory in the CWA.

Currently, only two active “wet labs” still exist in Bldg 2700; neither is for RAM. One wet lab (2C211) is used for battery testing and fabrication and the other (2D310) is used in the handling of crystals and welding (contains solvents and corrosives). Most rooms in the building today are computer labs and office space. Bldg 2700 originally had three radiological labs, which were completely renovated into administrative areas. The renovations, which included the removal of all laboratory equipment/furniture and the capping of all plumbing in those rooms, was performed approximately 10 years ago when ARL moved out of the building. No RAM have been used at this location since 1997, effectively qualifying the majority of the building as non-impacted. The Directorate of Public Works (DPW) contracted to remove all tritium exit signs in 2004 (Ameresco was the lighting replacement contractor). No indications of RAM or contamination were observed. An extract of the Radiation Inventory for Year 1995 shows the listing of a Photometer containing four sources of Carbon-14, totaling 200 microcuries. Data for this Photometer is unavailable, other than its listing as being identified with the Coding system as “C-04” and used in Bldg 2700, Room 4D312. Leak test data was not available since each source is less than the 100 microcurie limit requirement for leak testing of sealed sources. According to leak test data for other sealed sources used in this building (Cobalt-57 Mossbauer Source, Bldg 2700, Room 4C111), affected areas used for radioactive commodities indicate no contamination above the lower limits of detection, and therefore, no contamination would be present in the sinks leading to the Acid Neutralization Pit either (3).

Prior to the construction of Bldg 2700, Parcel 15 was occupied by buildings, latrines, warehouses, and a motor pool (14,18,19). Based on the time at which these previous facilities existed (1940s and early 1950s), it is likely that fuel oil was the primary heating fuel and individual USTs were likely utilized for the storage of fuel oil at each building. A review of documented UST removal locations versus the location of former buildings within Parcel 15 was conducted. Based on this review, it was determined that no UST removals have been documented to have occurred at the locations of numerous former buildings within Parcel 15.

3.3.2 Previous Investigations

U.S. Army Environmental Hygiene Agency (USAEHA) sampling of Bldg 2700 effluent from 1974-1975 showed discharges of the following wastewaters: alkaline cleaning agents, high concentrations of (hexavalent) chromium that were likely rinse water from a chrome plating operation, 93-94 percent sodium hydroxide slugs, sulfuric acid that was likely a dip solution used to activate a metal surface for plating, copper pickling waste, sodium dichromate as part of a cleaning agent, parabenzoquinone likely from photographic processing effluent, ammonium persulfate from the printed circuit manufacturing shop, and acetone. Samples were collected from each of the two former wastewater treatment lime pits (CW-1 and CW-2) serving Bldg 2700 prior to discharge to the CWA sewage treatment plant (STP). The purpose of the investigation was to characterize the wastewater because the FTMM STP was scheduled to be replaced by the local sewerage authority (20). The wastewater lime pits CW-1 and CW-2 were further evaluated under the IRP, as discussed below.

In fiscal year 1992, DPW personnel collected limestone and sludge samples from the CW-1 pit to evaluate the potential for environmental contaminants being present. Analytical testing of the sample material identified elevated levels of organic contaminants.

A cleanup action ensued which generated ninety-two 55-gallon drums of Resource Conservation and Recovery Act (RCRA) waste. Following the cleanup action, fresh limestone chips were placed into the pit as a precautionary measure. Current hazardous waste management practices prohibit the discharge of corrosive wastes into the wastewater treatment lime pit system. Due to the presence of elevated levels of organic contaminants being identified in the pit prior to the cleanup action, an SI was conducted to evaluate the potential impact to soil and groundwater.

Under the SI phase, soil borings were drilled on each side of the lime pit. Both soil and groundwater samples were analyzed for TCL+30 parameters and TAL metals. In reference to the four soil samples, no COCs were detected above NJDEP Direct Contact Soil Cleanup Criteria. TCE, PCE, and 1,2-DCE were detected in downgradient monitoring wells above NJDEP GWQC and remedial investigation (RI) activities were conducted.

Under the RI phase, a passive soil gas survey was conducted at the CW-1 site in March 1996 to delineate the extent of lateral soil contamination at the site and aid in the placement of additional monitoring wells. Results of the soil gas survey determined that COCs were migrating horizontally in site soil. Three new monitoring wells were installed at the CW-1 site during the first week of May 1996. One deep well was installed next to the lime pit to determine the vertical extent of contamination both in soil and groundwater. The other two wells were placed downgradient of the contaminant plume. The RI phase delineated the vertical and horizontal extent of the contaminant plume. At present, the contaminant plume has not reached the footprint of the Myer Center facility.

A remedial design was completed and approved by the NJDEP in August 1997. The selected remedial technologies involve using a combination of air sparging and soil vapor extraction (SVE) techniques. Construction of the selected remedial alternative was completed in April 1998. In January 2002, two groundwater recovery wells (RW-1 and RW-2) were installed in the source area and two additional air sparge points (SPG-3 and SPG-4) were installed to further enhance source area remediation. Groundwater recovery system wells RW-1 and RW-2 were connected to a newly constructed groundwater treatment system (GWTS). The GWTS is designed to capture and treat contaminated groundwater in the source area and reduce the elevated concentrations of detected chlorinated hydrocarbons as well as achieve hydraulic control in the source area and beyond. The GWTS utilizes an air stripper to remove dissolved-phase chlorinated hydrocarbons from impacted groundwater extracted from the recovery wells. The air stripper effluent is polished via two in-series 500-pound granular activated carbon units prior to final discharge to the sanitary sewer.

In addition to groundwater extraction, recovery wells RW-1 and RW-2 and source area monitoring wells MW-28 and MW-29 were tied into the SVE system to further enhance

removal of vapor phase chlorinated hydrocarbons in the source area. Air sparge wells SPG-1, SPG-2, SPG-3, and SPG-4 were installed to enhance the stripping of volatile chlorinated hydrocarbons from source area groundwater, where they are subsequently captured by the vapor extraction at RW-1, RW-2, MW-28, MW-29, SVE-1, and SVE- 2. The vapor phase carbon units were upgraded from two in-series 55-gallon drums to two in-series 1,000-pound vapor phase units capable of a substantial SVE airflow increase. The flow upgrade resulted in a substantial increase of contaminant mass removal rates. As part of the 2002 system upgrade, the wastewater treatment lime pit was demolished and all existing limestone was removed and properly disposed. A new sewer pipe was installed in order to maintain the existing sewer connection.

The GWTS was turned off in May of 2005 based upon groundwater monitoring data. Contaminant levels in the form of TCE have since rebounded at the site making it necessary to restart the system. The GWTS was restarted on October 11, 2007. Currently, twelve groundwater monitoring wells are sampled on a quarterly basis. The DPW will commence injecting hydrogen releasing compound (HRC) into site groundwater during FY08 with the goal of achieving groundwater compliance by FY11. Injection of HRC is subject to requirements pursuant to N.J.A.C 7:26E-4.1(a)4 and N.J.A.C. 7:26E-6.3(c) related to the performance of a pilot study and approval of a permit-by-rule.

The CW-2 site is the second wastewater treatment lime pit located next to the Myer Center facility (Bldg 2700). The CW-2 wastewater treatment lime pit is located on the east side of the Myer Center facility, near the former electrical substation. Site CW-2 has been investigated under the FTMM IRP. The wastewater treatment lime pit was constructed concurrently with the Myer Center facility in 1952. The pit was designed to treat corrosive wastes generated from laboratory activities operating within the facility. The pit was a concrete vault measuring 7 by 13 by 8 ft in height and contained limestone chips. Corrosive waste discharge lines originating from the south and east wings of Bldg 2700 were plumbed to the pit. The effluent discharge line exiting the pit was connected to the sanitary sewer.

In fiscal year 1992, DPW personnel collected limestone and sludge samples from the pit to evaluate the potential for environmental contaminants being present. Analytical testing of the sample material identified elevated levels of organic contaminants. A cleanup action ensued which generated ninety-one 55-gallon drums of RCRA waste. Following the cleanup action, fresh limestone chips were placed into the pit as a precautionary measure. Due to the presence of organic contaminants being identified in the pit prior to the cleanup action, the focus of the SI was to evaluate the potential impact to soil and groundwater. Under the SI phase, soil borings were drilled on each side of the lime pit. In the absence of field instrument readings and visible staining, one soil sample was collected from each boring at an interval just above the water table. In addition, each boring was converted to a monitoring well in order to evaluate groundwater quality.

Both soil and groundwater samples were analyzed for TCL+30 parameters and TAL metals. In reference to the four soil samples, only PCBs were detected in one soil

sample slightly above NJDEP Direct Contact Soil Cleanup Criteria. The PCB detection in soil (7 to 9 ft bgs) was measured at 0.75 mg/kg, which is below the NJDEP NRDCSCC of 2.0 mg/kg. PCE was detected in one downgradient monitoring well slightly above NJDEP GWQC. As of 2002, 19 consecutive quarterly rounds of groundwater samples had been collected for subsequent analysis. During August and October of 2000, low flow sampling techniques were employed at the four site monitoring wells. Laboratory results for arsenic and lead were detected below respective NJDEP GWQC. Under the RI phase, a passive soil gas survey commenced at the CW-2 site in December 1995. The purpose of the soil gas survey was to delineate the lateral extent of soil contamination at the site and to use the survey data to aid in the placement of additional monitoring wells, if required. Results of the soil gas survey were negative.

An RI report requesting an NFA determination was submitted to the NJDEP. No response has been received from the NJDEP. The CW-2 Wastewater Treatment Lime Pit was demolished in 2002. All limestone was removed from the pit prior to demolition activities, and the limestone was properly disposed.

3.3.3 Site Investigation Sampling

As discussed in **Section 3.3.2**, the former lime pits were formerly connected to the sanitary sewer and have been extensively investigated under the FTMM IRP. Groundwater associated with the former lime pits is addressed under the IRP. However, no evaluation of potential historical discharges to the stormwater system from Bldg 2700 has been conducted. A review of stormwater management plans and historical documents was conducted to evaluate potential discharge locations, and sediment sampling was conducted to evaluate the potential impact of previous Bldg 2700 activities to stormwater outfall locations associated with Bldg 2700.

A review of documented UST removal locations versus the location of former buildings within Parcel 15 was also conducted. Based on this review, it was determined that no UST removals have been documented at the locations of numerous former barracks within Parcel 15. In order to determine the absence/presence of formerly utilized USTs and the potential release from the USTs to the environment, geophysical surveys, soil sampling, and groundwater sampling were conducted north, northeast, and southwest of Bldg 2700.

Through previous investigations conducted under the IRP, groundwater VO contamination has been identified in close proximity to Bldg 2700. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs (12). Soil gas and indoor air samples were collected in association with Bldg 2700 to evaluate the potential for VI at this facility.

Sediment Investigation

A total of seven sediment samples (including one duplicate sample) were collected from three stormwater outfall locations within Shrewsbury Creek. Two samples were collected from each location; one from the 0- to 6-inch interval, and the other from the 18- to 24-inch interval, measured from the bottom of the creek.

Vapor Intrusion Investigation

The downgradient migration pathway for VO (chlorinated ethenes) contaminants is in the direction of Bldg 2700, and these contaminants have been detected above the GWSLs within 100 ft of Bldg 2700. Therefore, VI at Bldg 2700 was further evaluated through the collection of near-slab soil gas samples and indoor air samples in December 2007. Upon review of building plans and discussions with building personnel, it was determined that the floors in the basement and ground levels of Bldg 2700 are approximately 24 inches thick and constructed of reinforced concrete. Therefore, indoor air samples were conducted in lieu of the sub-slab soil gas samples proposed in the SI work plan.

Geophysical Survey Investigation

An EM survey was conducted throughout the area of the parcel where former barracks were identified to determine if USTs are present. Follow-up GPR surveys were conducted where anomalies were identified during the EM surveys. **Section 2.1** summarizes the methodologies utilized during the geophysical surveys.

Geoprobe® Investigation

Geoprobe® soil and groundwater samples were collected in October 2007 in Parcel 15 in order to investigate potential releases from historic USTs associated with former barrack areas around Bldg 2700. A total of 53 surface soil samples and 59 subsurface soil samples (including six duplicate samples) were collected from 53 distinct Geoprobe® borings (**Figure 3.3-1**). Soil borings located north of Bldg 2700 were conducted on 50-ft centers due to the dense spacing of previous barracks in this area. Boring locations southwest and northeast of Bldg 2700 were conducted on 100-ft centers. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch bgs interval. Subsurface soil samples were collected from the 6-inch interval directly above the water table from each boring. Field screening of the soil boring cores was conducted using a PID/FID meter.

Seven groundwater samples (including one duplicate sample) were collected from six distinct temporary wells that were installed. Temporary wells were installed along the downgradient boundary of the parcel (along Shrewsbury Creek) and were constructed of PVC and 5 ft of factory-slotted screen. Groundwater samples were collected for the

dual purpose of investigating any potential release from possible former heating oil USTs associated with former barracks and other potential discharges from historic activities at Bldg 2700. The SI work plan specified that previously installed monitoring well UST-2337-65 was to be used as a reference for comparison with Geoprobe® results. However, the monitoring well could not be located and therefore was not sampled.

Table 3.3-1 presents a summary of all field activities. Sample locations are provided on **Figure 3.3-1**. **Table 3.3-2** provides a summary of the sediment sampling, soil gas and indoor air sampling, and Geoprobe® soil and groundwater sampling activities, including sample IDs, collection dates, and analytical parameters.

Table 3.3-1
Parcel 15 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
Former Barracks Areas (three areas – 9 acres total)	A geophysical survey was conducted to target areas within the parcel in which barracks formerly existed to determine if formerly used USTs are present. The geophysical investigation consisted of an EM survey followed by targeted a GPR survey of anomalies identified by the EM survey.		
P15-A1 through P15-A18 (18 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 50-ft centers due to close spacing of former barracks in this area) to investigate the potential release from former heating oil USTs associated with the former barracks north of Bldg 2700. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
P15-A1 through P15-A18 (19 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 3 to 12.5 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 50-ft centers due to close spacing of former barracks in this area) to investigate the potential release from former heating oil USTs associated with the former barracks north of Bldg 2700. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
P15-B1 through P15-E4 (13 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks northeast of Bldg 2700. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
P15-B1 through P15-E4 (15 samples – includes 2 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 5 to 9 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft center) to investigate the potential release from former heating oil USTs associated with the former barracks northeast of Bldg 2700. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
P15-F1 through P15-K6 (22 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks southwest of Bldg 2700. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
P15-F1 through P15-K6 (25 samples – includes 3 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 2.5 to 15 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks southwest of Bldg 2700. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
15GW-1 through 15GW-6 (7 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® borings to investigate the potential release from former heating oil USTs associated with the former barracks and former industrial processes associated with Bldg 2700.	TCL+30 (w/o pesticides or PCBs), TAL Metals
Monitoring well UST-2337-65 (No samples)	Groundwater	A monitoring well was selected for sampling based on its location on referenced maps to investigate the potential release from former heating oil USTs associated with the former barracks and to use as a reference for comparison with Geoprobe® results. The monitoring well could not be located and therefore was not sampled.	Not Sampled
15SD-1, 2 and 3 (3 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential historic discharges from Bldg 2700. Samples were collected at the discharge points of an underground stream diversion near the southwest end of Bldg 2525; 30-inch reinforced concrete stormwater pipe outfall; and an additional outfall location noted during site visit. All sample locations were south of the walking bridge near the southwest portion of Bldg 2525 on the western side of Shrewsbury Creek.	TCL+30 (w/o pesticides), TAL Metals

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
15SD-1D, 2D, and 3D (4 samples – includes 1 duplicate sample)	Sediment	Sediment samples were collected from the 6-inch interval from 18 to 24 inches bgs to investigate potential historic discharges from Bldg 2700.	TCL+30 (w/o pesticides), TAL Metals
15SG-1 through 15SG-15	Near-slab soil gas	15 near-slab soil gas samples were collected at Bldg 2700. Groundwater flow direction is from the west and VOs have been detected above GWSLs within the courtyard of Bldg 2700. Therefore, 12 sample locations were biased to the walls of Bldg 2700 on the east side of the courtyard downgradient of the detected contaminants. Three locations were biased to the walls of Bldg 2700 on the west side of the courtyard due to close proximity of the building to groundwater contamination.	NJDEP – SRWM USEPA TO-15 Method
15IA-1 through 15IA-15	Indoor Air samples	15 sub-slab soil gas samples were originally proposed to be collected in the western portion of Bldg 2700 in central locations of the basement. Because this is an active laboratory facility and material is stored in the basement that could contribute to positive detections of VOs in indoor air (paint storage), sub-slab soil gas samples were proposed to be sampled in lieu of indoor air within the basement in order to determine VI contributions from groundwater contamination. However, due to the thickness of the reinforced concrete basement floors (18 to 24 inches); indoor air samples were collected in lieu of sub-slab soil gas samples.	NJDEP – SRWM USEPA TO-15 Method

3.3.4 Site Investigation Results

Geophysical Survey Results

The EM survey identified a total of 41 target EM anomalies. The survey areas are presented on **Figure 3.3-1**. This area was scanned with the EM-61 because the parking lots which comprise most of the area could only be cordoned off in small portions and the EM-61 towing rig is better suited for the necessary tight turns. Several areas in this parcel were scanned with only the TW-6 due to interference of the GPS signal by nearby buildings and trees and the presence of parked cars during the EM survey.

This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. No metallic anomalies interpreted to be a UST were delineated.

The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.3-3** and full results of the geophysical surveys are included in **Appendix A**. In summary, GPR scanning of the 41 targets revealed:

- Nine targets that were associated with surface metal/debris (previously unaccounted for).
- Thirty-one targets with moderate-amplitude near-surface point target reflections indicative of areas containing small pieces of buried debris; not indicative of a UST.
- One target with the moderate-amplitude parabolic scattered reflections indicative of small pieces of scattered debris; not indicative of a UST.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides). Shrewsbury Creek is a non-tidal water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Freshwater Sediment Screening Values-LEL.

A total of 12 B/Ns and 18 metals were detected in Parcel 15 sediment samples, presented in **Table 3.3-4**. Two B/Ns (acenaphthene and fluorene) were detected at concentrations that exceeded the LEL. Of the 18 metals, two (chromium and copper) were detected at concentrations that exceeded the LEL. No constituents were detected at concentrations greater than the SEL.

Chromium was detected above the LEL of 26 mg/kg in all seven sediment samples (including one duplicate sample) collected in Parcel 15 at concentrations ranging from 29.4 mg/kg in sample 15SD-1 to 73.4 mg/kg in sample 15SD-3D (**Figure 3.3-1**). The chromium concentrations in four of the samples also exceeded the Charles Wood Background Concentration (CWBC) of 36.9 mg/kg. Thus, chromium is considered a COC in the Parcel 15 sediment.

Copper was detected above the LEL of 16 mg/kg in one sediment sample (the duplicate analysis of sample 15SD-2D) at a concentration of 19.5 mg/kg. However, the copper concentration of 19.5 mg/kg is below the CWBC of 24.5 mg/kg. Thus, copper is not a COC in the Parcel 15 sediment. The copper concentration detected in sample 15SD-2D was 13.6 mg/kg, below the LEL for copper. The COCs are presented on **Figure 3.3-1**.

Vapor Intrusion Investigation Results

Sample locations and detections above the NJDEP Soil Gas Screening Levels are presented on **Figure 3.3-2**.

A total of 32 VOs were detected in Parcel 15 soil gas samples. Of the 32 VOs detected, four (benzene, PCE, TCE, and vinyl chloride) were detected at concentrations that exceeded NJDEP Soil Gas Non-Residential Standards (NRSs). As shown in **Table 3.3-**

5, benzene was detected above the standard of 26 micrograms per cubic meter ($\mu g/m^3$) in three of the 15 soil gas samples at concentrations ranging from 39 $\mu g/m^3$ in sample 15SG-13 to 90.7 $\mu g/m^3$ in sample 15SG-14. PCE was detected above the standard of 36 $\mu g/m^3$ in 11 of the 15 soil gas samples at concentrations ranging from 47 $\mu g/m^3$ in sample 15SG-12 to 149 $\mu g/m^3$ in sample 15SG-1. TCE was detected above the standard of 27 $\mu g/m^3$ in three of the 15 soil gas samples at concentrations ranging from 55.9 $\mu g/m^3$ in sample 15SG-4 to 506 $\mu g/m^3$ in sample 15-SG-2. Vinyl chloride was detected above the standard of 48 $\mu g/m^3$ in one of the 15 samples at a concentration of 73.9 $\mu g/m^3$ in soil gas sample 15SG-10.

Indoor air analytical results are summarized in **Table 3.3-6**. No constituents were detected at concentrations above the NJDEP Indoor Air Non-Residential or Residential Standards. A total of 22 VOs were detected at low concentrations below NJDEP Indoor Air Non-Residential and Residential Standards.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis. Groundwater samples were analyzed for VO+10, B/N+15, and TAL metals.

Soil

Soil TPHC analytical results are presented in **Table 3.3-7**. TPHC was detected in seven of the 53 surface soil samples and in two of the 59 subsurface soil samples. None of the TPHC results exceeded the NJDEP NRDCSCC and RDCSCC of 10,000 mg/kg, and no detections were greater than 1,000 mg/kg; therefore, no VO analysis for soil was required.

Groundwater

One VO, toluene, was detected at a concentration of 0.65 $\mu g/L$, which is below the GWQC of 600 $\mu g/L$.

One B/N, bis(2-ethylhexyl)phthalate, was detected in Parcel 15 groundwater samples. As shown in **Table 3.3-8**, bis(2-ethylhexyl)phthalate was detected in 15GW-3 at a concentration of 3.74 $\mu g/L$ and in 15GW-4 at a concentration of 4.04 $\mu g/L$, which exceed the NJDEP GWQC of 3 $\mu g/L$. Bis(2-ethylhexyl)phthalate was not detected in the duplicate sample collected at 15GW-3 (15GW-3DUP). A commonly used plasticizer, bis(2-ethylhexyl)phthalate, is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected in the field blank associated with Parcel 15 groundwater sampling. The contamination in the field blank was most likely the result of the polyethylene sampling tube that is commonly used for sampling wells. Therefore, it is not considered a COC in groundwater at Parcel 15.

A total of 19 metals were detected in Parcel 15 groundwater samples. Of the 19 metals detected, six (aluminum, arsenic, iron, lead, manganese, and sodium) were detected above the respective GWQC. All sample results are presented in **Table 3.3-8**.

As discussed in the 1995 Site Investigation Report (47), several natural and anthropogenic factors contribute to the wide range in concentrations of metals in soils, which further impact the concentration of metals in groundwater. Soils derived from glauconitic sands contain abundant aluminum, calcium, potassium, iron, magnesium, manganese, and sodium (among others), which are likely to be present at elevated concentrations in the groundwater, particularly when sediments are entrained in the collected groundwater samples. Aluminum, iron, manganese, and sodium were detected in Parcel 15 groundwater samples, collected from temporary wells, at concentrations above the NJDEP GWQC. Aluminum, iron, manganese, and sodium are regarded as naturally occurring metals within the native soil types at FTMM and are not considered COCs. The remaining metals detected in samples collected from temporary wells were compared to the respective GWQC and MBCs to determine COCs requiring further evaluation. The COCs are presented on **Figure 3.3-1**.

Arsenic was detected at concentrations exceeding the NJDEP GWQC of 3 μg/L in two samples, 15GW-1 (4.41 μg/L) and 15GW-4 (7.47 μg/L). However, these concentrations did not exceed the CWBC of 25.1 μg/L. In addition, arsenic is associated with the native glauconitic sands (48). The elevated arsenic concentrations in the native soil in turn influence the arsenic levels in groundwater. Lead was detected at a concentration exceeding the NJDEP GWQC of 5 μg/L in one sample (15GW-6) at a concentration of 6.41 μg/L. However, the lead concentration did not exceed the CWBC of 7.3 μg/L. Thus, arsenic and lead are not considered COCs in Parcel 15 groundwater.

3.3.5 Summary and Conclusions

No suspected USTs were identified as a result of the geophysical surveys, and no constituents were identified above applicable NJDEP criteria in surface or subsurface soil. Four naturally occurring metal constituents common to local soils, aluminum, iron, manganese, and sodium, were detected at concentrations greater than the NJDEP GWQC. As discussed in detail in **Section 2.3.1**, high concentrations of aluminum, iron, manganese, and sodium are expected to occur due to the chemical nature of glauconitic quartzose sands deposited throughout FTMM. Since these native metals are attributed to the aquifer material and are not site-related, these metals are not considered COCs.

Two metal constituents, arsenic and lead, were detected at concentrations slightly above the NJDEP GWQC, but were detected at sporadic locations and at low concentrations from temporary well points. In addition, arsenic and lead were detected at concentrations below the CWBC. NFA is recommended for soil and groundwater within Parcel 15.

Four VOs, benzene, PCE, TCE, and vinyl chloride, exceeded NJDEP Soil Gas NRSs in soil gas at Parcel 15. No VOs, including constituents present in groundwater proximal to Bldg 2700 (chlorinated ethenes), were detected in indoor air at Bldg 2700 at concentrations above the NJDEP Indoor Air NRSs. Based on NJDEP VI guidance (12), a second round of indoor air sampling is recommended if indoor air sampling results are within 1 order of magnitude of the IASLs. Benzene was detected within one order of magnitude of the IASL in indoor air samples and was also detected in near slab soil gas samples at concentrations greater than the Soil Gas NRSs. One additional round of indoor air sampling is recommended to confirm that constituents present in groundwater are not present above applicable criteria in indoor air at Bldg 2700.

Two B/Ns (acenaphthene and fluorene) and one metal (chromium) were detected in sediment at concentrations greater than the Freshwater Sediment Screening Values-LEL. Sediment at Parcel 15 is recommended for further evaluation and will be included as part of a facility-wide baseline ecological evaluation.

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	10/22/07	7:00	--	--	NA								
SOIL	GEOPROBE	P15-A1-A	10/22/07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P15-A1-B	10/22/07	8:40	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A1-C	10/22/07	9:20	12.5	13.0	X								
SOIL	GEOPROBE	P15-A2-A	10/22/07	9:50	0.0	0.5	X								
SOIL	GEOPROBE	P15-A2-B	10/22/07	9:50	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A2-C	10/22/07	10:00	11.5	12.0	X								
SOIL	GEOPROBE	P15-A3-A	10/22/07	10:25	0.0	0.5	X								
SOIL	GEOPROBE	P15-A3-B	10/22/07	10:25	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A3-C	10/22/07	10:45	11.5	12.0	X								
SOIL	GEOPROBE	P15-A4-A	10/22/07	10:55	0.0	0.5	X								
SOIL	GEOPROBE	P15-A4-B	10/22/07	10:55	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A4-C	10/22/07	11:25	11.5	12.0	X								
SOIL	GEOPROBE	P15-A4-C DUPLICATE	10/22/07	11:25	11.5	12.0									No duplicate collected this day. Sample on chain but not received by lab.
SOIL	GEOPROBE	P15-A5-A	10/22/07	11:35	0.0	0.5	X								
SOIL	GEOPROBE	P15-A5-B	10/22/07	11:35	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A5-C	10/22/07	11:55	11.5	12.0	X								
BLANK	FIELD	FIELD BLANK-SO	10/22/07	13:20	--	--	X								
SOIL	GEOPROBE	P15-A6-A	10/22/07	13:30	0.0	0.5	X								
SOIL	GEOPROBE	P15-A6-B	10/22/07	13:30	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A6-C	10/22/07	13:30	3.0	3.5	X								
SOIL	GEOPROBE	P15-A7-A	10/22/07	13:50	0.0	0.5	X								
SOIL	GEOPROBE	P15-A7-B	10/22/07	13:50	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A7-C	10/22/07	14:10	9.5	10.0	X								
SOIL	GEOPROBE	P15-A8-A	10/22/07	14:45	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-A8-B	10/22/07	14:45	1.5	2.0	NA								

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-A8-C	10/22/07	15:05	9.5	10.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-A10-A	10/22/07	15:25	0.0	0.5	X								
SOIL	GEOPROBE	P15-A10-B	10/22/07	15:25	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A10-C	10/22/07	15:30	3.0	3.5	X								
BLANK	TRIP	TRIP BLANK	10/23/07	7:00	--	--	NA								
SOIL	GEOPROBE	P15-A9-A	10/23/07	7:45	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-A9-B	10/23/07	7:45	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A9-C	10/23/07	8:05	10.5	11.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-A11-A	10/23/07	8:25	0.0	0.5	X								
SOIL	GEOPROBE	P15-A11-B	10/23/07	8:25	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A11-C	10/23/07	8:50	11.5	12.0	X								
SOIL	GEOPROBE	P15-A12-A	10/23/07	9:05	0.0	0.5	X								
SOIL	GEOPROBE	P15-A12-B	10/23/07	9:05	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A12-C	10/23/07	9:20	3.5	4.0	X								
SOIL	GEOPROBE	P15-A13-A	10/23/07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P15-A13-B	10/23/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A13-C	10/23/07	10:15	8.5	9.0	X								
SOIL	GEOPROBE	P15-A13-C DUPLICATE	10/23/07	10:15	8.5	9.0	X								
SOIL	GEOPROBE	P15-A14-A	10/23/07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P15-A14-B	10/23/07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A14-C	10/23/07	10:40	6.5	7.0	X								
SOIL	GEOPROBE	P15-A15-A	10/23/07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P15-A15-B	10/23/07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A15-C	10/23/07	11:05	7.0	7.5	X								
SOIL	GEOPROBE	P15-A16-A	10/23/07	13:15	0.0	0.5	X								

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-A16-B	10/23/07	13:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A16-C	10/23/07	13:35	5.5	6.0	X								
SOIL	GEOPROBE	P15-A17-A	10/23/07	13:45	0.0	0.5	X								
SOIL	GEOPROBE	P15-A17-B	10/23/07	13:45	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A17-C	10/23/07	13:50	5.5	6.0	X								
SOIL	GEOPROBE	P15-A18-A	10/23/07	14:05	0.0	0.5	X								
SOIL	GEOPROBE	P15-A18-B	10/23/07	14:05	1.5	2.0	NA								
SOIL	GEOPROBE	P15-A18-C	10/23/07	14:15	5.5	6.0	X								
BLANK	FIELD	FIELD BLANK	10/23/07	14:20	--	--	X								
BLANK	TRIP	TRIP BLANK	10/24/07	7:00	--	--	NA								
SOIL	GEOPROBE	P15-J6-A	10/24/07	7:55	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J6-B	10/24/07	7:55	1.5	2.0	NA								
SOIL	GEOPROBE	P15-J6-C	10/24/07	8:05	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J5-A	10/24/07	8:30	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J5-B	10/24/07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P15-J5-C	10/24/07	8:40	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J4-A	10/24/07	9:40	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J4-B	10/24/07	9:40	1.5	2.0	NA								
SOIL	GEOPROBE	P15-J4-C	10/24/07	9:40	3.0	3.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-J3-A	10/24/07	11:15	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J3-B	10/24/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-J3-C	10/24/07	11:25	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J2-A	10/24/07	13:15	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J2-B	10/24/07	13:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-J2-C	10/24/07	13:30	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-J1-A	10/24/07	13:45	0.0	0.5	X								
SOIL	GEOPROBE	P15-J1-B	10/24/07	13:45	1.5	2.0	NA								
SOIL	GEOPROBE	P15-J1-C	10/24/07	14:05	11.5	12.0	X								
BLANK	FIELD	FIELD BLANK	10/24/07	13:00	--	--	X								
SOIL	GEOPROBE	P15-K1-A	10/24/07	14:20	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K1-B	10/24/07	14:20	1.5	2.0	NA								
SOIL	GEOPROBE	P15-K1-C	10/24/07	14:35	10.0	10.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K2-A	10/24/07	15:15	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K2-B	10/24/07	15:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-K2-C	10/24/07	15:20	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-K2-C DUPLICATE	10/24/07	15:20	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK	10/25/07	7:00	--	--	NA								
SOIL	GEOPROBE	P15-K3-A	10/25/07	8:10	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K3-B	10/25/07	8:10	1.5	2.0	NA								
SOIL	GEOPROBE	P15-K3-C	10/25/07	8:20	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K4-A	10/25/07	8:55	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K4-B	10/25/07	8:55	1.5	2.0	NA								
SOIL	GEOPROBE	P15-K4-C	10/25/07	9:05	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K5-A	10/25/07	9:30	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K5-B	10/25/07	9:30	1.5	2.0	NA								
SOIL	GEOPROBE	P15-K5-C	10/25/07	11:15	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K6-A	10/25/07	11:45	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-K6-B	10/25/07	11:45	1.5	2.0	NA								
SOIL	GEOPROBE	P15-K6-C	10/25/07	11:45	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-I1-A	10/25/07	13:30	0.0	0.5	X								
SOIL	GEOPROBE	P15-I1-B	10/25/07	13:30	1.5	2.0	NA								

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-I1-C	10/25/07	13:50	11.5	12.0	X								
SOIL	GEOPROBE	P15-I2-A	10/25/07	14:15	0.0	0.5	X								
SOIL	GEOPROBE	P15-I2-B	10/25/07	14:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-I2-C	10/25/07	14:30	9.5	10.0	X								
SOIL	GEOPROBE	P15-I2-C DUPLICATE	10/25/07	14:30	9.5	10.0	X								
BLANK	FIELD	FIELD BLANK	10/25/07	14:40	--	--	X								
SOIL	GEOPROBE	P15-I3-A	10/25/07	15:15	0.0	0.5	X								
SOIL	GEOPROBE	P15-I3-B	10/25/07	15:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-I3-C	10/25/07	15:20	6.5	7.0	X								
SOIL	GEOPROBE	P15-H2-A	10/25/07	15:40	0.0	0.5	X								
SOIL	GEOPROBE	P15-H2-B	10/25/07	15:40	1.5	2.0	NA								
SOIL	GEOPROBE	P15-H2-C	10/25/07	16:00	11.0	11.5	X								
BLANK	TRIP	TRIP BLANK	10/26/07	7:00	--	--	NA								
SOIL	GEOPROBE	P15-H1-A	10/26/07	8:00	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-H1-B	10/26/07	8:00	1.5	2.0	NA								
SOIL	GEOPROBE	P15-H1-C	10/26/07	8:15	12.0	12.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-G1-A	10/26/07	8:45	0.0	0.5	X								
SOIL	GEOPROBE	P15-G1-B	10/26/07	8:45	1.5	2.0	NA								
SOIL	GEOPROBE	P15-G1-C	10/26/07	9:00	11.5	12.0	X								
SOIL	GEOPROBE	P15-G2-A	10/26/07	9:45	0.0	0.5	X								
SOIL	GEOPROBE	P15-G2-B	10/26/07	9:45	1.5	2.0	NA								
SOIL	GEOPROBE	P15-G2-C	10/26/07	10:20	13.0	13.5	X								
SOIL	GEOPROBE	P15-F1-A	10/26/07	10:40	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-F1-B	10/26/07	10:40	1.5	1.5	NA								

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-F1-C	10/26/07	11:10	15.5	16.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-F2-A	10/26/07	11:40	0.0	0.5	X								
SOIL	GEOPROBE	P15-F2-B	10/26/07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P15-F2-C	10/26/07	11:50	5.5	6.0	X								
SOIL	GEOPROBE	P15-F3-A	10/26/07	13:15	0.0	0.5	X								
SOIL	GEOPROBE	P15-F3-B	10/26/07	13:15	1.5	2.0	NA								
SOIL	GEOPROBE	P15-F3-C	10/26/07	13:20	3.0	3.5	X								
SOIL	GEOPROBE	P15-F3-C DUPLICATE	10/26/07	13:20	3.0	3.5	X								Duplicate on chain of custody but not received by lab. Sample P15-F3-C was split to make duplicate.
BLANK	FIELD	FIELD BLANK	10/26/07	13:30	--	--	X								
BLANK	TRIP	TRIP BLANK	10/27/07	7:00	--	--	NA								
SOIL	GEOPROBE	P15-B1-A	10/27/07	8:00	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-B1-B	10/27/07	8:00	1.5	2.0	NA								
SOIL	GEOPROBE	P15-B1-C	10/27/07	8:20	9.5	10.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-B2-A	10/27/07	8:35	0.0	0.5	X								
SOIL	GEOPROBE	P15-B2-B	10/27/07	8:35	1.5	2.0	NA								
SOIL	GEOPROBE	P15-B2-C	10/27/07	8:45	7.5	8.0	X								
SOIL	GEOPROBE	P15-B2-C DUPLICATE	10/27/07	8:45	7.5	8.0	X								
SOIL	GEOPROBE	P15-B3-A	10/27/07	9:00	0.0	0.5	X								
SOIL	GEOPROBE	P15-B3-B	10/27/07	9:00	1.5	2.0	NA								
SOIL	GEOPROBE	P15-B3-C	10/27/07	9:10	7.5	8.0	X								
SOIL	GEOPROBE	P15-B4-A	10/27/07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P15-B4-B	10/27/07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P15-B4-C	10/27/07	9:35	7.5	8.0	X								

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-C2-A	10/27/07	9:55	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-C2-B	10/27/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P15-C2-C	10/27/07	10:05	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-C3-A	10/27/07	10:25	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-C3-B	10/27/07	10:25	1.5	2.0	NA								
SOIL	GEOPROBE	P15-C3-C	10/27/07	10:35	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-C4-A	10/27/07	11:05	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-C4-B	10/27/07	11:05	1.5	2.0	NA								
SOIL	GEOPROBE	P15-C4-C	10/27/07	11:15	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK	10/27/07	11:45	--	--	X								
SOIL	GEOPROBE	P15-C1-A	10/29/07	8:45	0.0	0.5	X								
SOIL	GEOPROBE	P15-C1-B	10/29/07	8:45	1.5	2	NA								
SOIL	GEOPROBE	P15-C1-C	10/29/07	8:55	6.5	7	X								
BLANK	TRIP	TRIP BLANK	10/29/07	-	--	--		X							
SOIL	GEOPROBE	P15-D1-A	10/29/07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P15-D1-B	10/29/07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P15-D1-C	10/29/07	9:30	7.0	7.5	X								
SOIL	GEOPROBE	P15-D2-A	10/29/07	9:45	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-D2-B	10/29/07	9:45	1.5	2.0	NA								

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P15-D2-C	10/29/07	10:00	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-D3-A	10/29/07	10:40	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-D3-B	10/29/07	10:40	1.5	2.0	NA								
SOIL	GEOPROBE	P15-D3-C	10/29/07	11:00	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-E1-A	10/29/07	11:25	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-E1-B	10/29/07	11:25	1.5	2.0	NA								
SOIL	GEOPROBE	P15-E1-C	10/29/07	11:35	5.5	6.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-E2-A	10/29/07	13:20	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-E2-B	10/29/07	13:20	1.5	2.0	NA								
SOIL	GEOPROBE	P15-E2-C	10/29/07	13:35	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P15-E2-C DUPLICATE	10/29/07	13:35	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK	10/29/07	13:45	NA	NA	X								Field blank was not run for all sediment parameters.
SD	HAND AUGER	15SD-1	10/29/07	15:40	0.0	0.5		X	X	X	X				
SD	HAND AUGER	15SD-1D	10/29/07	16:00	1.5	2.0		X	X	X	X				
SD	HAND AUGER	15SD-2	10/29/07	15:10	0.0	0.5		X	X	X	X				
SD	HAND AUGER	15SD-2D	10/29/07	15:25	1.5	2.0		X	X	X	X				
SD	HAND AUGER	15SD-2D DUPLICATE	10/29/07	15:25	1.5	2.0		X	X	X	X				
SD	HAND AUGER	15SD-3	10/29/07	14:45	0.0	0.5		X	X	X	X				

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	15SD-3D	10/29/07	15:00	1.5	2.0		X	X	X	X				
BLANK	TRIP	TRIP BLANK-AQ	10/31/07	12:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	10/31/07	12:30	--	--		X	X		X				
GW	GEOPROBE	15GW-1	10/31/07	13:00	7.0	12		X	X		X				
GW	GEOPROBE	15GW-2	10/31/07	13:30	7.0	12		X	X		X				
GW	GEOPROBE	15GW-3	10/31/07	14:00	7.0	12		X	X		X				
GW	GEOPROBE	15GW-3 DUPLICATE	10/31/07	14:00	7.0	12		X	X		X				
GW	GEOPROBE	15GW-4	10/31/07	14:30	7.0	12		X	X		X				
GW	GEOPROBE	15GW-5	10/31/07	15:00	7.0	12		X	X		X				
GW	GEOPROBE	15GW-6	10/31/07	15:30	7.0	12		X	X		X				
GW	MONITORING WELL	UST-2337-65	--	--											Monitoring well could not be located. No sample.
IA	CANISTER	15IA-1	12/09/07	8:45	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-2	12/09/07	8:40	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-3	12/09/07	9:00	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-4	12/09/07	9:10	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-5	12/09/07	9:45	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-6	12/09/07	9:20	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-7	12/09/07	9:21	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-8	12/09/07	9:22	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-9	12/09/07	9:40	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-10	12/09/07	9:50	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-11	12/09/07	10:05	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-12	12/09/07	10:15	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-12 DUPLICATE	12/09/07	10:15	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-13	12/09/07	10:20	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-14	12/09/07	10:35	--	--		X							Indoor air samples collected in lieu of soil gas.
IA	CANISTER	15IA-15	12/09/07	10:40	--	--		X							Indoor air samples collected in lieu of soil gas.
BLANK	AMBIENT	15IA-AMBIENT	12/09/07	10:55	--	--		X							Indoor air samples collected in lieu of soil gas.
SG	CANISTER	15SG-1	12/11/07	11:13	3.0	3.0		X							
SG	CANISTER	15SG-2	12/11/07	11:46	6.0	6.0		X							

Table 3.3-2
Parcel 15 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SG	CANISTER	15SG-3	12/11/07	12:03	6.0	6.0		X							
SG	CANISTER	15SG-4	12/11/07	12:30	6.0	6.0		X							
SG	CANISTER	15SG-5	12/11/07	12:50	6.0	6.0		X							
SG	CANISTER	15SG-6	12/11/07	13:51	6.0	6.0		X							
SG	CANISTER	15SG-7	12/11/07	14:00	6.0	6.0		X							
SG	CANISTER	15SG-8	12/11/07	14:30	6.0	6.0		X							
SG	CANISTER	15SG-9	12/11/07	14:45	6.0	6.0		X							
SG	CANISTER	15SG-10	12/11/07	15:05	6.0	6.0		X							
SG	CANISTER	15SG-11	12/11/07	15:25	6.0	6.0		X							
SG	CANISTER	15SG-12	12/11/07	15:55	6.0	6.0		X							
SG	CANISTER	15SG-13	12/11/07	16:25	6.0	6.0		X							
SG	CANISTER	15SG-14	12/11/07	16:50	6.0	6.0		X							
SG	CANISTER	15SG-15	12/11/07	17:15	6.0	6.0		X							

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg. TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.
X = Sample analyzed for the indicated analytical parameter suite

Table 3.3-3
Parcel 15 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type: Differential	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P15_1	Differential	N/A	N/A	N/A	Surface metal.	606619	532908
P15_2	Differential	N/A	N/A	N/A	Surface metal.	606621	533550
P15_3	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606633	533264
P15_4	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606654	532758
P15_5	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606654	533309
P15_6	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606663	532782
P15_7	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606690	533315
P15_8	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606708	533285
P15_9	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606732	532818
P15_10	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606747	533315
P15_11	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606772	533462
P15_12	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606787	533318
P15_13	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606796	533480
P15_14	Differential	N/A	N/A	N/A	Surface metal.	606805	533432
P15_15	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606832	533327
P15_16	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606835	532599

Anomaly	Anomaly Type: Differential	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P15_17	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606910	532572
P15_18	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606937	532647
P15_19	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606937	533577
P15_20	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606949	532581
P15_21	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	606988	533504
P15_22	Differential	Yes	10 X 15	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	607060	532686
P15_23	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607060	533486
P15_24	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607075	533528
P15_25	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607130	532659
P15_26	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607199	533643
P15_27	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607226	533384
P15_28	Differential	N/A	N/A	N/A	Surface metal.	607238	533414
P15_29	Differential	N/A	N/A	N/A	Surface metal.	607274	533516
P15_30	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607301	533381
P15_31	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607304	533547
P15_32	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607328	533571
P15_33	Differential	N/A	N/A	N/A	Surface metal.	607343	533423

Anomaly	Anomaly Type: Differential	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P15_34	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607650	533345
P15_35	Differential	N/A	N/A	N/A	Surface metal.	607686	533396
P15_36	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607752	533297
P15_37	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607767	533225
P15_38	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607777	533261
P15_39	Differential	N/A	N/A	N/A	Surface metal.	607786	533408
P15_40	Differential	N/A	N/A	N/A	Surface metal.	607795	533354
P15_41	Differential	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	607822	533450

Table 3.3-4
Fort Monmouth Phase II Site Investigation, Parcel 15
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results						
		Sample ID:	15SD-1	15SD-1D	15SD-2	15SD-2D	15SD-2D DUP	15SD-3	15SD-3D
		Lab ID:	7042622	7042623	7042624	7042625	7042628	7042626	7042627
		Date Sampled:	10/29/2007	10/29/2007	10/29/2007	10/29/2007	10/29/2007	10/29/2007	10/29/2007
		Depth (ft. bgs):	0.0-0.5	1.5-2.0	0.0-0.5	1.5-2.0	1.5-2.0	0.0-0.5	1.5-2.0
Chemical	LEL[1]	SEL[2]	Result	Result	Result	Result	Result	Result	Result
Semi-Volatiles									
2-Methylphenol	NLE	NLE	1.200 U	1.100 U	1.200 U	1.000 U	1.200 U	**0.460 J**	1.000 U
Acenaphthene	0.016	NLE	1.200 U	**0.130 J**	1.200 U	1.000 U	1.200 U	1.200 U	1.000 U
Anthracene	0.220	370	1.200 U	1.100 U	1.200 U	1.000 U	1.200 U	**0.052 J**	1.000 U
Benzo[a]anthracene	0.320	1480	1.200 U	1.100 U	1.200 U	1.000 U	1.200 U	**0.200 J**	1.000 U
Benzoic acid	NLE	NLE	1.200 U	1.100 U	1.200 U	1.000 U	1.200 U	**0.790 J**	1.000 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	1.200 U	**0.260 J**	1.200 U	**0.270 J**	**0.460 J**	**1.300**	1.000 U
Chrysene	0.340	460	1.200 U	1.100 U	1.200 U	1.000 U	1.200 U	**0.320 J**	1.000 U
Di-n-butylphthalate	NLE	NLE	**0.810 JB**	**0.410 JB**	**0.280 JB**	**0.790 JB**	**0.920 JB**	**0.680 JB**	**0.750 JB**
Fluoranthene	0.750	1020	1.200 U	**0.098 J**	**0.170 J**	**0.049 J**	1.200 U	**0.280 J**	1.000 U
Fluorene	0.190	160	1.200 U	**0.210 J**	1.200 U	1.000 U	1.200 U	1.200 U	1.000 U
Phenanthrene	0.560	950	**0.061 J**	**0.078 J**	**0.170 J**	1.000 U	1.200 U	**0.220 J**	1.000 U
Pyrene	0.490	850	1.200 U	**0.220 J**	**0.340 J**	1.000 U	1.200 U	**0.470 J**	1.000 U
Metals									
Aluminum	NLE	NLE	**2540 B**	**3580 B**	**3280 B**	**3740 B**	**4740 B**	**4140 B**	**11600 B**
Arsenic	6	33	**1.65**	**1.59**	**2.29**	**2.31**	**2.93**	**3.03**	**5.73**
Barium	NLE	NLE	**13.7 B**	**23.1 B**	**18.3 B**	**19.5 B**	**21.4 B**	**21.2 B**	**81.3 B**
Beryllium	NLE	NLE	**0.252**	**0.366**	**0.361**	**0.422**	**0.417**	**0.472**	**0.780**
Cadmium	0.6	10	0.047 U	0.046 U	**0.228**	**0.149**	**0.209**	**0.243**	**0.0505**
Calcium	NLE	NLE	**622 B**	**989 B**	**750 B**	**783 B**	**1230 B**	**1010 B**	**1760 B**
Chromium (Total)	26	110	**29.4**	**35.9**	**31.1**	**54.1**	**54.4**	**37.0**	**73.4**
Cobalt	NLE	NLE	**0.733**	**0.531**	**1.60**	**1.52**	**2.41**	**2.67**	**0.604**
Copper	16	110	**8.23 B**	**8.43 B**	**10.7 B**	**13.6 B**	**19.5 B**	**13.0 B**	**9.10 B**
Iron	NLE	NLE	**7850**	**10500**	**9210**	**10800**	**11900**	**11400**	**17000**
Lead	31	250	**8.94**	**13.8**	**11.8**	**19.7**	**23.4**	**14.6**	**7.99**
Magnesium	NLE	NLE	**972**	**1310**	**1090**	**1250**	**1460**	**1650**	**2820**
Manganese	NLE	NLE	**30.7 B**	**28.0 B**	**20.4 B**	**26.1 B**	**77.9 B**	**16.9 B**	**41.0 B**
Nickel (Soluble Salts)	16	75	**3.50**	**3.43**	**4.73**	**5.12**	**6.42**	**7.47**	**9.55**
Potassium	NLE	NLE	**1870 B**	**2530 B**	**2260 B**	**2490 B**	**2720 B**	**3180 B**	**4820 B**
Sodium	NLE	NLE	**137 B**	42.019 U	**150 B**	43.161 U	41.194 U	45.633 U	40.141 U
Vanadium	NLE	NLE	**14.1**	**18.6**	**16.8**	**18.6**	**21.9**	**21.4**	**46.9**
Zinc	120	820	**49.9**	**52.3**	**56.6**	**64.1**	**96.2**	**86.0**	**44.1**

[1] NJDEP Freshwater Sediment Screening Values - Lowest Effect Levels, 1998.

[2] NJDEP Freshwater Sediment Screening Guidelines - Severe Effects Levels, 1998.
For non-polar organics (PAHs, organochlorine pesticides, PCBs), the SEL is caluculated from a site-specific TOC level. To calculate a site-specific SEL, TOC is multiplied by the the table SEL. However, no TOC analysis was performed on the FTMM sediment samples. Generally, TOC values range from 1% (10,000 mg/kg) to 10% (100,000 mg/kg) (USEPA, 1998). Since the table SEL is based on 100% TOC, the calculated site-specific SEL would be lower.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds LEL.

Table 3.3-5
Fort Monmouth ECP Site Investigation, Parcel 15
Summary of Analytical Parameters Detected in Soil Gas (µg/m^3)

		Analytical Results														
	Sample ID:	15SG-1	15SG-2	15SG-3	15SG-4	15SG-5	15SG-6	15SG-7	15SG-8	15SG-9	15SG-10	15SG-11	15SG-12	15SG-13	15SG-14	15SG-15
	Lab ID:	J78947-1	J78947-2	J78947-3	J78947-4	J78947-5	J78947-6	J78947-7	J78947-8	J78947-9	J78947-10	J78947-11	J78947-12	J78947-13	J78947-14	J78947-15
	Date Sampled:	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07
	Depth (ft. bgs):	3'	6'	6'	6'	6'	6'	6'	6'	6'	6'	6'	6'	6'	6'	6'
Chemical	SG Non-residential[2]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																
Acetone	230,000	**48.0**	**23**	**14**	**24**	**39.0**	**21**	**27.3**	**15**	**13**	<1.3	<8.1	<1.3	<16	<7.6	<1.3
Benzene	26	**5.1**	<0.7	<0.7	**4.2 J**	<0.7	**2.7 J**	**5.1**	<0.7	<0.7	**10**	**66.1**	**8.0**	**39.0 J**	**90.7**	**3.5 J**
Carbon disulfide	51,000	**4.7 J**	**2.9 J**	<0.87	**14**	<0.87	**8.4**	**32.1**	<0.87	**9.3**	<0.87	<5.6	**14**	<11	<5	<0.87
Chloroform	24	<1.7	**10**	**4.9 J**	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	<10	<1.7	<21	<9.3	<1.7
Cyclohexane	430,000	**4.8 J**	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	**29**	**291**	**16**	**482**	**328**	<1.2
Dichlorodifluoromethane	13,000	<2.3	<2.3	<2.3	<2.3	<2.3	**4.8 J**	<2.3	<2.3	<2.3	**14**	<14	<2.3	<29	<13	<2.3
cis-1,2-Dichloroethylene	2,600	<1.7	**30**	**23**	<1.7	<1.7	<1.7	<1.7	<1.7	<1.7	**39**	<10	<1.7	<21	<9.5	<1.7
trans-1,2-Dichloroethylene	5,100	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<8.7	<1.4	<18	<8.3	<1.4
1,2-Dichloroethylene (total)	2,300	<1.7 (a)	**30 (a)**	**23 (a)**	<1.7 (a)	<1.7 (a)	<1.7 (a)	<1.7 (a)	<1.7 (a)	<1.7 (a)	**39 (a)**	<10 (a)	<1.7 (a)	<21 (a)	<9.5 (a)	<1.7 (a)
Dichloromethane	430	**8.0**	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<8.7	<1.4	<18	<8	<1.4
Ethanol	NLE	**19.0**	**7.3 J**	**15**	**15**	<2.3	**19.4**	**21.9**	**11**	**13**	<2.3	<14	<2.3	<26	**47.3**	**7.9**
Ethylbenzene	74,000	**6.9**	**5.2 J**	<0.65	**11**	**4.2 J**	**8.7**	**12**	**5.2 J**	**4.3 J**	**6.9**	<4	**13**	<7.8	<3.6	<0.65
4-Ethyltoluene	NLE	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<4.1	**6.4 J**	<8.4	<3.8	<0.69
n-Heptane	NLE	**34**	**17**	**11**	**13**	**9.0**	**11**	**31**	**5.3 J**	**4.5 J**	**35**	**582**	**26**	**717**	**126**	<0.98
n-Hexane	51,000	**20**	**6.3**	<0.99	**14**	<0.99	<0.99	**21**	<0.99	<0.99	**131**	**3520**	**117**	**3770**	**1170**	**11**
Isopropyl Alcohol	NLE	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2	<7.1	**8.1**	<14	<6.6	<1.2
4-Methyl-2-pentanone (MIBK)	220,000	**4.5 J**	<0.82	<0.82	<0.82	**8.2**	<0.82	<0.82	<0.82	<0.82	<0.82	<4.9	**15**	<10	<4.5	<0.82
Methyl ethyl ketone	360,000	**7.4**	<0.91	<0.91	<0.91	**14**	<0.91	<0.91	<0.91	<0.91	<0.91	<5.6	**25**	<11	<5	<0.91
Methyl tertiary butyl ether (MTBE)	180	<1.3	<1.3	<1.3	**4.0 J**	**6.5**	<1.3	<1.3	<1.3	<1.3	<1.3	<8.3	<1.3	<16	<7.6	<1.3
Propylene	NLE	**92.8**	<1	<1	<1	**4.1 J**	<1	**62.9**	**7.9**	<1	<1	<6	<1	<12	<5.5	**16**
Tertiary Butyl Alcohol	4,600	<1.1	<1.1	<1.1	**3.9 J**	<1.1	**3.6 J**	<1.1	<1.1	<1.1	<1.1	<6.7	<1.1	<13	<6.1	<1.1
Tetrachloroethylene	36	**149**	**83.4**	**67.8**	**87.5**	**65**	**69.2**	**92.9**	**54**	**48**	**58**	<8.1	**47**	<16	<7.5	<1.3
Toluene	360,000	**96.1**	**41.1**	**27**	**80.6**	**27**	**28**	**48.6**	**17**	**16**	**27**	<3.1	**34**	<6	<2.8	**4.5 J**
Trichloroethylene	27	<1.3	**506**	**332**	**55.9**	**19**	**7.5 J**	**11**	**5.4 J**	<1.3	**10**	<8.1	<1.3	<16	<7.5	<1.3
Trichlorofluoromethane	51,000	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<2.6	<16	**298**	**629**	**657**	<2.6
1,2,4-Trimethylbenzene	NLE	<0.84	**15**	<0.84	**4.3 J**	**10**	**4.6 J**	**5.9 J**	<0.84	<0.84	**5.4 J**	<4.9	**24**	<10	<4.6	<0.84
1,3,5-Trimethylbenzene	NLE	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<4.2	**6.4 J**	<8.4	<3.9	<0.69
2,2,4-Trimethylpentane	NLE	**7.5**	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	**17**	**9150**	**747**	**31900**	**15600**	**72.9**
Vinyl chloride	48	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84	<0.84	**73.9**	<5.1	<0.84	<10	<4.9	<0.84
Xylenes (m&p)	NLE	**23**	**16**	**9.1**	**29**	**15**	**34**	**47.3**	**22**	**17**	**22**	**32 J**	**40**	<15	**27 J**	**6.1 J**
o-Xylene	NLE	**6.9**	**6.5 J**	**3.3 J**	**10**	**4.8 J**	**18**	**27**	**12**	**8.3**	**11**	<4.8	**13**	<9.1	<4.3	<0.74
Xylenes (total)	7,700	**30**	**22**	**12**	**40**	**20**	**51.7**	**74.7**	**34**	**25**	**33**	**32 J**	**52.6**	<9.1	**27 J**	**6.1 J**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected.

Shaded = Concentration exceeds SG Nonresidential.

Table 3.3-6
Fort Monmouth ECP Site Investigation, Parcel 15
Summary of Analytical Parameters Detected Indoor Air (µg/m^3)

			Analytical Results					
		Sample ID:	15IA-1	15IA-2	15IA-3	15IA-4	15IA-5	15IA-6
		Lab ID:	J78674-21	J78674-22	J78674-23	J78674-24	J78674-25	J78674-26
		Date Sampled:	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07
Chemical	RAL[3]	IA Non-residential[2]	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	6,600	4,600	**10**	**7.1**	**5.7**	**5.0**	**6.2**	**3.6**
Benzene	14	2	**1.1**	**1.3**	**1.2**	**1.1**	**1.1**	**0.96**
Carbon tetrachloride	10	3	<0.31	<0.31	**0.82 J**	<0.31	<0.31	<0.31
Chloromethane	NLE	130	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**
Dichlorodifluoromethane	NLE	260	**2.7**	**2.7**	**2.8**	**2.7**	**2.8**	**2.6**
Dichloromethane	400	9	**0.66 J**	**0.69**	**0.63 J**	**0.56 J**	**0.66 J**	**1.0**
Ethanol	NLE	NLE	**10**	**14**	**5.8**	**4.1**	**17**	**3.8**
Ethyl Acetate	NLE	NLE	<0.3	**2.5**	**2.2**	<0.3	<0.3	<0.3
Ethylbenzene	2,200	1,500	<0.083	<0.083	**0.43 J**	<0.083	<0.083	<0.083
n-Heptane	NLE	NLE	<0.13	**0.61 J**	**0.49 J**	<0.13	**0.45 J**	<0.13
Isopropyl Alcohol	NLE	NLE	**51.6**	**14**	**14**	**9.6**	**7.9**	**3.7**
Methyl ethyl ketone	NLE	7,200	**0.80**	**0.83**	**0.80**	**0.65**	**0.83**	**0.53 J**
Propylene	NLE	NLE	**2.4**	<0.12	<0.12	<0.12	**2.6**	**2.1**
Tetrahydrofuran	NLE	NLE	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	10,000	7,200	**1.7**	**5.7**	**2.1**	**1.5**	**1.8**	**1.4**
1,1,2-Trichloro-1,2,2-trifluoroethane	NLE	44,000	**0.75 J**	<0.25	<0.25	<0.25	<0.25	<0.25
Trichlorofluoromethane	NLE	1,000	**2.4**	**2.4**	**2.2**	**1.9**	**2.4**	**1.3**
1,2,4-Trimethylbenzene	NLE	NLE	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,2,4-Trimethylpentane	NLE	NLE	<0.093	<0.093	**0.56 J**	<0.093	<0.093	<0.093
o-Xylene	NLE	NLE	<0.096	<0.096	**0.52 J**	<0.096	<0.096	<0.096
Xylenes (m&p)	NLE	NLE	**0.83 J**	**1.1**	**1.9**	**0.91**	**1.0**	**0.78 J**
Xylenes (total)	220	150	**0.83 J**	**1.1**	**2.4**	**0.91**	**1.0**	**0.78 J**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

[3] NJDEP Rapid Action Levels for Indoor Air, March 2007.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.

Table 3.3-6
Fort Monmouth ECP Site Investigation, Parcel 15
Summary of Analytical Parameters Detected Indoor Air (µg/m^3)

			Analytical Results					
		Sample ID:	15IA-7	15IA-8	15IA-9	15IA-10	15IA-11	15IA-12
		Lab ID:	J78674-27	J78674-28	J78674-29	J78674-30	J78674-11	J78674-12
		Date Sampled:	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07
Chemical	RAL[3]	IA Non-residential[2]	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	6,600	4,600	**4.5**	**3.6**	**3.6**	<0.17	**6.7**	**6.2**
Benzene	14	2	**0.96**	**0.99**	**1.0**	**0.99**	**1.1**	**1.1**
Carbon tetrachloride	10	3	<0.31	<0.31	<0.31	<0.31	<0.31	<0.31
Chloromethane	NLE	130	**1.2**	**1.1**	**1.1**	**1.2**	**1.1**	**1.1**
Dichlorodifluoromethane	NLE	260	**2.7**	**2.6**	**2.7**	**2.7**	**2.4**	**2.5**
Dichloromethane	400	9	**0.69**	**0.63 J**	**0.83**	**0.76**	**0.56 J**	**0.63 J**
Ethanol	NLE	NLE	**4.1**	**4.1**	**3.8**	**4.5**	**12**	**18**
Ethyl Acetate	NLE	NLE	<0.3	**1.0**	**1.0**	<0.3	**2.4**	**2.3**
Ethylbenzene	2,200	1,500	<0.083	<0.083	**0.48 J**	<0.083	<0.083	**0.43 J**
n-Heptane	NLE	NLE	<0.13	<0.13	<0.13	<0.13	**0.53 J**	<0.13
Isopropyl Alcohol	NLE	NLE	**6.9**	**0.64**	**0.49**	**5.9**	**1.5**	**2.0**
Methyl ethyl ketone	NLE	7,200	**0.59**	**0.47 J**	**0.47 J**	**0.68**	**0.68**	**1.2**
Propylene	NLE	NLE	**2.1**	<0.12	**2.2**	**2.2**	**2.7**	**2.1**
Tetrahydrofuran	NLE	NLE	<0.2	<0.2	<0.2	<0.2	<0.2	**1.2**
Toluene	10,000	7,200	**1.3**	**1.4**	**1.4**	**1.5**	**1.9**	**2.0**
1,1,2-Trichloro-1,2,2-trifluoroethane	NLE	44,000	<0.25	<0.25	<0.25	<0.25	<0.25	**1.5 J**
Trichlorofluoromethane	NLE	1,000	**1.4**	**1.3**	**1.4**	**1.5**	**1.8**	**2.1**
1,2,4-Trimethylbenzene	NLE	NLE	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,2,4-Trimethylpentane	NLE	NLE	<0.093	<0.093	<0.093	<0.093	<0.093	<0.093
o-Xylene	NLE	NLE	<0.096	<0.096	**0.48 J**	<0.096	**0.41 J**	**0.40 J**
Xylenes (m&p)	NLE	NLE	**0.65 J**	**0.83 J**	**1.5**	**0.83 J**	**1.2**	**1.2**
Xylenes (total)	220	150	**0.65 J**	**0.83 J**	**2.0**	**0.83 J**	**1.6**	**1.7**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

[3] NJDEP Rapid Action Levels for Indoor Air, March 2007.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.

Table 3.3-6
Fort Monmouth ECP Site Investigation, Parcel 15
Summary of Analytical Parameters Detected Indoor Air (µg/m^3)

			Analytical Results				
		Sample ID:	15IA-12 DUP	15IA-13	15IA-14	15IA-15	15IA-AMBIENT
		Lab ID:	J78674-13	J78674-14	J78674-15	J78674-16	J78674-17
		Date Sampled:	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07
Chemical	RAL[3]	IA Non-residential[2]	Result	Result	Result	Result	Result
Volatiles							
Acetone	6,600	4,600	**6.7**	**5.7**	**5.7**	**5.9**	**3.8**
Benzene	14	2	**0.99**	**0.99**	**0.99**	**1.0**	**1.0**
Carbon tetrachloride	10	3	<0.31	<0.31	<0.31	<0.31	<0.31
Chloromethane	NLE	130	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**
Dichlorodifluoromethane	NLE	260	**2.8**	**3.2**	**2.8**	**2.7**	**2.7**
Dichloromethane	400	9	**0.59 J**	**0.63 J**	**0.52 J**	**0.45 J**	**0.52 J**
Ethanol	NLE	NLE	**20.2**	**15**	**9.2**	**19.8**	**4.0**
Ethyl Acetate	NLE	NLE	**2.6**	**2.5**	**2.6**	**2.5**	<0.3
Ethylbenzene	2,200	1,500	**0.74 J**	**0.74 J**	**0.56 J**	<0.083	<0.083
n-Heptane	NLE	NLE	<0.13	<0.13	<0.13	<0.13	<0.13
Isopropyl Alcohol	NLE	NLE	**2.3**	**2.7**	**4.7**	**1.8**	**4.4**
Methyl ethyl ketone	NLE	7,200	**1.2**	**0.77**	**0.65**	<0.11	**0.50 J**
Propylene	NLE	NLE	<0.12	**2.2**	**2.2**	**2.1**	**2.2**
Tetrahydrofuran	NLE	NLE	**1.3**	<0.2	<0.2	<0.2	<0.2
Toluene	10,000	7,200	**2.6**	**3.2**	**1.7**	**1.4**	**1.5**
1,1,2-Trichloro-1,2,2-trifluoroethane	NLE	44,000	**1.3 J**	**0.92 J**	<0.25	<0.25	<0.25
Trichlorofluoromethane	NLE	1,000	**2.3**	**1.8**	**1.9**	**1.5**	**1.4**
1,2,4-Trimethylbenzene	NLE	NLE	**2.6**	<0.1	<0.1	<0.1	<0.1
2,2,4-Trimethylpentane	NLE	NLE	<0.093	<0.093	<0.093	<0.093	<0.093
o-Xylene	NLE	NLE	**0.91**	**0.48 J**	**0.48 J**	<0.096	<0.096
Xylenes (m&p)	NLE	NLE	**2.5**	**1.8**	**1.5**	**0.69 J**	**0.78 J**
Xylenes (total)	220	150	**3.4**	**2.3**	**2.0**	**0.69 J**	**0.78 J**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

[3] NJDEP Rapid Action Levels for Indoor Air, March 2007.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.

Table 3.3-7
Fort Monmouth Phase II Site Investigation, Parcel 15
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P15-B1-A	7042403	10/27/07	0.5-1.0	91	69	10000	10000
P15-B1-C	7042405	10/27/07	9.5-10.0	115	75	10000	10000
P15-B3-A	7042409	10/27/07	0.0-0.5	277	72	10000	10000
P15-C3-C	7042420	10/27/07	6.0-6.5	387	70	10000	10000
P15-H1-A	7042303	10/26/07	0.5-1.0	130	68	10000	10000
P15-I1-A	7042215	10/25/07	0.0-0.5	350	76	10000	10000
P15-J1-A	7042118	10/24/07	0.0-0.5	609	73	10000	10000
P15-J4-A	7042109	10/24/07	0.5-1.0	177	74	10000	10000
P15-K4-A	7042206	10/25/07	0.5-1.0	120	70	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.3-8
Fort Monmouth Phase II Site Investigation, Parcel 15
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results						
	Sample ID:	15GW-1	15GW-2	15GW-3	15GW-3DUP	15GW-4	15GW-5	15GW-6
	Lab ID:	7043104	7043105	7043106	7043103	7043107	7043108	7043109
	Date Sampled:	10/31/2007	10/31/2007	10/31/2007	10/31/2007	10/31/2007	10/31/2007	10/31/2007
	Screened Interval (ft. bgs):	7-12'	7-12'	7-12'	7-12'	7-12'	7-12'	7-12'
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result	Result
Volatiles								
Toluene	600	**0.65**	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Semi-Volatiles								
bis(2-Ethylhexyl)phthalate	3	1.28 U	1.28 U	**3.74**	1.28 U	**4.04**	**1.19 J**	1.28 U
Metals								
Aluminum	200	**5240 B**	**1050 B**	**161 B**	**272 B**	**769 B**	**1280 B**	**800 B**
Arsenic	3	**4.41**	2.70 U	2.70 U	2.70 U	**7.47**	2.70 U	2.70 U
Barium	6000	**73.2**	**375**	**354**	**354**	**779**	**121**	**72.2**
Beryllium	1	**0.934**	**0.468**	0.100 U	0.100 U	0.100 U	**0.355**	**0.376**
Cadmium	4	**0.285**	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Calcium	NLE	**4330 B**	**57200 B**	**50000 B**	**49300 B**	**136000 B**	**19900 B**	**3880 B**
Chromium (Total)	70	**61.5**	**5.38**	**0.516**	**1.81**	**3.31**	**8.19**	**6.81**
Cobalt	100*	**13.2**	0.200 U	0.200 U	0.200 U	**0.387**	**0.707**	**0.457**
Copper	1300	**4.10**	0.500 U	0.500 U	0.500 U	**5.90**	**9.25**	**5.18**
Iron	300	**16800**	**14100**	**66200**	**64900**	**78800**	**9410**	**6840**
Lead	5	**1.74**	**2.66**	0.700 U	0.700 U	**1.07**	**3.46**	**6.41**
Magnesium	NLE	**11300**	**8070**	**6910**	**6790**	**20200**	**3260**	**512**
Manganese	50	**208**	**213**	**277**	**276**	**1380**	**141**	**245**
Nickel (Soluble Salts)	100	**19.4**	**0.976**	0.300 U	0.300 U	**1.10**	**3.94**	**1.28**
Potassium	NLE	**6780 B**	**9110 B**	**10100 B**	**10000 B**	**14700 B**	**2500 B**	**584 B**
Selenium	40	**3.62 B**	2.70 U	2.70 U	2.70 U	2.70 U	2.70 U	**6.98 B**
Sodium	50000	**49700**	**18300**	**50900**	**49200**	**40200**	**5380**	**1160**
Vanadium	NLE	**32.6**	**15.4**	**1.14**	**2.45**	**4.92**	**7.07**	**11.6**
Zinc	2000	**63.4**	**13.5**	**15.2**	**18.3**	**40.2**	**14.3**	**16.4**

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

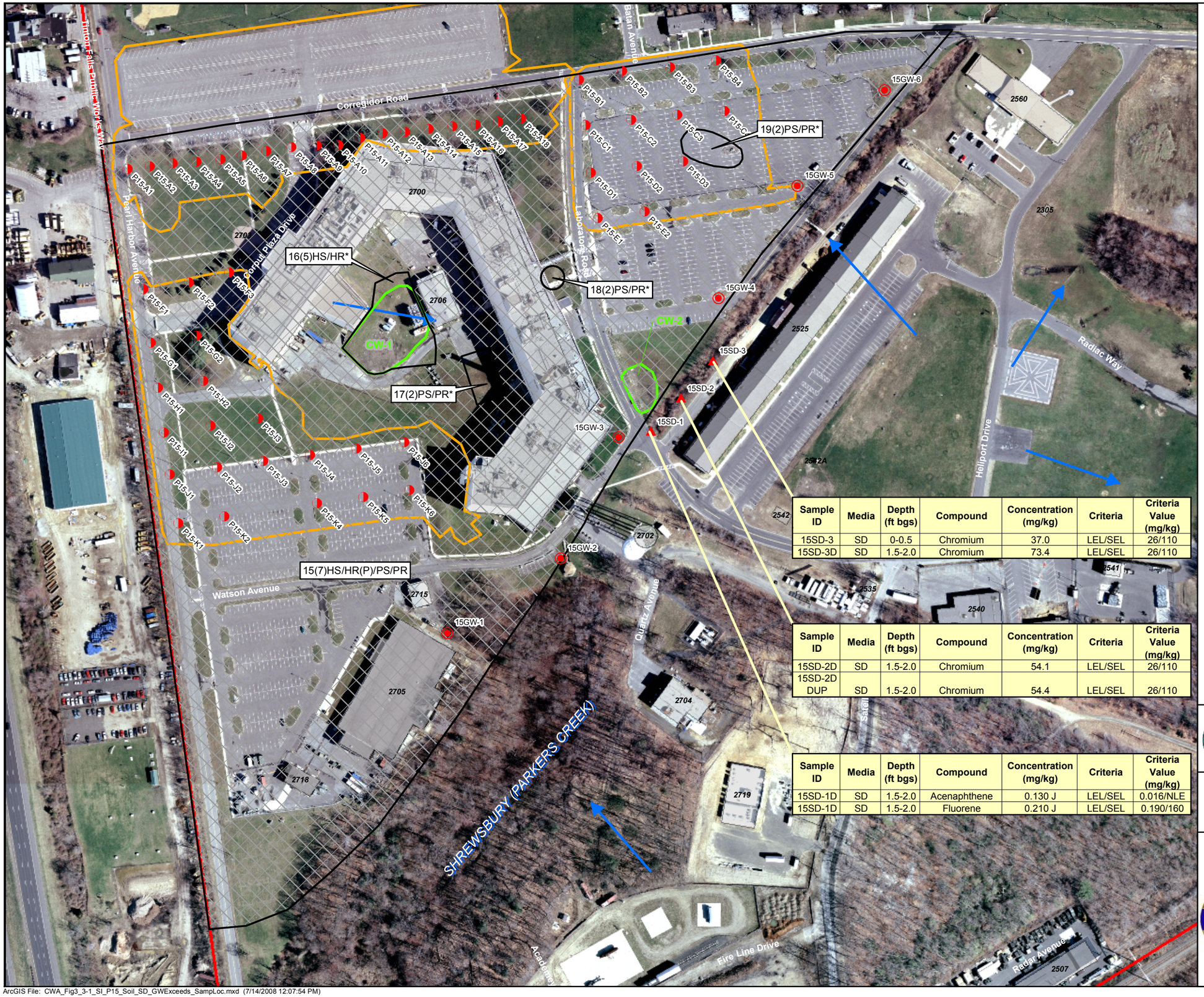
NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
15SD-3	SD	0-0.5	Chromium	37.0	LEL/SEL	26/110
15SD-3D	SD	1.5-2.0	Chromium	73.4	LEL/SEL	26/110

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
15SD-2D	SD	1.5-2.0	Chromium	54.1	LEL/SEL	26/110
15SD-2D DUP	SD	1.5-2.0	Chromium	54.4	LEL/SEL	26/110

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
15SD-1D	SD	1.5-2.0	Acenaphthene	0.130 J	LEL/SEL	0.016/NLE
15SD-1D	SD	1.5-2.0	Fluorene	0.210 J	LEL/SEL	0.190/160

LEGEND

- Geoprobe Groundwater Sample Location
- Geoprobe Soil Sample Location
- Sediment Sample Location
- Former Barracks Areas Targeted By Geophysical Survey (Electromagnetic followed by Ground Penetrating Radar of Anomalies)
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:
0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.3-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 15 SOIL, SEDIMENT, AND GROUNDWATER SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN
CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

Soil Gas Constituents Detected Above NJDEP Non-residential Soil Gas Screening Levels						
Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
15SG-1	SG	3	PCE	149	SG Non-residential	36
15SG-2	SG	6	PCE	83.4	SG Non-residential	36
15SG-2	SG	6	TCE	506	SG Non-residential	27
15SG-3	SG	6	PCE	67.8	SG Non-residential	36
15SG-3	SG	6	TCE	332	SG Non-residential	27
15SG-4	SG	6	PCE	87.5	SG Non-residential	36
15SG-4	SG	6	TCE	55.9	SG Non-residential	27
15SG-5	SG	6	PCE	65	SG Non-residential	36
15SG-6	SG	6	PCE	69.2	SG Non-residential	36
15SG-7	SG	6	PCE	92.9	SG Non-residential	36
15SG-8	SG	6	PCE	54	SG Non-residential	36
15SG-9	SG	6	PCE	48	SG Non-residential	36
15SG-10	SG	6	PCE	58	SG Non-residential	36
15SG-10	SG	6	Vinyl chloride	73.9	SG Non-residential	48
15SG-11	SG	6	Benzene	66.1	SG Non-residential	26
15SG-12	SG	6	PCE	47	SG Non-residential	36
15SG-13	SG	6	Benzene	39.0 J	SG Non-residential	26
15SG-14	SG	6	Benzene	90.7	SG Non-residential	26

LEGEND

- Soil-Gas Sample Location
- Indoor Air Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- IRP Site Boundary

N

SCALE:

0 40 80 160 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.3-2
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 15 SOIL GAS AND INDOOR AIR SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_3-2_SI_P15_SG_IA_Exceeds_SampLoc.mxd (7/14/2008 12:11:12 PM)

3.4 Parcel 27 – Southwestern Corner CWA

3.4.1 Site Description

Parcel 27 is located in the southwest portion of CWA and includes the Environmental Test Facility (Bldg 2704), former Pulse Power Center (Bldg 2707), Sheet Metal Shop (Bldg 2502), Machine Shop (2503), Paint and Fabrication Facility (2506), and a Former Motor Pool (2501).

Bldg 2704 has been used as an environmental test chamber since 1965. Chemical use in this building is limited to hydraulic fluid and standard shop chemicals (i.e., petroleum-based solvents, oils, and greases). While current waste handling practices are modern, historical waste handling practices are unknown. The building has multiple floor drains which, according to engineering drawings, are connected to the storm sewer.

Bldg 2707 was used by the Electronics Technology Devices Laboratory (ETD&L) until their move to Adelphi, Maryland, as part of the BRAC 1993 realignment initiative. Previous ETD&L activities at the facility included the R&D of high power/high voltage components and sub-systems for military applications.

During personnel interviews, a possible former debris disposal area was identified in the north-central portion of the parcel at the end of Academy Road (22). Additional information pertaining to this parcel can be found in Section 3.4.1.2, Table 3-5, Section 4.3.2.2.2, Section 4.3.2.2.3, Section 4.3.2.2.4, Section 4.3.2.2.6, Section 4.4.4.2, Table 4-3, Section 5.1.1, Section 5.1.1.1, Section 5.4.1, Section 5.5.2, Section 5.5.4, Table 5-1, Table 5-7, Section 5.8, Table 5-16, Section 5.13.9, and Section 5.13.10 of the Phase I ECP (1).

3.4.2 Previous Investigations

The CW-3A landfill, approximately 2.6 acres in size, is located due north of Bldg 2707 and adjacent to Parcel 27 along Pearl Harbor Avenue. All environmental issues associated with the CW-3A landfill are addressed under the FTMM IRP. Please refer to Sections 5.2.1 and 5.9 of the Phase I ECP for additional information about landfills on FTMM property (1).

Numerous former USTs were associated with buildings throughout Parcel 27. The USTs have been removed under the FTMM UST Management Program and are summarized within the FTMM Phase I ECP Report (1).

3.4.3 Site Investigation Sampling

No previous evaluation of potential historical discharges to the stormwater system from Bldg 2704 has been conducted. A review of stormwater management plans and historical documents was conducted to evaluate potential discharge locations, and sediment sampling was conducted to evaluate the potential impact of previous Bldg 2704 activities to stormwater outfall locations associated with Bldg 2704.

Bldgs 2502, 2503, 2504, 2506, and 2507 have an extensive history of vehicle and light industrial activities. The entire area immediately surrounding these buildings is paved, and natural surface water drainage is to the northeast. A site reconnaissance was conducted in spring 2007, and sample locations for soil were selected at depositional locations northeast of these buildings to evaluate potential impact from industrial and vehicle related activities at these buildings.

Geophysical Survey Investigation

An EM survey was conducted over the area identified as a possible debris burial area during personnel interviews. **Section 2.1** summarizes the methodologies utilized during the geophysical surveys.

Surface Soil Investigation

Surface soil samples were collected in December 2007 in Parcel 27. Surface soil samples were collected from two locations via hand augering to investigate potential discharges from Bldgs 2502 through 2507 (**Figure 3.4-1**). Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval directly bgs. Surface soil samples for VO analysis were collected from the 18- to 24-inch bgs interval. No visual or olfactory evidence of soil contamination was noted.

Sediment Investigation

Sediment samples were collected in December 2007 in Parcel 27. A total of four sediment samples were collected at two locations within Shrewsbury Creek, an outfall and an additional location downstream. Two samples were collected from each location; one from the 0- to 6-inch interval, and the other from the 12- to 18-inch interval, measured from the bottom of the creek. No visual or olfactory evidence of sediment contamination was noted.

Table 3.4-1 presents a summary of field activities, and sample locations are provided on **Figure 3.4-1**. An analytical summary of the soil and sediment sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.4-2**.

Table 3.4-1
Parcel 27 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
120-ft x 150-ft debris burial area	A geophysical survey was conducted over the 120-ft x 150-ft potential debris burial area. The geophysical investigation consisted of an EM survey: no follow-up GPR survey was necessary as no anomalies were identified by the EM survey.		
27SS-1 and 2 (2 samples)	Surface soil	Surface soil samples were collected from the 0- to 6-inch interval (samples for VO analysis collected from the 18- to 24-inch interval) in the wooded area to the northeast of Bldg 2507. Samples were collected in areas that display evidence of surface drainage and deposition to investigate potential historic discharges from Bldg 2507.	TCL+30 (w/o pesticides), TAL Metals
27SD-1 and 2 (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential historic discharges from Bldg 2704. Sample locations are at a stormwater outfall and a downstream location.	TCL+30 (w/o pesticides), TAL Metals
27SD-1D and 2D (2 samples)	Sediment	Sediment samples were collected from a 6-inch interval between 12 to 18 inches bgs to investigate potential historic discharges from Bldg 2704.	TCL+30 (w/o pesticides), TAL Metals

3.4.4 Site Investigation Results

Geophysical Survey Results

A geophysical survey was conducted to evaluate a potential burial area at the end of Academy Road. The Parcel 27 area is small and heavily wooded, and a GPS signal could not be received within the entire area. The area was cleared of brush and scanned with the TW-6 on 5-ft line spacing. No anomalies indicative of debris burial areas were identified.

Surface Soil Investigation Results

Soil samples were analyzed for TCL+30 (minus pesticides) and TAL metals.

A total of eight B/Ns and 18 metals were detected in Parcel 27 surface soil samples. Results are presented in **Table 3.4-3**. The eight B/Ns and 18 metals were detected below NJDEP NRDCSCC.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (minus pesticides) and TAL metals. Shrewsbury Creek is a non-tidal water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Freshwater Sediment Screening Values-LEL.

As shown in **Table 3.4-4**, eight B/Ns and 20 metals were detected in Parcel 27 sediment samples. No B/N was detected at a concentration in excess of the LEL. Of the 20 metals detected in sediment at Parcel 27, eight (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were detected at concentrations that exceeded the LEL. All metals detected above the LEL are presented on **Figure 3.4-1**. Copper is the only metal that was detected above the SEL.

Arsenic was detected above the LEL of 6 mg/kg and the CWBC of 5.8 mg/kg in two sediment samples collected in Parcel 27 at concentrations of 6.11 mg/kg in sample P27SD-1 and 8.00 mg/kg in sample P27SD-1D.

Cadmium was detected above the LEL of 0.6 mg/kg in all four sediment samples collected in Parcel 27 at concentrations ranging from 0.715 mg/kg in sample P27SD-2 to 4.88 mg/kg in sample P27SD-1D. The cadmium concentrations could not be compared to a CWBC because a background concentration has not been established for cadmium.

Chromium was detected above the LEL of 26 mg/kg and the CWBC of 36.9 mg/kg in all four sediment samples collected in Parcel 27 at concentrations ranging from 49.6 mg/kg in sample P27SD-2 to 68.8 mg/kg in sample P27SD-1D.

Copper was detected above the LEL of 16 mg/kg as well as the CWBC of 24.5 mg/kg and SEL of 110 mg/kg in two sediment samples collected in Parcel 27. Copper was detected at a concentration of 187 mg/kg in sample P27SD-1 and 338 mg/kg in sample P27SD-1D.

Lead was detected above the LEL of 31 mg/kg in two sediment samples collected in Parcel 27 at concentrations of 84.9 mg/kg in sample P27SD-1 and 149 mg/kg in sample P27SD-1D. The lead concentration in sample P27SD-1D also exceeded the CWBC of 142 mg/kg.

Mercury was detected above the LEL of 0.2 mg/kg in one sediment sample collected in Parcel 27 at a concentration of 0.23 mg/kg in sample P27SD-1D. The mercury concentrations could not be compared to a CWBC because a background concentration has not been established for mercury.

Nickel was detected above the LEL of 16 mg/kg and the CWBC of 11.3 mg/kg in one sediment sample collected in Parcel 27 at a concentration of 23.7 mg/kg in sample P27SD-1D.

Zinc was detected above the LEL of 120 mg/kg and the CWBC of 126 mg/kg in two sediment samples collected in Parcel 27 at concentrations of 264 mg/kg in sample P27SD-1 and 796 mg/kg in sample P27SD-1D.

All metal concentrations detected above the LEL were also in excess of their respective CWBC with the exception of the lead concentration in sample P27SD-1. Metals are identified as COCs in sediment at Parcel 27.

3.4.5 Summary and Conclusions

No constituents were identified above applicable NJDEP criteria in surface soil, and no anomalous features were identified during the geophysical survey to indicate the presence of a former debris disposal area. NFA is recommended for soil and the possible debris disposal area.

Eight metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were detected in sediment at concentrations greater than the Freshwater Sediment Screening Values-LEL and the CWBC. Sediment at Parcel 27 is recommended for further evaluation and will be addressed as part of a facility-wide baseline ecological evaluation.

Table 3.4-2
Parcel 27 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	P27-SD1	12/20/07	16:00	0.0	0.5									Samples cancelled by lab. Resampled 01/08/08.
SD	HAND AUGER	P27-SD1D	12/20/07	16:10	1.0	1.5									Samples cancelled by lab. Resampled 01/08/08.
SD	HAND AUGER	P27-SD2	12/20/07	16:30	0.0	0.5									Samples cancelled by lab. Resampled 01/08/08.
SD	HAND AUGER	P27-SD2D	12/20/07	16:40	1.0	1.5									Samples cancelled by lab. Resampled 01/08/08.
SOIL	HAND AUGER	P27SS-1	12/20/07	16:50	0.0	0.5									Samples cancelled by lab. Resampled 01/08/08.
SOIL	HAND AUGER	P27SS-2	12/20/07	16:55	0.0	0.5									Samples cancelled by lab. Resampled 01/08/08.
SOIL	HAND AUGER	27SS-1	12/27/07	11:00	1.5	2		X							No field blank or duplicate collected 12/27/07.
SOIL	HAND AUGER	27SS-2	12/27/07	11:05	1.5	2		X							No field blank or duplicate collected 12/27/07.
BLANK	TRIP	TRIP BLANK	12/27/07	-	--	--		X							
BLANK	TRIP	TRIP BLANK	01/08/08	-	--	--		X							
SOIL	HAND AUGER	P27SS-1	01/08/08	11:00	0.0	0.5		X	X	X	X				VOCs not needed. 12/27 VOCs collected at correct depth.
SOIL	HAND AUGER	P27SS-2	01/08/08	11:20	0.0	0.5		X	X	X	X				VOCs not needed. 12/27 VOCs collected at correct depth.
SD	HAND AUGER	P27-SD1	01/08/08	9:05	0.0	0.5		X	X	X	X				
SD	HAND AUGER	P27-SD1D	01/08/08	9:15	1.0	1.5		X	X	X	X				
SD	HAND AUGER	P27-SD2	01/08/08	9:55	0.0	0.5		X	X	X	X				
SD	HAND AUGER	P27-SD2D	01/08/08	10:15	1.0	1.5		X	X	X	X				
BLANK	FIELD	FIELD BLANK	01/08/08	11:40	--	--		X	X	X	X				

X = Sample analyzed for the indicated analytical parameter suite

Table 3.4-3
Fort Monmouth Phase II Site Investigation, Parcel 27
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results		
		Sample ID:	P27-SS1	P27-SS2	P27-SS2 DUP
		Lab ID:	8000707	8000708	8000702
		Date Sampled:	01/08/2008	01/08/2008	01/08/2008
		Depth (ft. bgs):	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result
Semi-Volatiles					
Benzo[a]anthracene	4	500	**0.150 J**	**0.440 J**	**0.510 J**
Benzo[b]fluoranthene	4	50	1.200 U	**0.750 J**	**0.830 J**
bis(2-Ethylhexyl)phthalate	210	100	**0.280 J**	**0.760 J**	**0.940 J**
Chrysene	40	500	**0.220 J**	**0.580 J**	**0.700 J**
Di-n-butylphthalate	10,000	100	**0.400 JB**	**0.890 JB**	**1.100 JB**
Fluoranthene	10,000	100	**0.210 J**	**0.600 J**	**0.810 J**
Phenanthrene	NLE	NLE	**0.100 J**	**0.360 J**	**0.410 J**
Pyrene	10,000	100	**0.430 J**	**1.300 J**	**1.500**
Metals					
Aluminum	NLE	NLE	**11600 B**	**22900 B**	**18700 B**
Arsenic	20	NLE	**9.86**	**16.7**	**14.9**
Barium	47,000	NLE	**29.5 B**	**74.4 B**	**60.2 B**
Beryllium	140	NLE	**0.498**	**1.41**	**1.19**
Cadmium	100	NLE	**0.720**	**5.62**	**4.51**
Calcium	NLE	NLE	**1550 B**	**6320 B**	**5610 B**
Chromium (Total)	NLE	NLE	**60.8 B**	**142 B**	**121 B**
Cobalt	NLE	NLE	**1.49**	**5.49**	**5.33**
Copper	45,000	NLE	**17.0 B**	**59.6 B**	**54.0 B**
Iron	NLE	NLE	**20200**	**46800**	**40300**
Lead	800	NLE	**44.6**	**87.0**	**87.6**
Magnesium	NLE	NLE	**1790 B**	**6040 B**	**5230 B**
Manganese	NLE	NLE	**64.3 B**	**342 B**	**287 B**
Mercury	270	NLE	0.122 U	**0.18**	**0.17**
Nickel (Soluble Salts)	2,400	NLE	**8.59**	**25.3**	**20.2**
Potassium	NLE	NLE	**2570 B**	**7760 B**	**6430 B**
Vanadium	7,100	NLE	**67.2**	**123**	**106**
Zinc	1,500	NLE	**81.4 B**	**324 B**	**274 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.4-4
Fort Monmouth Phase II Site Investigation, Parcel 27
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results			
		Sample ID:	P27-SD1	P27-SD1D	P27-SD2	P27-SD2D
		Lab ID:	8000703	8000704	8000705	8000706
		Date Sampled:	01/08/2008	01/08/2008	01/08/2008	01/08/2008
		Depth (ft. bgs):	0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5
Chemical	LEL[1]	SEL[2]	Result	Result	Result	Result
Semi-Volatiles						
Benzo[a]anthracene	0.320	1480	1.700 U	1.600 U	**0.120 J**	1.500 U
Benzoic acid	NLE	NLE	1.700 U	1.600 U	1.500 U	**2.400**
bis(2-Ethylhexyl)phthalate	NLE	NLE	1.700 U	**0.310 J**	**0.170 J**	1.500 U
Chrysene	0.340	460	1.700 U	1.600 U	**0.150 J**	1.500 U
Di-n-butylphthalate	NLE	NLE	**0.460 JB**	**2.000 B**	**0.610 JB**	**0.860 JB**
Fluoranthene	0.750	1020	**0.130 J**	**0.130 J**	**0.250 J**	1.500 U
Phenanthrene	0.560	950	1.700 U	1.600 U	**0.082 J**	1.500 U
Pyrene	0.490	850	**0.200 J**	**0.300 J**	**0.280 J**	1.500 U
Metals						
Aluminum	NLE	NLE	**7310 B**	**8660 B**	**5560 B**	**7160 B**
Antimony	NLE	NLE	0.636 U	**1.96**	0.620 U	0.594 U
Arsenic	6	33	**6.11**	**8.00**	**3.28**	**2.86**
Barium	NLE	NLE	**34.4 B**	**38.5 B**	**26.7 B**	**60.3 B**
Beryllium	NLE	NLE	**0.817**	**0.928**	**0.768**	**1.73**
Cadmium	0.6	10	**1.76**	**4.88**	**0.715**	**0.760**
Calcium	NLE	NLE	**1210 B**	**1660 B**	**793 B**	**436 B**
Chromium (Total)	26	110	**49.8 B**	**68.8 B**	**49.6 B**	**57.2 B**
Cobalt	NLE	NLE	**3.51**	**5.52**	**2.37**	0.453 U
Copper	16	110	**187 B**	**338 B**	**15.1 B**	**5.12 B**
Iron	NLE	NLE	**12800**	**21000**	**12000**	**2250**
Lead	31	250	**84.9**	**149**	**21.9**	**7.07**
Magnesium	NLE	NLE	**1530 B**	**1650 B**	**1550 B**	**553 B**
Manganese	NLE	NLE	**56.6 B**	**73.9 B**	**18.1 B**	**29.7 B**
Mercury	0.2	2	0.149 U	**0.23**	0.146 U	0.134 U
Nickel (Soluble Salts)	16	75	**12.8**	**23.7**	**10.3**	**8.00**
Potassium	NLE	NLE	**2590 B**	**2130 B**	**3040 B**	**1090 B**
Selenium	NLE	NLE	0.940 U	0.942 U	0.915 U	**4.47 B**
Vanadium	NLE	NLE	**44.4**	**57.2**	**29.3**	**21.7**
Zinc	120	820	**264 B**	**796 B**	**79.8 B**	**44.8 B**

[1] NJDEP Freshwater Sediment Screening Values - Lowest Effect Levels, 1998.

[2] NJDEP Freshwater Sediment Screening Guidelines - Severe Effects Levels, 1998.
For non-polar organics (PAHs, organochlorine pesticides, PCBs), the SEL is caluculated from a site-specific TOC level. To calculate a site-specific SEL, TOC is multiplied by the the table SEL. However, no TOC analysis was performed on the FTMM sediment samples. Generally, TOC values range from 1% (10,000 mg/kg) to 10% (100,000 mg/kg) (USEPA, 1998). Since the table SEL is based on 100% TOC, the calculated site-specific SEL would be lower.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

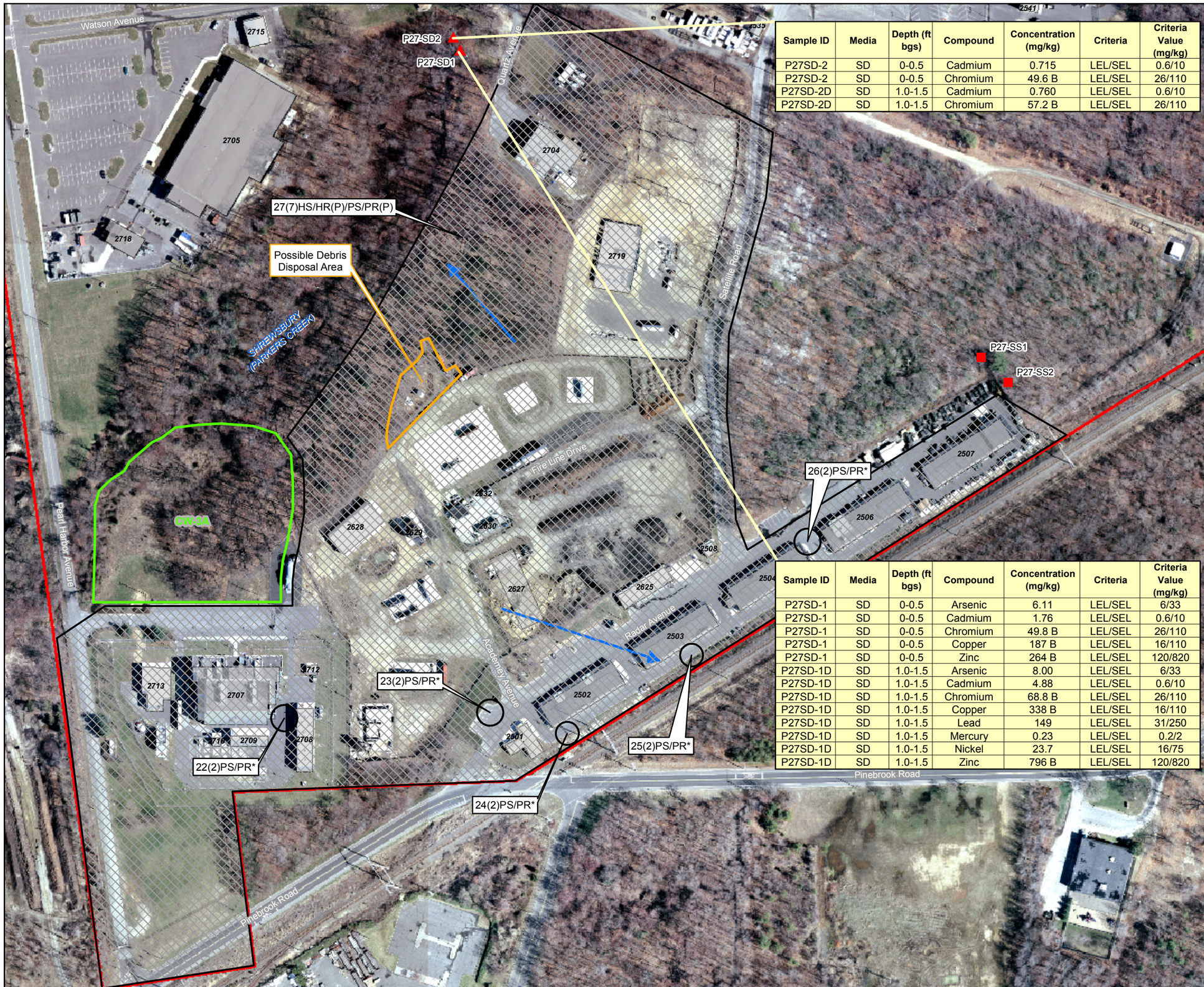
NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds LEL.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P27SD-2	SD	0-0.5	Cadmium	0.715	LEL/SEL	0.6/10
P27SD-2	SD	0-0.5	Chromium	49.6 B	LEL/SEL	26/110
P27SD-2D	SD	1.0-1.5	Cadmium	0.760	LEL/SEL	0.6/10
P27SD-2D	SD	1.0-1.5	Chromium	57.2 B	LEL/SEL	26/110

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P27SD-1	SD	0-0.5	Arsenic	6.11	LEL/SEL	6/33
P27SD-1	SD	0-0.5	Cadmium	1.76	LEL/SEL	0.6/10
P27SD-1	SD	0-0.5	Chromium	49.8 B	LEL/SEL	26/110
P27SD-1	SD	0-0.5	Copper	187 B	LEL/SEL	16/110
P27SD-1	SD	0-0.5	Zinc	264 B	LEL/SEL	120/820
P27SD-1D	SD	1.0-1.5	Arsenic	8.00	LEL/SEL	6/33
P27SD-1D	SD	1.0-1.5	Cadmium	4.88	LEL/SEL	0.6/10
P27SD-1D	SD	1.0-1.5	Chromium	68.8 B	LEL/SEL	26/110
P27SD-1D	SD	1.0-1.5	Copper	338 B	LEL/SEL	16/110
P27SD-1D	SD	1.0-1.5	Lead	149	LEL/SEL	31/250
P27SD-1D	SD	1.0-1.5	Mercury	0.23	LEL/SEL	0.2/2
P27SD-1D	SD	1.0-1.5	Nickel	23.7	LEL/SEL	16/75
P27SD-1D	SD	1.0-1.5	Zinc	796 B	LEL/SEL	120/820

LEGEND

- Surface and Subsurface Sample Location
- Sediment Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 90 180 360 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.4-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 27 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_4-1_SI_P27_Exceeds_SampLoc.mxd (7/14/2008 12:12:03 PM)

3.5 Parcel 28 – Former Eatontown Laboratory

3.5.1 Site Description

Parcel 28 is located in the CWA and encompasses Bldg 2525 – the former Eatontown Laboratory complex. Bldg 2525 was constructed in 1941-1942. The Eatontown Signal Laboratory was renamed Watson Laboratories in 1945 and subsequently moved to Rome, New York in 1951 (8).

It was reported that Bldg 2525 had been a chemical laboratory known as Eatontown Labs around the 1940s. This information was confirmed by FTMM site plans showing the Eatontown Laboratory complex. Plan No. 6148/1015 dated September 3, 1941, shows the Eatontown Laboratory complex, including Bldg 2525 (numbered 1 through 6 for the six bays) and nine other buildings numbered 7 through 15 (**Appendix G**). This plan also depicts three separate septic tanks and leach fields and one underground transformer vault. The main sanitary sewer line from the building is shown to discharge to a septic tank and leach field east of the building. A review of the DPW map and engineering drawings repository indicated a 2-inch “acid proof drain” leading from Bay 1 to a dry well southeast of the building. Floor drains were shown to discharge to the brook northwest of the building (23). Building revitalization plans show all floor drains were later connected to the sanitary sewer system.

Bldg 2525 was included in the Watson Laboratory complex in the mid-1940s. Crystal growing and processing operations were conducted in the Watson Laboratory building located in the southwest portion of the CWA in the early 1950s. Operations included cleaning of crystals, quartz etching, soldering, and gold (and other metal) plating, which was conducted in Bldg 2532. These operations involved chemicals such as carbon tetrachloride, ammonium bifluoride, cadmium sulfate, and sulfuric acid. Crystal etching was also noted in Bldg 2538 using ammonium bifluoride. Other processes associated with the Watson Laboratories included machining of metals and remelting lead in Bldg 2533; growing of crystals and physical chemistry in Bldg 2534; and machining of crystals in Bldg 2538 (15,24,25). In 1951, the laboratories were moved to Rome, New York (8).

Following the 1951 Watson Laboratories move, the Aviation Research and Development Command Laboratory was moved from the Myer Center to Bldg 2525. This laboratory operation occupied the building until 1978. A 1978 IH Survey reported ozalid reproduction in Room 5101 of Bldg 2525 (26). Building revitalization plans show all floor drains connected to the sanitary sewer system (27). No sumps or floor drains were noted during the 2006 VSI. The use of the building has been strictly administrative since the late 1990s, as confirmed during the VSI.

Prior to 1997, the building was used to house electronics laboratories. No chemical usage was associated with the electronics laboratories. Geothermal well fields used for the heating of facilities within Parcel 28 are present at multiple locations throughout the parcel.

Parcel 28 also contains the CECOM laboratory and radiological testing facility housed in Bldg 2540. This building contains a gamma irradiator, Radiac calibrators, a storage room for low-level RAM with multiple radioactive sources from the demilitarization of commodities, a nuclear counting laboratory, and several health physics laboratories. A survey of the interior of Bldg 2540 will be performed as part of the radiological scoping surveys.

The 1993 Environmental Research, Inc. Aerial Photographic Site Analysis noted a fenced open storage area and possible tank pads in the northern portion of Parcel 28, to the northeast of Bldg 2525 (14). Additional information pertaining to this parcel can be found in Section 4.3.2.2.1, Section 4.3.2.2.6, Section 4.4.4.2, Section 5.4, Section 5.8, Section 5.13.3, Table 5-1, Section 5.13.7, Table 5-16, and Appendix G of the Phase I ECP (1).

3.5.2 Previous Investigations

Multiple former USTs associated with buildings throughout Parcel 27 have been removed under the FTMM UST Management Program and are summarized within the FTMM Phase I ECP Report (1). However, no investigations have been conducted to evaluate the potential impact from previous operations associated with the Eatontown and Watson Laboratory facilities (area around Bldg 2525) or the former open storage area and possible tank pads in the northern portion of the parcel.

3.5.3 Site Investigation Sampling

A review of documented septic tank locations and of historical site drawings revealed several septic tanks, leaching fields, and USTs that once existed within Parcel 28 as well as a former acid proof drain in Bldg 2525 that discharged to Shrewsbury Creek. All known USTs have been removed; however, no investigations have been conducted to evaluate the potential impact from previously operated septic systems, former open storage and possible tank pads, and the former floor drains. Further, two USTs were identified on historic figures for which no UST removal documentation was identified. Geophysical surveys were conducted in order to determine the absence/presence of formerly utilized septic tanks, associated leaching fields, and USTs. The potential for historic releases to the environment were investigated via soil sampling, sediment sampling, groundwater sampling, and test pit soil sampling throughout Parcel 28. The locations of all samples and survey areas within Parcel 28 are illustrated on **Figure 3.5-1**.

Geophysical Survey Investigation

GPR surveys were conducted in Parcel 28 to delineate the locations of former septic tanks, USTs, and drywells. One survey was conducted over an area north of Bldg 2541 to investigate the location of a former septic tank (southeast of Bldg 2525). One survey was conducted over an area adjacent to Bldg 2542 to investigate a former drywell southeast of Bldg 2525. An EM and GPR survey was also performed to investigate former USTs associated with former Bldgs T-7, T-8, and T-9. The survey was extended

north to investigate the location of a 500-gallon septic tank associated with former Bldgs T-7 and T-10.

Geoprobe® Investigation

Soil and groundwater samples were collected in December 2007 in Parcel 28 in order to investigate potential septic system discharges and former storage pads that were identified through aerial analysis. A total of three surface soil samples and three subsurface soil samples were collected from three distinct Geoprobe® borings. Two boring locations, P28-SB-1;2, were located downgradient of a former drainage field that once serviced former Bldgs 13, 14, and 15. Boring P28-SB-3 was located where former pads existed in an open field west of Bldg 2290 and Guam Lane. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores was conducted using PID/FID instruments. No visual or olfactory evidence of soil contamination was noted during field operations.

A total of five groundwater samples (including one duplicate sample) were collected from four distinct temporary wells that were installed with the Geoprobe® rig. Three temporary wells, P28GW-1;2;4, were installed downgradient of former drainage fields, and one temporary well, P28GW-3, was installed downgradient of a former storage pad area located in an open field west of Bldg 2290 and Guam Lane. Temporary wells were constructed of PVC and 5 ft of factory-slotted screen.

Test Pit Soil Investigation

In order to determine if any contamination exists resulting from former septic tank discharges that once serviced Bldg 2525, four test pits were excavated in an open field east of Bldg 2525 and Heliport Drive. Test pits P28-TP1;3 were excavated within the boundaries of the former leaching field, and test pits P28TP-2;4 were excavated directly downgradient of former leaching pool structures (**Figure 3.5-1**). Top soil was observed to extend from ground surface to a depth of 0.5 ft bgs. The former leaching field was confirmed to still be in place through the observance of a 2-ft layer of sand and gravel underlain by a layer of engineered gravel 4 ft in thickness that extended to a depth of 6.5 ft bgs. Soil sample depths at P28-TP1;3, for non-VO and VO analysis, were contingent upon visual observations (i.e., depth to water table, thickness of layered engineered gravel) and field screening results. Based upon field observations at P28-TP1;3, three soil samples (including one duplicate sample) were collected at the 6-inch interval below the layer of engineered gravel, approximately 6.5 to 7.0 ft bgs. This depth coincided with the 6-inch interval directly above the water table. Soil sample depths at P28-TP2;4, for non-VO and VO analysis, were contingent upon visual observations (i.e., depth to water table, depth below leaching pool structure) and field screening results. Based upon field observations at P28-TP2, one soil sample was collected below the leaching pool structure at approximately 4.5 to 5.0 ft bgs, and one soil sample, P28-TP2-B, was collected at the 6-inch interval directly above the water table (5.5 to 6.0 ft bgs). Due to the close proximity of groundwater to the leaching pool

structure at P28TP-4, only one soil sample was collected at the 6-inch interval directly above the water table (4.5 to 5.0 ft bgs). No visual or olfactory evidence of impacted soil was noted.

Test Pit 5 (P28-TP5) was excavated within the boundaries of a former leaching field. P28-TP5 was originally planned to be located southeast of Bldg 2525 in order to investigate the location of a former drywell. This test pit was relocated upon preliminary evaluation of geophysical survey results that did not reveal any anomalous features that would represent a dry well. The test pit was relocated northeast of Bldg 2525 in order to investigate the septic system and leach field that was associated with former Bldgs T-7 and T-10 (**Figure 3.5-1**). Soil sample depths for non-VO and VO analysis were contingent upon visual observations (i.e., depth to water table, thickness of layered engineered gravel) and field screening results. Based upon field observations at P28-TP5, two soil samples (including one duplicate sample) were collected at the 6-inch interval below the layer of engineered gravel, approximately 6.0 to 6.5 ft bgs. This depth coincided with the 6-inch interval directly above the water table. No visual or olfactory evidence of impacted soil was noted.

Surface Soil Investigation

Surface soil samples were collected in December 2007 in Parcel 28. A total of two surface soil samples were collected from two distinct hand augered borings located in a former storage area in an open field west of Bldg 2290 and Guam Lane (**Figure 3.5-1**). Samples were collected in order to investigate the former storage area. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. No visual or olfactory evidence of impacted soil was noted.

Sediment Investigation

Sediment samples were collected in December 2007 in Parcel 28. A total of four sediment samples were collected from two distinct hand augered borings located along the southeast bank of Shrewsbury Creek adjacent to Bldg 2525 (**Figure 3.5-1**). Samples were collected to investigate potential discharges from former floor drains to outfalls that were associated with Bldg 2525. Samples were located directly downgradient of potential former discharge pipes observed on the southeast bank of the Creek. Two samples were collected from each location; one from the 0- to 6-inch interval, and the other from the 12- to 18-inch interval, measured from the bottom of the creek. No visual or olfactory evidence of impacted sediment was noted.

Table 3.5-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.5-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.5-2**.

Table 3.5-1
Parcel 28 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
Former septic tank and dry well associated with Bldg 2525	A geophysical investigation consisting of a GPR survey was conducted over a 125-ft x 125-ft area, 650 ft east of Bldg 2542 and 175 ft north of Bldg 2541, in order to investigate the location of former septic tank southeast of Bldg 2525, and a 100-ft x 100-ft area adjacent to Bldg 2542 to investigate the former drywell southeast of Bldg 2525.		
200-ft x 800-ft former shops and labs area and concrete vault	A geophysical survey was conducted over the 200-ft x 800-ft area to investigate former USTs associated with former Bldgs T-7, T-8, and T-9. The geophysical investigation area was extended to the north to investigate the location of a 500-gallon septic tank associated with Bldgs T-7 and T-10 – the associated leach field was removed during installation of the geothermal well field. The geophysical investigation consisted of both an EM and GPR survey of the entire area.		
28TP-1A/B through 28TP-4A/B (6 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from test pits to investigate the location of the former septic drainage field associated with Bldg 2525. Sample collection depths were determined based upon visual observations (i.e., depth to water table, depth below engineered gravel layer, depth below leaching pool structure) and by field monitoring instrument readings.	TCL+30 (w/o pesticides), TAL Metals
28GW-1 (2 samples – includes 1 duplicate sample)	Groundwater	A groundwater sample was collected from a Geoprobe® boring to evaluate potential impact to groundwater from the former drainage field associated with Bldg 2525.	TCL+30 (w/o pesticides/PCBs), TAL Metals, ammonia, nitrate, nitrite
28SS-1 and 2 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from the Geoprobe® soil borings to investigate the location of the former drainage field from former Bldgs 13, 14, and 15.	TCL+30 (w/o pesticides), TAL Metals
28SB-1 and 2 (2 samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depth 4.5 to 5.0 ft bgs) from each Geoprobe® soil boring to investigate the location of the former drainage field from former Bldgs 13, 14, and 15. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals
28GW-2 (1 sample)	Groundwater	A groundwater sample was collected from the specified Geoprobe® soil boring to investigate the location of the former drainage field from former Bldgs 13, 14, and 15.	TCL+30 (w/o pesticides/PCBs), TAL Metals, ammonia, nitrate, nitrite

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
28SS-3, 4, and 5 (3 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval to investigate the former fenced storage area west of Bldg 2290 (west side of Guam Lane) and the former pads immediately to the south, identified in aerial analysis.	TCL+30 (w/o pesticides), TAL Metals
28SB-3 (1 sample)	Subsurface soil	A soil sample was collected from the 6-inch interval directly above the water table (depth 5.0 to 5.5 ft bgs) from the specified Geoprobe® soil boring to investigate the former pads in the northern section of Parcel 28. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals
28GW-3 (1 sample)	Groundwater	A groundwater sample was collected from the specified Geoprobe® soil boring to investigate the former pads identified in aerial analysis of the northern section of Parcel 28.	TCL+30 (w/o pesticides/PCBs), TAL Metals
28TP-5 (2 samples – includes 1 duplicate sample)	Subsurface soil	Soil sample was collected from a test pit to investigate the location of the former drainage field northeast of Bldg 2525 that serviced former Bldgs T-7, T-10. Sample collection depths were determined by visual observations (i.e., depth to water table, depth to engineered gravel layer) and by field monitoring instrument readings.	TCL+30 (w/o pesticides), TAL Metals
28GW-4 (1 sample)	Groundwater	A groundwater sample was collected from the specified Geoprobe® boring to investigate the potential impact to groundwater from the former drainage field northeast of Bldg 2525 that serviced former Bldgs T-7, T-10.	TCL+30 (w/o pesticides/PCBs), TAL Metals
28SD-1 and 2 (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges from former 3-inch floor drains within Bldg 2525 that previously discharged to Shrewsbury Creek. Samples were collected directly at the former discharge point and a location downgradient.	TCL+30 (w/o pesticides), TAL Metals
28SD-1D and 2D (2 samples)	Sediment	Sediment samples were collected from the 12- to 18-inch bgs interval to investigate potential discharges from former 3-inch floor drains within Bldg 2525 that previously discharged to Shrewsbury Creek. Samples were collected directly at the former discharge point and a location downgradient.	TCL+30 (w/o pesticides), TAL Metals

3.5.4 Site Investigation Results

Geophysical Survey Results

The geophysical surveys identified a total of 23 target EM anomalies. The survey areas and results (locations of suspected USTs, suspected septic tanks, and suspected septic system distribution tanks) are presented on **Figure 3.5-2**. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.5-3**, and full results of the geophysical surveys are included in **Appendix A**. In summary, GPR scanning of the 23 targets revealed:

- Eight targets that were associated with surface metal/debris (previously unaccounted for).
- Seven targets that could not be relocated with the TW-6 because the targets were too small to be re-occupied, and therefore are most likely not a drywell, UST, or septic tank.
- Three targets with the characteristics of a utility.
- Two targets with moderate-amplitude near-surface point target/anomaly indicative of small pieces of buried debris; not indicative of a UST, drywell, or septic tank.
- One target with the high-amplitude parabolic reflections indicating a possible UST (P28-8). The location of the suspected UST matches up with former Bldg 2526. Bldg 2526 (AKA T8-H) served as a laboratory heater building, a non-housing structure, until the end of its life cycle. Supporting real property records are included in **Appendix I**.
- Two targets with a high-amplitude flat reflection indicating possible septic tanks.

Additional GPR scanning was completed within the small roughly square areas labeled **A** and **B** on **Figure 3.5-2**. These areas are thought to contain possible remnant septic system features. Several anomalies were delineated. In Area A, a roughly 4-ft x 6-ft non-metallic anomaly was delineated and may represent a former septic holding tank reported to have been in place in that area. In Area B, a high-amplitude non-metallic linear anomaly was partially delineated and is suspected to be the former supply pipe to a septic distribution box which was delineated in the EM survey. Follow-up GPR scanning showed a 10-ft x 10-ft high-amplitude flat anomaly characteristic of a box-shaped septic tank. No other features of the suspected septic systems in Areas A and B were observed.

In summary, no drywell was identified within Parcel 28; however, one possible UST (P28-8), one suspected septic holding tank, and one suspected septic distribution box and associated piping were identified.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TCL+30 (without pesticides) and TAL metals.

As presented in **Tables 3.5-4 and 3.5-5**, one VO (acetone) and 12 B/Ns were detected in Parcel 28 surface or subsurface soil samples at concentrations below the NJDEP NRDCSCC. A total of 17 metals were detected in surface and subsurface soil samples. Of the 17 metals, one (arsenic) was detected at a concentration in excess of the NJDEP NRDCSCC. Arsenic was detected at a concentration of 20.7 mg/kg in soil sample (P28-SB3-C) that exceeded the NJDEP NRDCSCC of 20 mg/kg. The arsenic concentration of P28-SB3-C did not exceed the CWBC of 31.6 mg/kg. Sample P28-SB3-C was collected at a depth of 5.0 to 5.5 ft bgs, directly above the water table. The arsenic concentration in surface soil is below the NRDCSCC, and arsenic was not detected in groundwater at this location.

There are several factors both natural and anthropogenic that can have an influence on arsenic levels in the soil at FTMM. The primary natural influence on the chemical concentrations in soil at FTMM is parent material. The parent material at FTMM is glauconitic soil of the Tinton and Red Bank sands and their fluvially- and tidally-reworked equivalents (47). Total arsenic levels in glauconite-bearing soils in New Jersey have been reported to range up to 131 mg/kg, with a median concentration of 30 mg/kg (48). Anthropogenic influences on arsenic levels in the soil include the use of pesticides and herbicides. Arsenic was a common constituent of herbicides and pesticides in the past. As a result of these natural and anthropogenic influences, arsenic is not considered a COC in the soil.

Test Pit Investigation Results

Subsurface soil samples were analyzed for TCL+30 (minus pesticides) and TAL metals.

As shown in **Table 3.5-4**, one VO and 12 B/Ns were detected in subsurface soil samples at concentrations below NJDEP NRDCSCC. A total of 17 metals were detected at concentrations below NJDEP NRDCSCC. No COCs were identified in test pit soil.

Groundwater Investigation Results

Groundwater samples P28GW-1 and 2 were analyzed for TCL+30 (without pesticides/PCBs), TAL metals, ammonia, nitrate, and nitrite. Groundwater samples P28GW-3 and 4 were analyzed for TCL+30 (without pesticides/PCBs) and TAL metals.

As presented in **Table 3.5-6**, a total of 13 metals were detected in Parcel 28 groundwater samples. Only two metals (aluminum and manganese) were detected at concentrations above the NJDEP GWQC.

Several natural and anthropogenic factors contribute to the wide range in concentrations of metals in soils, which further impact the concentration of metals in groundwater. Soils derived from glauconitic sands contain abundant aluminum, calcium, potassium, iron, magnesium, and manganese (among others), which are likely to be present at elevated concentrations in the groundwater, particularly when sediments are entrained in the collected groundwater samples. As a result of these natural influences, aluminum and manganese are not considered COCs in groundwater.

A total of three VOs, acetone, chloroform, and toluene, were detected at concentrations below the NJDEP GWQC in Parcel 28 groundwater samples. One B/N, bis(2-ethylhexyl)phthalate, was detected at concentrations below the NJDEP GWQC.

As shown in **Table 3.5-6**, nitrite and nitrate were detected at concentrations below the NJDEP GWQC in groundwater samples collected from temporary wells P28GW-1, P28GW-1-Duplicate, and P28GW-2. No COCs were identified in groundwater at Parcel 28.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. Shrewsbury Creek is a non-tidal water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Freshwater Sediment Screening Values-LEL and SEL.

As presented in **Table 3.5-7**, one VO, five B/Ns, and 17 metals were detected in Parcel 28 sediment samples. Acetone was detected at concentrations below the LEL in all four samples. All B/N concentrations were below the LEL. Only one metal (chromium) was detected at a concentration greater than the LEL.

Chromium was detected above the LEL of 26 mg/kg in all four sediment samples collected in Parcel 28 at concentrations ranging from 36.8 mg/kg in sample P28SD-2 to 50.6 mg/kg in sample P28SD-2D (**Table 3.5-7**). Three of the four chromium concentrations also exceeded the CWBC of 36.9 mg/kg. No constituents were detected at concentrations greater than the SEL. Chromium is considered a COC in sediment at Parcel 28.

3.5.5 Summary and Conclusions

The locations of a suspected UST (P28-8), suspected former septic holding tank, a suspected septic distribution box, and suspected supply piping associated with the suspected septic distribution box were identified as a result of the geophysical survey.

Soil and groundwater analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for the suspected UST, suspected former septic holding tank, suspected septic distribution box, and suspected supply piping associated with the suspected septic distribution box is recommended.

Arsenic was detected at a concentration above the NJDEP NRDCSCC in the soil. However, the arsenic concentrations did not exceed the CWBC, and arsenic levels in the soil in Monmouth County are influenced by several natural and anthropogenic sources causing elevated concentrations. Thus, arsenic is not considered a COC in soil. No further evaluation is recommended for soil at Parcel 28.

One metal, chromium, was detected in sediment at concentrations greater than the Freshwater Sediment Screening Values-LEL and the CWBC and was identified as a COC. Sediment at Parcel 28 is recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

Table 3.5-2
Parcel 28 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK	12/04/07	-	--	--		X							
SOIL	TEST PIT	P28-TP1	12/04/07	9:55	6.5	7.0		X	X	X					
SOIL	TEST PIT	P28-TP3	12/04/07	10:55	6.5	7.0		X	X	X					
SOIL	TEST PIT	P28-TP3 DUPLICATE	12/04/07	10:55	6.5	7.0		X	X	X					
SOIL	TEST PIT	P28-TP2-A	12/04/07	13:30	4.5	5.0		X	X	X					
SOIL	TEST PIT	P28-TP2-B	12/04/07	13:50	5.5	6.0		X	X	X					
SD	HAND AUGER	P28-SD1	12/04/07	14:40	0.0	0.5		X	X	X					
SD	HAND AUGER	P28-SD1-D	12/04/07	14:45	1.0	1.5		X	X	X					
SD	HAND AUGER	P28-SD2	12/04/07	15:00	0.0	0.5		X	X	X					
SD	HAND AUGER	P28-SD2-D	12/04/07	15:05	1.0	1.5		X	X	X					
BLANK	FIELD	FIELD BLANK	12/04/07	15:10	--	--		X	X	X					Semi-volatiles extracted for Base Neutrals only. No Acids were reported by lab.
BLANK	TRIP	TRIP BLANK	12/05/07	-	--	--		X							
SOIL	HAND AUGER	P28-SS4-A	12/05/07	7:55	0.0	0.5			X	X	X				
SOIL	HAND AUGER	P28-SS4-B	12/05/07	7:55	1.5	2.0		X							
SOIL	HAND AUGER	P28-SS5-A	12/05/07	8:10	0.0	0.5			X	X	X				
SOIL	HAND AUGER	P28-SS5-B	12/05/07	8:10	1.5	2.0		X							
SOIL	GEOPROBE	P28-SB3-A	12/05/07	9:40	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P28-SB3-B	12/05/07	9:40	1.5	2.0		X							
SOIL	GEOPROBE	P28-SB3-C	12/05/07	9:50	5.0	5.5		X	X	X	X				
SOIL	TEST PIT	P28-TP4	12/05/07	10:30	4.5	5.0		X	X	X	X				
SOIL	GEOPROBE	P28-SB1-A	12/05/07	11:10	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P28-SB1-B	12/05/07	11:10	1.5	2.0		X							
SOIL	GEOPROBE	P28-SB1-C	12/05/07	11:20	4.5	5.0		X	X	X	X				
SOIL	GEOPROBE	P28-SB2-A	12/05/07	11:30	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P28-SB2-B	12/05/07	11:30	1.5	2.0		X							
SOIL	GEOPROBE	P28-SB2-C	12/05/07	11:35	4.5	5.0		X	X	X	X				
SOIL	TEST PIT	P28-TP5	12/05/07	14:00	6.0	6.5		X	X	X	X				

Table 3.5-2
Parcel 28 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	TEST PIT	P28-TP5 DUPLICATE	12/05/07	14:00	6.0	6.5		X	X	X	X				
BLANK	FIELD	FIELD BLANK	12/05/07	14:05	--	--		X	X	X	X				
BLANK	TRIP	TRIP BLANK-AQ	12/06/07	10:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/06/07	11:00	--	--		X	X		X			X	
GW	GEOPROBE	P28GW-1	12/06/07	11:30	6.0	11.0		X	X		X			X	
GW	GEOPROBE	P28GW-1 DUPLICATE	12/06/07	11:30	6.0	11.0		X	X		X			X	
GW	GEOPROBE	P28GW-2	12/06/07	12:00	2.5	7.5		X	X		X			X	
GW	GEOPROBE	P28GW-3	12/06/07	13:30	3.0	8.0		X	X		X				
GW	GEOPROBE	P28GW-4	12/06/07	14:30	5.0	10.0		X	X		X				

X = Sample analyzed for the indicated analytical parameter suite

Table 3.5-3
Parcel 28 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P28_1	Inphase	N/A	N/A	N/A	Surface metal.	607941	532602
P28_2	Both	N/A	N/A	N/A	Surface metal.	608174	532700
P28_3	Both	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	608179	532811
P28_4	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608194	532694
P28_5	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608199	532962
P28_6	Conductivity	Yes	N/A	N/A	Possible utility.	608212	532635
P28_7	Both	N/A	N/A	N/A	Surface metal.	608212	532987
P28_8	Both	Yes	10 x 10	7 x 7	High-amplitude parabolic anomaly characteristic of UST; also note associated linear anomaly is suspected pipe.	308212	532882
P28_9	Both	N/A	N/A	N/A	Surface metal.	608217	532610
P28_10	Conductivity	Yes	< 2 x 2	< 2 x 2	Moderate-amplitude point target/anomaly, possible debris.	608221	532844
P28_11	Both	N/A	N/A	N/A	Surface metal.	608228	532528
P28_12	Inphase	N/A	N/A	N/A	Surface metal.	608250	533240
P28_13	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608254	532992
P28_14	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608273	532658
P28_15	Conductivity	Yes	N/A	N/A	Possible utility.	608284	532567
P28_16	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608302	532624
P28_17	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608321	532687
P28_18	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	608325	532782
P28_19	Both	Yes	N/A	N/A	Possible utility.	608352	532694
P28_20	Inphase	N/A	N/A	N/A	Surface metal.	608375	533130
P28_21	Inphase	N/A	N/A	N/A	Surface metal.	608379	533094
P28_22	Both	Yes	12 x 12	10 x 10	Suspected septic system distribution box.	608611	532714
P28_23	GPR	N/A	N/A	4 x 6	Suspected septic tank.	608272	533247

Table 3.5-4
Fort Monmouth Phase II Site Investigation, Parcel 28
Summary of Analytical Parameters in Soil (mg/kg) South of Corregidor Road

			Analytical Results					
		Sample ID:	P28-SB1-A	P28-SB1-B	P28-SB1-C	P28-SB2-A	P28-SB2-B	P28-SB2-C
		Lab ID:	7051111	7051112	7051113	7051114	7051115	7051116
		Date Sampled:	12/5/2007	12/5/2007	12/5/2007	12/5/2007	12/5/2007	12/5/2007
		Depth (ft. bgs):	0.0-0.5'	1.5-2.0'	4.5-5.0	0.0-0.5'	1.5-2.0'	4.5-5.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	1000	100	NT	**3.100 B**	**0.690 B**	NT	**0.650 B**	**0.360 B**
Semi-Volatiles								
Benzo[b]fluoranthene	4	50	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
Indeno[1,2,3-cd]pyrene	4	500	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
Benzo[a]anthracene	4	500	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
Benzo[a]pyrene	0.66	100	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
Benzo[k]fluoranthene	4	500	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
bis(2-Ethylhexyl)phthalate	210	100	**0.160 J**	NT	1.200 U	1.000 U	NT	1.100 U
Chrysene	40	500	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
Di-n-butylphthalate	10000	100	**1.100 JB**	NT	**0.290 JB**	**0.200 JB**	NT	**0.630 JB**
Di-n-octyl phthalate	10000	100	1.100 U	NT	1.200 U	1.000 U	NT	1.100 U
Fluoranthene	10000	100	**0.095 J**	NT	1.200 U	1.000 U	NT	**0.074 J**
Phenanthrene	NLE	NLE	**0.069 J**	NT	1.200 U	1.000 U	NT	**0.081 J**
Pyrene	10000	100	**0.120 J**	NT	1.200 U	1.000 U	NT	1.100 U
Metals								
Aluminum	NLE	NLE	**7170 B**	NT	**5580 B**	**2290 B**	NT	**7200 B**
Arsenic	20	NLE	**7.16**	NT	**3.29**	**1.78**	NT	**4.17**
Barium	47000	NLE	**30.1 B**	NT	**19.2 B**	**8.30 B**	NT	**19.8 B**
Beryllium	140	NLE	**0.794**	NT	**0.295**	**0.154**	NT	**0.291**
Cadmium	100	NLE	**0.338**	NT	**0.173**	**0.147**	NT	**0.233**
Calcium	NLE	NLE	**1280 B**	NT	**491 B**	**461 B**	NT	**336 B**
Chromium (Total)	NLE	NLE	**58.6**	NT	**35.9**	**17.4**	NT	**38.9**
Cobalt	NLE	NLE	**1.15**	NT	0.334 U	**0.465**	NT	0.324 U
Copper	45000	NLE	**9.21 B**	NT	**4.53 B**	**5.27 B**	NT	**5.91 B**
Iron	NLE	NLE	**21900**	NT	**10400**	**5660**	NT	**11600**
Lead	800	NLE	**28.0**	NT	**6.79**	**27.8**	NT	**10.5**
Magnesium	NLE	NLE	**2690 B**	NT	**822 B**	**524 B**	NT	**894 B**
Manganese	NLE	NLE	**52.4**	NT	**35.0**	**24.1**	NT	**29.7**
Nickel (Soluble Salts)	2400	NLE	**6.55**	NT	**3.32**	**2.15**	NT	**3.19**
Potassium	NLE	NLE	**5250**	NT	**1310**	**770**	NT	**1400**
Vanadium	7100	NLE	**33.7**	NT	**30.6**	**16.6**	NT	**36.1**
Zinc	1500	NLE	**51.9 B**	NT	**51.4 B**	**31.1 B**	NT	**47.9 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.5-4
Fort Monmouth Phase II Site Investigation, Parcel 28
Summary of Analytical Parameters in Soil (mg/kg) South of Corregidor Road

		Sample ID:	P28-TP1	P28-TP2-A	P28-TP2-B	P28-TP3	P28-TP3 DUP	P28-TP4	P28-TP5	P28-TP5 DUP
		Lab ID:	7050603	7050605	7050606	7050604	7050602	7051110	7051117	7051102
		Date Sampled:	12/4/2007	12/4/2007	12/4/2007	12/4/2007	12/4/2007	12/5/2007	12/5/2007	12/5/2007
		Depth (ft. bgs):	6.5-7.0'	4.5-5.0'	5.5-6.0'	6.5-7.0	6.5-7.0	4.5-5.0'	6.0-6.5'	6.0-6.5'
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles										
Acetone	1000	100	**0.350**	**0.430**	**0.320**	**0.270 J**	**0.370**	**0.520**	**0.550 B**	**0.340**
Semi-Volatiles										
Benzo[b]fluoranthene	4	50	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.130 J**	1.100 U	1.100 U
Indeno[1,2,3-cd]pyrene	4	500	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.066 J**	1.100 U	1.100 U
Benzo[a]anthracene	4	500	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.120 J**	1.100 U	1.100 U
Benzo[a]pyrene	0.66	100	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.100 J**	1.100 U	1.100 U
Benzo[k]fluoranthene	4	500	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.062 J**	1.100 U	1.100 U
bis(2-Ethylhexyl)phthalate	210	100	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.120 J**
Chrysene	40	500	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.150 J**	1.100 U	1.100 U
Di-n-butylphthalate	10000	100	**0.140 JB**	**0.780 JB**	**0.130 JB**	**0.220 JB**	**0.530 JB**	**0.860 JB**	**1.300 B**	**1.200 B**
Di-n-octyl phthalate	10000	100	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U
Fluoranthene	10000	100	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.270 J**	1.100 U	1.100 U
Phenanthrene	NLE	NLE	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.110 J**	1.100 U	1.100 U
Pyrene	10000	100	1.100 U	1.100 U	1.100 U	1.100 U	1.100 U	**0.260 J**	1.100 U	1.100 U
Metals										
Aluminum	NLE	NLE	**10800 B**	**7980 B**	**6800 B**	**6460 B**	**6570 B**	**3920 B**	**8980 B**	**8320 B**
Arsenic	20	NLE	**5.80**	**5.29**	**4.03**	**5.12**	**4.62**	**4.00**	**4.43**	**3.97**
Barium	47000	NLE	**9.95 B**	**12.0 B**	**9.73 B**	**12.0 B**	**11.8 B**	**17.5 B**	**7.62 B**	**7.08 B**
Beryllium	140	NLE	**0.848**	**0.633**	**0.571**	**0.745**	**0.762**	**0.304**	**0.811**	**0.693**
Cadmium	100	NLE	**0.166**	**0.110**	**0.129**	**0.112**	**0.117**	**0.129**	**0.253**	**0.234**
Calcium	NLE	NLE	**327 B**	**488 B**	**404 B**	**171 B**	**173 B**	**373 B**	**685 B**	**650 B**
Chromium	NLE	NLE	**109**	**81.7**	**73.2**	**99.1**	**89.2**	**28.7**	**130**	**115**
Cobalt	NLE	NLE	**0.373**	0.338 U	0.322 U	**0.622**	**1.57**	0.320 U	0.342 U	**0.398**
Copper	45000	NLE	**4.93 B**	**3.64 B**	**2.91 B**	**4.38 B**	**4.63 B**	**4.80 B**	**4.62 B**	**4.60 B**
Iron	NLE	NLE	**23000**	**19900**	**16400**	**21200**	**20600**	**7960**	**23700**	**20900**
Lead	800	NLE	**1.49**	**0.458**	**1.12**	**5.07**	**4.25**	**9.74**	**1.16**	**1.84**
Magnesium	NLE	NLE	**2900 B**	**2040 B**	**1860 B**	**2460 B**	**2420 B**	**794 B**	**2460 B**	**2300 B**
Manganese	NLE	NLE	**11.6**	**21.9**	**14.0**	**12.3**	**20.3**	**22.1**	**11.6**	**10.0**
Nickel	2400	NLE	**4.46**	**3.48**	**2.83**	**3.72**	**3.67**	**2.87**	**3.88**	**4.09**
Potassium	NLE	NLE	**5850**	**4350**	**4010**	**5340**	**5240**	**1280**	**5450**	**4820**
Vanadium	7100	NLE	**61.7**	**48.8**	**40.6**	**45.0**	**44.4**	**24.3**	**55.1**	**49.4**
Zinc	1500	NLE	**41.1 B**	**27.6 B**	**22.6 B**	**32.0 B**	**38.6 B**	**22.6 B**	**51.0 B**	**46.0 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.5-5
Fort Monmouth Phase II Site Investigation, Parcel 28
Summary of Analytical Parameters in Soil (mg/kg) North of Corregidor Road

				Analytical Results						
			Sample ID:	P28-SB3-A	P28-SB3-B	P28-SB3-C	P28-SS4-A	P28-SS4-B	P28-SS5-A	P28-SS5-B
			Lab ID:	7051107	7051108	7051109	7051103	7051104	7051105	7051106
			Date Sampled:	12/5/2007	12/5/2007	12/5/2007	12/5/2007	12/5/2007	12/5/2007	12/5/2007
			Depth (ft. bgs):	0.0-0.5'	1.5-2.0'	5.0-5.5'	0.0-0.5'	1.5-2.0'	0.0-0.5'	1.5-2.0'
Chemical	RDCSCC[1]	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result
Volatiles										
Acetone	1000	1000	100	NT	**0.430**	**0.580**	NT	**0.430**	NT	**0.420**
Semi-Volatiles										
Benzo[b]fluoranthene	0.9	4	50	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Indeno[1,2,3-cd]pyrene	0.9	4	500	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Benzo[a]anthracene	0.9	4	500	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Benzo[a]pyrene	0.66	0.66	100	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Benzo[k]fluoranthene	0.9	4	500	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
bis(2-Ethylhexyl)phthalate	49	210	100	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Chrysene	9	40	500	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Di-n-butylphthalate	5700	10000	100	**0.940 JB**	NT	**0.950 JB**	**0.510 JB**	NT	**0.420 JB**	NT
Di-n-octyl phthalate	1100	10000	100	1.200 U	NT	**0.087 J**	1.200 U	NT	1.200 U	NT
Fluoranthene	2300	10000	100	**0.074 J**	NT	1.200 U	1.200 U	NT	1.200 U	NT
Phenanthrene	NLE	NLE	NLE	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	NT
Pyrene	1700	10000	100	**0.073 J**	NT	1.200 U	1.200 U	NT	1.200 U	NT
Metals										
Aluminum	NLE	NLE	NLE	**13900 B**	NT	**17700 B**	**15100 B**	NT	**14500 B**	NT
Arsenic	20	20	NLE	**14.6**	NT	**20.7**	**14.9**	NT	**19.1**	NT
Barium	700	47000	NLE	**37.1 B**	NT	**36.3 B**	**59.0 B**	NT	**48.4 B**	NT
Beryllium	16	140	NLE	**1.77**	NT	**2.11**	**2.33**	NT	**2.12**	NT
Cadmium	39	100	NLE	**0.602**	NT	**0.785**	**0.853**	NT	**0.824**	NT
Calcium	NLE	NLE	NLE	**1090 B**	NT	**330 B**	**1650 B**	NT	**1630 B**	NT
Chromium (Total)	NLE	NLE	NLE	**132**	NT	**194**	**172**	NT	**151**	NT
Cobalt	NLE	NLE	NLE	**1.98**	NT	**1.74**	**2.97**	NT	**2.16**	NT
Copper	3100	45000	NLE	**7.43 B**	NT	**4.57 B**	**11.6 B**	NT	**13.0 B**	NT
Iron	NLE	NLE	NLE	**50900**	NT	**60600**	**65100**	NT	**62100**	NT
Lead	400	800	NLE	**6.80**	NT	0.401 U	**28.0**	NT	**18.8**	NT
Magnesium	NLE	NLE	NLE	**6160 B**	NT	**7910 B**	**8240 B**	NT	**7700 B**	NT
Manganese	NLE	NLE	NLE	**36.6**	NT	**26.4**	**63.4**	NT	**34.5**	NT
Nickel (Soluble Salts)	250	2400	NLE	**9.34**	NT	**10.8**	**12.6**	NT	**10.9**	NT
Potassium	NLE	NLE	NLE	**13300**	NT	**18300**	**18700**	NT	**17100**	NT
Vanadium	370	7100	NLE	**63.6**	NT	**91.2**	**70.8**	NT	**71.6**	NT
Zinc	1500	1500	NLE	**77.6 B**	NT	**82.0 B**	**105 B**	NT	**110 B**	NT

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

mg/kg = milligram per kilogram.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.

(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

Table 3.5-6
Fort Monmouth Phase II Site Investigation, Parcel 28
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results				
	Sample ID:	P28GW-1	P28GW-1 DUP	P28GW-2	P28GW-3	P28GW-4
	Lab ID:	7051404	7051403	7051405	7051406	7051407
	Date Sampled:	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007
	Screened Interval (ft. bgs):	6-11'	6-11'	2.5-7.5'	3-8'	5-10'
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result
Volatiles						
Acetone	6,000	**1.33**	0.85 U	0.85 U	**1.25**	**1.43**
Chloroform	70	0.32 U	0.32 U	**0.66**	0.32 U	0.32 U
Toluene	600	0.27 U	0.27 U	**0.38**	0.27 U	0.27 U
Semi-Volatiles						
bis(2-Ethylhexyl)phthalate	3	**2.07 B**	1.28 U	1.28 U	**0.94 JB**	**2.30 B**
Metals						
Aluminum	200	**198**	**80.4**	**75.6**	**550**	**973**
Barium	6,000	**27.8**	**24.9**	**13.9**	**77.2**	**92.0**
Beryllium	1	0.100 U	0.100 U	0.100 U	**0.507**	**0.533**
Cadmium	4	0.200 U	0.200 U	**0.314 B**	**0.388 B**	**0.533 B**
Calcium	NLE	**5540**	**5200**	**5910**	**7160**	**30400**
Chromium (Total)	70	0.200 U	0.200 U	0.200 U	**2.34**	0.200 U
Cobalt	100*	0.200 U	0.200 U	0.200 U	**6.21**	**5.99**
Magnesium	NLE	**3220**	**3000**	**2060**	**8210**	**7380**
Manganese	50	**56.9**	**53.3**	**8.36**	**50.0**	**248**
Nickel (Soluble Salts)	100	0.300 U	0.300 U	0.300 U	**21.0**	**5.03**
Potassium	NLE	**3270**	**2980**	**507**	**2000**	**3520**
Sodium	50,000	**4670 B**	**4250 B**	**48800 B**	**4850 B**	**14700 B**
Zinc	2,000	3.58 U	3.58 U	3.58 U	**65.0**	**35.8**
Anions						
Nitrate	10,000	**2040**	**2220**	**550**	NT	NT
Nitrite	1,000	200 U	200 U	**250**	NT	NT

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

Table 3.5-7
Fort Monmouth Phase II Site Investigation, Parcel 28
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results			
		Sample ID:	P28SD-1	P28SD-1D	P28SD-2	P28SD-2D
		Lab ID:	7050607	7050608	7050609	7050610
		Date Sampled:	12/4/2007	12/4/2007	12/4/2007	12/4/2007
		Depth (ft. bgs):	0.0-0.5	1.0-1.5'	0.0-0.5	1.0-1.5'
Chemical	LEL[1]	SEL[2]	Result	Result	Result	Result
Volatiles						
Acetone	NLE	NLE	**0.440**	**0.480**	**0.390**	**0.330 J**
Semi-Volatiles						
Benzo[a]anthracene	0.320	1480	1.200 U	1.300 U	**0.180 J**	1.300 U
Chrysene	0.340	460	1.200 U	1.300 U	**0.270 J**	1.300 U
Di-n-butylphthalate	NLE	NLE	**0.190 JB**	**0.180 JB**	**0.150 JB**	**0.220 JB**
Fluoranthene	0.750	1020	1.200 U	1.300 U	**0.160 J**	1.300 U
Pyrene	0.490	850	1.200 U	1.300 U	**0.370 J**	1.300 U
Metals						
Aluminum	NLE	NLE	**4710 B**	**5620 B**	**4340 B**	**5630 B**
Arsenic	6	33	**2.32**	**3.39**	**2.75**	**3.20**
Barium	NLE	NLE	**28.7 B**	**40.9 B**	**31.6 B**	**34.3 B**
Beryllium	NLE	NLE	**0.454**	**0.485**	**0.399**	**0.510**
Cadmium	0.6	10	**0.222**	**0.372**	**0.449**	**0.263**
Calcium	NLE	NLE	**964 B**	**1130 B**	**1080 B**	**1150 B**
Chromium (Total)	26	110	**43.0**	**48.7**	**36.8**	**50.6**
Cobalt	NLE	NLE	**0.596**	**0.826**	**1.09**	**0.735**
Copper	16	110	**5.92 B**	**8.61 B**	**11.5 B**	**4.40 B**
Iron	NLE	NLE	**13200**	**21500**	**10600**	**13100**
Lead	31	250	**7.69**	**7.78**	**28.0**	**4.78**
Magnesium	NLE	NLE	**1530 B**	**1590 B**	**1390 B**	**1710 B**
Manganese	NLE	NLE	**24.2**	**36.6**	**31.0**	**31.5**
Nickel (Soluble Salts)	16	75	**5.42**	**6.17**	**5.28**	**5.76**
Potassium	NLE	NLE	**3220**	**3300**	**2150**	**3310**
Vanadium	NLE	NLE	**23.5**	**24.8**	**22.3**	**32.0**
Zinc	120	820	**35.9 B**	**66.7 B**	**55.6 B**	**29.5 B**

[1] NJDEP Freshwater Sediment Screening Values - Lowest Effect Levels, 1998.

[2] NJDEP Freshwater Sediment Screening Guidelines - Severe Effects Levels, 1998.
For non-polar organics (PAHs, organochlorine pesticides, PCBs), the SEL is caluculated from a site-specific TOC level. To calculate a site-specific SEL, TOC is multiplied by the the table SEL. However, no TOC analysis was performed on the FTMM sediment samples. Generally, TOC values range from 1% (10,000 mg/kg) to 10% (100,000 mg/kg) (USEPA, 1998). Since the table SEL is based on 100% TOC, the calculated site-specific SEL would be lower.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds LEL.

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P28SD-2D	SD	1-1.5	Chromium	50.6	LEL/SEL	26/110

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P28SD-1	SD	0-0.5	Chromium	43.0	LEL/SEL	26/110
P28SD-1D	SD	1-1.5	Chromium	48.7	LEL/SEL	26/110

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Geoprobe Groundwater Sample Location
- Test Pit Soil Sample Location
- Surface Soil Sample Location
- Sediment Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- Geophysical Investigation Area - Ground Penetrating Radar (GPR)
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:
0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

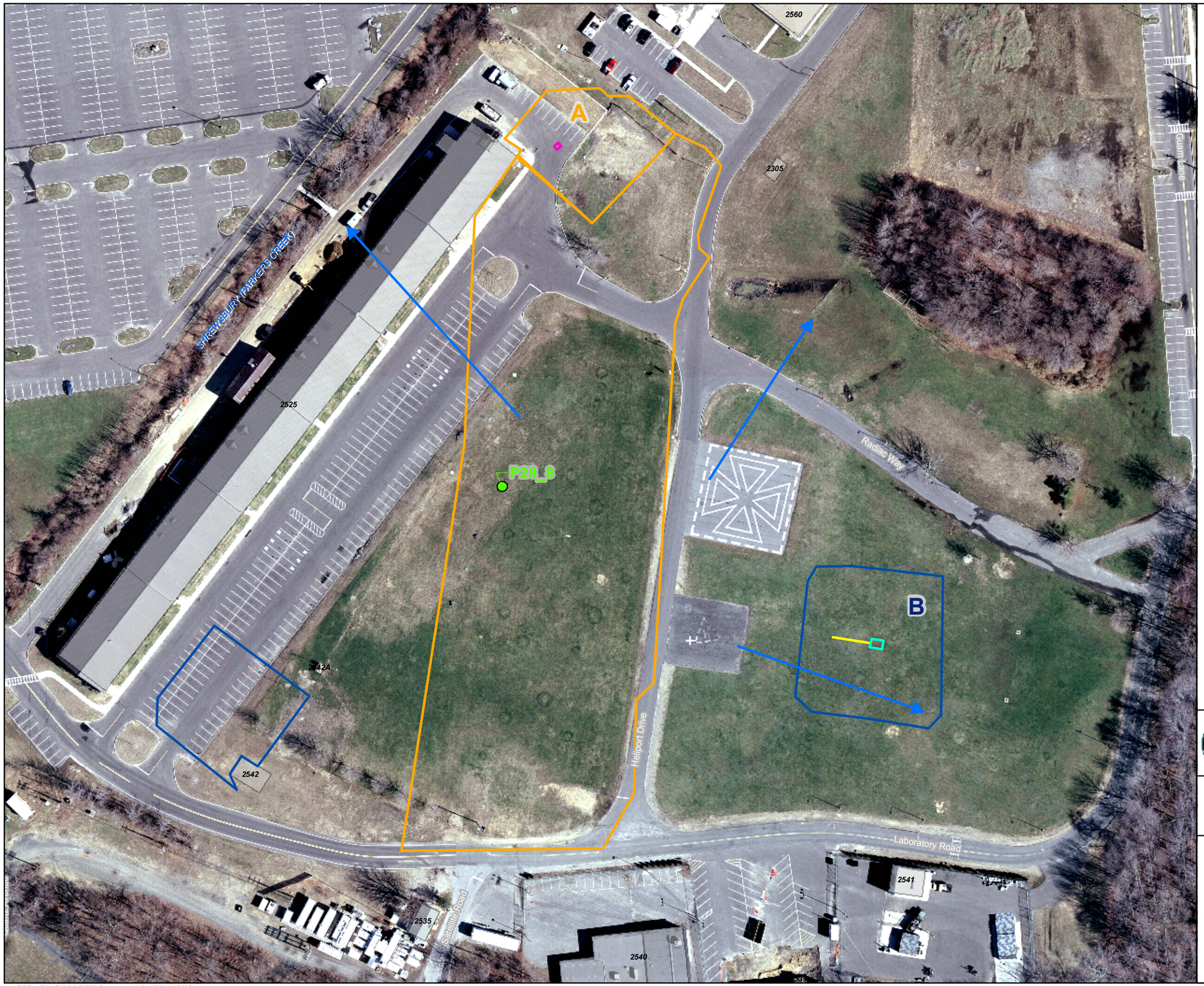
FIGURE 3.5-1

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 28 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_5-1_SI_P28_Exceeds_SampLoc.mxd (7/14/2008 12:13:05 PM)



LEGEND

- Subsurface Metallic Object (Suspected UST)
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Installation Boundary
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- Geophysical Investigation Area - Ground Penetrating Radar (GPR)

GPR Scanning Results

- Suspected Pipe
- Suspected Septic System Distribution Tank
- Suspected Septic Tank

N

SCALE:

0 50 100 200 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3.5-2

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 28 SUSPECTED UST
AND GPR SCANNING RESULTS

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_5-2_SI_P28_Geophysics.mxd (7/14/2008 12:19:52 PM)

3.6 Parcel 34 – Bldg 2567

3.6.1 Site Description

Bldg 2567 is a combination mini-mart and gasoline station located at the corner of Hope Road and Laboratory Road in the CWA. Bldg 2567 is a one-story building built on slab and is approximately 1,335 square feet in size. The facility sells gasoline and other household commodities to active, reserve, and retired military personnel and their dependents. No automotive repair work is conducted at this site. The gasoline portion of the facility consists of three USTs and two fuel dispensing pumps. Each pump is equipped with six hose attachments for dispensing fuel. All three tanks are 10,000 gallons in capacity and store various grades of unleaded gasoline.

The tanks and piping at the site are constructed of double-walled fiberglass. Continuous leak detection monitoring at the site is accomplished through the use of liquid leak sensors that have been placed in the interstitial spaces of the tanks and piping. Automatic tank gauges have also been installed within the tanks, which continuously monitor the product levels within each tank (28). Additional information pertaining to this parcel can be found in Section 5.2.1.3 and Section 5.4 of the Phase I ECP (1).

3.6.2 Previous Investigations

Bldg 2567 has been investigated under the FTMM IRP and is designated as Site FTMM-58. Four single-walled steel gasoline USTs were replaced by the existing tanks as part of a renovation project that was initiated as a result of one UST failing a tightness test. Tank removals involving these four single-walled steel gasoline USTs included three 10,000-gallon gasoline USTs and one 6,000-gallon gasoline UST. The four gasoline USTs were removed in February 1993. Two other tank removals, one 1,000-gallon heating oil UST and one 550-gallon used oil UST, were also removed as part of the renovation project. The heating oil and used oil USTs were both removed in December 1991.

Approximately 1,000 cubic yards of petroleum-contaminated soil were excavated and stockpiled for off-site disposal. A preliminary assessment was conducted at the site, and five monitoring wells were installed. Groundwater samples have been collected and analyzed for VOA+15 and lead. Benzene, 1,2-DCE, MTBE, and lead were initially detected above NJDEP GWQC.

Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. Benzene, xylenes, tert-butyl alcohol (TBA), and MTBE were detected in two of the five site monitoring wells above NJDEP GWQC. A remedial design that addresses groundwater contamination was submitted to the NJDEP. The remedial approach selected for the Bldg 2567 site involves the use of monitored natural attenuation. A Classification Exception Area (CEA) for site groundwater was filed with the NJDEP. A Geoprobe® investigation was performed in early 2004 to further evaluate site groundwater conditions. An RI report summarizing these findings was prepared

and was submitted to the NJDEP in February 2006. The Army is waiting for NJDEP approval of this document. Currently, as part of a monitoring program, seven groundwater monitoring wells are sampled on a quarterly basis. Due to the installation being selected for closure under the 2005 BRAC program, the cleanup strategy was re-evaluated. The current cleanup strategy includes oxygen release compound (ORC) injections and the continued monitoring of groundwater as a key component of the monitored natural attenuation program. Injection of ORC is subject to requirements pursuant to N.J.A.C 7:26E-4.1(a)4 and N.J.A.C. 7:26E-6.3(c) related to the performance of a pilot study and approval of a permit-by-rule. ORC injections will be performed in 2008. Site closeout is anticipated for 2011.

3.6.3 Site Investigation Sampling

Through previous investigations conducted under the IRP, groundwater VO contamination has been identified in close proximity to Bldg 2567. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs. In the case of petroleum hydrocarbon contamination (particularly BTEX), a 30-ft distance criterion is utilized (12). Benzene, DCE, and MTBE have been detected in groundwater above the GWSLs proximal to Bldg 2567. Therefore, VI at Bldg 2567 was further evaluated through the collection of near-slab and sub-slab soil gas samples.

See **Table 3.6-1** for a summary of field activities conducted for Parcel 34 as part of this SI and **Figure 3.6-1** for sample locations. A summary of the analytical and sampling program, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.6-2**.

Table 3.6-1
Parcel 34 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
34SG-1 (1 sample)	Sub-slab soil gas	One sub-slab soil gas sample was collected from under Bldg 2567. Because this is a mini-mart associated with an active fueling station, sub-slab soil gas was sampled in lieu of indoor air.	NJDEP – SRWM USEPA TO-15 Method
34SG-2 and 3 (3 samples – includes 1 duplicate sample)	Near-slab soil gas	Two near-slab soil gas samples were collected at Bldg 2567.	NJDEP – SRWM USEPA TO-15 Method

3.6.4 Site Investigation Results

A total of 20 VOs were detected in soil gas samples collected in Parcel 34. Of the 20 VOs detected, one (benzene) exceeded the NJDEP Soil Gas NRS of 26 $\mu g/m^3$ in one near-slab soil gas sample. No constituents were detected above the NJDEP Soil Gas NRS in sub-slab soil gas sample 34SG-1. As presented in **Table 3.6-3**, benzene was detected at concentrations of 28 $\mu g/m^3$ and 36.7 $\mu g/m^3$ in sample 34SG-3 and a duplicate sample collected at this location, respectively.

3.6.5 Summary and Conclusions

One constituent, benzene, exceeded NJDEP Soil Gas NRSs in near-slab soil gas at Parcel 34. No constituents were detected above the NJDEP Soil Gas NRS in sub-slab soil gas. Based on NJDEP VI guidance (12), further evaluation is required if constituents are detected above the NRS in near slab soil gas. Evaluation of indoor air in Bldg 2567 is recommended for Parcel 34.

Table 3.6-2
Parcel 34 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SG	CANISTER	34SG-1	12/13/07	13:40	3.0	3.0		X							
SG	CANISTER	34SG-2	12/13/07	12:10	5.0	5.0		X							
SG	CANISTER	34SG-3	12/13/07	12:50	5.0	5.0		X							
SG	CANISTER	34SG-3 DUPLICATE	12/13/07	13:00	5.0	5.0		X							

X = Sample analyzed for the indicated analytical parameter suite

Table 3.6-3
Fort Monmouth ECP Site Investigation, Parcel 34
Summary of Analytical Parameters Detected Soil Gas (ug/m^3)

		Analytical Results			
	Sample ID:	34SG-1	34SG-2	34SG-3	34SG-3 DUP
	Lab ID:	J79249-17	J79249-18	J79249-15	J79249-16
	Date Sampled:	12/13/07	12/13/07	12/13/07	12/13/07
	Depth (ft. bgs):	3'	5'	5'	5'
Chemical	SG Non-residential[2]	Result	Result	Result	Result
Volatiles					
Acetone	230,000	**58.9**	**271**	**53.4**	<3.3
Benzene	26	**18**	**14**	**36.7**	**28**
Carbon disulfide	51,000	<1.8	**5.0**	**8.7 J**	**12 J**
Cyclohexane	430,000	<2.4	<1.2	**38.6**	**68.5**
Ethanol	NLE	**16**	**46.7**	<5.5	<5.5
Ethylbenzene	74,000	**241**	**186**	**1760**	**1500**
n-Heptane	NLE	**20**	**16**	**190**	**193**
n-Hexane	51,000	**33**	**27**	**298**	**479**
Isopropyl Alcohol	NLE	<2.3	**21**	**<2.9**	<2.9
Methyl ethyl ketone	360,000	**14**	**50.4**	<2.2	<2.2
Propylene	NLE	<2.1	**203**	**277**	**261**
Styrene	73,000	<1.3	<0.64	**24**	**20**
Tertiary Butyl Alcohol	4,600	<2.2	<1.1	**14**	**12 J**
Tetrachloroethylene	36	**20 J**	**22**	<3.3	<3.3
Toluene	360,000	**1590**	**1430**	**10700**	**9310**
1,2,4-Trimethylbenzene	NLE	<1.6	**5.9 J**	**15 J**	**12 J**
2,2,4-Trimethylpentane	NLE	<1.5	<0.75	**1540**	**3280**
Xylenes (m&p)	NLE	**791**	**621**	**6300**	**5170**
o-Xylene	NLE	**146**	**115**	**1210**	**999**
Xylenes (total)	7,700	**938**	**734**	**7510**	**6170**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compare

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Detection

Shaded = Exceedance of SG Nonresidential.

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
34SG-3	SG	5	Benzene	36.7	SG Non-residential	26
34SG-3 DUP	SG	5	Benzene	28	SG Non-residential	26

LEGEND

- Soil-Gas Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 — Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS
- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 25 50 100 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.6-1
FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 34 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_6-1_SI_P34_Exceeds_SampLoc.mxd (7/14/2008 3:55:02 PM)

3.7 Parcel 38 – Former Outdoor Pistol Range (1940 - 1955)

3.7.1 Site Description

Parcel 38 is located in the northwestern portion of the MP, directly west of Bldg 200. The former Outdoor Firing Range was used from approximately 1940 through 1955. The small arms firing that occurred at the former Pistol Range (1935-1940 Pistol Range) directly west of Bldg 292 was relocated to this location around 1940 when the STP was constructed on the old range location. Range structures and the backstop berm at the former Outdoor Firing Range (1940-1955) have been removed/demolished. Munitions associated with the former Outdoor Firing Range are assumed to be small arms ammunition only; therefore, no MEC and limited MC are anticipated. The primary MC associated with small arms ranges is lead. Additional information pertaining to this parcel can be found in Section 4.3.4, Section 5.2.1.2, Section 5.2.2, and Section 5.10 of the Phase I ECP (1).

3.7.2 Previous Investigations

This site was originally included in the IRP as FTMM-21. Evidence of the former Outdoor Firing Range was uncovered during preparation of a preliminary assessment report. Because the location of the former range has been developed for over 40 years, the IRP recommendation was for NFA. This determination was approved by the NJDEP. An HRR was subsequently conducted at FTMM under the MMRP. Based on information discovered during the HRR, the correct location of the pistol Range was identified. Because the correct location is a manicured lawn adjacent to Bldg 1220, which may not have been heavily re-worked, the recommendation in the HRR was for further evaluation.

3.7.3 Site Investigation Sampling

The findings of the HRR (29) were reviewed to determine the location of the former berm and to establish a soil sampling grid. In order to evaluate the potential impact from previous pistol range operations in the area of the former berm, the following soil sampling was conducted at the former Outdoor Firing Range (29).

Surface Soil Investigation

Surface soil samples were collected in December 2007 in Parcel 38. A total of 25 surface soil samples (including one duplicate sample) were collected from 24 distinct hand augered borings located in the area of the former berm (**Figure 3.7-1**). Samples were taken in order to determine if any contamination exists from previous pistol range operations. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. No visual or olfactory evidence of impacted soil was noted.

Table 3.7-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.7-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.7-2**.

Table 3.7-1
Parcel 38 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
38SS-A1 through 38SS-C8 (25 samples – includes 1 duplicate sample)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval (below topsoil) from a sample grid (conducted on 15-ft centers) to investigate the former pistol range berm.	TAL Metals

3.7.4 Site Investigation Results

Surface Soil Investigation Results

Surface soil samples were analyzed for TAL metals.

As shown in **Table 3.7-3**, a total of 18 metals were detected at Parcel 38; however, no metals were detected at concentrations above the NJDEP NRDCSCC or RDCSCC. No COCs were identified in soil at Parcel 38.

3.7.5 Summary and Conclusions

No constituents were identified above applicable NJDEP criteria. NFA is recommended for Parcel 38.

Table 3.7-2
Parcel 38 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	HAND AUGER	P38-SS1-A	12/21/07	9:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS2-A	12/21/07	9:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS3-A	12/21/07	9:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-A	12/21/07	9:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS5-A	12/21/07	9:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS6-A	12/21/07	9:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS7-A	12/21/07	10:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS8-A	12/21/07	10:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS1-B	12/21/07	10:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS2-B	12/21/07	10:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS3-B	12/21/07	10:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-B	12/21/07	10:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-B DUPLICATE	12/21/07	10:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS5-B	12/21/07	11:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS6-B	12/21/07	11:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS7-B	12/21/07	11:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS8-B	12/21/07	11:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS1-C	12/21/07	11:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS2-C	12/21/07	11:50	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS3-C	12/21/07	12:00	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS4-C	12/21/07	12:10	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS5-C	12/21/07	12:20	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS6-C	12/21/07	12:30	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS7-C	12/21/07	12:40	0.0	0.5					X				
SOIL	HAND AUGER	P38-SS8-C	12/21/07	12:50	0.0	0.5					X				
BLANK	FIELD	FIELD BLANK	12/21/07	13:00	--	--					X				

X = Sample analyzed for the indicated analytical parameter suite

Table 3.7-3
Fort Monmouth Phase II Site Investigation, Parcel 38
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results												
		Sample ID:	P38SS-A1	P38SS-A2	P38SS-A3	P38SS-A4	P38SS-A5	P38SS-A6	P38SS-A7	P38SS-A8	P38SS-B1	P38SS-B2	P38SS-B3	P38SS-B4	P38SS-B4 DUP
			7055601	7055602	7055603	7055604	7055605	7055606	7055607	7055608	7055609	7055610	7055611	7055612	7055625
		Date Sampled:	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007
		Depth (ft. bgs):	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Metals															
Aluminum	NLE	NLE	**13100 B**	**14800 B**	**14900 B**	**16300 B**	**12800 B**	**13500 B**	**12400 B**	**14300 B**	**19700 B**	**17900 B**	**15100 B**	**15800 B**	**16700 B**
Arsenic	20	NLE	**10.0**	**11.2**	**9.05**	**10.8**	**9.25**	**12.6**	**13.0**	**13.0**	**15.1**	**16.0**	**11.9**	**9.52**	**11.8**
Barium	47,000	NLE	**44.6 B**	**62.6 B**	**42.5 B**	**46.0 B**	**31.6 B**	**28.5 B**	**34.3 B**	**25.9 B**	**79.6 B**	**67.7 B**	**35.9 B**	**40.7 B**	**40.4 B**
Beryllium	140	NLE	**0.936**	**1.17**	**1.77**	**1.84**	**1.47**	**1.30**	**1.31**	**1.34**	**1.75**	**1.73**	**2.00**	**1.92**	**2.15**
Cadmium	100	NLE	**0.192**	**0.220**	**0.112**	**0.322**	**0.120**	**0.168**	**0.131**	**0.169**	**0.543**	**0.461**	**0.367**	**0.384**	**0.766**
Calcium	NLE	NLE	**417 B**	**602 B**	**1410 B**	**805 B**	**979 B**	**740 B**	**742 B**	**771 B**	**925 B**	**668 B**	**599 B**	**779 B**	**873 B**
Chromium (Total)	NLE	NLE	**80.8**	**102**	**141**	**151**	**124**	**108**	**103**	**117**	**175**	**157**	**160**	**154**	**171 B**
Cobalt	NLE	NLE	**0.525**	**1.03**	**1.24**	**1.76**	**1.40**	**1.58**	**1.69**	**1.35**	**1.83**	**1.19**	**1.29**	**1.32**	**1.71**
Copper	45,000	NLE	**18.2 B**	**23.5 B**	**13.2 B**	**12.3 B**	**9.78 B**	**8.55 B**	**12.2 B**	**12.0 B**	**34.0 B**	**23.8 B**	**11.6 B**	**12.4 B**	**13.2 B**
Iron	NLE	NLE	**31000**	**38000**	**52700 E**	**56500 E**	**46300 E**	**43300 E**	**41400**	**44200**	**63200 E**	**59900 E**	**64200 E**	**58200 E**	**62200 E**
Lead	800	NLE	**76.3**	**104**	**36.2**	**35.3**	**26.0**	**13.0**	**15.8**	**23.3**	**176**	**96.5**	**24.9**	**75.2**	**104**
Magnesium	NLE	NLE	**3380**	**4210**	**6590**	**6810**	**5390**	**4650**	**4260**	**4860**	**6860**	**6450**	**7090**	**7140**	**7780 B**
Manganese	NLE	NLE	**70.7 B**	**87.5 B**	**51.2 B**	**66.2 B**	**62.8 B**	**67.8 B**	**78.7 B**	**79.6 B**	**66.1 B**	**69.1 B**	**47.1 B**	**64.0 B**	**66.9 B**
Mercury	270	NLE	**0.32**	**0.62**	0.116 U	0.115 U	0.114 U	0.103 U	0.113 U	0.109 U	0.137 U	0.110 U	0.101 U	0.121 U	0.104 U
Nickel (Soluble Salts)	2,400	NLE	**11.4**	**14.8**	**12.1**	**10.7**	**8.67**	**8.57**	**8.56**	**8.17**	**62.4**	**22.7**	**9.97**	**10.7**	**12.4**
Potassium	NLE	NLE	**6170 B**	**7580 B**	**14000 B**	**14200 B**	**11500 B**	**9430 B**	**8420 B**	**9730 B**	**13100 B**	**12600 B**	**15600 B**	**15500 B**	**17200 B**
Vanadium	7,100	NLE	**102**	**129**	**100**	**98.0**	**77.5**	**71.5**	**69.3**	**73.8**	**715**	**273**	**109**	**95.9**	**107**
Zinc	1,500	NLE	**73.2 B**	**98.1 B**	**106 B**	**88.0 B**	**68.2 B**	**55.1 B**	**67.2 B**	**56.2 B**	**95.2 B**	**86.3 B**	**76.5 B**	**85.9 B**	**98.4 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.

(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.7-3
Fort Monmouth Phase II Site Investigation, Parcel 38
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results											
		Sample ID:	P38SS-B5	P38SS-B6	P38SS-B7	P38SS-B8	P38SS-C1	P38SS-C2	P38SS-C3	P38SS-C4	P38SS-C5	P38SS-C6	P38SS-C7	P38SS-C8
			7055613	7055614	7055615	7055616	7055617	7055618	7055619	7055620	7055621	7055622	7055623	7055624
		Date Sampled:	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007
		Depth (ft. bgs):	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Metals														
Aluminum	NLE	NLE	**13200 B**	**14800 B**	**15300 B**	**14200 B**	**10800 B**	**15000 B**	**15700 B**	**13100 B**	**9750 B**	**11600 B**	**13900 B**	**12700 B**
Arsenic	20	NLE	**10.2**	**11.0**	**11.3**	**12.9**	**8.65**	**9.75**	**9.70**	**9.53**	**9.65**	**8.61**	**11.9**	**12.2**
Barium	47,000	NLE	**32.7 B**	**42.5 B**	**52.9 B**	**46.9 B**	**42.6 B**	**36.1 B**	**48.3 B**	**35.5 B**	**24.6 B**	**42.2 B**	**30.9 B**	**31.9 B**
Beryllium	140	NLE	**1.07**	**1.18**	**1.19**	**1.14**	**1.45**	**1.96**	**2.04**	**1.65**	**0.895**	**0.988**	**1.35**	**1.23**
Cadmium	100	NLE	**0.131**	**0.141**	**0.299**	**0.291**	**0.524**	**0.417**	**0.620**	**0.479**	**0.299**	**0.551**	**0.410**	**0.583**
Calcium	NLE	NLE	**954 B**	**868 B**	**1090 B**	**1030 B**	**1620 B**	**422 B**	**829 B**	**764 B**	**899 B**	**1250 B**	**950 B**	**1010 B**
Chromium	NLE	NLE	**93.7**	**98.9**	**91.2**	**90.8**	**113 B**	**159 B**	**161 B**	**127 B**	**75.6 B**	**72.3 B**	**112 B**	**98.3 B**
Cobalt	NLE	NLE	**1.10**	**1.16**	**0.507**	**1.26**	**1.76**	**1.54**	**1.55**	**1.43**	**1.47**	**1.21**	**1.71**	**1.64**
Copper	45,000	NLE	**11.2 B**	**9.55 B**	**14.6 B**	**13.5 B**	**15.5 B**	**11.4 B**	**14.6 B**	**13.5 B**	**9.30 B**	**19.0 B**	**11.3 B**	**10.7 B**
Iron	NLE	NLE	**35700**	**38300**	**36500**	**36500**	**41500**	**57400 E**	**58100 E**	**49200 E**	**28200**	**29900**	**41900**	**37500**
Lead	800	NLE	**16.7**	**16.3**	**37.3**	**18.4**	**57.4**	**21.8**	**39.9**	**42.7**	**25.0**	**64.9**	**21.5**	**19.0**
Magnesium	NLE	NLE	**3880**	**4060**	**4050**	**3750**	**5110 B**	**6950 B**	**7340 B**	**6000 B**	**3050 B**	**3310 B**	**4780 B**	**4240 B**
Manganese	NLE	NLE	**79.0 B**	**87.2 B**	**128 B**	**85.4 B**	**63.0 B**	**49.1 B**	**59.1 B**	**58.0 B**	**64.4 B**	**114 B**	**77.4 B**	**73.5 B**
Mercury	270	NLE	0.106 U	0.105 U	0.106 U	0.103 U	0.109 U	0.108 U	0.112 U	0.112 U	0.112 U	0.118 U	0.102 U	0.108 U
Nickel	2,400	NLE	**8.53**	**8.66**	**9.47**	**11.6**	**16.8**	**9.33**	**13.5**	**10.8**	**7.67**	**8.62**	**9.54**	**9.22**
Potassium	NLE	NLE	**7980 B**	**8870 B**	**8280 B**	**8150 B**	**10600 B**	**15100 B**	**16000 B**	**13000 B**	**5980 B**	**6470 B**	**9910 B**	**8730 B**
Vanadium	7,100	NLE	**67.2**	**69.3**	**68.0**	**71.2**	**132**	**96.0**	**118**	**106**	**56.9**	**53.1**	**81.4**	**69.0**
Zinc	1,500	NLE	**57.9 B**	**52.6 B**	**76.7 B**	**63.0 B**	**91.6 B**	**80.5 B**	**103 B**	**75.1 B**	**51.3 B**	**93.1 B**	**68.7 B**	**72.4 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

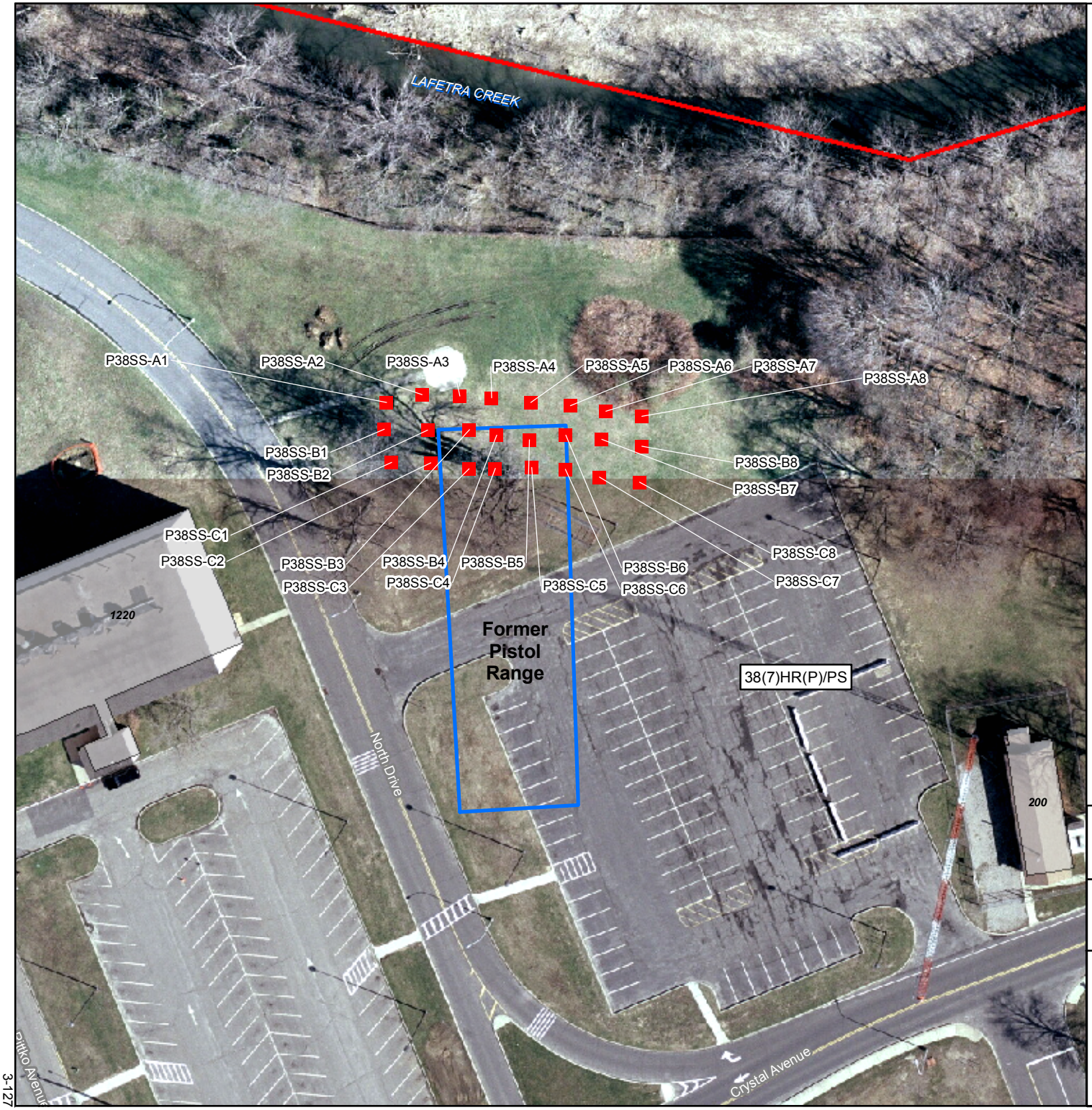
NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.

(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).



LEGEND

- Surface Soil Sample Location
- Former Pistol Range
- Water Body
- Building
- Installation Boundary

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 32.5 65 130 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.7-1

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 38 SAMPLE LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_7-1_SI_P38_SampleLocations.mxd (7/14/2008 3:57:25 PM)

3.8 Parcel 39 – Bldg 1150 (Vail Hall)

3.8.1 Site Description

Parcel 39 is located in the southwestern portion of the MP and encompasses the area between Bldg 1150 (Vail Hall) and Mill Creek. Bldg 1150 is utilized for administrative purposes. Within the basement is a large Uninterruptible Power Supply Room, emergency generator, floor drains, and a sump pump strictly for high water table events (discharges to basin behind building and ultimately to Mill Creek). Film developing activities formerly occurred in the basement of the building. Additional information pertaining to this parcel can be found in Section 4.3.2.1.5, Section 4.4.4.2, and Table 4-3 of the Phase I ECP (1).

3.8.2 Previous Investigations

The M-2 Landfill (Parcel 40) is located on the south bank of Mill Creek directly south of Parcel 39. Under the SI phase, surface water samples were collected from Mill Creek and surface water monitoring continues under the IRP within close proximity to Parcel 39.

3.8.3 Site Investigation Sampling

Surface water monitoring conducted in relation to Parcel 40 under the IRP adequately addresses the quality of surface water in proximity to Parcel 39. Surface soil and sediment sampling was conducted to determine the impact of Bldg 1150 operations on soil and sediment at potential discharge locations from Bldg 1150 along Mill Creek.

Surface Soil Investigation

A surface soil sample was collected in December 2007 in Parcel 39 from one distinct hand augered boring located at an outfall on the north bank of Mill Creek adjacent to Bldg 1150 (**Figure 3.8-1**). The outfall is the end of a underground terracotta pipe that leads from the direction of Bldg 1150. It was identified during a 2007 site walk as a potential historic discharge location from Bldg 1150 based on the orientation in which it appears to extend underground (towards Bldg 1150). A sample was collected in order to determine if any contamination exists from potential historic discharges from Bldg 1150. The surface soil sample for non-VO analysis was collected from the 0- to 6-inch interval bgs, and the soil sample for VO analysis was collected from the 18- to 24-inch bgs interval. No visual or olfactory evidence of soil contamination was noted.

Sediment Investigation

Sediment samples were collected in January 2008 in Parcel 39. A total of four sediment samples were collected from two distinct hand augered borings located along the north bank of Mill Creek adjacent to Bldg1150 (**Figure 3.8-1**). Samples were collected from deposition locations immediately downgradient of the drainage basin located immediately behind Bldg 1150 in order to determine if contamination exists from potential historic discharges from Bldg 1150. Sediment samples for non-VO and VO

analysis were collected from the 0- to 6-inch interval bgs and the 18- to 24-inch interval bgs, respectively. No visual or olfactory evidence of impacted sediment was noted.

Table 3.8-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.8-1**. An analytical summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.8-2**.

Table 3.8-1
Parcel 39 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
39SD-1 and 2 (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges from Bldg 1150. Samples were located at the closest point in the creek from the drainage basin located across the parking area at the rear of the building and at the downstream stormwater outfall.	TCL+30 (w/o pesticides), TAL Metals
39SD-1D and 2D (2 samples)	Sediment	Sediment samples were collected from the18- to 24-inch interval bgs to investigate potential historic discharges from Bldg 1150.	TCL+30 (w/o pesticides), TAL Metals
39SS-1 (1 sample)	Surface soil	A soil sample was collected from the 0- to 6-inch bgs interval to investigate potential discharges from Bldg 1150. The sample was located at the outfall of a clay pipe leading from the direction of Bldg 1150.	TCL+30 (w/o pesticides), TAL Metals

3.8.4 Site Investigation Results

Soil Investigation Results

The surface soil sample collected at Parcel 39 was analyzed for TCL+30 (minus pesticides) and TAL metals.

As presented in **Table 3.8-3**, four B/Ns were detected at concentrations below NJDEP NRDCSCC. A total of 18 metals were detected; however, all metals were detected at concentrations below NJDEP NRDCSCC.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. Mill Creek is a non-tidal water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Freshwater Sediment Screening Values-LEL.

As summarized in **Table 3.8-4**, a total of nine B/Ns and 18 metals were detected in Parcel 39 sediment samples. Of the nine B/Ns detected, six (benzo[a]anthracene, benzo[a]pyrene, chrysene, fluoranthene, phenanthrene, and pyrene) were detected at

concentrations that exceeded Freshwater Sediment Screening Values-LEL. Many of these concentrations also exceeded their respective Main Post Background Concentration (MPBC). No B/Ns were detected above the SEL.

Benzo(a)anthracene was detected above the LEL of 0.320 mg/kg in one sediment sample (P39-SD2) collected in Parcel 39 at a concentration of 0.540 mg/kg. Benzo(a)anthracene concentrations did not exceed the MPBC of 1.3 mg/kg.

Benzo(a)pyrene was detected above the LEL of 0.370 mg/kg and the MPBC of 1.2 mg/kg in one sediment sample (P39-SD1D) at a concentration of 1.400 mg/kg.

Chrysene was detected above the LEL of 0.340 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 0.370 mg/kg (P39-SD1) and 0.710 mg/kg (P39-SD2). These two chrysene concentrations were equal to or exceeded the MPBC of 0.370 mg/kg.

Fluoranthene was detected above the LEL of 0.750 mg/kg in one sediment sample (P39-SD2) at a concentration of 0.990 mg/kg. Fluoranthene concentrations did not exceed the MPBC of 1.5 mg/kg.

Phenanthrene was detected above the LEL of 0.560 mg/kg and the MPBC of 0.39 mg/kg in one sediment sample (P39-SD2) at a concentration of 0.670 mg/kg.

Pyrene was detected above the LEL of 0.490 mg/kg in three sediment samples collected in Parcel 39 at concentrations ranging from 1.000 mg/kg (P39-SD1) to 2.000 mg/kg (P39-SD2). Pyrene concentrations did not exceed the MPBC of 2.00 mg/kg.

Of the 18 metals detected, eight (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were detected at concentrations that exceeded the LEL. Only one metal, chromium, was detected in sediment at Parcel 39 marginally above the SEL.

Arsenic was detected above the LEL of 6 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 6.21 mg/kg (sample P39SD-1D) and 8.89 mg/kg (sample P39SD-2). Arsenic concentrations did not exceed the MPBC of 14.5 mg/kg.

Cadmium was detected above the LEL of 0.6 mg/kg in three sediment samples collected in Parcel 39 at concentrations ranging from 0.629 mg/kg in sample P39SD-1 to 1.85 mg/kg in sample P39SD-2. No background concentration has been established for cadmium.

Chromium was detected above the LEL of 26 mg/kg in all four sediment samples collected in Parcel 39 at concentrations ranging from 44.2 mg/kg in sample P39SD-1 to 131 mg/kg in sample P39SD-2. The SEL of 110 mg/kg for chromium was exceeded at concentrations of 113 mg/kg and 131 mg/kg in samples P39-SD1D and P39-SD2, respectively. Three of the four chromium concentrations also exceeded the MPBC of 88.1 mg/kg.

Copper was detected above the LEL of 16 mg/kg in three sediment samples ranging from concentrations of 27.7 mg/kg (sample P39SD-1) to 41.0 mg/kg (sample P39SD-2). Copper concentrations did not exceed the MPBC of 48.4 mg/kg.

Lead was detected above the LEL of 31 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 61.7 mg/kg in sample P39SD-2 and 69.0 mg/kg in sample P39SD-2D. The lead concentration detected in sample P39SD-2D also exceeded the MPBC of 64.1 mg/kg.

Mercury was detected above the LEL of 0.2 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 0.67 mg/kg in sample P39SD-2 and 0.59 mg/kg in sample P39SD-2D. Mercury concentrations did not exceed the MPBC of 1.7 mg/kg.

Nickel was detected above the LEL of 16 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 32.4 mg/kg in sample P39SD-2 and 23.0 mg/kg in sample P39SD-2D. Nickel concentrations did not exceed the MPBC of 131 mg/kg.

Zinc was detected above the LEL of 120 mg/kg and the MPBC of 162 mg/kg in two sediment samples collected in Parcel 39 at concentrations of 210 mg/kg in sample P39SD-2 and 204 mg/kg in sample P39SD-2D.

Since benzo(a)pyrene, chrysene, phenanthrene, cadmium, chromium, lead, and zinc concentrations exceeded the LEL and the MPBC, these compounds are considered COCs in sediment at Parcel 39.

3.8.5 Summary and Conclusions

No constituents were identified above applicable NJDEP criteria in surface soil. NFA is recommended for soil within Parcel 39.

Three B/Ns (benzo[a]pyrene, chrysene, and phenanthrene) and four metals (cadmium, chromium, lead, and zinc) were detected in sediment at concentrations greater than the Freshwater Sediment Screening Values-LEL and MPBC. The three B/Ns and four metals are identified as COCs. Chromium was the only compound detected in excess of the Freshwater Sediment Screening Values-SEL. Sediment at Parcel 39 is recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

Table 3.8-2
Parcel 39 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	12/20/07	8:30	NA	NA									Cancelled by lab. Recollected 01/08/08.
BLANK	FIELD	FIELD BLANK-SO	12/20/07	16:50	NA	NA									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD1	12/20/07	9:00	0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD1D	12/20/07	9:10	1	1.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD2	12/20/07	9:40	0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P39-SD2D	12/20/07	9:50	1	1.5									Cancelled by lab. Recollected 01/08/08.
SOIL	HAND AUGER	P39-SS1	12/20/07	10:20	0	0.5									Cancelled by lab. Recollected 01/08/08.
SOIL	HAND AUGER	P39SS-1	12/27/07	11:39	1.5	2		X							Associated trip blank collected with Parcel 27. No field blank or duplicate collected 12/27/07.
SOIL	HAND AUGER	P39-SS1	01/08/08	14:10	0	0.5		X	X	X	X				VOCs not needed. They were collected at correct depth on 12/27. Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD1	01/08/08	13:10	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD1D	01/08/08	13:25	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD2	01/08/08	13:40	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P39-SD2D	01/08/08	13:55	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.

X = Sample analyzed for the indicated analytical parameter suite

Table 3.8-3
Fort Monmouth Phase II Site Investigation, Parcel 39
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results
		Sample ID:	P39-SS1
		Lab ID:	8000805
		Date Sampled:	1/8/2008
		Depth (ft. bgs):	0.0-0.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result
Semi-Volatiles			
bis(2-Ethylhexyl)phthalate	210	100	**0.570 J**
Di-n-butylphthalate	10000	100	**0.780 J**
Fluoranthene	10000	100	**0.120 J**
Pyrene	10000	100	**0.290 J**
Metals			
Aluminum	NLE	NLE	**7450 B**
Arsenic	20	NLE	**3.43**
Barium	47000	NLE	**50.6 B**
Beryllium	140	NLE	**1.78**
Cadmium	100	NLE	**1.56**
Calcium	NLE	NLE	**1480 B**
Chromium (Total)	NLE	NLE	**94.0**
Cobalt	NLE	NLE	**31.9**
Copper	45000	NLE	**27.7 B**
Iron	NLE	NLE	**26400**
Lead	800	NLE	**80.0**
Magnesium	NLE	NLE	**3000**
Manganese	NLE	NLE	**15.9**
Mercury	270	NLE	**0.21**
Nickel (Soluble Salts)	2400	NLE	**22.1**
Potassium	NLE	NLE	**7170**
Vanadium	7100	NLE	**41.8**
Zinc	1500	NLE	**140 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.8-4
Fort Monmouth Phase II Site Investigation, Parcel 39
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results			
		Sample ID:	P39-SD1	P39-SD1D	P39-SD2	P39-SD2D
		Lab ID:	8000801	8000802	8000803	8000804
		Date Sampled:	01/08/2008	01/08/2008	01/08/2008	01/08/2008
		Depth (ft. bgs):	0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5
Chemical	LEL[1]	SEL[2]	Result	Result	Result	Result
Semi-Volatiles						
Benzo[a]anthracene	0.320	1480	**0.260 J**	1.300 U	**0.540 J**	1.600 U
Benzo[a]pyrene	0.370	1440	1.300 U	**1.400**	2.100 U	1.600 U
Benzo[b]fluoranthene	NLE	NLE	1.300 U	1.300 U	**1.100 J**	1.600 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	**2.100**	1.300 U	**1.300 J**	**2.900**
Chrysene	0.340	460	**0.370 J**	1.300 U	**0.710 J**	1.600 U
Di-n-butylphthalate	NLE	NLE	**0.950 J**	**2.100**	**1.900 J**	**1.000 J**
Fluoranthene	0.750	1020	**0.440 J**	**0.180 J**	**0.990 J**	**0.550 J**
Phenanthrene	0.560	950	**0.260 J**	**0.180 J**	**0.670 J**	**0.390 J**
Pyrene	0.490	850	**1.000 J**	**0.380 J**	**2.000 J**	**1.200 J**
Metals						
Aluminum	NLE	NLE	**4710 B**	**11900 B**	**13900 B**	**9510 B**
Arsenic	6	33	**2.28**	**6.21**	**8.89**	**5.56**
Barium	NLE	NLE	**26.8 B**	**40.6 B**	**96.4 B**	**73.5 B**
Beryllium	NLE	NLE	**0.638**	**1.58**	**3.34**	**2.11**
Cadmium	0.6	10	**0.629**	**0.432**	**1.85**	**1.49**
Calcium	NLE	NLE	**3150 B**	**2550 B**	**2390 B**	**3600 B**
Chromium (Total)	26	110	**44.2**	**113**	**131**	**89.1**
Cobalt	NLE	NLE	**3.92**	**1.86**	**14.2**	**11.7**
Copper	16	110	**27.7 B**	**12.5 B**	**41.0 B**	**30.9 B**
Iron	NLE	NLE	**17200**	**40200**	**45600**	**30000**
Lead	31	250	**19.5**	**7.58**	**61.7**	**69.0**
Magnesium	NLE	NLE	**2720**	**5020**	**3910**	**3020**
Manganese	NLE	NLE	**49.6**	**61.0**	**68.4**	**38.5**
Mercury	0.2	2	0.120 U	0.129 U	**0.67**	**0.59**
Nickel (Soluble Salts)	16	75	**11.6**	**8.16**	**32.4**	**23.0**
Potassium	NLE	NLE	**3150**	**10300**	**7870**	**3040**
Vanadium	NLE	NLE	**31.1**	**60.0**	**74.4**	**53.0**
Zinc	120	820	**100 B**	**66.6 B**	**210 B**	**204 B**

[1] NJDEP Freshwater Sediment Screening Values - Lowest Effect Levels, 1998.

[2] NJDEP Freshwater Sediment Screening Guidelines - Severe Effects Levels, 1998.
For non-polar organics (PAHs, organochlorine pesticides, PCBs), the SEL is caluculated from a site-specific TOC level. To calculate a site-specific SEL, TOC is multiplied by the the table SEL. However, no TOC analysis was performed on the FTMM sediment samples. Generally, TOC values range from 1% (10,000 mg/kg) to 10% (100,000 mg/kg) (USEPA, 1998). Since the table SEL is based on 100% TOC, the calculated site-specific SEL would be lower.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

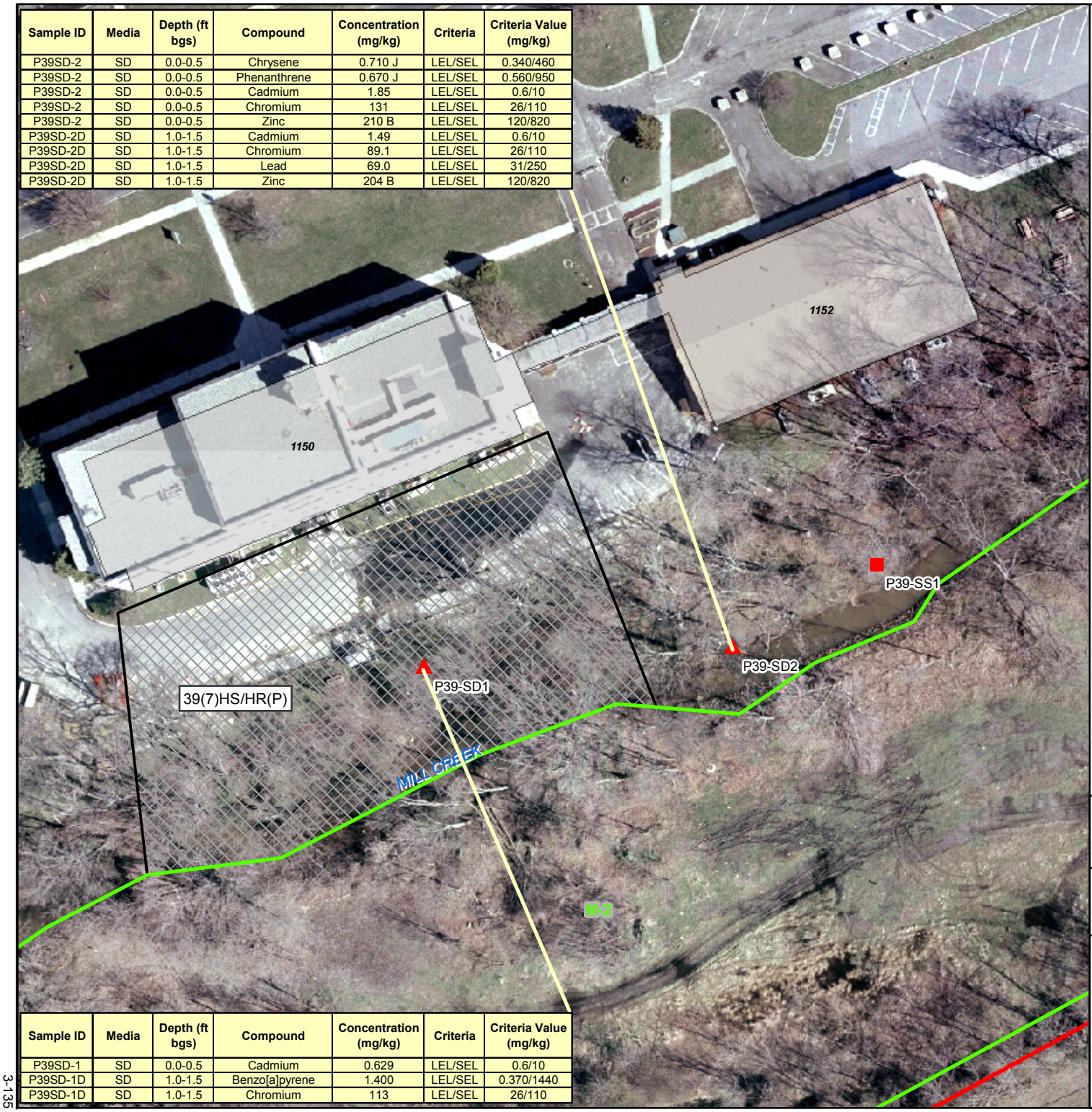
NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds LEL.

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P39SD-2	SD	0.0-0.5	Chrysene	0.710 J	LEL/SEL	0.340/460
P39SD-2	SD	0.0-0.5	Phenanthrene	0.670 J	LEL/SEL	0.560/950
P39SD-2	SD	0.0-0.5	Cadmium	1.85	LEL/SEL	0.6/10
P39SD-2	SD	0.0-0.5	Chromium	131	LEL/SEL	26/110
P39SD-2	SD	0.0-0.5	Zinc	210 B	LEL/SEL	120/820
P39SD-2D	SD	1.0-1.5	Cadmium	1.49	LEL/SEL	0.6/10
P39SD-2D	SD	1.0-1.5	Chromium	89.1	LEL/SEL	26/110
P39SD-2D	SD	1.0-1.5	Lead	69.0	LEL/SEL	31/250
P39SD-2D	SD	1.0-1.5	Zinc	204 B	LEL/SEL	120/820



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P39SD-1	SD	0.0-0.5	Cadmium	0.629	LEL/SEL	0.6/10
P39SD-1D	SD	1.0-1.5	Benzo[a]pyrene	1.400	LEL/SEL	0.370/1440
P39SD-1D	SD	1.0-1.5	Chromium	113	LEL/SEL	26/110

LEGEND

- Surface Soil Sample Location
- Sediment Sample Location
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 30 60 120 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3.8-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 39 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_8-1_SI_P39_Exceeds_SampLoc.mxd (7/14/2008 3:58:41 PM)

3.9 Parcel 43 – Bldg 1122 (Do-It-Yourself Auto Repair)

3.9.1 Site Description

Bldg 1122 is located on the MP and houses a modern "do-it-yourself" vehicle repair shop. Bldg 1122 is a one-story building built on a slab and is approximately 11,600 square feet in size. Furniture paint stripping was reported in the Woodworking Craft Shop section of Bldg 1122 in 1973 (30).

Currently, all vehicle repairs are done by FTMM personnel and are performed inside the building. Degreasing solvents are used and generate hazardous waste from these operations (31). Pneumatic lifts are present. The 2006 Stormwater Pollution Prevention Plan states, "Floor drains located near the pneumatic lifts, have been closed off." Used oil is collected in a 55-gallon drum stored inside the shop. When filled, the contents are pumped into a 995-gallon double-walled aboveground storage tank (AST) located between the repair shop and the car wash (Bldg 1124).

Floor drains in the bays and satellite accumulation room were noted during the 2006 VSI. The floors drains, previously connected to the car wash facility in Bldg 1124, were sealed off in June 2007. The enclosed car wash facility is located to the east of the repair shop. All wash water is recycled and reused and an active oil/water separator is in place (33). A 1993 renovation plan, which details the replacement of the floor drains, shows that the drains were connected to the sanitary sewer system (32). A former oil/water separator was associated with this building. Additional information pertaining to this parcel can be found in Section 4.3.2.1.2, Section 4.4.3.2, Section 5.1.1.2.1, Section 5.1.7.1, and Table 5-5 of the Phase I ECP (1).

3.9.2 Previous Investigations

Bldg 1122 has been investigated under the FTMM IRP as Site FTMM-59. There have been two USTs removed from the Bldg 1122 area. The DPW removed one UST located west of Bldg 1122 in June 1994. The UST was a 1,500-gallon single-walled steel tank used for storing # 2 fuel oil. During tank closure activities, a petroleum discharge to site soil and groundwater was identified. In accordance with NJDEP UST Site Assessment activity requirements, all petroleum contaminated soils have been removed and disposed. In addition, the DPW installed two monitoring wells to determine any adverse impact to groundwater.

The DPW removed a 550-gallon waste oil UST from beneath the pavement north of the building. During the UST removal, the subsurface evaluator did not identify any holes in the tank and did not observe any potentially contaminated soil. Following soil excavation and soil removal, five post-excavation samples were collected and analyzed for TPHC and organic and inorganic TCL compounds plus 40 TICs. TPHC was detected below the NJDEP criteria of 10,000 mg/kg.

The area of the former waste oil tank removal was the focus of an RI performed in 2005. PCE was initially detected at levels above NJDEP GWQC. PCE concentrations may be attributable to the former 550-gallon single wall steel waste oil UST removed from the

site on January 6, 1992. However, according to the UST Closure and SI Report, all post-excavation sample results were below the proposed New Jersey Department of Environmental Protection and Energy subsurface cleanup criteria (46). PCE was not detected in any of the post-excavation samples which were analyzed for TPHC and PP+40. The UST Closure Report was submitted to NJDEP on February 26, 1996. Subsequent to the 2005 RI, consecutive quarterly rounds of groundwater samples were collected for analysis. Surface water sampling points (Mill Creek) currently exist downgradient from the site and are being monitored. PCE continues to be quantified in one of the two site monitoring wells above NJDEP GWQC.

Also reported in the 2005 RI report, a Geoprobe® Investigation was performed in April 2004 to further evaluate site soil and groundwater conditions and potential contaminant migration under the FTMM IRP. The investigation determined there was a release of # 2 fuel oil to the site. The investigation to determine the extent of the petroleum contamination concluded that the extent of the release was localized. A well sump was installed for the removal of free-phase product. No free-phase product has been observed. An RI report summarizing these findings was submitted to the NJDEP in October 2005. To date, no response has been received from the NJDEP.

Currently, as part of the monitoring program for this IRP site, five groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of surface water and five groundwater monitoring wells as a key component of monitored natural attenuation. Due to the target date of 2011 for installation closure under the 2005 BRAC program, the cleanup strategy was re-evaluated. The current cleanup strategy includes 2 years of HRC injections to enhance monitored natural attenuation. Injection of HRC is subject to requirements pursuant to N.J.A.C 7:26E-4.1(a)4 and N.J.A.C. 7:26E-6.3(c) related to the performance of a pilot study and approval of a permit-by-rule. HRC will be injected into a localized area in 2008 and 2009. Site closeout is anticipated to occur in 2011.

3.9.3 Site Investigation Sampling

As discussed in **Section 3.9.2**, Bldg 1122 has been extensively investigated under the FTMM IRP. The IRP is addressing all issues associated with former USTs and groundwater contamination. However, no evaluations of potential impact to sediment in Mill Creek or VI pathways have been conducted. A review of stormwater management plans and historical documents was conducted to evaluate potential discharge locations. Sediment sampling locations were then selected to evaluate the potential impact of previous Bldg 1122 activities on sediment located within Mill Creek. Historic groundwater monitoring data was screened to determine if a VI investigation is warranted.

Sediment Investigation

Sediment samples were collected in December 2007 in Parcel 43. The methodology followed during sediment sampling is presented in **Section 2.1**. A total of six sediment samples were collected from three distinct locations in Mill Creek adjacent to Bldg 1122.

Two samples were collected from each location; one from the 0- to 6-inch interval below the creek, and another from the 12- to 18-inch interval, measured from the bottom of the creek.

Vapor Intrusion Investigation

Through previous investigations conducted under the IRP, groundwater VO contamination has been identified in close proximity to Bldg 1122. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs (12). PCE is the sole contaminant detected above the GWSLs within 100 ft of Bldg 1122, and no degradation products have been observed. Therefore, VI at Bldg 1122 was further evaluated through the collection of near-slab soil gas samples, sub-slab soil gas samples, and indoor air samples.

Table 3.9-1 presents a summary of all field activities, and sample locations are provided on **Figure 3.9-1**. An analytical summary of the sediment sampling, soil gas and indoor air sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.9-2**.

Table 3.9-1
Parcel 43 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
43SD-1, 2, and 3 (3 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential historic discharges to Mill Creek from Bldg 1122.	TCL+30 (w/o pesticides), TAL Metals
43SD-1D, 2D, and 3D (3 samples)	Sediment	Sediment samples were collected from the 6-inch interval from 12 to 18 inches bgs to investigate potential historic discharges from Bldg 1122.	TCL+30 (w/o pesticides), TAL Metals
43SG-1 and 2 (3 samples – includes 1 duplicate sample)	Near-slab soil gas	Two near-slab soil gas samples were collected at Bldg 1122. Groundwater flow direction is to the northwest, and PCE has been detected above GWSLs north and northeast of the building. Therefore, the sample locations were biased to the northeast corner of the building.	NJDEP – SRWM Low Level USEPA TO-15 Method
43SG-3 and 4 (2 samples)	Sub-slab soil gas	Two sub-slab soil gas samples were collected from the northeast portion of Bldg 1122 (Autocraft). Because this is a facility utilized for auto repair, sub-slab soil gas was selected for analysis in lieu of indoor air.	NJDEP – SRWM Low Level USEPA TO-15 Method

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
43IA-1 (1 sample)	Indoor air	One indoor air sample was collected from within Bldg 1122 in the southwest portion of the facility (Arts and Crafts). One ambient air sample was collected from outside the building.	NJDEP – SRWM Low Level USEPA TO-15 Method

3.9.4 Site Investigation Results

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. Mill Creek is a tidally influenced water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Marine/Estuarine Sediment Screening Values-ER-L.

As shown in **Table 3.9-3**, two VOs and 11 B/Ns were detected in the sediment samples. VO concentrations were below ER-L values. Of the 11 B/Ns detected, eight B/Ns were detected at concentrations in excess of the ER-L. Some B/Ns were also detected above the MPBC. No B/Ns were detected above the ER-M.

Anthracene was detected above the ER-L of 0.085 mg/kg and the MPBC of 0.061 mg/kg in one sediment sample (P43-SD1) at a concentration of 0.150 mg/kg.

Benzo(a)anthracene was detected above the ER-L of 0.261 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 0.610 mg/kg (P43-SD1) and 0.510 mg/kg (P43-SD3). The benzo(a)anthracene concentrations were below the MPBC of 1.3 mg/kg.

Benzo(a)pyrene was detected above the ER-L of 0.430 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 0.610 mg/kg (P43-SD1) and 0.510 mg/kg (P43-SD3). The benzo(a)pyrene concentrations were below the MPBC of 1.2 mg/kg.

Benzo(k)fluoranthene was detected above the ER-L of 0.240 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 0.340 mg/kg (P43-SD1) and 0.390 mg/kg (P43-SD3). The benzo(k)fluoranthene concentrations were below the MPBC of 0.58 mg/kg.

Chrysene was detected above the ER-L of 0.384 mg/kg and the MPBC of 0.370 mg/kg in two sediment samples collected in Parcel 43 at concentrations of 0.860 mg/kg (P43-SD1) and 0.880 mg/kg (P43-SD3).

Fluoranthene was detected above the ER-L of 0.600 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 1.400 mg/kg (P43-SD1) and 1.300 mg/kg (P43-SD3). The fluoranthene concentrations were below the MPBC of 1.5 mg/kg.

Phenanthrene was detected above the ER-L of 0.240 mg/kg and the MPBC of 0.39 mg/kg in three sediment samples at concentrations ranging from 0.280 mg/kg (P43-SD1D) to 0.700 mg/kg (P43-SD1).

Pyrene was detected above the ER-L of 0.665 mg/kg in two sediment samples collected at Parcel 43 at concentrations of 1.400 mg/kg (P43-SD3) and 1.600 mg/kg (P43-SD1). The pyrene concentrations were below the MPBC of 2.0 mg/kg.

A total of 18 metals were detected in Parcel 43 sediment samples. Eight metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc) were detected at concentrations that exceed the ER-L. No metals were detected in excess of the ER-M.

Arsenic was detected above the ER-L of 8.2 mg/kg in one sediment sample collected in Parcel 43 at a concentration of 10.2 mg/kg (sample P43-SD2). Arsenic concentrations were below the MPBC of 14.5 mg/kg.

Cadmium was detected above the ER-L of 1.2 mg/kg in four sediment samples collected in Parcel 43 at concentrations ranging from 1.34 mg/kg in sample P43-SD1D to 1.86 mg/kg in sample P43-SD1. The cadmium concentrations could not be compared to background levels because no background concentration has been established for cadmium.

Chromium was detected above the ER-L of 81 mg/kg and the MPBC of 88.1 mg/kg in five sediment samples collected in Parcel 43 at concentrations ranging from 125 mg/kg in sample P43-SD1D to 473 mg/kg in sample P43-SD3D.

Copper was detected above the ER-L of 34 mg/kg in two sediment samples collected in Parcel 43 at concentrations of 39.4 mg/kg in sample P43-SD1 and 53.6 mg/kg in sample P43-SD2 (**Table 3.9-3**). The copper concentration detected in sample P43-SD2 also exceeded the MPBC of 48.4 mg/kg.

Lead was detected above the ER-L of 47 mg/kg in three sediment samples collected in Parcel 43 at concentrations ranging from 58.8 mg/kg in sample P43-SD1D to 116 mg/kg in sample P43-SD2. Lead concentrations also exceeded the MPBC of 64.1 mg/kg in two samples.

Mercury was detected above the ER-L of 0.15 mg/kg in five sediment samples collected in Parcel 43 at concentrations ranging from 0.25 mg/kg in sample P43-SD2 to 0.47 mg/kg in sample P43-SD1. Mercury concentrations were below the MPBC of 1.7 mg/kg.

Nickel was detected above the ER-L of 21 mg/kg in five sediment samples collected in Parcel 43 at concentrations ranging from 23.7 mg/kg in sample P43-SD3 to 36.4 mg/kg in sample P43-SD1. Nickel concentrations were below the MPBC of 131 mg/kg.

Zinc was detected above the ER-L of 150 mg/kg in four sediment samples collected in Parcel 43 at concentrations ranging from 157 mg/kg in sample P43-SD2D to 286 mg/kg

in sample P43-SD1. Zinc concentrations exceeded the MPBC of 162 mg/kg in three samples.

Since anthracene, chrysene, phenanthrene, cadmium, chromium, copper, lead, and zinc concentrations exceeded the ER-L and the MPBC, these constituents are identified as COCs in sediment at Parcel 43.

Vapor Intrusion Investigation Results

Soil gas and indoor air samples were analyzed for VOs by USEPA Method TO-15.

A total of 21 VOs were detected in soil gas samples collected in Parcel 43. Of the 21 VOs detected, two (PCE and TCE) exceeded NJDEP Soil Gas NRSs for soil gas. As presented in **Table 3.9-4**, PCE was detected in all five soil gas samples (including one duplicate) at concentrations ranging from 78.7 $\mu g/m^3$ in sample 43SG-2 to 285 $\mu g/m^3$ in sample 43SG-3. TCE was detected in three of the five soil gas samples at concentrations ranging from 44 $\mu g/m^3$ in sample 43SG-3 to 1,130 $\mu g/m^3$ in sample 43SG-1.

A total of 25 VOs were detected in the indoor air sample collected in Parcel 43. Of the 25 VOs detected, two (benzene and dichloromethane) exceeded NJDEP Indoor Air NRSs for indoor air samples. No constituents were detected above the Rapid Action Levels for indoor air. Results are presented in **Table 3.9-5**. Neither benzene nor dichloromethane were detected above screening criteria in soil gas and were not detected above the GWSLs in groundwater; therefore, the detections of these constituents in indoor air are likely attributable to current activities within the building and not from contamination in groundwater proximal to Bldg 1122. Further, a strong aroma indicative of the recent use of spray paint was evident in the immediate area of the indoor air sample canister upon entry into the Craft Shop during sample retrieval. TCE and PCE (the only constituents identified above the Soil Gas NRSs in soil gas proximal to Bldg 1122) were not detected in indoor air within Bldg 1122.

3.9.5 Summary and Conclusions

Three B/Ns (anthracene, chrysene, and phenanthrene) and five metals (cadmium, chromium, copper, lead, and zinc) were detected in sediment at concentrations greater than the Marine/Estuarine Sediment Screening Values-ER-L and their respective MPBC. As a result, these compounds are considered COCs. Sediments at Parcel 43 are recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

PCE and TCE exceeded NJDEP Soil Gas NRSs in soil gas collected at Parcel 43, but were not detected in indoor air within Bldg 1122. Benzene and dichloromethane were detected at concentrations greater than the NJDEP Indoor Air NRSs in indoor air at Bldg 1122. Benzene and dichloromethane detections in indoor air are likely attributable to activities within the building and the use of products that contain these constituents. Based on NJDEP VI guidance (12), a second round of indoor air sampling is

recommended. One additional round of indoor air sampling is recommended to confirm constituents associated with groundwater are not present above criteria for indoor air at Bldg 1122. One additional indoor air sample should be collected in the northeastern corner of the building, coinciding with the location at which PCE and TCE were detected in soil gas.

Table 3.9-2
Parcel 43 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	P43-SD1	12/19/07	14:15	0.0	0.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD1D	12/19/07	14:20	1.0	1.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD2	12/19/07	14:50	0.0	0.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD2D	12/19/07	15:00	1.0	1.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD3	12/19/07	15:20	0.0	0.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
SD	HAND AUGER	P43-SD3D	12/19/07	15:30	1.0	1.5		X	X	X	X				Associated field blank and trip collected with Parcel 83.
IA	CANISTER	43IA-1	12/09/07	11:30	--	--		X							
BLANK	AMBIENT	43IA-AMBIENT	12/09/07	11:40	--	--		X							
SG	CANISTER	43SG-1	12/13/07	10:00	5.0	5.0		X							
SG	CANISTER	43SG-2	12/13/07	8:15	5.0	5.0		X							
SG	CANISTER	43SG-2 DUPLICATE	12/13/07	8:25	5.0	5.0		X							
SG	CANISTER	43SG-3	12/13/07	10:50	3.0	3.0		X							
SG	CANISTER	43SG-4	12/13/07	9:05	3.0	3.0		X							

X = Sample analyzed for the indicated analytical parameter suite

Table 3.9-3
Fort Monmouth Phase II Site Investigation, Parcel 43
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results					
		Sample ID:	P43-SD1	P43-SD1D	P43-SD2	P43-SD2D	P43-SD3	P43-SD3D
		Lab ID:	7054801	7054802	7054803	7054804	7054805	7054806
		Date Sampled:	12/19/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007
		Depth (ft. bgs):	0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5
Chemical	ER-L[1]	ER-M[2]	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	NLE	NLE	**0.330 J**	**0.290 J**	**0.220 J**	**0.380 J**	**0.330 J**	**0.210 J**
Methylene Chloride	NLE	NLE	**0.086 JB**	**0.073 JB**	**0.072 JB**	0.450 U	0.520 U	0.360 U
Semi-Volatiles								
Anthracene	0.085	1.1	**0.150 J**	1.500 U	1.400 U	1.800 U	2.100 U	1.400 U
Benzo[a]anthracene	0.261	1.6	**0.610 J**	**0.250 J**	**0.200 J**	**0.190 J**	**0.510 J**	1.400 U
Benzo[a]pyrene	0.430	1.6	**0.610 J**	**0.250 J**	**0.190 J**	**0.190 J**	**0.510 J**	**0.310 J**
Benzo[b]fluoranthene	NLE	NLE	**1.100 J**	**0.370 J**	**0.210 J**	**0.300 J**	**1.000 J**	1.400 U
Benzo[k]fluoranthene	0.240	NLE	**0.340 J**	**0.170 J**	**0.160 J**	**0.095 J**	**0.390 J**	1.400 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	**0.780 JB**	**0.560 JB**	**0.440 JB**	**0.720 JB**	**1.400 JB**	**0.350 JB**
Chrysene	0.384	2.8	**0.860 J**	**0.320 J**	**0.250 J**	**0.280 J**	**0.880 J**	1.400 U
Di-n-butylphthalate	NLE	NLE	1.800 U	1.500 U	**0.098 JB**	1.800 U	2.100 U	1.400 U
Fluoranthene	0.600	5.1	**1.400 J**	**0.520 J**	**0.380 J**	**0.490 J**	**1.300 J**	**0.120 J**
Phenanthrene	0.240	1.5	**0.700 J**	**0.280 J**	**0.210 J**	**0.200 J**	**0.520 J**	1.400 U
Pyrene	0.665	2.6	**1.600 J**	**0.600 J**	**0.450 J**	**0.480 J**	**1.400 J**	**0.140 J**
Metals								
Aluminum	NLE	NLE	**13700 B**	**11000 B**	**14500 B**	**8380 B**	**16400 B**	**28100 B**
Arsenic	8.2	70	**7.48**	**6.58**	**10.2**	**5.99**	**7.99**	**7.87**
Barium	NLE	NLE	**83.5 B**	**69.5 B**	**52.4 B**	**69.4 B**	**67.0 B**	**168 B**
Beryllium	NLE	NLE	**3.22**	**2.50**	**2.01**	**1.62**	**2.97**	**3.21**
Cadmium	1.2	9.6	**1.86**	**1.34**	**0.358**	**1.67**	**1.67**	**0.854**
Calcium	NLE	NLE	**2320 B**	**1500 B**	**1490 B**	**1410 B**	**1300 B**	**2130 B**
Chromium (Total)	81	370	**155 B**	**125 B**	**161 B**	**71.9 B**	**155 B**	**473 B**
Cobalt	NLE	NLE	**20.1**	**20.1**	**15.7**	**11.9**	**6.01**	**0.940**
Copper	34	270	**39.4 B**	**32.5 B**	**53.6 B**	**20.7 B**	**29.1 B**	**12.0 B**
Iron	NLE	NLE	**66800 B**	**45200 B**	**47800 B**	**21300 B**	**39600 B**	**97400 B**
Lead	47	218	**74.6**	**58.8**	**116**	**29.5**	**45.0**	**13.6**
Magnesium	NLE	NLE	**5490**	**4720**	**5170**	**2240**	**5190**	**15500**
Manganese	NLE	NLE	**152 B**	**45.8 B**	**140 B**	**38.0 B**	**31.6 B**	**29.3 B**
Mercury	0.15	0.71	**0.47**	**0.31**	**0.25**	**0.26**	**0.28**	0.132 U
Nickel (Soluble Salts)	21	52	**36.4**	**36.0**	**28.3**	**24.6**	**23.7**	**9.11**
Potassium	NLE	NLE	**10700 B**	**9620 B**	**9580 B**	**3790 B**	**10200 B**	**30100 B**
Vanadium	NLE	NLE	**79.1**	**60.9**	**81.1**	**43.2**	**75.4**	**161**
Zinc	150	410	**286 B**	**237 B**	**108 B**	**157 B**	**252 B**	**84.0 B**

[1] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Low.

[2] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Medium.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds ER-L.

Table 3.9-4
Fort Monmouth ECP Site Investigation, Parcel 43
Summary of Analytical Parameters Detected Soil Gas (ug/m^3)

		Analytical Results				
	Sample ID:	43SG-1	43SG-2	43SG-2 DUP	43SG-3	43SG-4
	Lab ID:	J79249-10	J79249-11	J79249-14	J79249-12	J79249-13
	Date Sampled:	12/13/07	12/13/07	12/13/07	12/13/07	12/13/07
	Depth (ft. bgs):	5'	5'	5'	3'	3'
Chemical	SG Non-residential[2]	Result	Result	Result	Result	Result
Volatiles						
Acetone	230,000	**124**	**130**	**62.7**	**34.4**	**51.1**
Benzene	26	**5.8**	**8.0**	**3.5 J**	**3.1 J**	**3.1 J**
Carbon disulfide	51,000	**12**	**11**	**5.3**	**7.5**	**4.0 J**
Dichlorodifluoromethane	13,000	**5.4 J**	<2.3	<2.3	<2.3	<2.3
cis-1,2-Dichloroethylene	2,600	**172**	<1.7	<1.7	<1.7	**132**
trans-1,2-Dichloroethylene	5,100	**5.6 J**	<1.4	<1.4	<1.4	<1.4
1,2-Dichloroethylene (total)	2,300	**177.6 J (a)**	<1.7 (a)	<1.7 (a)	<1.7 (a)	**132 (a)**
Ethanol	NLE	**26.9**	**53.9**	**17**	**12**	**16**
Ethylbenzene	74,000	**113**	**4.8 J**	<0.65	**132**	<0.65
2-Hexanone	NLE	<1.6	<1.6	<1.6	<1.6	**8.6**
4-Methyl-2-pentanone (MIBK)	220,000	<0.82	**6.6**	**8.6**	<0.82	**11**
Methyl ethyl ketone	360,000	<0.91	**4.4 J**	**4.7**	<0.91	**5.6**
Methyl tertiary butyl ether (MTBE)	180	<1.3	**5.8**	<1.3	<1.3	<1.3
Propylene	NLE	<1	**69.9**	**39.2**	**23.5**	**44.8**
Tetrachloroethylene	36	**162**	**78.7**	**107**	**285**	**135**
Toluene	360,000	**535**	**24**	**11**	**535**	**15**
Trichloroethylene	27	**1130**	<1.3	**8.6**	**44**	**763**
1,2,4-Trimethylbenzene	NLE	**4.6 J**	**12**	<0.84	**4.5 J**	**9.3**
Xylenes (m&p)	NLE	**491**	**18**	<1.3	**586**	**12**
o-Xylene	NLE	**109**	**6.1 J**	<0.74	**133**	<0.74
Xylenes (total)	7,700	**599**	**24**	<0.74	**721**	**12**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Detection

Shaded = Exceedance of SG Nonresidential.

Table 3.9-5
Fort Monmouth ECP Site Investigation, Parcel 43
Summary of Analytical Parameters Detected Indoor Air (ug/m^3)

			Analytical Results	
		Sample ID:	43IA-1	43IA-AMBIENT
		Lab ID:	J78674-18	J78674-19
		Date Sampled:	12/09/07	12/09/07
Chemical	RAL[3]	IA Non-residential[2]	Result	Result
Volatiles				
Acetone	6,600	4,600	**496**	**5.7**
Benzene	14	2	**2.6**	**1.4**
Chloromethane	NLE	130	**1.2**	**1.2**
Cyclohexane	NLE	8,700	**0.96**	<0.15
Dichlorodifluoromethane	NLE	260	**5.4**	**2.7**
Dichloromethane	400	9	**15**	**0.76**
Ethanol	NLE	NLE	**49.2**	**5.3**
Ethyl Acetate	NLE	NLE	**84.2**	<0.3
Ethylbenzene	2,200	1,500	**3.8**	**0.43 J**
4-Ethyltoluene	NLE	NLE	**5.9**	<0.084
n-Heptane	NLE	NLE	**3.0**	**0.49 J**
Isopropyl Alcohol	NLE	NLE	<0.15	**0.93**
Methyl ethyl ketone	NLE	7,200	**17**	**0.53 J**
Methyl tertiary butyl ether (MTBE)	200	4	**0.87**	<0.17
Propylene	NLE	NLE	**12**	**2.9**
Tetrahydrofuran	NLE	NLE	**0.75 J**	<0.16
Toluene	10,000	7,200	**199**	**2.5**
1,1,1-Trichloroethane	NLE	1,400	**0.65 J**	<0.27
Trichlorofluoromethane	NLE	1,000	**1.6**	**1.5**
1,2,4-Trimethylbenzene	NLE	NLE	**19**	<0.1
1,3,5-Trimethylbenzene	NLE	NLE	**6.9**	<0.088
2,2,4-Trimethylpentane	NLE	NLE	**2.4**	**0.47 J**
o-Xylene	NLE	NLE	**5.2**	**0.48 J**
Xylenes (m&p)	NLE	NLE	**13**	**1.4**
Xylenes (total)	220	150	**19**	**1.9**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

[3] NJDEP Rapid Action Levels for Indoor Air, March 2007.

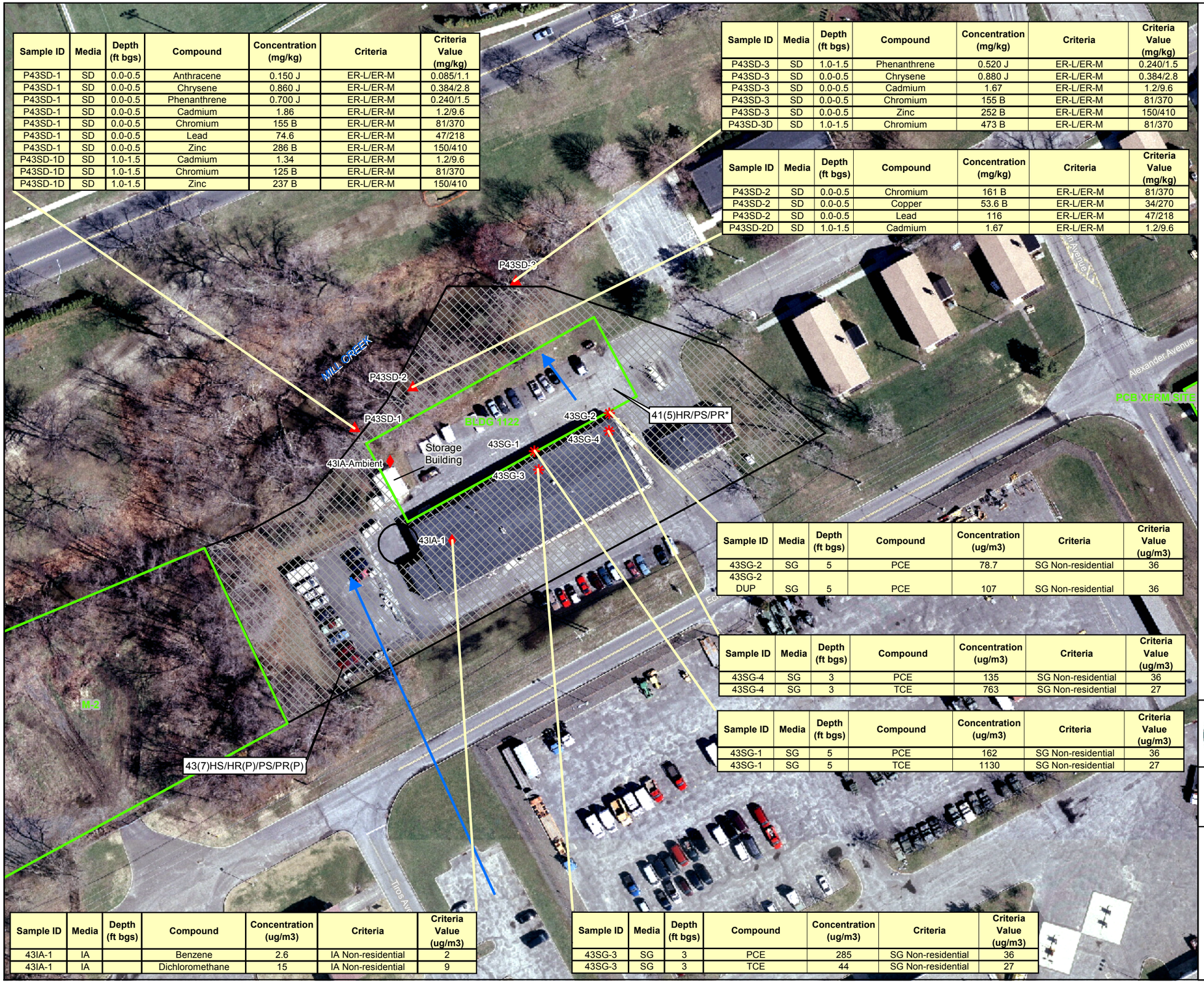
J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P43SD-1	SD	0.0-0.5	Anthracene	0.150 J	ER-L/ER-M	0.085/1.1
P43SD-1	SD	0.0-0.5	Chrysene	0.860 J	ER-L/ER-M	0.384/2.8
P43SD-1	SD	0.0-0.5	Phenanthrene	0.700 J	ER-L/ER-M	0.240/1.5
P43SD-1	SD	0.0-0.5	Cadmium	1.86	ER-L/ER-M	1.2/9.6
P43SD-1	SD	0.0-0.5	Chromium	155 B	ER-L/ER-M	81/370
P43SD-1	SD	0.0-0.5	Lead	74.6	ER-L/ER-M	47/218
P43SD-1	SD	0.0-0.5	Zinc	286 B	ER-L/ER-M	150/410
P43SD-1D	SD	1.0-1.5	Cadmium	1.34	ER-L/ER-M	1.2/9.6
P43SD-1D	SD	1.0-1.5	Chromium	125 B	ER-L/ER-M	81/370
P43SD-1D	SD	1.0-1.5	Zinc	237 B	ER-L/ER-M	150/410

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P43SD-3	SD	1.0-1.5	Phenanthrene	0.520 J	ER-L/ER-M	0.240/1.5
P43SD-3	SD	0.0-0.5	Chrysene	0.880 J	ER-L/ER-M	0.384/2.8
P43SD-3	SD	0.0-0.5	Cadmium	1.67	ER-L/ER-M	1.2/9.6
P43SD-3	SD	0.0-0.5	Chromium	155 B	ER-L/ER-M	81/370
P43SD-3	SD	0.0-0.5	Zinc	252 B	ER-L/ER-M	150/410
P43SD-3D	SD	1.0-1.5	Chromium	473 B	ER-L/ER-M	81/370

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P43SD-2	SD	0.0-0.5	Chromium	161 B	ER-L/ER-M	81/370
P43SD-2	SD	0.0-0.5	Copper	53.6 B	ER-L/ER-M	34/270
P43SD-2	SD	0.0-0.5	Lead	116	ER-L/ER-M	47/218
P43SD-2D	SD	1.0-1.5	Cadmium	1.67	ER-L/ER-M	1.2/9.6

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-2	SG	5	PCE	78.7	SG Non-residential	36
43SG-2 DUP	SG	5	PCE	107	SG Non-residential	36

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-4	SG	3	PCE	135	SG Non-residential	36
43SG-4	SG	3	TCE	763	SG Non-residential	27

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-1	SG	5	PCE	162	SG Non-residential	36
43SG-1	SG	5	TCE	1130	SG Non-residential	27

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43IA-1	IA		Benzene	2.6	IA Non-residential	2
43IA-1	IA		Dichloromethane	15	IA Non-residential	9

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m3)	Criteria	Criteria Value (ug/m3)
43SG-3	SG	3	PCE	285	SG Non-residential	36
43SG-3	SG	3	TCE	44	SG Non-residential	27

LEGEND

- Soil-Gas Sample Location
- Indoor Air Sample Location
- Sediment Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- IRP Site Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 37.5 75 150 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.9-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 43 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_9-1_SI_P43_Exceeds_SampLoc.mxd (7/14/2008 12:24:49 PM)

3.10 Parcel 49 – Former Squier Laboratory Complex, Museum Storage Facility, and MP Battery Test Facility

3.10.1 Site Description

Parcel 49 encompasses the buildings associated with the former Squier Laboratory and other facilities with similar operational histories in the north-central portion of the MP. The Squier Laboratory Complex included existing Bldgs 283, 285, 288, 292, 293, and 298, and former Bldgs S-5, S-6, S-6 Annex, S-9, S-10, S-11, S-12, and S-15. Bldgs 291, 294, and 295, and former Bldgs 289, 290, L-3, T-45, X-9, and X-7 have a similar operational history and are included in Parcel 49 along with the Squier Laboratory buildings. Historic aerial photographs and site plans which show the location of former buildings are included in **Appendix G** for reference. Many of the "buildings" were identified as part of the Squier Laboratory Complex in historic reports, without any indication of the specific location of these facilities. It is assumed that these buildings were small, temporary, and/or auxiliary structures in the immediate vicinity of Squier Laboratory and nearby buildings, such that they did not warrant individual identification on historic site plans of the area.

In 1934, FTMM laboratory operations were consolidated in a new facility, Squier Laboratory. Squier Laboratory continued to be the principal laboratory on post until 1954 when the new R&D facility, Myer Center (Bldg 2700), was opened. The Squier Laboratory complex supported the Signal Corps Laboratories' research into batteries and electronics coatings. Environmental conditions were identified for some of the laboratory operations based on the size and intensity of historical operations and the timeframe during which the services took place. A detailed description of process operations that took place in this area is presented in Section 4.3.2 of the FTMM Phase I ECP (1). Environmental concerns associated with Squier Laboratory operations include the use of chemicals, solvents, radioisotopes, and metals when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. The potential for a release to the environment from laboratory operations in the following buildings is considered to be a Recognized Environmental Condition:

- Squier Laboratory in Bldg 283. Bldg 283 has a long and extensive history of laboratory operations.
- Bldg 288 was historically used for reproduction and photoprocessing.
- Bldg 291 formerly housed the Crystal Section where crystals were grown.
- Bldg 292 formerly housed the Climatic Section where testing of electronic equipment at environmental extremes was conducted.
- Former Bldg 293 housed a battery testing operation. A ground stain was observed emanating from the vicinity of Bldg 293 in aerial photographs taken in

1969 and 1974 (18). Aerial photographs are included in **Appendix G**. Bldg 293 was destroyed by a fire. A second Bldg 293 was constructed. The new building is currently used for battery testing. Current battery testing operations are not considered a data gap.

- Bldg 294 formerly housed a shock and vibration testing operation.
- Bldg 295 was used for R&D fabrication for reinforced plastics.
- Operations in Bldgs S-5, S-9, S-10, S-11, and S-12 used various laboratory chemicals in hoods for the manufacture and testing of dry cell batteries.
- Bldg L-3 was used for paint experimentation.
- Bldg T-45 was used for the experimental manufacture of storage batteries.
- Bldg X-9 was used for testing gasoline engines.
- Bldg X-7 was used for mixing acids.

A corollary investigation of the historical use of RAMs was conducted by Cabrera. A Special Investigation Report issued in 1951 for the Squier Signal Laboratory Director discussed a wipe test performed on samples of aluminum covered with polonium lacquer (approximately 230 microcuries) to ensure that no hazard was present at Bldg 283. Bldg 292 serves as storage space for the communications-electronics museum. This storage space contains or contained a Chinese radio and a vacuum tube where radiological commodities were identified with radiological readings above background levels, and radium-contaminated components were found in a posted radioactive storage locker. This storage space once contained 65 items containing RAM, but numerous non-radioactive items have since been removed (3).

Recommendations for SI activity related to RAM were prepared based on the HSA results and will be conducted at Bldg 283 and Bldg 292 upon departure of the current tenants from the FTMM property (45). Additional information pertaining to this parcel can be found in Section 3.3, Section 4.3.2.1.1, Section 4.3.2.1.2, Section 4.3.2.1.6, Section 4.4.4.2, Table 4-3, Section 4.4.4.3, Table 4-4, Section 4.6.2.7, Section 5.1.1.2.1, Section 5.8, Table 5-16, Section 5.13.3, Section 5.13.4, and Section 5.13.6 of the Phase I ECP (1).

3.10.2 Previous Investigations

Multiple former USTs associated with buildings throughout Parcel 49 have been removed under the FTMM UST Management Program and are summarized within the FTMM Phase I ECP Report (1). Bldg 283 groundwater and soil contamination associated with former USTs that were removed is currently being addressed under the FTMM IRP as site FTMM-61.

3.10.3 Site Investigation Sampling

As noted in **Section 3.10.2**, numerous former USTs have been removed within Parcel 49, and contamination identified in association with the former USTs at Bldg 283 is currently being addressed under the FTMM IRP. However, limited evaluation of potential discharges related to previous building operations has been conducted within Parcel 49. A review of historical site plans, IRP documents, sanitary plans, and stormwater management plans was conducted to evaluate potential discharge locations throughout the parcel. The following soil sampling, sediment sampling, and groundwater sampling was performed to determine if any contamination exists.

Geoprobe® Investigation

Soil and groundwater samples were collected in December 2007 in Parcel 49 in order to determine if any contamination exists as a result of former industrial and laboratory operations. A total of six surface soil samples and seven subsurface soil samples (including one duplicate sample) were collected from six distinct Geoprobe® borings located throughout Parcel 49 (**Figure 3.10-1**). Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores were conducted using PID and FID instruments. No visual or olfactory evidence of contaminated soil was noted.

A total of two groundwater samples were collected from two distinct temporary wells that were installed using the Geoprobe® rig. P49GW-1 was installed north of Bldg 293, and P49GW-2 was installed east of former Bldg 289. Temporary wells were constructed of PVC and 5 ft of factory-slotted screen. A total of five groundwater samples (including one duplicate sample) were collected from four existing FTMM monitoring wells located along the northern perimeter of the former Squier Complex area to evaluate groundwater on a parcel-wide basis (**Figure 3.10-1**).

Surface Soil Investigation

Surface samples were collected in December 2007 in Parcel 49. A total of seven surface soil samples, located throughout Parcel 49, were collected from seven distinct hand augered borings (**Figure 3.10-1**). Samples P49SS-7 and 8 were collected near doorways in the courtyard of Bldg 283 to investigate potential discharges from previous laboratory operations. Sample P49SS-9 was collected near the eastern doorway of Bldg 291 to investigate potential discharges from previous laboratory operations. Samples P49SS-10;13 were collected around a concrete slab for former Bldg 293 to investigate potential discharges from a fire that destroyed the building. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. No visual or olfactory evidence of soil contamination was noted.

Sediment Investigation

Sediment samples were collected in December 2007 in Parcel 49. A total of seven (including one duplicate sample) sediment samples were collected from three distinct hand augered borings located along the south bank of Parkers Creek (**Figure 3.10-1**). Samples were collected in order to determine if previous discharges from former septic and sump systems associated with the Squier Complex have impacted sediment within Parkers Creek. Sediment samples for non-VO and VO analysis were collected from the 0- to 6-inch interval bgs and the 18- to 24-inch interval bgs. No visual or olfactory evidence of contamination was noted.

Table 3.10-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.10-1**. An analytical summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.10-2**.

Table 3.10-1
Parcel 49 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
49SS-1 and 2 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located north of Bldg 293 and east of former Bldg 289 to investigate potential discharges from previous industrial activities within the buildings.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SB-1 and 2 (2 samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 5.5 to 9.0 ft bgs) from Geoprobe® borings located north of Bldg 293 and east of former Bldg 289 to investigate potential discharges from previous industrial activities within the buildings. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49GW-1 and 2 (2 samples)	Groundwater	Groundwater samples were collected from the specified Geoprobe® borings located north of Bldg 293 and east of former Bldg 289 to investigate potential discharges from previous industrial activities within the buildings.	TCL+30 (w/o pesticides/PCBs), tertiary butyl alcohol (TBA)
49SS-3 and 4 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located at loading docks of Bldg 283 to investigate potential historical discharges from previous laboratory operations.	TCL+30 (w/o pesticides), TAL Metals, cyanide

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
49SB-3 and 4 (2 samples)	Subsurface soil	Soil samples collected from the 6-inch interval directly above the water table (depths ranging from 3.5 to 8.0 ft bgs) from Geoprobe® borings located at loading docks of Bldg 283 to investigate potential historical discharges from previous laboratory operations. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SS-5 and 6 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located at loading dock and garage doors of Bldg 292 to investigate potential historical discharges from previous laboratory operations. Numerous underground utilities are present in the immediate vicinity of the loading dock on the east side of Bldg 292. Therefore, the location of 49SS-5 had to be moved east of the originally proposed location.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SB-5 and 6 (3 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depth 6.0 to 6.5 ft bgs) from Geoprobe® borings located at loading docks and garage doors of Bldg 292 to investigate potential historical discharges from previous laboratory operations. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters. Numerous underground utilities are present in the immediate vicinity of the loading dock on the east side of Bldg 292. Therefore, the location of 49SS-5 had to be moved east of the originally proposed location.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SS-7 and 8 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval at doorways within courtyard of Bldg 283 to investigate potential historical discharges from previous laboratory operations.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SS-9 (1 sample)	Surface soil	A soil sample was collected from the 0- to 6-inch bgs interval at a western doorway of Bldg 291 to investigate potential historical discharges from previous laboratory operations.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SS-10, 11, 12, and 13 (4 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval around the concrete slab for former Bldg 293 (immediately north of current building) to investigate potential discharges from the fire which destroyed the building.	TCL+30 (w/o pesticides), TAL Metals, cyanide
296MW07, 283MW03, 283MW01, B4MW0B4 (4 samples)	Groundwater	Groundwater samples were collected from the existing monitoring wells located along the northern perimeter of the former Squier Complex area to evaluate groundwater on a parcel-wide basis.	TCL+30 (w/o pesticides), TBA, TAL Metals, cyanide

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
49SD-1, 49SD-1D (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval and at the 18- to 24-inch interval bgs to investigate potential discharges from the former septic system that was associated with former Bldg 78.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SD-2, 49SD-2D (3 samples – includes 1 duplicate sample)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval and at the 18- to 24-inch interval bgs to investigate potential discharges from sump pumps identified within the basement of Bldg 283.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49SD-3, 49SD-3D (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval and at the 18- to 24-inch interval bgs to investigate potential downgradient impact to sediment from the sump pumps in the basement of Bldg 283 and the former septic discharge from former Bldg 78.	TCL+30 (w/o pesticides), TAL Metals, cyanide

3.10.4 Site Investigation Results

Geoprobe®/Soil Investigation Results

Surface and subsurface soil samples were analyzed for TCL+30 (minus pesticides), TAL metals, and cyanide. Groundwater samples 49GW-1;2 were analyzed for TCL+30 (minus pesticides/PCBs) and TBA. Monitoring well groundwater samples were analyzed for TCL+30 (minus pesticides), TBA, TAL metals, and cyanide.

Soil

Five VOs, 22 B/Ns, 20 metals, and one Aroclor were detected in Parcel 49 soil samples, presented in **Table 3.10-3**. The five VOs were detected at concentrations below NJDEP NRDCSCC. Seven of the 22 detected B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) were detected at concentrations that exceeded NJDEP NRDCSCC. B/Ns were detected above the NRDCSCC and their respective MPBC in five surface soil samples, P49-SB4-A, P49-SS7-A, P49-SS8-A, P49-SS9-A, and P49-SS13-A. Of the 20 metals, one (arsenic) was detected at concentrations that exceeded NJDEP NRDCSCC.

Four soil samples (49SB-5A, 49SB-5C, 49SB-6A, and 49SB-6C) each contained an unknown TIC at elevated concentrations ranging from 330 mg/kg to 460 mg/kg. The retention time for the unknown TIC ranged from 7.23 minutes to 7.27 minutes in the four samples. This suggests the same unknown TIC was identified in all four samples. One or more semi-volatile constituents were identified in each of the four samples; however, no TCL organic constituents were identified at concentrations greater than the NRDCSCC.

Arsenic was detected above the NRDCSCC of 20 mg/kg in four subsurface soil samples collected in Parcel 49 at concentrations ranging from 21.5 mg/kg in sample P49-SB5-C to 24.3 mg/kg in sample P49-SB2-C. The arsenic concentrations in two samples also exceeded the MPBC of 22.9 mg/kg. The three isolated locations at which arsenic was detected at concentrations marginally above the NRDCSCC of 20 mg/kg are all greater than 6 ft bgs, and no detections in exceedance of criteria were present in surface soil.

There are several factors both natural and anthropogenic that can have an influence on arsenic levels in the soil at FTMM. The primary natural influence on the chemical concentrations in the soil at FTMM is parent material. The parent material at FTMM is glauconitic soil of the Tinton and Red Bank sands and their fluvially- and tidally-reworked equivalents (47). Total arsenic levels in glauconite-bearing soils in New Jersey have been reported to range up to 131 mg/kg, with a median of 30 mg/kg (48). Anthropogenic influences on arsenic levels in the soil include the use of pesticides and herbicides. Arsenic was a common constituent of herbicides and pesticides in the past. As a result of these natural and anthropogenic influences, arsenic is not considered a COC in the soil.

As shown in **Table 3.10-3**, one PCB, Aroclor 1260, was detected in one surface soil sample (P49-SS8-A) at a concentration of 8.85 mg/kg, which exceeds the NJDEP NRDCSCC of 2 mg/kg.

Cyanide was not detected in soil.

B/Ns and PCBs are COCs in soil at Parcel 49.

Groundwater

A total of nine VOs were detected in groundwater samples collected in Parcel 49. Two (benzene and bromodichloromethane) were detected at concentrations that exceed the respective GWQC. Benzene was detected at a concentration that exceeded the NJDEP GWQC of 1 μg/L in one groundwater sample (P49-GW-1) at a concentration of 1.24 μg/L. Bromodichloromethane was detected at a concentration that exceeded the NJDEP GWQC of 1 μg/L in one groundwater sample (P49-GW-2) at a concentration of 1.35 μg/L.

A total of four B/Ns were detected in Parcel 49 groundwater samples. Of the four B/Ns, one (bis[2-ethylhexyl]phthalate) was detected at concentrations that exceeded NJDEP GWQC. Bis(2-ethylhexyl)phthalate was detected at concentrations exceeding the NJDEP GWQC of 3 μg/L in three groundwater samples at concentrations ranging from 3.55 μg/L in P49-296-MW7 to 25.94 μg/L in P49-GW-1. Bis(2-ethylhexyl)phthalate is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected in the field blank associated with these samples. Therefore, it is not considered a COC in groundwater at Parcel 49.

A total of 18 metals were detected in Parcel 49 groundwater samples collected from monitoring wells. Of the 18 metals detected, six (aluminum, arsenic, beryllium, iron,

manganese, and sodium) were detected at concentrations that exceeded NJDEP GWQC.

Several natural and anthropogenic factors contribute to the wide range in concentrations of metals in soils, which impact the concentration of metals in groundwater. Soils derived from glauconitic sands contain abundant aluminum, calcium, potassium, iron, magnesium, manganese, and sodium (among others), which are likely to be present at elevated concentrations in the groundwater (47). Sodium concentrations can also be influenced by saltwater intrusion at FTMM. Due to the naturally elevated levels of these native metals in the groundwater, aluminum, iron, manganese, and sodium are not considered COCs. The remaining metals detected in groundwater samples have been compared to the respective GWQC and MBCs, presented in **Appendix H**, to determine COCs.

Arsenic was detected at concentrations exceeding the NJDEP GWQC of 3 μg/L in two samples, 49MW-3 (3.68 μg/L) and 49MW-7 (6.17 μg/L). However, these concentrations did not exceed the MPBC of 89.3 μg/L. In addition, arsenic is associated with the native glauconitic sands (48). The elevated arsenic concentrations in the native soil in turn influence the arsenic levels in groundwater. Beryllium was detected at concentrations exceeding the NJDEP GWQC of 1 μg/L in two samples, 49MW-1 (1.28 μg/L) and 49MW-1-DUP (1.33 μg/L). However, these concentrations did not exceed the MPBC of 2.1 μg/L. Therefore, arsenic and beryllium are not considered COCs.

As shown in **Table 3.10-4**, cyanide was not detected in the groundwater samples.

Benzene and bromodichloromethane are COCs in groundwater at Parcel 49.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides), TAL metals, and cyanide. Parkers Creek is a tidally influenced water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Marine/Estuarine Sediment Screening Values-ER-L.

As presented in **Table 3.10-5**, one VO, ten B/Ns, and 20 metals were detected in Parcel 49 sediment samples. The VO acetone and B/Ns were detected at concentrations below the ER-L. Of the 20 metals, nine (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) were detected at concentrations that exceeded the ER-L. Two metals, zinc and chromium, were detected above the ER-M.

Arsenic was detected above the ER-L of 8.2 mg/kg and the MPBC of 14.5 mg/kg in all seven sediment samples collected in Parcel 49 at concentrations ranging from 14.8 mg/kg in sample P49SD-2A to 29.7 mg/kg in sample P49SD-3A.

Cadmium was detected above the ER-L of 1.2 mg/kg in four sediment samples (including the duplicate) collected in Parcel 49 at concentrations ranging from 1.41 mg/kg in sample P43SD-2B to 5.55 mg/kg in sample P43SD-2A-DUP. A background concentration has not been established for cadmium.

Chromium was detected above the ER-L of 81 mg/kg and the MPBC of 88.1 mg/kg in all seven sediment samples (including the duplicate sample) collected in Parcel 49 at concentrations ranging from 149 mg/kg in sample P49SD-3A to 394 mg/kg in sample P49SD-2B. Chromium was detected in one sample, P49SD-2B, at a concentration above the ER-M of 370 mg/kg.

Copper was detected above the ER-L of 34 mg/kg and the MPBC of 48.4 mg/kg in three sediment samples collected in Parcel 49 at concentrations of 76.5 mg/kg in sample P49SD-3A, 82.3 mg/kg in sample P49SD-2A, and 111 mg/kg in sample P49SD-2A-DUP.

Lead was detected above the ER-L of 47 mg/kg and the MPBC of 64.1 mg/kg in one sediment sample collected in Parcel 49 at a concentration of 148 mg/kg in sample P49SD-3A.

Mercury was detected above the ER-L of 0.15 mg/kg in three sediment samples collected in Parcel 49 at concentrations ranging from 0.23 mg/kg in sample P49SD-3A to 0.53 mg/kg in sample P49SD-2A-DUP. The mercury concentrations did not exceed the MPBC of 1.7 mg/kg.

Nickel was detected above the ER-L of 21 mg/kg in two sediment samples collected in Parcel 49 at concentrations of 44 mg/kg in sample P43SD-2A and 68.5 mg/kg in sample P49SD-2A-DUP. The nickel concentrations did not exceed the MPBC of 131 mg/kg.

Silver was detected above the ER-L of 1 mg/kg in one sediment sample collected in Parcel 49 at a concentration of 1.4 mg/kg in sample P49SD-2A. A background concentration has not been established for silver.

Zinc was detected above the ER-L of 150 mg/kg in three sediment samples collected in Parcel 49 at concentrations ranging from 155 mg/kg in sample P49SD-2B to 2,090 mg/kg in sample P49SD-2A-DUP. The zinc concentration in P49SD-2A and P49SD-2A DUP exceeded the MPBC of 162 mg/kg and the ER-M of 410 mg/kg. Metals are COCs in sediment at Parcel 49.

PCBs and cyanide were not detected in Parcel 49 sediment samples.

3.10.5 Summary and Conclusions

Analytical results for soil samples exceeded NJDEP NRDCSCC for B/Ns and Aroclor 1260. Aroclor 1260 and B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) are COCs in soil at Parcel 49 and further delineation is recommended. The B/N COCs identified in soil at Parcel 49 are polycyclic aromatic

hydrocarbons (PAHs). PAHs are contained in asphalt and are commonly detected in soil under asphalt pavement. Re-collection of samples at locations that are currently paved and/or were paved in the past will be conducted as part of the further evaluation to determine if the PAHs detected in soil are attributable to asphalt.

Benzene and bromodichloromethane were detected at concentrations slightly above the NJDEP GWQC and are considered COCs in groundwater. Benzene and bromodichloromethane in groundwater at Parcel 49 will be incorporated into the existing M-18 groundwater CEA.

Seven metals (arsenic, cadmium, chromium, copper, lead, silver, and zinc) were detected in sediment at concentrations greater than the Marine/Estuarine Sediment Screening Values-ER-L and MPBC. They are considered COCs in Parcel 49 sediment. Sediment at Parcel 49 is recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

Table 3.10-2
Parcel 49 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	12/06/07	-	--	--		X							
SOIL	HAND AUGER	P49-SS10-A	12/06/07	9:15	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS10-B	12/06/07	9:15	1.5	2.0		X							
SOIL	HAND AUGER	P49-SS11-A	12/06/07	9:30	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS11-B	12/06/07	9:30	1.5	2.0		X							
SOIL	HAND AUGER	P49-SS12-A	12/06/07	10:45	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS12-B	12/06/07	10:45	1.5	2.0		X							
SOIL	HAND AUGER	P49-SS13-A	12/06/07	10:50	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS13-B	12/06/07	10:50	1.5	2.0		X							
SOIL	HAND AUGER	P49-SS9-A	12/06/07	11:05	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS9-B	12/06/07	11:05	1.5	2.0		X							
SOIL	HAND AUGER	P49-SS8-A	12/06/07	11:30	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS8-B	12/06/07	11:30	1.5	2.0		X							
SOIL	HAND AUGER	P49-SS7-A	12/06/07	11:25	0.0	0.5			X	X	X	X			
SOIL	HAND AUGER	P49-SS7-B	12/06/07	11:25	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB1-A	12/06/07	13:30	0.0	0.5			X	X	X	X			
SOIL	GEOPROBE	P49-SB1-B	12/06/07	13:30	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB1-C	12/06/07	13:40	5.5	6.0		X	X	X	X	X			
SD	HAND AUGER	P49-SD1-A	12/06/07	14:40	0.0	0.5			X	X	X	X			
SD	HAND AUGER	P49-SD1-A	12/27/07	13:30	0.0	0.5		X							Associated trip blank collected with Parcel 27 data. No field blank or duplicate collected 12/27/07.
SD	HAND AUGER	P49-SD1-B	12/06/07	14:40	1.5	2.0		X							
SD	HAND AUGER	P49-SD1-B	12/27/07	13:30	1.5	2.0			X	X	X	X			Associated trip blank collected with Parcel 27 data. No field blank or duplicate collected 12/27/07.
SD	HAND AUGER	P49-SD2-A	12/06/07	15:00	0.0	0.5			X	X	X	X			
SD	HAND AUGER	P49-SD2-A	12/27/07	13:45	0.0	0.5		X							Associated trip blank collected with Parcel 27 data. No field blank or duplicate collected 12/27/07.
SD	HAND AUGER	P49-SD2-A DUPLICATE	12/06/07	15:00	0.0	0.5			X	X	X	X			Mistake on chain of custody. VOAs were collected at 1.5-2.0. The duplicate for VOAs should have been listed as a separate sample associated with B depth.
SD	HAND AUGER	P49-SD2-B	12/06/07	15:00	1.5	2.0		X							

Table 3.10-2
Parcel 49 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	HAND AUGER	P49-SD2-B DUPLICATE	12/06/07	15:00	1.5	2		X							Mistakenly labeled at A depth (0.0-0.5) on chain of custody.
SD	HAND AUGER	P49-SD2-B	12/27/07	13:45	1.5	2.0			X	X	X	X			Associated trip blank collected with Parcel 27 data. No field blank or duplicate collected 12/27/07.
SD	HAND AUGER	P49-SD3-A	12/06/07	15:30	0.0	0.5			X	X	X	X			
SD	HAND AUGER	P49-SD3-A	12/27/07	13:55	0.0	0.5		X							Associated trip blank collected with Parcel 27 data. No field blank or duplicate collected 12/27/07.
SD	HAND AUGER	P49-SD3-B	12/06/07	15:30	1.5	2.0		X							
SD	HAND AUGER	P49-SD3-B	12/27/07	13:55	1.5	2.0			X	X	X	X			Associated trip blank collected with Parcel 27 data. No field blank or duplicate collected 12/27/07.
BLANK	FIELD	FIELD BLANK-SO	12/06/07	15:40	--	--		X	X	X	X	X			
BLANK	TRIP	TRIP BLANK	12/07/07	-	--	--		X							
SOIL	GEOPROBE	P49-SB2-A	12/07/07	9:20	0.5	1.0			X	X	X	X			Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P49-SB2-B	12/07/07	9:20	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB2-C	12/07/07	9:40	9.0	9.5		X	X	X	X	X			Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P49-SB4-A	12/07/07	10:10	0.5	1.0			X	X	X	X			Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P49-SB4-B	12/07/07	10:10	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB4-C	12/07/07	10:20	8.0	8.5		X	X	X	X	X			Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P49-SB3-A	12/07/07	11:00	0.0	0.5			X	X	X	X			
SOIL	GEOPROBE	P49-SB3-B	12/07/07	11:00	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB3-C	12/07/07	11:10	3.5	4.0		X	X	X	X	X			
BLANK	FIELD	FIELD BLANK	12/07/07	11:30	--	--		X	X	X	X	X			
SOIL	GEOPROBE	P49-SB5-A	12/07/07	13:50	0.0	0.5			X	X	X	X			
SOIL	GEOPROBE	P49-SB5-B	12/07/07	13:50	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB5-C	12/07/07	14:05	6.0	6.5		X	X	X	X	X			

Table 3.10-2
Parcel 49 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P49-SB5-C DUPLICATE	12/07/07	14:05	6.0	6.5		X	X	X	X	X			
SOIL	GEOPROBE	P49-SB6-A	12/07/07	14:25	0.5	1.0			X	X	X	X			Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P49-SB6-B	12/07/07	14:25	1.5	2.0		X							
SOIL	GEOPROBE	P49-SB6-C	12/07/07	14:40	6.5	7.0		X	X	X	X	X			Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK-AQ	12/08/07	8:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/08/07	10:00	--	--		X	X	X	X	X			
GW	GEOPROBE	P49-GW-1	12/08/07	12:30	5.0	10.0		X	X						
GW	GEOPROBE	P49-GW-2	12/08/07	12:00	9.0	14.0		X	X						
GW	MONITORING WELL	P49-296MW-7	12/08/07	14:30	1.8	11.8		X	X	X	X	X			
GW	MONITORING WELL	P49-283MW-3	12/08/07	13:00	14.1	24.1		X	X	X	X	X			
GW	MONITORING WELL	P49-283MW-1	12/08/07	12:40	9.8	19.8		X	X	X	X	X			
GW	MONITORING WELL	P49-283MW-1 DUPLICATE	12/08/07	12:40	9.8	19.8		X	X	X	X	X			
GW	MONITORING WELL	P49-B4MW0B4	12/08/07	15:30	7.1	17.1		X	X	X	X	X			

X = Sample analyzed for the indicated analytical parameter suite

Table 3.10-3
Fort Monmouth Phase II Site Investigation, Parcel 49
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results											
		Sample ID:	P49-SB1-A	P49-SB1-B	P49-SB1-C	P49-SB2-A	P49-SB2-B	P49-SB2-C	P49-SB3-A	P49-SB3-B	P49-SB3-C	P49-SB4-A	P49-SB4-B	P49-SB4-C
		Lab ID:	7051517	7051518	7051519	7051603	7051604	7051605	7051609	7051610	7051611	7051606	7051607	7051608
		Date Sampled:	12/06/2007	12/06/2007	12/06/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007
		Depth (ft. bgs):	0.0-0.5	1.5-2.0	5.5-6.0	0.5-1.0	1.5-2.0	9.0-9.5	0.0-0.5	1.5-2.0	3.5-4.0	0.5-1.0	1.5-2.0	8.0-8.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles														
Acetone	1000	100	NT	**0.390 B**	**0.420 B**	NT	**0.230 J**	0.300 U	NT	**0.260 J**	**0.370 J**	NT	**0.280**	**0.290 J**
Carbon disulfide	NLE	NLE	NT	**0.028 J**	0.330 U	NT	0.260 U	0.300 U	NT	0.320 U	0.380 U	NT	0.270 U	0.320 U
Ethylbenzene	1000	100	NT	0.290 U	0.330 U	NT	0.260 U	0.300 U	NT	0.320 U	0.380 U	NT	0.270 U	0.320 U
Toluene	1000	500	NT	0.290 U	0.330 U	NT	0.260 U	0.300 U	NT	0.320 U	0.380 U	NT	0.270 U	0.320 U
Xylenes (Total)	1000	67	NT	0.870 U	0.990 U	NT	0.780 U	0.900 U	NT	0.960 U	1.150 U	NT	0.810 U	0.970 U
Semi-Volatiles														
Acenaphthene	10000	100	1.100 U	NT	**1.300**	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	1.100 U	NT	1.300 U
Acenaphthylene	NLE	NLE	**0.056 J**	NT	**0.210 J**	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	**0.920 J**	NT	1.300 U
Anthracene	10000	100	1.100 U	NT	**0.590 J**	1.100 U	NT	1.300 U	**0.100 J**	NT	**0.034 J**	**0.370 J**	NT	1.300 U
Benzo[a]anthracene	4	500	**0.091 J**	NT	**0.730 J**	1.100 U	NT	1.300 U	**0.550 J**	NT	**0.110 J**	**2.500**	NT	1.300 U
Benzo[a]pyrene	0.66	100	**0.083 J**	NT	**0.560 J**	1.100 U	NT	1.300 U	**0.440 J**	NT	1.200 U	**2.200**	NT	1.300 U
Benzo[b]fluoranthene	4	50	**0.120 J**	NT	**0.750 J**	1.100 U	NT	1.300 U	**0.670 J**	NT	**0.120 J**	**2.800**	NT	1.300 U
Benzo[g,h,i]perylene	NLE	NLE	1.100 U	NT	1.100 U	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	**0.900 J**	NT	1.300 U
Benzo[k]fluoranthene	4	500	**0.038 J**	NT	**0.320 J**	1.100 U	NT	1.300 U	**0.260 J**	NT	**0.047 J**	**0.890 J**	NT	1.300 U
bis(2-Ethylhexyl)phthalate	210	100	**0.058 J**	NT	1.100 U	1.100 U	NT	1.300 U	**0.450 J**	NT	**0.130 J**	1.100 U	NT	1.300 U
Butyl benzyl phthalate	10000	100	1.100 U	NT	1.100 U	1.100 U	NT	1.300 U	**1.800**	NT	**0.250 J**	1.100 U	NT	1.300 U
Chrysene	40	500	**0.120 J**	NT	**0.810 J**	1.100 U	NT	1.300 U	**0.610 J**	NT	**0.130 J**	**3.500**	NT	1.300 U
Dibenz[a,h]anthracene	0.66	100	1.100 U	NT	1.100 U	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	1.100 U	NT	1.300 U
Dibenzofuran	NLE	NLE	1.100 U	NT	**0.440 J**	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	1.100 U	NT	1.300 U
Di-n-butyl phthalate	10000	100	**1.500**	NT	**1.100 B**	**0.420 JB**	NT	**1.100 JB**	**0.810 JB**	NT	**8.500 B**	**1.800 B**	NT	**0.940 JB**
Fluoranthene	10000	100	**0.110 J**	NT	**1.600**	1.100 U	NT	1.300 U	**1.000 J**	NT	**0.220 J**	**1.500**	NT	1.300 U
Fluorene	10000	100	1.100 U	NT	**1.100 J**	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	**0.130 J**	NT	1.300 U
Indeno[1,2,3-cd]pyrene	4	500	1.100 U	NT	**0.140 J**	1.100 U	NT	1.300 U	**0.160 J**	NT	1.200 U	**0.680 J**	NT	1.300 U
2-Methylnaphthalene	NLE	NLE	1.100 U	NT	**0.190 J**	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	**0.098 J**	NT	1.300 U
4-Methylphenol	10000	NLE	1.100 U	NT	1.100 U	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	1.100 U	NT	1.300 U
Naphthalene	4200	100	1.100 U	NT	**0.110 J**	1.100 U	NT	1.300 U	1.200 U	NT	1.200 U	**0.100 J**	NT	1.300 U
Phenanthrene	NLE	NLE	**0.038 J**	NT	**2.300**	1.100 U	NT	1.300 U	**0.500 J**	NT	**0.210 J**	**0.230 J**	NT	1.300 U
Pyrene	10000	100	**0.170 J**	NT	**2.000**	1.100 U	NT	1.300 U	**1.000 J**	NT	**0.210 J**	**4.800**	NT	1.300 U
PCBs														
Aroclor 1260	2	50	0.0041 U	NT	0.0040 U	0.0042 U	NT	0.0041 U	**0.34**	NT	**0.10**	0.0039 U	NT	0.0040 U
Metals														
Aluminum	NLE	NLE	**12700 B**	NT	**9810 B**	**7840 B**	NT	**27700 B**	**21600 B**	NT	**28300 B**	**13200 B**	NT	**27600 B**
Antimony	340	NLE	0.410 U	NT	**1.05**	0.426 U	NT	0.514 U	0.470 U	NT	0.511 U	0.389 U	NT	0.549 U
Arsenic	20	NLE	**6.32**	NT	**11.4**	**4.67**	NT	**24.3**	**12.8**	NT	**17.1**	**6.15**	NT	**23.4**
Barium	47000	NLE	**32.3 B**	NT	**73.5 B**	**22.0**	NT	**51.1**	**54.5**	NT	**65.9**	**65.0**	NT	**676**
Beryllium	140	NLE	**1.34**	NT	**0.903**	**0.899**	NT	**3.96**	**2.35**	NT	**3.09**	**1.60**	NT	**3.08**
Cadmium	100	NLE	**1.02**	NT	**1.54**	**0.202**	NT	**1.29**	**1.81**	NT	**1.52**	**0.444**	NT	**1.58**
Calcium	NLE	NLE	**4860 B**	NT	**1070 B**	**1700**	NT	**1110**	**11300**	NT	**4630**	**11600**	NT	**421**
Chromium (Total)	NLE	NLE	**104**	NT	**74.2**	**62.2**	NT	**328**	**313**	NT	**400**	**79.5**	NT	**484**
Cobalt	NLE	NLE	**3.37**	NT	**2.05**	**0.968**	NT	**4.57**	**3.93**	NT	**0.517**	**1.85**	NT	0.418 U
Copper	45000	NLE	**20.9 B**	NT	**33.8 B**	**4.63 B**	NT	**13.2 B**	**36.9 B**	NT	**18.1 B**	**9.85 B**	NT	**13.6 B**
Iron	NLE	NLE	**42300 B**	NT	**26100 B**	**26500**	NT	**106000**	**75000**	NT	**95900**	**33800**	NT	**110000**
Lead	800	NLE	**11.7**	NT	**204**	**5.78**	NT	0.416 U	**91.7**	NT	**19.6**	**14.8**	NT	0.445 U
Magnesium	NLE	NLE	**6590 B**	NT	**3140 B**	**3040**	NT	**17400**	**12700**	NT	**14600**	**5370**	NT	**16200**
Manganese	NLE	NLE	**93.1 B**	NT	**197 B**	**41.1**	NT	**36.6**	**53.7**	NT	**34.1**	**146**	NT	**32.0**
Mercury	270	NLE	**0.91**	NT	**0.36**	0.099 U	NT	0.122 U	**1.19**	NT	**0.33**	0.097 U	NT	0.123 U
Nickel (Soluble Salts)	2400	NLE	**9.48 B**	NT	**12.4 B**	**4.38**	NT	**12.1**	**10.7**	NT	**7.95**	**7.91**	NT	**6.44**
Potassium	NLE	NLE	**11400 B**	NT	**5630 B**	**4600 B**	NT	**34100 B**	**22900 B**	NT	**30400 B**	**7220 B**	NT	**32100 B**
Sodium	NLE	NLE	35.545 U	NT	38.353 U	36.920 U	NT	44.587 U	40.728 U	NT	44.277 U	33.720 U	NT	47.589 U
Vanadium	7100	NLE	**62.4**	NT	**44.0**	**40.6**	NT	**108**	**114**	NT	**145**	**48.1**	NT	**154**
Zinc	1500	NLE	**75.1 B**	NT	**223 B**	**49.4**	NT	**124**	**174**	NT	**110**	**74.9**	NT	**99.0**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

Table 3.10-3
Fort Monmouth Phase II Site Investigation, Parcel 49
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results											
		Sample ID:	P49-SB5-A	P49-SB5-B	P49-SB5-C	P49-SB5-C DUP	P49-SB6-A	P49-SB6-B	P49-SB6-C	P49-SS7-A	P49-SS7-B	P49-SS8-A	P49-SS8-B	P49-SS9-A
		Lab ID:	7051613	7051614	7051615	7051602	7051616	7051617	7051618	7051515	7051516	7051513	7051514	7051511
		Date Sampled:	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/07/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007
		Depth (ft. bgs):	0.0-0.5	1.5-2.0	6.0-6.5	6.0-6.5	0.5-1.0	1.5-2.0	6.5-7.0	0.0-0.5	1.5-2.0	0.0-0.5	1.5-2.0	0.0-0.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles														
Acetone	1000	100	NT	**0.045 J**	0.290 U	**0.330**	NT	0.250 U	0.330 U	NT	**1.000 B**	NT	**0.680 B**	NT
Carbon disulfide	NLE	NLE	NT	0.300 U	0.290 U	0.290 U	NT	0.250 U	0.330 U	NT	0.280 U	NT	0.270 U	NT
Ethylbenzene	1000	100	NT	0.300 U	0.290 U	0.290 U	NT	0.250 U	0.330 U	NT	0.280 U	NT	0.270 U	NT
Toluene	1000	500	NT	0.300 U	0.290 U	0.290 U	NT	0.250 U	0.330 U	NT	0.280 U	NT	0.270 U	NT
Xylenes (Total)	1000	67	NT	0.900 U	0.860 U	0.880 U	NT	0.750 U	0.980 U	NT	0.850 U	NT	0.810 U	NT
Semi-Volatiles														
Acenaphthene	10000	100	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**20.000 JD**	NT	**0.660 J**	NT	**0.180 J**
Acenaphthylene	NLE	NLE	**0.260 J**	NT	1.200 U	1.200 U	**0.076 J**	NT	1.200 U	**0.450 J**	NT	**0.048 J**	NT	**0.490 J**
Anthracene	10000	100	**0.099 J**	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**46.000 JD**	NT	**1.800**	NT	**3.000**
Benzo[a]anthracene	4	500	**0.420 J**	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**80.000 D**	NT	**3.600**	NT	**10.000 JD**
Benzo[a]pyrene	0.66	100	**0.460 J**	NT	1.200 U	1.200 U	**0.110 J**	NT	1.200 U	**54.000 JD**	NT	**2.600**	NT	**9.600**
Benzo[b]fluoranthene	4	50	**0.460 J**	NT	1.200 U	1.200 U	**0.140 J**	NT	1.200 U	**75.000 D**	NT	**3.900**	NT	**9.200 JD**
Benzo[g,h,i]perylene	NLE	NLE	**0.260 J**	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**16.000 JD**	NT	**0.840 J**	NT	**3.500**
Benzo[k]fluoranthene	4	500	**0.160 J**	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**29.000 JD**	NT	**1.500**	NT	**6.200**
bis(2-Ethylhexyl)phthalate	210	100	**0.240 J**	NT	1.200 U	1.200 U	1.000 U	NT	**0.100 J**	1.100 U	NT	**0.690 J**	NT	1.200 U
Butyl benzyl phthalate	10000	100	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**0.670 J**	NT	**0.520 J**	NT	1.200 U
Chrysene	40	500	**0.610 J**	NT	1.200 U	1.200 U	**0.150 J**	NT	1.200 U	**79.000 D**	NT	**3.700**	NT	**10.000 JD**
Dibenz[a,h]anthracene	0.66	100	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**2.600**	NT	**0.340 J**	NT	**1.300**
Dibenzofuran	NLE	NLE	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**12.000**	NT	**0.390 J**	NT	**0.340 J**
Di-n-butyl phthalate	10000	100	**1.700 B**	NT	**1.500 B**	**0.620 JB**	**1.000 B**	NT	**0.760 JB**	1.100 U	NT	**0.630 JB**	NT	**1.200 B**
Fluoranthene	10000	100	**0.410 J**	NT	1.200 U	1.200 U	**0.071 J**	NT	1.200 U	**190.000 D**	NT	**9.000**	NT	**23.000 D**
Fluorene	10000	100	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**17.000 JD**	NT	**0.640 J**	NT	1.200 U
Indeno[1,2,3-cd]pyrene	4	500	**0.180 J**	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**18.000 JD**	NT	**0.930 J**	NT	**3.500**
2-Methylnaphthalene	NLE	NLE	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**4.400**	NT	**0.130 J**	NT	**0.240 J**
4-Methylphenol	10000	NLE	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**0.320 J**	NT	1.200 U	NT	1.200 U
Naphthalene	4200	100	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**11.000**	NT	**0.280 J**	NT	**0.098 J**
Phenanthrene	NLE	NLE	**0.380 J**	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**170.000 D**	NT	**7.100**	NT	**13.000**
Pyrene	10000	100	**0.890 J**	NT	1.200 U	1.200 U	**0.190 J**	NT	1.200 U	**160.000 D**	NT	**7.300**	NT	**20.000 D**
PCBs														
Aroclor 1260	2	50	0.0040 U	NT	0.0041 U	0.0040 U	0.0042 U	NT	0.0039 U	**0.47**	NT	**8.85**	NT	0.0041 U
Metals														
Aluminum	NLE	NLE	**13700 B**	NT	**31400 B**	**26900 B**	**11500 B**	NT	**15100 B**	**15100 B**	NT	**14600 B**	NT	**17500 B**
Antimony	340	NLE	0.421 U	NT	0.457 U	0.445 U	0.438 U	NT	0.491 U	0.432 U	NT	0.434 U	NT	0.456 U
Arsenic	20	NLE	**10.5**	NT	**21.5**	**21.6**	**5.10**	NT	**8.92**	**10.1**	NT	**10.6**	NT	**17.4**
Barium	47000	NLE	**76.9**	NT	**77.5**	**80.6**	**26.2**	NT	**41.0**	**93.6 B**	NT	**95.5 B**	NT	**53.8 B**
Beryllium	140	NLE	**1.06**	NT	**5.22**	**4.36**	**0.422**	NT	**2.50**	**1.87**	NT	**1.61**	NT	**2.11**
Cadmium	100	NLE	**0.786**	NT	**2.90**	**2.21**	**0.199**	NT	**0.875**	**1.86**	NT	**3.66**	NT	**1.31**
Calcium	NLE	NLE	**13300**	NT	**2460**	**2740**	**758**	NT	**1340**	**3750 B**	NT	**2790 B**	NT	**2500 B**
Chromium	NLE	NLE	**92.4**	NT	**351**	**312**	**33.7**	NT	**167**	**146**	NT	**144**	NT	**135**
Cobalt	NLE	NLE	**1.47**	NT	**5.15**	**4.67**	**1.56**	NT	**2.45**	**1.20**	NT	**1.55**	NT	**3.01**
Copper	45000	NLE	**28.3 B**	NT	**7.42 B**	**7.74 B**	**19.8 B**	NT	**10.5 B**	**73.1 B**	NT	**115 B**	NT	**27.3 B**
Iron	NLE	NLE	**29000**	NT	**146000**	**125000**	**20300**	NT	**57400**	**47800 B**	NT	**43000 B**	NT	**69500 B**
Lead	800	NLE	**176**	NT	0.370 U	0.360 U	**9.84**	NT	**11.7**	**49.1**	NT	**109**	NT	**22.7**
Magnesium	NLE	NLE	**4320**	NT	**21100**	**17500**	**1200**	NT	**8430**	**6220 B**	NT	**6000 B**	NT	**6630 B**
Manganese	NLE	NLE	**104**	NT	**30.2**	**28.0**	**82.6**	NT	**16.0**	**68.7 B**	NT	**120 B**	NT	**163 B**
Mercury	270	NLE	**0.16**	NT	0.111 U	0.120 U	0.093 U	NT	0.114 U	0.113 U	NT	0.119 U	NT	0.109 U
Nickel	2400	NLE	**9.88**	NT	**17.2**	**12.1**	**6.69**	NT	**9.67**	**8.80 B**	NT	**12.1 B**	NT	**14.7 B**
Potassium	NLE	NLE	**7010 B**	NT	**47500 B**	**38300 B**	**1940 B**	NT	**19800 B**	**13200 B**	NT	**10700 B**	NT	**13800 B**
Sodium	NLE	NLE	36.475 U	NT	39.649 U	38.587 U	**89.8**	NT	42.551 U	37.456 U	NT	37.629 U	NT	39.562 U
Vanadium	7100	NLE	**58.3**	NT	**137**	**103**	**43.4**	NT	**81.1**	**74.2**	NT	**71.8**	NT	**85.8**
Zinc	1500	NLE	**304**	NT	**138**	**147**	**32.9**	NT	**110**	**255 B**	NT	**206 B**	NT	**193 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

Table 3.10-3
Fort Monmouth Phase II Site Investigation, Parcel 49
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results								
		Sample ID:	P49-SS9-B	P49-SS10-A	P49-SS10-B	P49-SS11-A	P49-SS11-B	P49-SS12-A	P49-SS12-B	P49-SS13-A	P49-SS13-B
		Lab ID:	7051512	7051503	7051504	7051505	7051506	7051507	7051508	7051509	7051510
		Date Sampled:	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007	12/06/2007
		Depth (ft. bgs):	1.5-2.0	0.0-0.5	1.5-2.0	0.0-0.5	1.5-2.0	0.0-0.5	1.5-2.0	0.0-0.5	1.5-2.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles											
Acetone	1000	100	**0.760 B**	NT	**0.770 B**	NT	**0.670 B**	NT	**0.670**	NT	**0.780 B**
Carbon disulfide	NLE	NLE	0.320 U	NT	0.280 U	NT	0.300 U	NT	0.280 U	NT	0.290 U
Ethylbenzene	1000	100	**0.058 J**	NT	0.280 U	NT	0.300 U	NT	0.280 U	NT	0.290 U
Toluene	1000	500	**0.047 J**	NT	0.280 U	NT	0.300 U	NT	0.280 U	NT	0.290 U
Xylenes (Total)	1000	67	**0.119 J**	NT	0.850 U	NT	0.890 U	NT	0.850 U	NT	0.880 U
Semi-Volatiles											
Acenaphthene	10000	100	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Acenaphthylene	NLE	NLE	NT	**0.073 J**	NT	**0.059 J**	NT	**0.130 J**	NT	**0.097 J**	NT
Anthracene	10000	100	NT	**0.083 J**	NT	**0.093 J**	NT	**0.100 J**	NT	**0.200 J**	NT
Benzo[a]anthracene	4	500	NT	**0.470 J**	NT	**0.350 J**	NT	**0.380 J**	NT	**0.810 J**	NT
Benzo[a]pyrene	0.66	100	NT	**0.610 J**	NT	**0.310 J**	NT	**0.360 J**	NT	**0.730 J**	NT
Benzo[b]fluoranthene	4	50	NT	**0.960 J**	NT	**0.430 J**	NT	**0.580 J**	NT	**1.200**	NT
Benzo[g,h,i]perylene	NLE	NLE	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Benzo[k]fluoranthene	4	500	NT	**0.340 J**	NT	**0.220 J**	NT	**0.220 J**	NT	**0.490 J**	NT
bis(2-Ethylhexyl)phthalate	210	100	NT	**0.160 J**	NT	**0.150 J**	NT	**0.500 J**	NT	**0.220 J**	NT
Butyl benzyl phthalate	10000	100	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Chrysene	40	500	NT	**0.600 J**	NT	**0.440 J**	NT	**0.480 J**	NT	**0.860 J**	NT
Dibenz[a,h]anthracene	0.66	100	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Dibenzofuran	NLE	NLE	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Di-n-butylphthalate	10000	100	NT	**1.300 B**	NT	**0.380 JB**	NT	**1.900 B**	NT	**0.800 JB**	NT
Fluoranthene	10000	100	NT	**0.780 J**	NT	**0.670 J**	NT	**0.690 J**	NT	**1.600**	NT
Fluorene	10000	100	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Indeno[1,2,3-cd]pyrene	4	500	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
2-Methylnaphthalene	NLE	NLE	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
4-Methylphenol	10000	NLE	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Naphthalene	4200	100	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	1.200 U	NT
Phenanthrene	NLE	NLE	NT	**0.270 J**	NT	**0.370 J**	NT	**0.380 J**	NT	**0.750 J**	NT
Pyrene	10000	100	NT	1.100 U	NT	**0.770 J**	NT	**1.100 J**	NT	**2.200**	NT
PCBs											
Aroclor 1260	2	50	NT	0.0041 U	NT	0.0039 U	NT	0.0041 U	NT	0.0041 U	NT
Metals											
Aluminum	NLE	NLE	NT	**7420 B**	NT	**7720 B**	NT	**10500 B**	NT	**7310 B**	NT
Antimony	340	NLE	NT	0.472 U	NT	0.451 U	NT	0.433 U	NT	0.475 U	NT
Arsenic	20	NLE	NT	**6.32**	NT	**7.66**	NT	**10.3**	NT	**5.23**	NT
Barium	47000	NLE	NT	**39.7 B**	NT	**39.4 B**	NT	**55.0 B**	NT	**38.4 B**	NT
Beryllium	140	NLE	NT	**0.361**	NT	**0.381**	NT	**0.818**	NT	**0.346**	NT
Cadmium	100	NLE	NT	**0.511**	NT	**0.429**	NT	**0.723**	NT	**0.424**	NT
Calcium	NLE	NLE	NT	**34800 B**	NT	**44700 B**	NT	**23100 B**	NT	**65400 B**	NT
Chromium	NLE	NLE	NT	**27.1**	NT	**25.6**	NT	**71.7**	NT	**25.9**	NT
Cobalt	NLE	NLE	NT	**2.19**	NT	**2.36**	NT	**2.07**	NT	**2.20**	NT
Copper	45000	NLE	NT	**19.5 B**	NT	**24.3 B**	NT	**36.8 B**	NT	**26.8 B**	NT
Iron	NLE	NLE	NT	**15600 B**	NT	**13600 B**	NT	**25400 B**	NT	**12900 B**	NT
Lead	800	NLE	NT	**46.0**	NT	**35.0**	NT	**101**	NT	**49.7**	NT
Magnesium	NLE	NLE	NT	**2830 B**	NT	**4190 B**	NT	**4130 B**	NT	**5610 B**	NT
Manganese	NLE	NLE	NT	**132 B**	NT	**115 B**	NT	**95.9 B**	NT	**281 B**	NT
Mercury	270	NLE	NT	0.113 U	NT	0.106 U	NT	0.108 U	NT	0.107 U	NT
Nickel	2400	NLE	NT	**8.10 B**	NT	**15.5 B**	NT	**9.12 B**	NT	**8.09 B**	NT
Potassium	NLE	NLE	NT	**1320 B**	NT	**1270 B**	NT	**5470 B**	NT	**1280 B**	NT
Sodium	NLE	NLE	NT	40.910 U	NT	39.056 U	NT	37.562 U	NT	41.153 U	NT
Vanadium	7100	NLE	NT	**32.8**	NT	**33.1**	NT	**46.7**	NT	**32.3**	NT
Zinc	1500	NLE	NT	**115 B**	NT	**57.9 B**	NT	**190 B**	NT	**64.8 B**	NT

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

Table 3.10-4
Fort Monmouth Phase II Site Investigation, Parcel 49
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results						
	Sample ID:	P49-283-MW1	P49-283-MW1 DUP	P49-283-MW3	P49-296-MW7	P49-B4MWOB4	P49-GW-1	P49-GW-2
	Lab ID:	7051808	7051803	7051807	7051806	7051809	7051804	7051805
	Date Sampled:	12/08/2007	12/08/2007	12/08/2007	12/08/2007	12/08/2007	12/08/2007	12/08/2007
	Screened Interval (ft. bgs):	9.8-19.8	9.8-19.8	14.1-24.1	1.8-11.8	7.1-17.1	5-10	9-14
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	6000	0.85 U	0.85 U	0.85 U	**1.08**	0.85 U	**14.21**	0.85 U
Benzene	1	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	**1.24**	0.17 U
Bromodichloromethane	1	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	**1.35**
Chloroform	70	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	**3.47**
Ethylbenzene	700	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	**0.25 J**	0.28 U
Methyl ethyl ketone (2-Butanone)	300	0.14 U	0.14 U	0.14 U	**0.61**	0.14 U	**1.35**	0.14 U
Toluene	600	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U	**1.39**	0.27 U
Vinyl Chloride	1	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U	**0.27 J**	0.30 U
Xylenes (Total)	1000	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	**2.75**	0.49 U
Semi-Volatiles								
Benzoic acid	30000	0.86 U	0.86 U	0.86 U	**6.47**	0.86 U	0.86 U	0.86 U
bis(2-Ethylhexyl)phthalate	3	**0.80 J**	**1.04 J**	**6.77**	**3.55**	1.28 U	**25.94**	**1.22 J**
Diethyl phthalate	6000	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	**7.70**	0.96 U
Naphthalene	300	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	**0.64 J**	0.76 U
Metals								
Aluminum	200	**4900**	**5110**	**60.8**	**112**	**106**	NT	NT
Arsenic	3	2.70 U	2.70 U	**3.68**	**6.17**	2.70 U	NT	NT
Barium	6000	**123**	**126**	**95.6**	**8.99**	**40.2**	NT	NT
Beryllium	1	**1.28**	**1.33**	0.100 U	0.100 U	0.100 U	NT	NT
Cadmium	4	**0.550 B**	**0.592 B**	**0.273 B**	**0.297 B**	**0.626 B**	NT	NT
Calcium	NLE	**11900**	**12300**	**17100**	**14600**	**7140**	NT	NT
Cobalt	100*	**5.58**	**5.79**	0.200 U	0.200 U	0.200 U	NT	NT
Copper	1300	**2.78**	**2.65**	0.500 U	0.500 U	0.500 U	NT	NT
Iron	300	323 U	323 U	**10200**	**10600**	**1220**	NT	NT
Magnesium	NLE	**22100**	**22900**	**3310**	**3180**	**2850**	NT	NT
Manganese	50	**51.6**	**52.8**	**49.0**	**84.9**	**36.3**	NT	NT
Nickel (Soluble Salts)	100	**14.4**	**14.7**	**7.34**	0.300 U	0.300 U	NT	NT
Potassium	NLE	**6570**	**6810**	**8500**	**6830**	**3470**	NT	NT
Selenium	40	2.70 U	**4.51**	2.70 U	2.70 U	**3.64**	NT	NT
Silver	40	**0.881**	0.800 U	0.800 U	0.800 U	0.800 U	NT	NT
Sodium	50000	**110000 B**	**114000 B**	**8610 B**	**7430 B**	**11000 B**	NT	NT
Vanadium	NLE	0.500 U	0.500 U	0.500 U	**0.854**	0.500 U	NT	NT
Zinc	2000	**103**	**107**	3.58 U	3.58 U	**18.3**	NT	NT

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.
ft. bgs = Feet below ground surface.
NT = Not tested.
NLE = No limit established.
Bold = Analyte was detected.
Shaded = Concentration exceeds Quality Criteria.

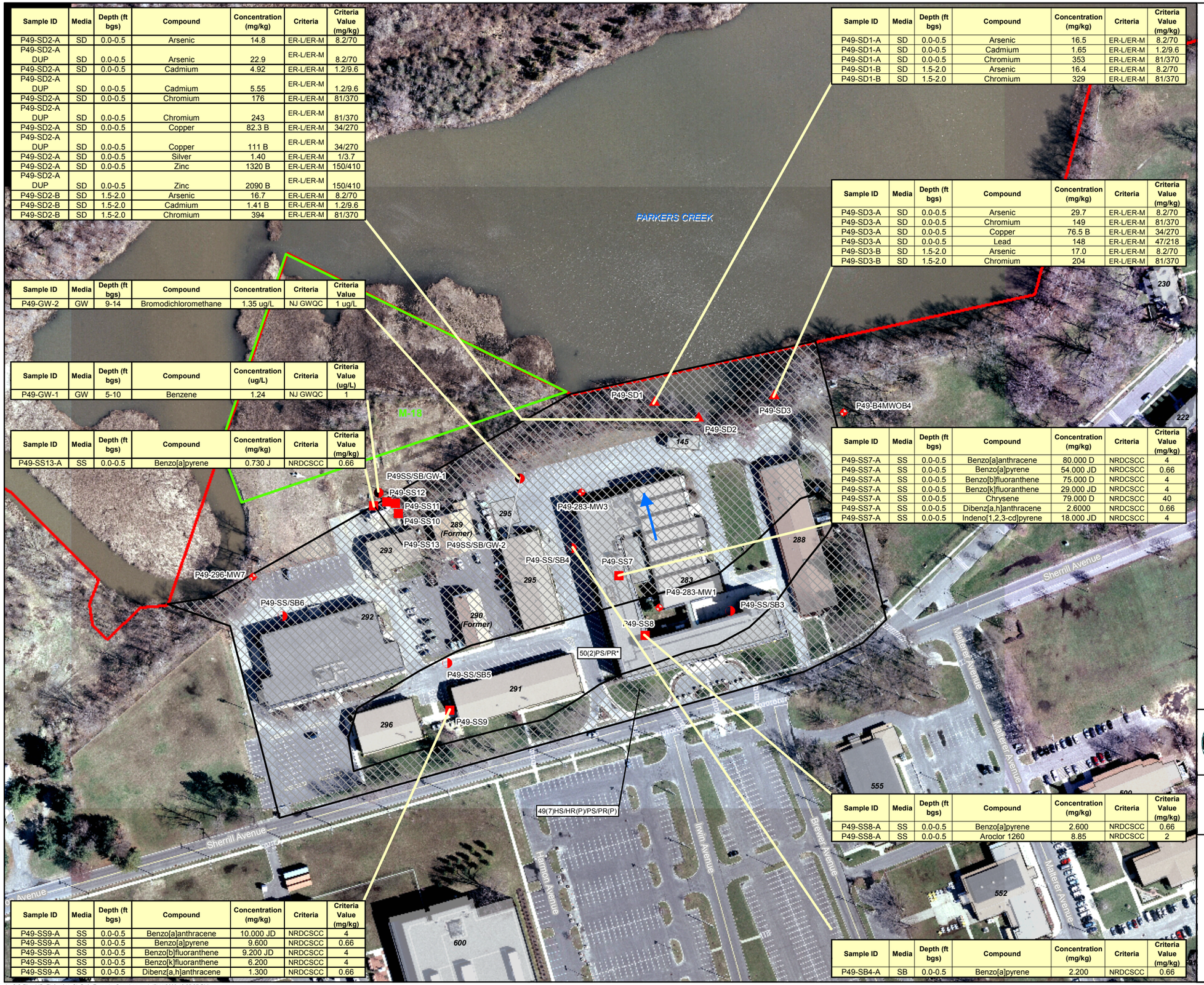
µg/L = micrograms per liter.
B = The compound was found in the associated method blank as well as in the sample.
D = Sample was diluted.
E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.
J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.
U = The compound was analyzed for but not detected.

Table 3.10-5
Fort Monmouth Phase II Site Investigation, Parcel 49
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results													
		Sample ID:	P49-SD1-A	P49-SD1-A	P49-SD1-B	P49-SD1-B	P49-SD2-A	P49-SD2-A	P49-SD2-A DUP	P49-SD2-B	P49-SD2-B	P49-SD2-B	P49-SD3-A	P49-SD3-A	P49-SD3-B	P49-SD3-B
		Lab ID:	12/06/2007	12/27/2007	12/06/2007	12/27/2007	12/06/2007	12/27/2007	12/06/2007	12/06/2007	12/27/2007	12/06/2007	12/06/2007	12/27/2007	12/06/2007	12/27/2007
		Date Sampled:	7051520	7056801	7051521	7056802	7051522	7056803	7051502	7051523	7056804	7051502	7051524	7056805	7051525	7056806
		Depth (ft. bgs):	0.0-0.5	0.0-0.5	1.5-2.0	1.5-2.0	0.0-0.5	0.0-0.5	0.0-0.5	1.5-2.0	1.5-2.0	1.5-2.0	0.0-0.5	0.0-0.5	1.5-2.0	1.5-2.0
Chemical	ER-L[1]	ER-M[2]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																
Acetone	NLE	NLE	NT	0.350 U	**0.460 B**	NT	NT	0.360 U	NT	**0.320 B**	NT	**1.600 B**	NT	0.320 U	**0.420 B**	NT
Semi-Volatiles																
Benzo[a]anthracene	0.261	1.6	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	1.400 U	NT	**0.200 J**	NT	NT	1.400 U
Benzo[a]pyrene	0.430	1.6	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	1.400 U	NT	**0.160 J**	NT	NT	1.400 U
Benzo[b]fluoranthene	NLE	NLE	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	1.400 U	NT	**0.240 J**	NT	NT	1.400 U
Benzo[k]fluoranthene	0.240	NLE	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	1.400 U	NT	**0.091 J**	NT	NT	1.400 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	**0.250 J**	NT	**0.070 J**	NT	NT	**0.520 J**
Chrysene	0.384	2.8	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	1.400 U	NT	**0.230 J**	NT	NT	1.400 U
Di-n-butylphthalate	NLE	NLE	**0.890 JB**	NT	NT	**0.100 JB**	**2.400 B**	NT	**0.950 JB**	NT	**0.470 JB**	NT	**1.500 B**	NT	NT	1.400 U
Fluoranthene	0.600	5.1	0.920 U	NT	NT	1.300 U	2.100 U	NT	**0.160 J**	NT	1.400 U	NT	**0.410 J**	NT	NT	**0.140 J**
Phenanthrene	0.240	1.5	0.920 U	NT	NT	1.300 U	2.100 U	NT	2.500 U	NT	1.400 U	NT	**0.160 J**	NT	NT	1.400 U
Pyrene	0.665	2.6	0.920 U	NT	NT	1.300 U	2.100 U	NT	**0.130 J**	NT	1.400 U	NT	**0.370 J**	NT	NT	**0.150 J**
Metals																
Aluminum	NLE	NLE	**29200 B**	NT	NT	**29400 B**	**13900 B**	NT	**18500 B**	NT	**36300 B**	NT	**15600 B**	NT	NT	**19200 B**
Arsenic	8.2	70	**16.5**	NT	NT	**16.4**	**14.8**	NT	**22.9**	NT	**16.7**	NT	**29.7**	NT	NT	**17.0**
Barium	NLE	NLE	**96.4 B**	NT	NT	**39.9 B**	**65.3 B**	NT	**79.0 B**	NT	**110 B**	NT	**83.7 B**	NT	NT	**57.2 B**
Beryllium	NLE	NLE	**4.52**	NT	NT	**4.08**	**2.42**	NT	**3.24**	NT	**5.13**	NT	**1.70**	NT	NT	**2.13**
Cadmium	1.2	9.6	**1.65**	NT	NT	**0.971 B**	**4.92**	NT	**5.55**	NT	**1.41 B**	NT	**1.02**	NT	NT	**0.844 B**
Calcium	NLE	NLE	**719 B**	NT	NT	**430 B**	**1690 B**	NT	**2210 B**	NT	**1700 B**	NT	**1360 B**	NT	NT	**804 B**
Chromium (Total)	81	370	**353**	NT	NT	**329**	**176**	NT	**243**	NT	**394**	NT	**149**	NT	NT	**204**
Cobalt	NLE	NLE	**4.91**	NT	NT	**3.22**	**19.4**	NT	**29.3**	NT	**4.18**	NT	**2.10**	NT	NT	0.446 U
Copper	34	270	**18.9 B**	NT	NT	**12.7 B**	**82.3 B**	NT	**111 B**	NT	**21.0 B**	NT	**76.5 B**	NT	NT	**18.9 B**
Iron	NLE	NLE	**120000 B**	NT	NT	**123000 EB**	**48900 B**	NT	**67800 B**	NT	**160000 EB**	NT	**49900 B**	NT	NT	**71100 EB**
Lead	47	218	0.432 U	NT	NT	0.413 U	**41.8**	NT	**45.7**	NT	**4.99**	NT	**148**	NT	NT	**23.4**
Magnesium	NLE	NLE	**20600 B**	NT	NT	**17400 B**	**7610 B**	NT	**10800 B**	NT	**22400 B**	NT	**6190 B**	NT	NT	**8440 B**
Manganese	NLE	NLE	**44.8 B**	NT	NT	**19.3**	**24.2 B**	NT	**28.3 B**	NT	**34.9**	NT	**61.7 B**	NT	NT	**22.8**
Mercury	0.15	0.71	0.124 U	NT	NT	0.119 U	**0.49**	NT	**0.53**	NT	0.145 U	NT	**0.23**	NT	NT	0.134 U
Nickel (Soluble Salts)	21	52	**13.1 B**	NT	NT	**14.6**	**44.0 B**	NT	**68.5 B**	NT	**17.9**	NT	**11.3 B**	NT	NT	**11.1**
Potassium	NLE	NLE	**40800 B**	NT	NT	**38600**	**15800 B**	NT	**22600 B**	NT	**49200**	NT	**11800 B**	NT	NT	**17700**
Silver	1.0	3.7	0.203 U	NT	NT	0.195 U	**1.40**	NT	0.407 U	NT	0.234 U	NT	0.208 U	NT	NT	0.223 U
Sodium	NLE	NLE	**219**	NT	NT	44.262 U	69.037 U	NT	92.593 U	NT	53.211 U	NT	47.409 U	NT	NT	50.781 U
Vanadium	NLE	NLE	**125**	NT	NT	**146**	**82.3**	NT	**118**	NT	**156**	NT	**79.3**	NT	NT	**93.2**
Zinc	150	410	**139 B**	NT	NT	**131**	**1320 B**	NT	**2090 B**	NT	**155**	NT	**117 B**	NT	NT	**93.7**

[1] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Low, 1998.
[2] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Medium, 1998.
DUP = Duplicate Sample.
ft. bgs = Feet below ground surface.
mg/kg = milligram per kilogram.
Bold = Analyte detected.
Shaded = Concentration exceeds ER-L.

NT = Not tested.
NLE = No limit established.
B = The compound was found in the associated method blank as well as in the sample.
D = Sample was diluted.
E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.
J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.
U = The compound was analyzed for but not detected.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SD2-A	SD	0.0-0.5	Arsenic	14.8	ER-L/ER-M	8.2/70
P49-SD2-A DUP	SD	0.0-0.5	Arsenic	22.9	ER-L/ER-M	8.2/70
P49-SD2-A	SD	0.0-0.5	Cadmium	4.92	ER-L/ER-M	1.2/9.6
P49-SD2-A DUP	SD	0.0-0.5	Cadmium	5.55	ER-L/ER-M	1.2/9.6
P49-SD2-A	SD	0.0-0.5	Chromium	176	ER-L/ER-M	81/370
P49-SD2-A DUP	SD	0.0-0.5	Chromium	243	ER-L/ER-M	81/370
P49-SD2-A	SD	0.0-0.5	Copper	82.3 B	ER-L/ER-M	34/270
P49-SD2-A DUP	SD	0.0-0.5	Copper	111 B	ER-L/ER-M	34/270
P49-SD2-A	SD	0.0-0.5	Silver	1.40	ER-L/ER-M	1/3.7
P49-SD2-A	SD	0.0-0.5	Zinc	1320 B	ER-L/ER-M	150/410
P49-SD2-A DUP	SD	0.0-0.5	Zinc	2090 B	ER-L/ER-M	150/410
P49-SD2-B	SD	1.5-2.0	Arsenic	16.7	ER-L/ER-M	8.2/70
P49-SD2-B	SD	1.5-2.0	Cadmium	1.41 B	ER-L/ER-M	1.2/9.6
P49-SD2-B	SD	1.5-2.0	Chromium	394	ER-L/ER-M	81/370

Sample ID	Media	Depth (ft bgs)	Compound	Concentration	Criteria	Criteria Value
P49-GW-2	GW	9-14	Bromodichloromethane	1.35 ug/L	NJ GWQC	1 ug/L

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P49-GW-1	GW	5-10	Benzene	1.24	NJ GWQC	1

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SS13-A	SS	0.0-0.5	Benzo[a]pyrene	0.730 J	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SD1-A	SD	0.0-0.5	Arsenic	16.5	ER-L/ER-M	8.2/70
P49-SD1-A	SD	0.0-0.5	Cadmium	1.65	ER-L/ER-M	1.2/9.6
P49-SD1-A	SD	0.0-0.5	Chromium	353	ER-L/ER-M	81/370
P49-SD1-B	SD	1.5-2.0	Arsenic	16.4	ER-L/ER-M	8.2/70
P49-SD1-B	SD	1.5-2.0	Chromium	329	ER-L/ER-M	81/370

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SD3-A	SD	0.0-0.5	Arsenic	29.7	ER-L/ER-M	8.2/70
P49-SD3-A	SD	0.0-0.5	Chromium	149	ER-L/ER-M	81/370
P49-SD3-A	SD	0.0-0.5	Copper	76.5 B	ER-L/ER-M	34/270
P49-SD3-A	SD	0.0-0.5	Lead	148	ER-L/ER-M	47/218
P49-SD3-B	SD	1.5-2.0	Arsenic	17.0	ER-L/ER-M	8.2/70
P49-SD3-B	SD	1.5-2.0	Chromium	204	ER-L/ER-M	81/370

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SS7-A	SS	0.0-0.5	Benzo[a]anthracene	80.000 D	NRDCSCC	4
P49-SS7-A	SS	0.0-0.5	Benzo[a]pyrene	54.000 JD	NRDCSCC	0.66
P49-SS7-A	SS	0.0-0.5	Benzo[b]fluoranthene	75.000 D	NRDCSCC	4
P49-SS7-A	SS	0.0-0.5	Benzo[k]fluoranthene	29.000 JD	NRDCSCC	4
P49-SS7-A	SS	0.0-0.5	Chrysene	79.000 D	NRDCSCC	40
P49-SS7-A	SS	0.0-0.5	Dibenz[a,h]anthracene	2.6000	NRDCSCC	0.66
P49-SS7-A	SS	0.0-0.5	Indeno[1,2,3-cd]pyrene	18.000 JD	NRDCSCC	4

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SS8-A	SS	0.0-0.5	Benzo[a]pyrene	2.600	NRDCSCC	0.66
P49-SS8-A	SS	0.0-0.5	Aroclor 1260	8.85	NRDCSCC	2

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SS9-A	SS	0.0-0.5	Benzo[a]anthracene	10.000 JD	NRDCSCC	4
P49-SS9-A	SS	0.0-0.5	Benzo[a]pyrene	9.600	NRDCSCC	0.66
P49-SS9-A	SS	0.0-0.5	Benzo[b]fluoranthene	9.200 JD	NRDCSCC	4
P49-SS9-A	SS	0.0-0.5	Benzo[k]fluoranthene	6.200	NRDCSCC	4
P49-SS9-A	SS	0.0-0.5	Dibenz[a,h]anthracene	1.300	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P49-SB4-A	SB	0.0-0.5	Benzo[a]pyrene	2.200	NRDCSCC	0.66

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil and Groundwater Sample Location
- Surface and Subsurface Soil Sample Location
- Sediment Sample Location
- Groundwater Sample Location at Existing Monitoring Well
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 75 150 300 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.10-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 49 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_10-1_SI_P49_Exceeds_SampLoc.mxd (7/14/2008 12:27:27 PM)

3.11 Parcel 50 – IRP Sites FTMM-54, FTMM-55, and FTMM-61

3.11.1 Site Description

Site FTMM-54 is a former fuel distribution facility on the MP which was abandoned. The tanks and distribution piping were rediscovered during a renovation project at Bldg 296. The facility dates back to the 1940s and is located on Sherrill Avenue. The UST system was comprised of ten 1,000-gallon tanks which stored various types of fuel products. These products were distributed from remote pumping islands located over 450 ft from the UST field and within 50 ft of Parkers Creek (a sensitive estuarine marsh area).

FTMM-55 is the site of a former UST system which was located at Bldg 290. The site formerly served as a motor pool for a military unit that has since left FTMM.

Site FTMM-61 is located off of Sherrill Avenue in the northern section of the MP. On August 28, 1997, a 3,000-gallon steel UST (No. 0081533- 229) was removed. The tank was used to store gasoline. The UST was located within the courtyard of Bldg 283. Additional information pertaining to this parcel can be found in Section 5.2.1.1, Table 5-10, Section 5.13.2, and Appendix G of the Phase I ECP (1).

3.11.2 Previous Investigations

The Bldg 296 site, the Bldg 290 site, and the M-18 Landfill are located in close proximity to one another (44). Due to the close proximity, the RI results for all three sites were reported in one RI Report. This report, submitted to the NJDEP in October 2003, presents a groundwater flow and transport model to evaluate the migration of benzene and metals in groundwater.

<u>FTMM-54: Bldg 296</u>. Between November and December 1993, the previously unknown fuel distribution system was removed and the source of contamination was eliminated. Benzene and lead were detected in site monitoring wells above NJDEP GWQC. An NFA determination was requested for this site. Currently, as part of the monitoring program, seven groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue compliance monitoring of seven groundwater monitoring wells.

<u>FTMM-55: Bldg 290</u>. The UST tanks at this location were used to store gasoline and they were both removed on September 2, 1994. On July 2, 1996, a construction activity identified gasoline-contaminated soil within 50 ft of the former UST site. Soils were removed and disposed of in accordance with NJDEP requirements. Additional soil and groundwater samples were collected in March 1998 to further delineate the area of contamination. No additional contaminated soils were identified within the AOC. Arsenic and lead were detected in site monitoring wells above NJDEP GWQC. An NFA determination was requested for this site. The cleanup strategy is to continue compliance monitoring of two groundwater monitoring wells.

FTMM-61: Bldg 283. Approximately 400 cubic yards of contaminated soil (associated with the removed UST) were removed and disposed of in accordance with NJDEP requirements. Benzene, ethyl benzene, toluene, and lead were detected above the NJDEP GWQC. The cleanup strategy is to inject ORC for 2 years and continue compliance monitoring of groundwater (six wells quarterly) and surface water. This is a key component of monitored natural attenuation. ORC injection is anticipated for 2008 and 2009. Injection of ORC is subject to requirements pursuant to N.J.A.C 7:26E-4.1(a)4 and N.J.A.C. 7:26E-6.3(c) related to the performance of a pilot study and approval of a permit-by-rule.

3.11.3 Site Investigation Sampling

Through previous investigations conducted under the IRP, groundwater VO contamination has been identified in close proximity to Bldg 283. All groundwater is currently being addressed under the IRP. However, Bldg 283 is a two-story building with a basement and totals approximately 76,500 square feet in size. The footprint of Bldg 283 covers approximately 50,000 square feet. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs. In the case of the presence of petroleum hydrocarbon contamination (particularly BTEX), a 30-ft distance criterion is utilized (12). BTEX contaminants have been detected above the GWSLs within 30 ft of the Bldg 283. Therefore, VI at Bldg 283 was evaluated through the collection of near-slab soil gas samples and indoor air samples. No sub-slab soil gas samples were collected at Bldg 283 due to the observation of groundwater intrusion within the basement during the 2006 VSI.

See **Table 3.11-1** for a summary of proposed field activities and **Figure 3.11-1** for sample locations. An analytical summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.11-2**.

Table 3.11-1
Parcel 50 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
50SG-1 through 50SG-5 (5 samples)	Near-slab soil gas	Five near-slab soil gas samples were collected at Bldg 283. Groundwater flow direction is to the northwest, and VOs have been detected above GWSLs in groundwater within the courtyard area of Bldg 283 and near the northwestern corner of the building. Therefore, four sample locations were biased to the walls of Bldg 283 on the northwest side of the courtyard (50SG-1:4), and one was biased to the northwestern corner of the building (50SG-5).	NJDEP – SRWM USEPA TO-15 Method

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
50IA-1 through 50IA-10 (10 samples – includes 1 duplicate sample)	Indoor air	Nine indoor air samples were collected from within Bldg 283. One additional ambient air sample was collected from outside the building. Sample locations were biased towards potential source areas and potential migration pathways.	NJDEP – SRWM USEPA TO-15 Method

3.11.4 Site Investigation Results

A total of 25 VOs were detected in soil gas samples (**Table 3.11-3**) collected in Parcel 50. Of the 25 VOs detected, two (benzene and PCE) equaled and/or exceeded NJDEP Soil Gas NRSs for soil gas samples. Benzene was detected in two of the five soil gas samples at a concentration equal to the NRS of 26 $\mu g/m^3$ (samples 50SG-2 and 3). PCE was detected in two of the five soil gas samples at concentrations greater than the NRS of 36 $\mu g/m^3$; ranging from 97.6 $\mu g/m^3$ in sample 50SG-1 to 144 $\mu g/m^3$ in sample 50SG-5.

A total of 23 VOs were detected at concentrations below NJDEP Indoor Air NRSs in indoor air samples collected in Bldg 283 (**Table 3.11-4**).

3.11.5 Summary and Conclusions

No constituents were identified above applicable NJDEP criteria in indoor air samples collected from Bldg 283. Two VOs, benzene and PCE, equaled and/or exceeded NJDEP Soil Gas NRSs in soil gas at Parcel 50. Based on NJDEP VI guidance (12), one additional round of indoor air sampling is recommended to confirm constituents are not present above criteria in indoor air at Bldg 283.

Table 3.11-2
Parcel 50 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
IA	CANISTER	50IA-1	12/09/07	11:50	--	--		X							
IA	CANISTER	50IA-2	12/09/07	11:51	--	--		X							
IA	CANISTER	50IA-3	12/09/07	11:52	--	--		X							
IA	CANISTER	50IA-4	12/09/07	12:05	--	--		X							
IA	CANISTER	50IA-5	12/09/07	12:07	--	--		X							
IA	CANISTER	50IA-6	12/09/07	12:12	--	--		X							
IA	CANISTER	50IA-7	12/09/07	12:30	--	--		X							
IA	CANISTER	50IA-8	12/09/07	12:25	--	--		X							
IA	CANISTER	50IA-8 DUPLICATE	12/09/07	12:25	--	--		X							
IA	CANISTER	50IA-9	12/09/07	12:20	--	--		X							
BLANK	AMBIENT	50IA-AMBIENT	12/09/07	12:33	--	--		X							
SG	CANISTER	50SG-1	12/12/07	13:45	5.0	5.0		X							
SG	CANISTER	50SG-2	12/12/07	14:25	5.0	5.0		X							
SG	CANISTER	50SG-3	12/12/07	15:05	5.0	5.0		X							
SG	CANISTER	50SG-4	12/12/07	15:55	5.0	5.0		X							
SG	CANISTER	50SG-5	12/12/07	12:40	5.0	5.0		X							

X = Sample analyzed for the indicated analytical parameter suite

Table 3.11-3
Fort Monmouth ECP Site Investigation, Parcel 50
Summary of Analytical Parameters Detected in Indoor Air (µg/m^3)

			Analytical Results					
		Sample ID:	50IA-1	50IA-2	50IA-3	50IA-4	50IA-5	50IA-6
		Lab ID:	J78674-1	J78674-2	J78674-3	J78674-4	J78674-5	J78674-6
		Date Sampled:	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07
Chemical	RAL[3]	IA Non-residential[2]	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	6,600	4,600	**4.5**	**4.3**	**11**	**8.1**	**7.8**	**7.1**
Benzene	14	2	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.1**
Chloromethane	NLE	130	**0.97**	**0.95**	**1.0**	**1.0**	**1.0**	**1.0**
Dichlorodifluoromethane	NLE	260	**2.2**	**2.2**	**2.5**	**2.3**	**2.4**	**2.3**
Dichloromethane	400	9	**1.1**	**0.52 J**	**0.80**	**0.49 J**	**0.52 J**	**0.52 J**
Ethanol	NLE	NLE	**4.7**	**6.2**	**4.1**	**18**	**16**	**14**
Ethyl Acetate	NLE	NLE	<0.3	**2.7**	**4.0**	**1.8**	<0.3	<0.3
Ethylbenzene	2,200	1,500	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
n-Heptane	NLE	NLE	<0.13	<0.13	<0.13	**0.61 J**	**0.57 J**	<0.13
Isopropyl Alcohol	NLE	NLE	**0.76**	**0.64**	**1.1**	**2.3**	**15**	**12**
Methyl ethyl ketone	NLE	7,200	**0.41 J**	**0.53 J**	**1.4**	**0.86**	**0.94**	**0.94**
Propylene	NLE	NLE	**2.1**	**1.9**	**2.2**	<0.12	<0.12	<0.12
Tetrahydrofuran	NLE	NLE	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	10,000	7,200	**2.0**	**2.1**	**1.9**	**2.1**	**2.1**	**2.2**
1,1,1-Trichloroethane	NLE	1,400	<0.27	<0.27	<0.27	**0.87 J**	<0.27	<0.27
1,1,2-Trichloro-1,2,2-trifluoroethane	NLE	44,000	<0.25	<0.25	**0.77 J**	<0.25	<0.25	<0.25
Trichloroethylene	20	3	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16
Trichlorofluoromethane	NLE	1,000	**1.3**	**1.2**	**1.3**	**1.5**	**2.0**	**2.0**
1,2,4-Trimethylbenzene	NLE	NLE	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,3,5-Trimethylbenzene	NLE	NLE	<0.088	<0.088	<0.088	<0.088	<0.088	<0.088
o-Xylene	NLE	NLE	**0.61 J**	**0.43 J**	**0.43 J**	**0.37 J**	<0.096	**0.48 J**
Xylenes (m&p)	NLE	NLE	**1.4**	**1.1**	**1.2**	**1.0**	**0.96**	**1.2**
Xylenes (total)	220	150	**2.0**	**1.6**	**1.7**	**1.4**	**0.96**	**1.7**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

[3] NJDEP Rapid Action Levels for Indoor Air, March 2007.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.

Table 3.11-3
Fort Monmouth ECP Site Investigation, Parcel 50
Summary of Analytical Parameters Detected in Indoor Air (µg/m^3)

			Analytical Results				
		Sample ID:	50IA-7	50IA-8	50IA-8 DUP	50IA-9	50IA-AMBIENT
		Lab ID:	J78674-7	J78674-8	J78674-9	J78674-10	J78674-20
		Date Sampled:	12/09/07	12/09/07	12/09/07	12/09/07	12/09/07
Chemical	RAL[3]	IA Non-residential[2]	Result	Result	Result	Result	Result
Volatiles							
Acetone	6,600	4,600	**8.3**	**6.9**	**4.0**	**7.8**	**4.5**
Benzene	14	2	**1.2**	**1.2**	**1.2**	**1.1**	**1.2**
Chloromethane	NLE	130	**1.0**	**1.1**	**1.1**	**1.2**	**1.1**
Dichlorodifluoromethane	NLE	260	**2.3**	**2.3**	**2.6**	**2.7**	**2.7**
Dichloromethane	400	9	**0.52 J**	**0.52 J**	**0.49 J**	**0.56 J**	**0.76**
Ethanol	NLE	NLE	**18**	**6.2**	**3.2**	**19.2**	**5.7**
Ethyl Acetate	NLE	NLE	**2.6**	**2.5**	**4.7**	<0.3	**1.4**
Ethylbenzene	2,200	1,500	**0.78 J**	<0.083	<0.083	**0.42 J**	<0.083
n-Heptane	NLE	NLE	**0.49 J**	<0.13	**0.40 J**	**0.49 J**	<0.13
Isopropyl Alcohol	NLE	NLE	**2.1**	**1.7**	<0.15	**2.7**	**0.76**
Methyl ethyl ketone	NLE	7,200	**2.2**	**0.77**	**0.56 J**	**0.97**	**0.68**
Propylene	NLE	NLE	<0.12	<0.12	**2.2**	<0.12	**2.2**
Tetrahydrofuran	NLE	NLE	**0.83**	<0.2	<0.2	<0.2	<0.2
Toluene	10,000	7,200	**3.4**	**2.0**	**1.9**	**2.1**	**2.0**
1,1,1-Trichloroethane	NLE	1,400	<0.27	<0.27	<0.27	<0.27	<0.27
1,1,2-Trichloro-1,2,2-trifluoroethane	NLE	44,000	<0.25	<0.25	<0.25	<0.25	<0.25
Trichloroethylene	20	3	<0.16	<0.16	<0.16	<0.16	**0.64 J**
Trichlorofluoromethane	NLE	1,000	**2.4**	**1.3**	**1.4**	**2.6**	**1.4**
1,2,4-Trimethylbenzene	NLE	NLE	**2.1**	<0.1	<0.1	**1.2**	<0.1
1,3,5-Trimethylbenzene	NLE	NLE	**0.48 J**	<0.088	<0.088	<0.088	<0.088
o-Xylene	NLE	NLE	**1.1**	**0.40 J**	**0.40 J**	**0.43 J**	**0.40 J**
Xylenes (m&p)	NLE	NLE	**2.7**	**1.0**	**1.1**	**1.3**	**1.1**
Xylenes (total)	220	150	**3.9**	**1.4**	**1.5**	**1.7**	**1.5**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Indoor Air Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

[3] NJDEP Rapid Action Levels for Indoor Air, March 2007.

J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected

Shaded = Concentration exceeds of IA Nonresidential.

Table 3.11-4
Fort Monmouth ECP Site Investigation, Parcel 50
Summary of Analytical Parameters Detected Soil Gas (ug/m^3)

		Analytical Results				
	Sample ID:	50SG-1	50SG-2	50SG-3	50SG-4	50SG-5
	Lab ID:	J79249-6	J79249-7	J79249-8	J79249-9	J79249-5
	Date Sampled:	12/12/07	12/12/07	12/12/07	12/12/07	12/12/07
	Depth (ft. bgs):	5'	5'	5'	5'	5'
Chemical	SG Non-residential[2]	Result	Result	Result	Result	Result
Volatiles						
Acetone	230,000	**102**	**40.6**	**60.6**	**14**	**24.5**
Benzene	26	**22**	**26**	**26**	<0.7	<0.7
Carbon disulfide	51,000	**6.2**	**4.7 J**	**4.4 J**	**3.4 J**	**6.5**
Cyclohexane	430,000	**6.2**	**11**	**6.9**	<1.2	<1.2
Ethanol	NLE	**50.3**	<2.3	**26.6**	**34.3**	**25.4**
Ethylbenzene	74,000	**8.3**	**6.1 J**	**4.8 J**	<0.65	**3.6 J**
4-Ethyltoluene	NLE	**6.4 J**	<0.69	<0.69	<0.69	<0.69
n-Heptane	NLE	**20**	**32**	**32**	<0.98	<0.98
n-Hexane	51,000	**40.9**	**79.3**	**56.0**	<0.99	<0.99
2-Hexanone	NLE	**4.9 J**	<1.6	<1.6	<1.6	<1.6
Isopropyl Alcohol	NLE	**5.7**	<1.2	<1.2	<1.2	**9.8**
4-Methyl-2-pentanone (MIBK)	220,000	**8.2**	<0.82	<0.82	<0.82	<0.82
Methyl ethyl ketone	360,000	**4.7**	<0.91	<0.91	<0.91	<0.91
Methyl tertiary butyl ether (MTBE)	180	**6.1**	<1.3	<1.3	<1.3	<1.3
Propylene	NLE	**15**	**20.4**	**14**	**5.7 J**	**12**
Tertiary Butyl Alcohol	4,600	<1.1	<1.1	<1.1	**3.0 J**	<1.1
Tetrachloroethylene	36	**97.6**	**9.5 J**	**14**	<1.3	**144**
Toluene	360,000	**55.8**	**62.6**	**56.9**	**8.7**	**8.7**
Trichloroethylene	27	<1.3	**9.7**	<1.3	<1.3	**26**
1,2,4-Trimethylbenzene	NLE	**35**	**7.4 J**	<0.84	**6.4 J**	**17**
1,3,5-Trimethylbenzene	NLE	**7.9**	<0.69	<0.69	<0.69	<0.69
2,2,4-Trimethylpentane	NLE	**22**	**38**	**34**	**8.4**	<0.75
Xylenes (m&p)	NLE	**36**	**24**	**20**	**7.8**	**18**
o-Xylene	NLE	**13**	**8.3**	**6.9**	<0.74	**7.4**
Xylenes (total)	7,700	**49.5**	**32**	**27**	**7.8**	**25**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

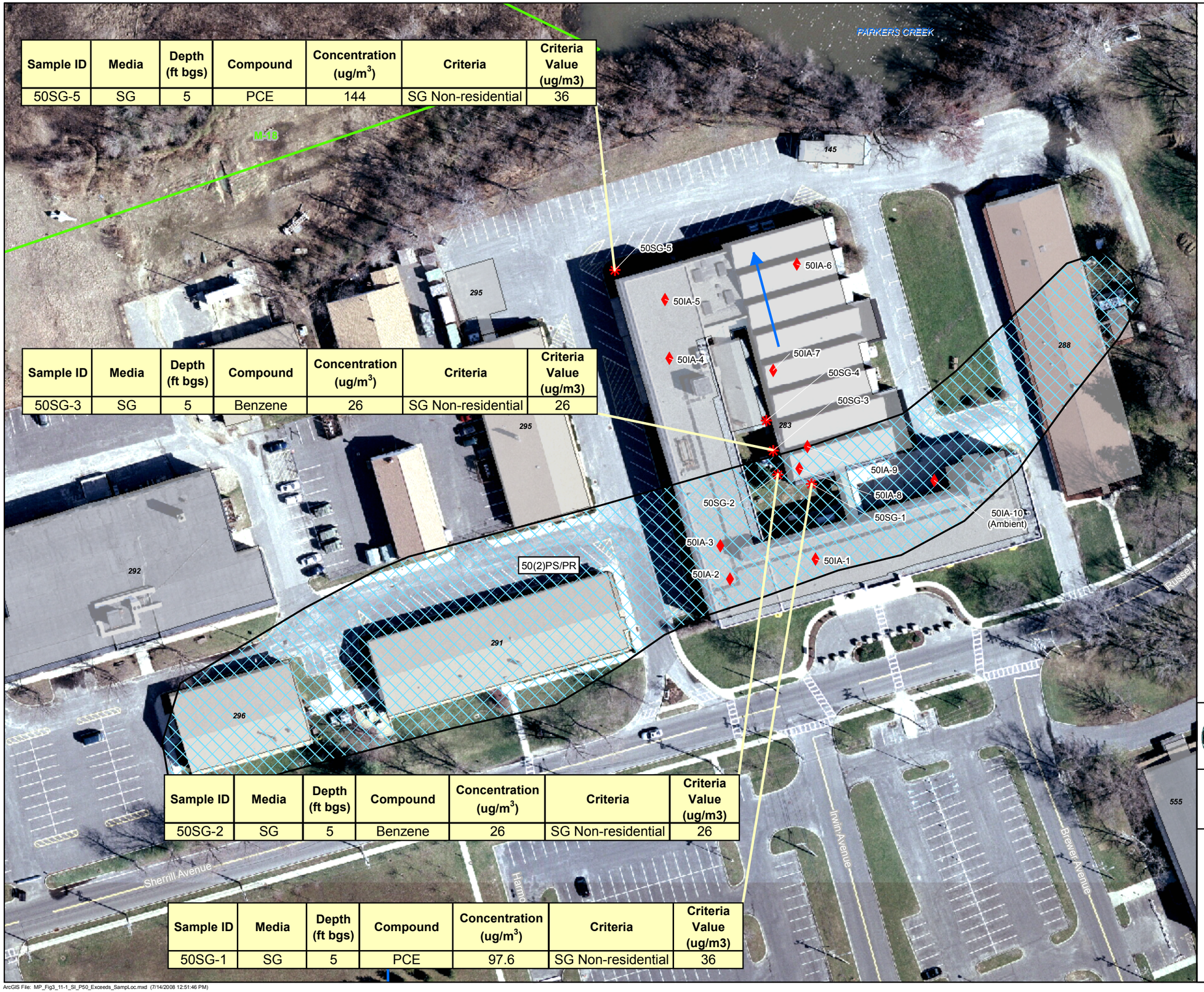
J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected.

Shaded = Concentration exceeds SG Nonresidential.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
50SG-5	SG	5	PCE	144	SG Non-residential	36

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
50SG-3	SG	5	Benzene	26	SG Non-residential	26

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
50SG-2	SG	5	Benzene	26	SG Non-residential	26

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
50SG-1	SG	5	PCE	97.6	SG Non-residential	36

LEGEND

- Soil-Gas Sample Location
- Indoor Air Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 — Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:
0 37.5 75 150 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3.11-1

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 50 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_11-1_SI_P50_Exceeds_SampLoc.mxd (7/14/2008 12:51:46 PM)

3.12 Parcel 51 – 750 Area, 500 Area, 600 Area, 1100 Area – Former Buildings

3.12.1 Site Description

Parcel 51 is located in the central portion of the MP and encompasses the 500 Area, 600 Area, 750 Area, and 1100 Area former buildings. Plan No. 506, "Gas and Fuel Storage Tanks Distribution System" dated January 22, 1956 (**Appendix G**), was reviewed for the MP as part of the Phase I ECP. The plan depicts numerous fuel oil USTs that existed within Parcel 51 in 1956 in association with the former buildings. Additional information pertaining to this parcel can be found in Section 4.4.3.2, Section 4.4.4.2, Section 4.4.4.3, Section 5.1.1.2.1, Section 5.2.1.1, Section 5.4, Section 5.4.2, and Appendix G of the Phase I ECP (1).

3.12.2 Previous Investigations

Numerous USTs associated with former and current buildings within the 500, 600, and 1100 Area have been removed under the FTMM UST program and are summarized within the FTMM Phase I ECP Report (1). A review of documented UST removal locations versus the location of former buildings within Parcel 51 was conducted. Based on this review, it was determined that no UST removals have been documented at the locations of numerous former buildings within Parcel 51 throughout the 750 Area (current motor pool), within the northern portion of the 1100 Area, and around the east and south perimeter of the 600 Area.

A soil investigation and remedial action was recently conducted in portions of the 400, 700, and 800 Bldg areas. The only portion of Parcel 51 that was included within this investigation was the southwestern corner of the parcel associated with Bldgs 787, 788, and 789 (34).

3.12.3 Site Investigation Sampling

In order to determine the absence/presence of formerly utilized USTs and the potential release from the USTs, geophysical surveys, soil sampling, and groundwater sampling were conducted throughout the 750 Area (current motor pool), within the northern portion of the 1100 Area, and around the east and south perimeter of the 600 Area.

Geophysical Investigation

An EM survey was conducted throughout the three identified former buildings areas to determine if USTs are present. Follow-up GPR surveys were conducted at anomalies identified from the EM surveys. **Section 2.1** summarizes the methodologies utilized during the geophysical surveys.

Geoprobe® Investigation

Geoprobe® soil samples were collected in October and November 2007, and groundwater samples were collected in November 2007 in Parcel 51 in order to investigate potential releases from historic USTs associated with the former 600, 750, and 1100 Area buildings. A total of 122 surface soil and 136 subsurface soil (including 12 duplicate samples) were collected from 122 distinct Geoprobe® borings (**Figure 3.12-1**). Soil boring locations were conducted on 100-ft centers. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch bgs interval. Subsurface soil samples were collected from the 6-inch interval directly above the water table from each boring. Due to high water table conditions encountered at three boring locations (grid locations G11, I6, and K7), subsurface soil samples were collected from the 18- to 24-inch bgs interval. No additional VO sample was collected as the sample interval coincided with the 18- to 24-inch surface soil VO sampling interval. Field screening of the soil boring cores was conducted using a PID and FID meter. Olfactory evidence of impacted soil was noted 6 ft bgs at boring location P51-G12. Two additional soil samples were collected based on elevated results from field screening tests at boring location 51-G12.

A total of 26 groundwater samples (including four duplicate samples) were collected from 22 distinct temporary wells (**Figure 3.12-1**). Temporary wells were installed along the downgradient boundaries of the soil boring grids and constructed of PVC and 5 ft of factory-slotted screen.

Table 3.12-1 presents a summary of field activities, and sample locations are provided on **Figure 3.12-1**. A summary of the analytical and sampling program, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.12-2**.

Table 3.12-1
Parcel 51 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
Former Buildings Areas (11 Acres)	A geophysical survey was conducted in three areas throughout the parcel to determine the presence/absence of USTs associated with former buildings. The geophysical investigations consisted of an EM survey followed by targeted GPR surveys of anomalies identified by the EM survey. One survey was conducted around the east and south perimeter of the 600 Area to investigate potential USTs not addressed under previous removals and investigations; one survey was conducted in the footprint of former buildings in the 1100 Area; and one survey was conducted in the footprint of former buildings in the 750 Area (current motor pool) not addressed as part of the 700 Residential Communities Initiative project.		

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
51SS-A10 through 51SS-I12 (51 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft center) to investigate the potential release from former heating oil USTs associated with the former buildings around the eastern and southern perimeter of the 600 Area. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
51SB-A10 through 51SB-I12 (57 samples – includes 4 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 2.5 to 8 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former buildings around the eastern and southern perimeter of the 600 Area. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
51SS-J1 through 51SS-K9 (18 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft center) to investigate the potential release from former heating oil USTs associated with the former buildings in the 1100 Area (former Bldgs 1111 through 1118). If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
51SB-J1 through 51SB-K9 (20 samples – includes 2 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 2.5 to 9 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former buildings in the 1100 Area (former Bldgs 1111 through 1118). Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
51SS-L1 through 51SS-R9 (53 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft center) to investigate the potential release from former heating oil USTs associated with the former buildings in the 750 Area. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
51SB-L1 through 51SB-R9 (59 samples – includes 6 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 1 to 14.5 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former buildings southwest of Bldg 2700. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
51GW-A10, A12, C12, E12, G12, I1, I3, I5, I10, I12, K1, K3, K5, K7, K9, L9, N9, P9, R3, R5, R7, R9 (26 samples – includes 4 duplicate samples)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings in the grid to investigate the potential release from former heating oil USTs associated with the former buildings.	VO+10, B/N+15

3.12.4 Site Investigation Results

Geophysical Survey Results

The EM survey identified a total of 74 target EM anomalies in the 750 Area. The survey areas are presented on **Figure 3.12-2**. This area was scanned with the EM-61 because of a large amount of surface metal, and the parking lots which comprise most of the area could only be cordoned off in small portions. The EM-61 towing rig was better suited for the necessary tight turns. Several areas in this parcel were scanned with the TW-6 only due to interference of the GPS signal by nearby buildings and trees and the presence of parked cars during the EM survey. No anomalies indicative of USTs were located within the TW-6 scanning areas. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.12-3**, and full results of the geophysical surveys are included in **Appendix A**. Targets located on the asphalt-covered portions within the 750 Area could not be scanned with the TW-6 due to suspected high metal content fill material; therefore, only GPR was utilized in these areas. In summary, GPR scanning of the 74 targets in the 750 Area revealed:

- Thirty-four targets that were associated with surface metal/debris (previously unaccounted for).
- Seven targets with moderate-amplitude near-surface point target reflections indicative of small buried debris; not indicative of USTs.
- Six targets with the moderate-amplitude parabolic scattered reflections indicative of scattered small debris.
- Three targets that are suspected to be associated with nearby utility features.
- Three targets with the characteristics of a utility.

- Eleven targets that could not be relocated with the TW-6 because the targets were too small to be re-occupied, and therefore are most likely scrap metallic debris, not USTs.

- One target scanned with GPR only, no GPR anomaly associated with EM anomaly.

- Nine targets with the high-amplitude parabolic reflections indicating a possible UST. The suspected USTs match up with former Bldgs 758, 759, 763, 764, 767, 768, 769, 771, and 790. Said buildings served as schools/general instrument buildings, non-housing structures, until the end of their life cycles. Supporting real property records are included in **Appendix I**.

The geophysical surveys identified a total of 49 target EM anomalies in the 600 and 1100 Areas. The survey areas are presented on **Figure 3.12-2**. Several locations were scanned with the TW-6 due to the presence of parked cars during the main EM survey; however, no TW-6 anomalies were detected. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.12-4**, and full results of the geophysical surveys are included in **Appendix A**. In summary, GPR scanning of the 49 targets revealed:

- Twenty-two targets that were associated with surface metal/debris (previously unaccounted for).

- Thirteen targets that could not be relocated with the TW-6 because the targets were terrain conductivity anomalies not associated with metallic objects, and therefore are not USTs.

- Six targets with the characteristics of a utility.

- Five targets with moderate-amplitude near-surface reflections indicative of small buried debris; not indicative of a UST.

- Two targets in the 1100 Area with the high-amplitude parabolic reflections indicating a possible UST. The suspected USTs match up with former Bldgs 1111 and 1112. Said buildings served as schools/general instrument buildings, non-housing structures, until the end of their life cycles. Supporting real property records are included in **Appendix I**.

- One target resulted from a parked car that was later scanned with TW-6 and with no resulting anomalies.

This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. A total of 11 suspected USTs were identified within Parcel 51 (nine in the 750 Area and two in the 1100 Area); the location of the suspected USTs is presented on **Figure 3.12-2**.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis. Groundwater samples were analyzed for VO+10 and B/N+15.

Soil

In addition to the subsurface soil samples collected from the interval directly above the water table, two supplementary subsurface soil samples, P51-G12-D and P51-G12-D-DUP, were collected for TPHC and contingent VO analysis based on elevated field screening measurements. As shown in **Table 3.12-5**, TPHC was detected in 41 of the 122 surface soil samples and in 18 of the 137 subsurface soil samples. A total of six subsurface soil samples, P51-G12-D;DUP, P51-H12-C, P51-N3-C, and P51-O7-C;DUP, contained TPHC at concentrations greater than 1,000 mg/kg, and VO analysis was conducted (**Table 3.12-6**). No VOs or TPHC were detected in soil above the NJDEP NRDCSCC.

Groundwater

As presented in **Table 3.12-7**, a total of 11 VOs were detected at concentrations below NJDEP GWQC in groundwater samples collected from temporary wells at Parcel 51.

A total of eight B/Ns were detected in Parcel 51 groundwater samples. Of the eight B/Ns detected, two (2-methylnaphthalene and bis[2-ethylhexyl]phthalate) were detected at concentrations that exceeded NJDEP GWQC. 2-Methylnaphthalene was detected at a concentration exceeding the NJDEP GWQC of 30 μg/L in one groundwater sample (P51-G12) at a concentration of 40.51 μg/L and is considered a COC in groundwater. Bis(2-ethylhexyl)phthalate was detected at a concentration exceeding the NJDEP GWQC of 3 μg/L in three groundwater samples at concentrations ranging from 3.49 μg/L in P51-P9 to 4.47 μg/L in P51-K7. Bis(2-ethylhexyl)phthalate is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected in the field blank associated with the Parcel 51 groundwater samples. Therefore, it is not considered a COC in groundwater at Parcel 51.

3.12.5 Summary and Conclusions

Eleven suspected USTs were identified during the geophysical survey. No constituents were identified above applicable NJDEP criteria in surface or subsurface soil. Soil and analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for soil and the suspected USTs in Parcel 51 is recommended.

One COC, 2-methylnaphthalene, was detected in groundwater above the NJDEP GWQC. Further evaluation of 2-methylnaphthalene in groundwater is recommended.

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	10/31/07	-	--	--	X								
SOIL	GEOPROBE	Duplicate	10/31/07	-	--	--									Sample on chain, but not received by lab. No duplicate sample for this day.
SOIL	GEOPROBE	P51-I11-A	10/31/07	7:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-I11-B	10/31/07	7:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I11-C	10/31/07	8:05	3.5	4.0	X								
SOIL	GEOPROBE	P51-I9-A	10/31/07	8:25	0.0	0.5	X								
SOIL	GEOPROBE	P51-I9-B	10/31/07	8:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I9-C	10/31/07	8:30	3.5	4.0	X								
SOIL	GEOPROBE	P51-I8-A	10/31/07	9:35	0.0	0.5	X								
SOIL	GEOPROBE	P51-I8-B	10/31/07	9:35	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I8-C	10/31/07	9:40	3.5	4.0	X								
SOIL	GEOPROBE	P51-I7-A	10/31/07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-I7-B	10/31/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I7-C	10/31/07	10:00	2.0	2.5	X								
SOIL	GEOPROBE	P51-I6-A	10/31/07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-I6-B	10/31/07	10:50	1.5	2.0	X								
SOIL	GEOPROBE	P51-I4-A	10/31/07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-I4-B	10/31/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I4-C	10/31/07	11:25	2.0	2.5	X								
SOIL	GEOPROBE	P51-I2-A	10/31/07	11:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-I2-B	10/31/07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I2-C	10/31/07	11:45	5.5	6.0	X								
SOIL	GEOPROBE	P51-H12-A	10/31/07	13:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-H12-B	10/31/07	13:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H12-C	10/31/07	14:00	4.0	8.0	X	X							
SOIL	GEOPROBE	P51-H11-A	10/31/07	14:20	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-H11-B	10/31/07	14:20	1.5	2.0	NA								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-H11-C	10/31/07	14:30	4.5	5.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-H10-A	10/31/07	14:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-H10-B	10/31/07	14:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H10-C	10/31/07	15:00	3.5	4.0	X								
BLANK	FIELD	FIELD BLANK-SO	10/31/07	15:05	--	--	X	X							
SOIL	GEOPROBE	P51-H9-A	10/31/07	15:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-H9-B	10/31/07	15:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H9-C	10/31/07	15:25	5.0	5.5	X								
SOIL	GEOPROBE	P51-H8-A	10/31/07	15:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-H8-B	10/31/07	15:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H8-C	10/31/07	15:45	3.5	4.0	X								
SOIL	GEOPROBE	P51-H7-A	10/31/07	15:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-H7-B	10/31/07	15:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H7-C	10/31/07	16:00	3.0	3.5	X								
SOIL	GEOPROBE	P51-H6-A	10/31/07	16:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-H6-B	10/31/07	16:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H6-C	10/31/07	16:20	3.5	4.0	X								
BLANK	TRIP	TRIP BLANK-SO	11/01/07	-	--	--	NA								
SOIL	GEOPROBE	P51-H5-A	11/01/07	8:30	0.0	0.5	X								
SOIL	GEOPROBE	P51-H5-B	11/01/07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H5-C	11/01/07	8:50	5.0	5.5	X								
SOIL	GEOPROBE	P51-H4-A	11/01/07	9:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-H4-B	11/01/07	9:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H4-C	11/01/07	9:20	5.0	5.5	X								
SOIL	GEOPROBE	P51-H3-A	11/01/07	9:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-H3-B	11/01/07	9:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H3-C	11/01/07	9:50	2.0	2.5	X								
SOIL	GEOPROBE	P51-H2-A	11/01/07	10:00	0.0	0.5	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-H2-B	11/01/07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H2-C	11/01/07	10:10	5.5	6.0	X								
SOIL	GEOPROBE	P51-H1-A	11/01/07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-H1-B	11/01/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-H1-C	11/01/07	11:25	3.0	3.5	X								
SOIL	GEOPROBE	P51-G11-A	11/01/07	13:25	0.0	0.5	X								
SOIL	GEOPROBE	P51-G11-B	11/01/07	13:25	1.5	2.0	X								
SOIL	GEOPROBE	P51-G10-A	11/01/07	13:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-G10-B	11/01/07	13:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-G10-C	11/01/07	14:00	3.5	4.0	X								
SOIL	GEOPROBE	P51-G9-A	11/01/07	14:05	0.0	0.5	X								
SOIL	GEOPROBE	P51-G9-B	11/01/07	14:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-G9-C	11/01/07	14:15	3.0	3.5	X								
SOIL	GEOPROBE	P51-G8-A	11/01/07	14:30	0.0	0.5	X								
SOIL	GEOPROBE	P51-G8-B	11/01/07	14:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-G8-C	11/01/07	14:40	4.5	5.0	X								
SOIL	GEOPROBE	P51-G7-A	11/01/07	15:05	0.0	0.5	X								
SOIL	GEOPROBE	P51-G7-B	11/01/07	15:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-G7-C	11/01/07	15:25	4.5	5.0	X								
SOIL	GEOPROBE	P51-G7-C DUPLICATE	11/01/07	15:25	4.5	5.0	X								
BLANK	FIELD	FIELD BLANK-SO	11/01/07	15:30	--	--	X								
BLANK	TRIP	TRIP BLANK-SO	11/02/07	-	--	--	NA								
SOIL	GEOPROBE	P51-F12-A	11/02/07	8:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-F12-B	11/02/07	8:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-F12-C	11/02/07	8:30	3.5	4.0	X								
SOIL	GEOPROBE	P51-F11-A	11/02/07	8:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-F11-B	11/02/07	8:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-F11-C	11/02/07	9:00	4.5	5.0	X								
SOIL	GEOPROBE	P51-F10-A	11/02/07	9:25	0.0	0.5	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-F10-B	11/02/07	9:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-F10-C	11/02/07	9:35	3.5	4.0	X								
SOIL	GEOPROBE	P51-F9-A	11/02/07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-F9-B	11/02/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-F9-C	11/02/07	10:05	5.0	5.5	X								
SOIL	GEOPROBE	P51-F8-A	11/02/07	11:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-F8-B	11/02/07	11:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-F8-C	11/02/07	11:30	5.0	5.5	X								
SOIL	GEOPROBE	P51-F7-A	11/02/07	11:35	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-F7-B	11/02/07	11:35	1.5	2.0	NA								
SOIL	GEOPROBE	P51-F7-C	11/02/07	13:55	5.5	6.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-E11-A	11/02/07	14:25	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-E11-B	11/02/07	14:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-E11-C	11/02/07	14:40	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-E11-C DUPLICATE	11/02/07	14:40	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK-SO	11/02/07	14:45	--	--	X								
SOIL	GEOPROBE	P51-E10-A	11/02/07	15:05	0.5	1.0	X								
SOIL	GEOPROBE	P51-E10-B	11/02/07	15:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-E10-C	11/02/07	15:10	3.5	4.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-D12-A	11/02/07	15:35	0.0	0.5	X								
SOIL	GEOPROBE	P51-D12-B	11/02/07	15:35	1.5	2.0	X								TPHC not necessary for this sample.

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-D12-C	11/02/07	15:40	2.0	2.5	X								
SOIL	GEOPROBE	P51-D11-A	11/02/07	15:55	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-D11-B	11/02/07	15:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-D11-C	11/02/07	16:20	5.5	6.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK-SO	11/05/07	-	--	--	NA								
SOIL	GEOPROBE	P51-I12-A	11/05/07	8:30	0.0	0.5	X								
SOIL	GEOPROBE	P51-I12-B	11/05/07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I12-C	11/05/07	8:40	3.0	3.5	X								
SOIL	GEOPROBE	P51-I10-A	11/05/07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-I10-B	11/05/07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I10-C	11/05/07	9:20	3.5	4.0	X								
SOIL	GEOPROBE	P51-I5-A	11/05/07	9:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-I5-B	11/05/07	9:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I5-C	11/05/07	9:55	3.5	4.0	X								
SOIL	GEOPROBE	P51-I3-A	11/05/07	10:35	0.0	0.5	X								
SOIL	GEOPROBE	P51-I3-B	11/05/07	10:35	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I3-C	11/05/07	10:40	2.5	3.0	X								
SOIL	GEOPROBE	P51-I1-A	11/05/07	10:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-I1-B	11/05/07	10:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-I1-C	11/05/07	11:05	6.0	6.5	X								
SOIL	GEOPROBE	P51-D10-A	11/05/07	11:30	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-D10-B	11/05/07	11:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-D10-C	11/05/07	11:40	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-C11-A	11/05/07	13:30	0.0	0.5	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-C11-B	11/05/07	13:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-C11-C	11/05/07	13:45	5.0	5.5	X								
SOIL	GEOPROBE	P51-C10-A	11/05/07	14:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-C10-B	11/05/07	14:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-C10-C	11/05/07	14:25	6.0	6.5	X								
BLANK	FIELD	FIELD BLANK-SO	11/05/07	14:30	--	--	X								
SOIL	GEOPROBE	P51-B12-A	11/05/07	15:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-B12-B	11/05/07	15:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-B12-C	11/05/07	15:35	5.0	5.5	X								
SOIL	GEOPROBE	P51-B12-C DUPLICATE	11/05/07	15:35	5.0	5.5	X								
SOIL	GEOPROBE	P51-B11-A	11/05/07	16:05	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-B11-B	11/05/07	16:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-B11-C	11/05/07	16:15	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK-SO	11/06/07	-	--	--		X							
SOIL	GEOPROBE	P51-G12-A	11/06/07	8:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-G12-B	11/06/07	8:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-G12-C	11/06/07	8:35	4.5	5.0	X								
SOIL	GEOPROBE	P51-G12-D	11/06/07	8:55	6.0	6.5	X	X							TPHC collected due to elevated field screening results.
SOIL	GEOPROBE	P51-G12-D DUPLICATE	11/06/07	8:55	6.0	6.5	X	X							
SOIL	GEOPROBE	P51-E12-A	11/06/07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-E12-B	11/06/07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-E12-C	11/06/07	9:30	5.5	6.0	X								
SOIL	GEOPROBE	P51-C12-A	11/06/07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-C12-B	11/06/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-C12-C	11/06/07	10:15	6.0	6.5	X								
SOIL	GEOPROBE	P51-A12-A	11/06/07	11:10	0.0	0.5	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-A12-B	11/06/07	11:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-A12-C	11/06/07	11:35	5.0	5.5	X								
SOIL	GEOPROBE	P51-A11-A	11/06/07	13:05	0.0	0.5	X								
SOIL	GEOPROBE	P51-A11-B	11/06/07	13:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-A11-C	11/06/07	13:20	6.0	6.5	X								
SOIL	GEOPROBE	P51-A10-A	11/06/07	13:45	0.0	0.5	X								
SOIL	GEOPROBE	P51-A10-B	11/06/07	13:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-A10-C	11/06/07	14:00	5.5	6.0	X								
SOIL	GEOPROBE	P51-B10-A	11/06/07	14:55	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-B10-B	11/06/07	14:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-B10-C	11/06/07	15:10	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK-SO	11/06/07	15:25	--	--	X	X							
BLANK	TRIP	TRIP BLANK-AQ	11/06/07	8:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	11/06/07	11:00	--	--		X	X						
GW	GEOPROBE	P51-I1	11/06/07	11:30	5.0	10.0		X	X						
GW	GEOPROBE	P51-I3	11/06/07	12:00	3.0	8.0		X	X						
GW	GEOPROBE	P51-I3 DUPLICATE	11/06/07	12:00	3.0	8.0		X	X						
GW	GEOPROBE	P51-I5	11/06/07	12:30	3.0	8.0		X	X						
GW	GEOPROBE	P51-I10	11/06/07	13:00	3.0	8.0		X	X						
GW	GEOPROBE	P51-I12	11/06/07	13:30	3.0	8.0		X	X						
BLANK	TRIP	TRIP BLANK-SO	11/08/07	-	--	--	NA								
SOIL	GEOPROBE	P51-K1-A	11/08/07	8:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-K1-B	11/08/07	8:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K1-C	11/08/07	8:20	2.5	3.0	X								
SOIL	GEOPROBE	P51-K2-A	11/08/07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-K2-B	11/08/07	8:40	1.5	2.0	NA								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-K2-C	11/08/07	8:45	2.5	3.0	X								
SOIL	GEOPROBE	P51-K3-A	11/08/07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-K3-B	11/08/07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K3-C	11/08/07	9:35	6.5	7.0	X								
SOIL	GEOPROBE	P51-K4-A	11/08/07	10:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-K4-B	11/08/07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K4-C	11/08/07	10:20	5.5	6.0	X								
SOIL	GEOPROBE	P51-K5-A	11/08/07	10:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-K5-B	11/08/07	10:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K5-C	11/08/07	10:50	2.0	2.5	X								
SOIL	GEOPROBE	P51-K6-A	11/08/07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-K6-B	11/08/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K6-C	11/08/07	11:20	6.5	7.0	X								
SOIL	GEOPROBE	P51-K6-C DUPLICATE	11/08/07	11:20	6.5	7.0	X								
BLANK	FIELD	FIELD BLANK-SO	11/08/07	13:30	--	--	X								
SOIL	GEOPROBE	P51-K7-A	11/08/07	14:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-K7-B	11/08/07	14:00	1.5	2.0	X								No C sample. High Water table.
SOIL	GEOPROBE	P51-K8-A	11/08/07	14:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-K8-B	11/08/07	14:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K8-C	11/08/07	14:55	6.5	7.0	X								
SOIL	GEOPROBE	P51-K9-A	11/08/07	15:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-K9-B	11/08/07	15:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-K9-C	11/08/07	15:30	6.5	7.0	X								
BLANK	TRIP	TRIP BLANK-AQ	11/08/07	7:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	11/08/07	9:30	--	--		X	X						
GW	GEOPROBE	P51-A10	11/08/07	12:00	5.0	10		X	X						
GW	GEOPROBE	P51-A12	11/08/07	11:30	5.0	10		X	X						
GW	GEOPROBE	P51-C12	11/08/07	11:00	5.0	10		X	X						
GW	GEOPROBE	P51-C12 DUPLICATE	11/08/07	11:00	5.0	10		X	X						

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
GW	GEOPROBE	P51-E12	11/08/07	10:30	5.0	10		X	X						
GW	GEOPROBE	P51-G12	11/08/07	10:00	5.0	10		X	X						
BLANK	TRIP	TRIP BLANK-SO	11/09/07	-	--	--	NA								
SOIL	GEOPROBE	P51-J1-A	11/09/07	8:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-J1-B	11/09/07	8:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J1-C	11/09/07	8:25	8.5	9.0	X								
SOIL	GEOPROBE	P51-J2-A	11/09/07	8:45	0.0	0.5	X								
SOIL	GEOPROBE	P51-J2-B	11/09/07	8:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J2-C	11/09/07	8:55	7.0	7.5	X								
SOIL	GEOPROBE	P51-J3-A	11/09/07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-J3-B	11/09/07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J3-C	11/09/07	9:35	6.5	7.0	X								
SOIL	GEOPROBE	P51-J4-A	11/09/07	9:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-J4-B	11/09/07	9:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J4-C	11/09/07	10:00	3.0	3.5	X								
SOIL	GEOPROBE	P51-J5-A	11/09/07	10:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-J5-B	11/09/07	10:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J5-C	11/09/07	10:25	7.0	7.5	X								
BLANK	FIELD	FIELD BLANK-SO	11/09/07	10:40	--	--	X								
SOIL	GEOPROBE	P51-J6-A	11/09/07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-J6-B	11/09/07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J6-C	11/09/07	11:15	7.0	7.5	X								
SOIL	GEOPROBE	P51-J6-C DUPLICATE	11/09/07	11:15	7.0	7.5	X								
SOIL	GEOPROBE	P51-J7-A	11/09/07	11:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-J7-B	11/09/07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J7-C	11/09/07	11:45	7.0	7.5	X								
SOIL	GEOPROBE	P51-J8-A	11/09/07	13:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-J8-B	11/09/07	13:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J8-C	11/09/07	13:20	7.5	8.0	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-J9-A	11/09/07	13:45	0.0	0.5	X								
SOIL	GEOPROBE	P51-J9-B	11/09/07	13:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-J9-C	11/09/07	14:00	7.0	7.5	X								
BLANK	TRIP	TRIP BLANK-AQ	11/10/07	8:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	11/10/07	10:20	--	--		X	X						
GW	GEOPROBE	P51-K1	11/10/07	11:00	10.0	15.0		X	X						
GW	GEOPROBE	P51-K3	11/10/07	11:30	10.0	15.0		X	X						
GW	GEOPROBE	P51-K5	11/10/07	12:00	10.0	15.0		X	X						
GW	GEOPROBE	P51-K7	11/10/07	10:30	10.0	15.0		X	X						
GW	GEOPROBE	P51-K7 DUPLICATE	11/10/07	10:30	10.0	15.0		X	X						
GW	GEOPROBE	P51-K9	11/10/07	12:30	10.0	15.0		X	X						
BLANK	TRIP	TRIP BLANK-SO	11/13/07	-	--	--	NA								
SOIL	GEOPROBE	P51-L1-A	11/13/07	8:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-L1-B	11/13/07	8:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L1-C	11/13/07	9:10	5.5	6.0	X								
SOIL	GEOPROBE	P51-L2-A	11/13/07	9:25	0.0	0.5	X								
SOIL	GEOPROBE	P51-L2-B	11/13/07	9:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L2-C	11/13/07	9:35	5.0	5.5	X								
SOIL	GEOPROBE	P51-L3-A	11/13/07	10:05	0.0	0.5	X								
SOIL	GEOPROBE	P51-L3-B	11/13/07	10:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L3-C	11/13/07	10:20	5.5	6.0	X								
SOIL	GEOPROBE	P51-L4-A	11/13/07	10:55	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L4-B	11/13/07	10:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L4-C	11/13/07	11:05	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L5-A	11/13/07	13:15	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-L5-B	11/13/07	13:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L5-C	11/13/07	13:25	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L6-A	11/13/07	14:00	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L6-B	11/13/07	14:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L6-C	11/13/07	14:30	4.5	5.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L7-A	11/13/07	15:10	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L7-B	11/13/07	15:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L7-C	11/13/07	15:20	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L7-C DUPLICATE	11/13/07	15:20	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK-SO	11/13/07	15:30	--	--	X								
SOIL	GEOPROBE	P51-L8-A	11/13/07	15:50	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-L8-B	11/13/07	15:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L8-C	11/13/07	16:00	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK-SO	11/14/07	-	--	--	NA								
SOIL	GEOPROBE	P51-M1-A	11/14/07	7:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-M1-B	11/14/07	7:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M1-C	11/14/07	8:05	4.5	5.0	X								
SOIL	GEOPROBE	P51-M2-A	11/14/07	8:30	0.0	0.5	X								
SOIL	GEOPROBE	P51-M2-B	11/14/07	8:30	1.5	2.0	NA								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-M2-C	11/14/07	8:40	5.0	5.5	X								
SOIL	GEOPROBE	P51-M3-A	11/14/07	9:20	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M3-B	11/14/07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M3-C	11/14/07	9:30	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M4-A	11/14/07	10:05	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M4-B	11/14/07	10:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M4-C	11/14/07	10:15	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M5-A	11/14/07	10:40	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M5-B	11/14/07	10:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M5-C	11/14/07	10:50	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M6-A	11/14/07	11:15	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M6-B	11/14/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M6-C	11/14/07	11:25	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M6-C DUPLICATE	11/14/07	11:25	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK-SO	11/14/07	11:30	--	--	X								
BLANK	TRIP	TRIP BLANK-SO	11/15/07	-	--	--		X							

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-M7-A	11/15/07	7:45	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M7-B	11/15/07	7:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M7-C	11/15/07	8:00	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M8-A	11/15/07	8:25	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M8-B	11/15/07	8:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M8-C	11/15/07	8:35	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-M9-A	11/15/07	9:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-M9-B	11/15/07	9:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-M9-C	11/15/07	9:10	5.0	5.5	X								
SOIL	GEOPROBE	P51-N1-A	11/15/07	9:45	0.0	0.5	X								
SOIL	GEOPROBE	P51-N1-B	11/15/07	9:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N1-C	11/15/07	9:50	3.0	3.5	X								
SOIL	GEOPROBE	P51-N2-A	11/15/07	10:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-N2-B	11/15/07	10:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N2-C	11/15/07	10:20	6.5	7.0	X								
SOIL	GEOPROBE	P51-N3-A	11/15/07	10:35	0.0	0.5	X								
SOIL	GEOPROBE	P51-N3-B	11/15/07	10:35	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N3-C	11/15/07	10:40	5.5	6.0	X	X							
SOIL	GEOPROBE	P51-N4-A	11/15/07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-N4-B	11/15/07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N4-C	11/15/07	11:10	7.0	7.5	X								
SOIL	GEOPROBE	P51-N5-A	11/15/07	11:25	0.0	0.5	X								
SOIL	GEOPROBE	P51-N5-B	11/15/07	11:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N5-C	11/15/07	11:35	7.0	7.5	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-N5-C DUPLICATE	11/15/07	11:35	7.0	7.5	X								
SOIL	GEOPROBE	P51-N6-A	11/15/07	13:10	0.0	0.5	X								
SOIL	GEOPROBE	P51-N6-B	11/15/07	13:10	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N6-C	11/15/07	13:15	6.5	7.0	X								
SOIL	GEOPROBE	P51-N7-A	11/15/07	13:35	0.0	0.5	X								
SOIL	GEOPROBE	P51-N7-B	11/15/07	13:35	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N7-C	11/15/07	13:40	6.5	7.0	X								
SOIL	GEOPROBE	P51-N8-A	11/15/07	14:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-N8-B	11/15/07	14:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-N8-C	11/15/07	14:05	3.0	3.5	X								
BLANK	FIELD	FIELD BLANK-SO	11/15/07	14:10	--	--	X	X							
BLANK	TRIP	TRIP BLANK-SO	11/16/07	-	--	--	NA								
SOIL	GEOPROBE	P51-R3-A	11/16/07	8:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-R3-B	11/16/07	8:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R3-C	11/16/07	8:35	14.0	14.5	X								
SOIL	GEOPROBE	P51-R5-A	11/16/07	8:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-R5-B	11/16/07	8:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R5-C	11/16/07	9:15	11.0	11.5	X								
SOIL	GEOPROBE	P51-R7-A	11/16/07	10:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-R7-B	11/16/07	10:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R7-C	11/16/07	10:30	9.5	10.0	X								
SOIL	GEOPROBE	P51-R9-A	11/16/07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-R9-B	11/16/07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R9-C	11/16/07	11:15	11.5	12.0	X								
SOIL	GEOPROBE	P51-P9-A	11/16/07	12:45	0.0	0.5	X								
SOIL	GEOPROBE	P51-P9-B	11/16/07	12:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-P9-C	11/16/07	13:00	5.0	5.5	X								
SOIL	GEOPROBE	P51-N9-A	11/16/07	13:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-N9-B	11/16/07	13:40	1.5	2.0	NA								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-N9-C	11/16/07	13:55	7.5	8.0	X								
SOIL	GEOPROBE	P51-L9-A	11/16/07	14:15	0.0	0.5	X								
SOIL	GEOPROBE	P51-L9-B	11/16/07	14:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-L9-C	11/16/07	14:30	3.5	4.0	X								
BLANK	FIELD	FIELD BLANK-SO	11/16/07	14:45	--	--	X								
SOIL	GEOPROBE	P51-O1-A	11/16/07	15:00	0.0	0.5	X								
SOIL	GEOPROBE	P51-O1-B	11/16/07	15:00	1.5	2.0	NA								
SOIL	GEOPROBE	P51-O1-C	11/16/07	15:15	11.0	11.5	X								
SOIL	GEOPROBE	P51-O1-C DUPLICATE	11/16/07	15:15	11.0	11.5	X								
BLANK	TRIP	TRIP BLANK-SO	11/17/07	-	--	--	NA								
SOIL	GEOPROBE	P51-R4-A	11/17/07	7:40	0.0	0.5	X								
SOIL	GEOPROBE	P51-R4-B	11/17/07	7:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R4-C	11/17/07	8:10	11.5	12.0	X								
SOIL	GEOPROBE	P51-R6-A	11/17/07	8:25	0.0	0.5	X								
SOIL	GEOPROBE	P51-R6-B	11/17/07	8:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R6-C	11/17/07	8:30	5.0	5.5	X								
SOIL	GEOPROBE	P51-R8-A	11/17/07	8:45	0.0	0.5	X								
SOIL	GEOPROBE	P51-R8-B	11/17/07	8:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-R8-C	11/17/07	9:05	0.5	1.0	X								
SOIL	GEOPROBE	P51-Q3-A	11/17/07	9:20	0.0	0.5	X								
SOIL	GEOPROBE	P51-Q3-B	11/17/07	9:20	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q3-C	11/17/07	9:45	11.0	11.5	X								
SOIL	GEOPROBE	P51-Q4-A	11/17/07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P51-Q4-B	11/17/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q4-C	11/17/07	10:35	13.0	13.5	X								
SOIL	GEOPROBE	P51-Q5-A	11/17/07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-Q5-B	11/17/07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q5-C	11/17/07	10:55	4.0	4.5	X								
SOIL	GEOPROBE	P51-Q6-A	11/17/07	11:15	0.0	0.5	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-Q6-B	11/17/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q6-C	11/17/07	11:30	4.5	5.0	X								
BLANK	FIELD	FIELD BLANK-SO	11/17/07	11:25	--	--	X								
SOIL	GEOPROBE	P51-Q7-A	11/17/07	11:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-Q7-B	11/17/07	11:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q7-C	11/17/07	12:00	7.5	8.0	X								
SOIL	GEOPROBE	P51-Q7-C DUPLICATE	11/17/07	12:00	7.5	8.0	X								
SOIL	GEOPROBE	P51-Q8-A	11/17/07	12:25	0.0	0.5	X								
SOIL	GEOPROBE	P51-Q8-B	11/17/07	12:25	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q8-C	11/17/07	12:30	5.0	5.5	X								
SOIL	GEOPROBE	P51-Q9-A	11/17/07	12:40	0.5	1.0	X								
SOIL	GEOPROBE	P51-Q9-B	11/17/07	12:40	1.5	2.0	NA								
SOIL	GEOPROBE	P51-Q9-C	11/17/07	12:50	5.5	6.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	TRIP	TRIP BLANK-AQ	11/17/07	7:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	11/17/07	8:00	--	--		X	X						
GW	GEOPROBE	P51-R3	11/17/07	8:30	15.0	20.0		X	X						
GW	GEOPROBE	P51-R3 DUPLICATE	11/17/07	8:30	15.0	20.0		X	X						
GW	GEOPROBE	P51-R5	11/17/07	9:00	11.0	16.0		X	X						
GW	GEOPROBE	P51-R7	11/17/07	9:30	10.0	15.0		X	X						
GW	GEOPROBE	P51-R9	11/17/07	10:00	11.0	16.0		X	X						
GW	GEOPROBE	P51-P9	11/17/07	10:30	5.0	10.0		X	X						
GW	GEOPROBE	P51-N9	11/17/07	11:00	7.0	12.0		X	X						
GW	GEOPROBE	P51-L9	11/17/07	11:30	3.0	8.0		X	X						
BLANK	TRIP	TRIP BLANK-SO	11/19/07	-	--	--		X							
SOIL	GEOPROBE	P51-O2-A	11/19/07	7:50	0.0	0.5	X								
SOIL	GEOPROBE	P51-O2-B	11/19/07	7:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-O2-C	11/19/07	8:00	5.5	6.0	X								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-O3-A	11/19/07	8:30	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O3-B	11/19/07	8:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-O3-C	11/19/07	8:40	8.0	8.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O7-A	11/19/07	9:05	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O7-B	11/19/07	9:05	1.5	2.0	NA								
SOIL	GEOPROBE	P51-O7-C	11/19/07	9:10	4.0	4.5	X	X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O7-C DUPLICATE	11/19/07	9:10	4.0	4.5	X	X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O7-D	11/19/07	9:25	8.0	8.5	X								TPHC collected due to elevated field screening results. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O8-A	11/19/07	9:50	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O8-B	11/19/07	9:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-O8-C	11/19/07	10:05	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-O9-A	11/19/07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P51-O9-B	11/19/07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-O9-C	11/19/07	10:40	6.5	7.0	X								
SOIL	GEOPROBE	P51-P3-A	11/19/07	11:00	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P3-B	11/19/07	11:00	1.5	2.0	NA								

Table 3.12-2
Parcel 51 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P51-P3-C	11/19/07	11:25	9.5	10.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P4-A	11/19/07	11:50	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P4-B	11/19/07	11:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-P4-C	11/19/07	12:00	6.5	7.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P5-A	11/19/07	12:45	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P5-B	11/19/07	12:45	1.5	2.0	NA								
SOIL	GEOPROBE	P51-P5-C	11/19/07	12:55	7.0	7.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P6-A	11/19/07	13:30	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P6-B	11/19/07	13:30	1.5	2.0	NA								
SOIL	GEOPROBE	P51-P6-C	11/19/07	13:35	3.0	3.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK-SO	11/19/07	13:40	--	--	X	X							
SOIL	GEOPROBE	P51-P7-A	11/19/07	13:50	1.0	1.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P51-P7-B	11/19/07	13:50	1.5	2.0	NA								
SOIL	GEOPROBE	P51-P7-C	11/19/07	13:55	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg. TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.
X = Sample analyzed for the indicated analytical parameter suite

Table 3.12-3
Parcel 51 – 750 Area Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_1	Differential	Yes	6 x 15	4 x 11	High-amplitude parabolic anomaly characteristic of UST.	617154	537902
P51_2	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617182	537825
P51_3	Differential	No	N/A	N/A	Surface metal.	617182	537885
P51_4	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617187	537802
P51_5	Differential	Yes	6 x 15	4 x 11	High-amplitude parabolic anomaly characteristic of UST.	617192	537962
P51_6	Differential	No	N/A	N/A	Surface metal.	617207	537986
P51_7	Differential	No	N/A	N/A	Surface metal.	617217	537891
P51_8	Differential	No	N/A	N/A	Surface metal.	617219	537902
P51_9	Differential	Yes	N/A	N/A	No MD anomaly found associated with EM anomaly.	617227	537805
P51_10	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617256	537805
P51_11	Differential	No	N/A	N/A	Surface metal.	617265	537979
P51_12	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617269	537792
P51_13	Differential	Yes	N/A	N/A	Surface metal.	617272	537949
P51_14	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617273	537831
P51_15	Differential	Yes	6 x 10	4 x 6	High-amplitude parabolic anomaly characteristic of UST.	617278	537782
P51_16	Differential	No	N/A	N/A	Surface metal.	617287	538023
P51_17	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617293	537927
P51_18	Differential	No	N/A	N/A	Surface metal.	617304	537902

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_19	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617305	538014
P51_20	Differential	Yes	7 x 14	5 x 12	High-amplitude parabolic anomaly characteristic of UST.	617321	538033
P51_21	Differential	No	see notes	see notes	Area scanned with GPR only; no GPR anomaly associated with EM anomaly.	617324	537892
P51_22	Differential	Yes	4 x 4	see notes	Moderate-amplitude scattered near surface anomalies, possible debris.	617331	538023
P51_23	Differential	No	N/A	N/A	Surface metal.	617338	537852
P51_24	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617340	538040
P51_25	Differential	No	N/A	N/A	Surface metal.	617351	537985
P51_26	Differential	No	N/A	N/A	Surface metal.	617360	537904
P51_27	Differential	Yes	6 x 10	4 x 7	High-amplitude parabolic anomaly characteristic of UST.	617362	537965
P51_28	Differential	No	N/A	N/A	Surface metal.	617364	537861
P51_29	Differential	No	N/A	N/A	Surface metal.	617368	537877
P51_30	Differential	No	N/A	N/A	Surface metal.	617389	538069
P51_31	Differential	Yes	6 x 10	4 x 7	High-amplitude parabolic anomaly characteristic of UST.	617432	537873
P51_32	Differential	No	N/A	N/A	Surface metal.	617469	537675
P51_33	Differential	Yes	see notes	see notes	Metal associated with P51_32 (surface metal).	617471	537682
P51_34	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617509	538069
P51_35	Differential	No	N/A	N/A	Surface metal.	617530	537612
P51_36	Differential	No	N/A	N/A	Surface metal.	617532	537564
P51_37	Differential	No	N/A	N/A	Surface metal.	617534	537577
P51_38		No	N/A	5 x 10	High-amplitude parabolic anomaly characteristic of UST.	617574	537953

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_39	Differential	Yes	10 x 15	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	617574	537573
P51_40	Differential	Yes	15 x 15	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	617605	537498
P51_41	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617643	538043
P51_42	Differential	No	N/A	5 x 11	High-amplitude parabolic anomaly characteristic of UST.	617647	537986
P51_43	Differential	Yes	see notes	see notes	Metal associated with P51_44(surface metal).	617667	537671
P51_44	Differential	No	N/A	N/A	Surface metal.	617671	537662
P51_45	Differential	No	N/A	N/A	Surface metal.	617698	538233
P51_46	Differential	Yes	5 x 7	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	617713	537636
P51_47	Differential	No	N/A	9 x 15	High-amplitude parabolic anomaly characteristic of UST.	617716	538029
P51_48	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617718	537627
P51_49	Differential	Yes	N/A	N/A	Suspected utility.	617720	538218
P51_50	Differential	Yes	N/A	N/A	Suspected utility.	617733	537754
P51_51	Differential	No	N/A	N/A	Surface metal.	617737	538258
P51_52	Differential	No	N/A	N/A	Surface metal.	617740	537696
P51_53	Differential	Yes	N/A	N/A	Suspected utility.	617745	538178
P51_54	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617749	537842
P51_55	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617754	537803
P51_56	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617758	537662
P51_57	Differential	No	N/A	N/A	Surface metal.	617770	537684

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_58	Differential	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617771	537773
P51_59	Differential	Yes	see notes	see notes	Suspected utility vault associated with P51_57(surface metal).	617774	537698
P51_60	Differential	No	N/A	N/A	Surface metal.	617778	538100
P51_61	Differential	No	N/A	N/A	Surface metal.	617783	537729
P51_62	Differential	Yes	7 x 10	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	617820	537691
P51_63	Differential	No	N/A	N/A	Surface metal.	617843	537765
P51_64	Differential	No	N/A	N/A	Surface metal.	617852	537594
P51_65	Differential	Yes	15 x 15	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	617862	538247
P51_66	Differential	No	N/A	N/A	Surface metal.	617882	538092
P51_67	Differential	No	N/A	N/A	Surface metal.	617892	538321
P51_68	Differential	No	N/A	N/A	Surface metal.	617927	538225
P51_69	Differential	No	N/A	N/A	Surface metal.	617938	538092
P51_70	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617943	538232
P51_71	Differential	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	617960	538163
P51_72	Differential	No	N/A	N/A	Surface metal.	617977	538134
P51_73	Differential	No	N/A	N/A	Surface metal.	618033	538058
P51_74	Differential	No	N/A	N/A	Surface metal.	618080	537918

Table 3.12-4
Parcel 51 – 600 and 1100 Area Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_75	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618115	539165
P51_76	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618191	539094
P51_77	Both	Yes	10 x 10	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	618244	539055
P51_78	Both	No	N/A	N/A	Surface metal.	618310	539068
P51_79	Both	No	N/A	N/A	Surface metal.	618321	539082
P51_80	Inphase	No	N/A	N/A	Surface metal.	618357	539123
P51_81	Both	No	N/A	N/A	Surface metal.	618385	539098
P51_82	Both	No	N/A	N/A	Surface metal.	618398	539103
P51_83	Conductivity	Yes	N/A	N/A	Suspected utility.	618446	539190
P51_84	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618674	539404
P51_85	Conductivity	No	N/A	N/A	Surface metal.	618691	539404
P51_86	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618697	539327
P51_87	Both	No	N/A	N/A	Surface metal.	618703	539206
P51_88	Inphase	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618717	539278
P51_89	Both	No	N/A	N/A	Surface metal.	618723	539418
P51_90	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly; suspected utility.	618768	539314
P51_91	Both	Yes	N/A	N/A	Suspected utility.	618823	539867
P51_92	Both	No	5 x 10	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	618852	539731
P51_93	Both	No	N/A	N/A	Surface metal.	618861	539699
P51_94	Both	Yes	N/A	N/A	Suspected utility.	618887	539739

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_95	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618889	539363
P51_96	Both	No	see notes	see notes	Parked cars. Area later scanned with TW-6; no anomalies detected.	618893	539627
P51_97	Both	Yes	11 x 12	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	618903	539700
P51_98	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude scattered near-surface anomalies, possible debris.	618930	539676
P51_99	Both	No	N/A	N/A	Surface metal.	618963	539731
P51_100	Inphase	Yes	12 x 15	see notes	Moderate-amplitude scattered near-surface anomalies, possible debris.	618964	539686
P51_101	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	619003	539480
P51_102	Conductivity	Yes	N/A	N/A	Suspected utility.	619009	539329
P51_103	Inphase	No	N/A	N/A	Surface metal.	619022	539568
P51_104	Both	No	N/A	N/A	Surface metal.	619031	539750
P51_105	Both	No	N/A	N/A	Surface metal.	619041	539629
P51_106	Both	No	N/A	N/A	Surface metal.	619044	539351
P51_107	Both	No	N/A	N/A	Surface metal.	619082	539605
P51_108	Both	No	N/A	N/A	Surface metal.	619094	539605
P51_109	Both	No	N/A	N/A	Surface metal.	617658	538510
P51_110	Inphase	Yes	7 x 12	5 x 10	High-amplitude parabolic anomaly characteristic of UST.	617676	538548
P51_111	Both	Yes	7 x 12	5 x 11	High-amplitude parabolic anomaly characteristic of UST.	617745	538585
P51_112	Both	No	N/A	N/A	Surface metal.	617759	538680
P51_113	Both	No	N/A	N/A	Surface metal.	617765	538558
P51_114	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	617813	538597
P51_115	Both	No	N/A	N/A	Surface metal.	617836	538586

Anomaly	Anomaly Type:	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P51_116	Both	No	N/A	N/A	Surface metal.	617850	538613
P51_117	Inphase	No	N/A	N/A	Suspected utility.	617867	538712
P51_118	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618012	538708
P51_119	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618077	538740
P51_120	Both	No	N/A	N/A	Surface metal.	618090	538851
P51_121	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618147	538779
P51_122	Both	No	N/A	N/A	Suspected utility.	618215	538944
P51_123	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	618219	538815

Table 3.12-5
Fort Monmouth Phase II Site Investigation, Parcel 51
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P51-B11-A	7044131	11/05/07	1.0-1.5	648	74	10000	10000
P51-C10-A	7044124	11/05/07	0.0-0.5	741	73	10000	10000
P51-C10-C	7044126	11/05/07	6.0-6.5	103	82	10000	10000
P51-C11-A	7044121	11/05/07	0.0-0.5	433	74	10000	10000
P51-D10-A	7044118	11/05/07	0.5-1.0	243	73	10000	10000
P51-D11-A	7043831	11/02/07	0.5-1.0	857	71	10000	10000
P51-D11-C	7043833	11/02/07	5.5-6.0	115	80	10000	10000
P51-D12-A	7043828	11/02/07	0.0-0.5	149	71	10000	10000
P51-E10-C	7043827	11/02/07	3.0-3.5	568	75	10000	10000
P51-E11-A	7043821	11/02/07	0.5-1.0	213	73	10000	10000
P51-F7-A	7043818	11/02/07	1.0-1.5	496	71	10000	10000
P51-G12-C	7044405	11/06/07	4.5-5.0	273	75	10000	10000
P51-G12-D	7044406	11/06/07	6.0-6.5	7487	83	10000	10000
P51-G12-D DUP	7044402	11/06/07	6.0-6.5	7524	82	10000	10000
P51-H10-A	7043029	10/31/07	0.0-0.5	150	73	10000	10000
P51-H11-A	7043026	10/31/07	1.0-1.5	200	75	10000	10000
P51-H11-C	7043028	10/31/07	4.5-5.0	98	71	10000	10000
P51-H12-A	7043023	10/31/07	0.0-0.5	99	77	10000	10000
P51-H12-C	7043025	10/31/07	4.0-8.0	3973	74	10000	10000
P51-H7-A	7043039	10/31/07	0.0-0.5	82	73	10000	10000
P51-H9-C	7043035	10/31/07	5.0-5.5	201	78	10000	10000
P51-I2-A	7043020	10/31/07	0.0-0.5	115	74	10000	10000
P51-I2-C	7043022	10/31/07	5.5-6.0	123	75	10000	10000
P51-I4-A	7043017	10/31/07	0.0-0.5	86	71	10000	10000
P51-I4-C	7043019	10/31/07	2.0-2.5	105	73	10000	10000
P51-I5-C	7044111	11/05/07	3.5-4.0	94	71	10000	10000
P51-I6-A	7043015	10/31/07	0.0-0.5	110	73	10000	10000
P51-I6-B	7043016	10/31/07	1.5-2.0	106	71	10000	10000
P51-I7-A	7043012	10/31/07	0.0-0.5	100	73	10000	10000
P51-I7-C	7043014	10/31/07	2.0-2.5	149	71	10000	10000
P51-I8-A	7043009	10/31/07	0.0-0.5	298	76	10000	10000
P51-I8-C	7043011	10/31/07	3.5-4.0	126	71	10000	10000
P51-I9-C	7043008	10/31/07	3.5-4.0	148	75	10000	10000
P51-J1-A	7045403	11/09/07	0.0-0.5	83	73	10000	10000
P51-J4-A	7045412	11/09/07	0.0-0.5	106	74	10000	10000
P51-J5-A	7045415	11/09/07	0.0-0.5	280	73	10000	10000
P51-K1-A	7044603	11/08/07	0.0-0.5	144	71	10000	10000
P51-K2-A	7044606	11/08/07	0.0-0.5	338	70	10000	10000
P51-K3-A	7044609	11/08/07	0.0-0.5	487	72	10000	10000
P51-K4-A	7044612	11/08/07	0.0-0.5	497	73	10000	10000
P51-K5-A	7044615	11/08/07	0.0-0.5	400	71	10000	10000
P51-K6-A	7044618	11/08/07	0.0-0.5	338	72	10000	10000
P51-K7-A	7044622	11/08/07	0.0-0.5	701	71	10000	10000

Table 3.12-5
Fort Monmouth Phase II Site Investigation, Parcel 51
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P51-K7-B	7044623	11/08/07	1.5-2.0	90	72	10000	10000
P51-K8-A	7044624	11/08/07	0.0-0.5	465	71	10000	10000
P51-K9-A	7044627	11/08/07	0.0-0.5	540	71	10000	10000
P51-L4-A	7045912	11/13/07	1.0-1.5	166	72	10000	10000
P51-L5-A	7045915	11/13/07	1.0-1.5	82	72	10000	10000
P51-L6-A	7045918	11/13/07	1.0-1.5	97	75	10000	10000
P51-L7-A	7045921	11/13/07	1.0-1.5	98	74	10000	10000
P51-L8-A	7045925	11/13/07	1.0-1.5	147	71	10000	10000
P51-M3-A	7046309	11/14/07	1.0-1.5	119	74	10000	10000
P51-M6-A	7046318	11/14/07	1.0-1.5	98	74	10000	10000
P51-M7-A	7046703	11/15/07	1.0-1.5	118	70	10000	10000
P51-M8-A	7046706	11/15/07	1.0-1.5	320	70	10000	10000
P51-N3-C	7046720	11/15/07	5.5-6.0	1498	74	10000	10000
P51-O7-C DUP	7047411	11/19/07	4.0-4.5	1188	71	10000	10000
P51-O7-C	7047402	11/19/07	4.0-4.5	1367	71	10000	10000
P51-R4-A	7047203	11/17/07	0.0-0.5	156	70	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.
[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.
[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.12-6
Fort Monmouth Phase II Site Investigation, Parcel 51
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results				
		Sample ID:	P51-G12-D	P51-G12-D DUP	P51-N3-C	P51-O7-C	P51-O7-C DUP
		Lab ID:	7044406	7044402	7046720	7047411	7047402
		Date Sampled:	11/6/2007	11/6/2007	11/15/2007	11/19/2007	11/19/2007
		Depth (ft. bgs):	6.0-6.5'	6.0-6.5'	5.5-6.0'	4.0-4.5'	4.0-4.5'
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result
Volatiles							
Acetone	1,000	100	0.360 U	0.320 U	**0.110 J**	**0.480 B**	**0.520 B**
Ethylbenzene	1,000	100	**0.730**	**0.560**	0.300 U	0.250 U	0.270 U
Xylenes (Total)	1,000	67	**1.900**	**1.400**	0.980 U	**0.096 J**	**0.095 J**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.12-7
Fort Monmouth Phase II Site Investigation, Parcel 51
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results										
	Sample ID:	P51-A10	P51-A12	P51-C12	P51-C12 DUP	P51-E12	P51-G12	P51-I3	P51-I3 DUP	P51-I5	P51-I10	P51-K1
	Lab ID:	7044704	7044705	7044706	7044703	7044707	7044708	7044305	7044303	7044306	7044307	7045504
	Date Sampled:	11/8/2007	11/8/2007	11/8/2007	11/8/2007	11/8/2007	11/8/2007	11/6/2007	11/6/2007	11/6/2007	11/6/2007	11/10/2007
	Screened Interval (ft. bgs):	5-10'	5-10'	5-10'	5-10'	5-10'	5-10'	3-8'	3-8'	3-8'	3-8'	10-15'
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles												
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	**6.78**	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Benzene	1	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	**0.10 J**	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Carbon disulfide	700	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U
Chloroform	70	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloromethane (Methyl chloride)	NLE	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U
Ethylbenzene	700	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	**1.74**	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Methyl ethyl ketone (2-Butanone)	300	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Methyl tertiary butyl ether (MTBE)	70	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Tertiary butyl alcohol	100	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U
Toluene	600	0.27 U	**1.03**	**0.65**	**0.54**	**1.07**	**2.00**	**0.37**	**0.82**	**0.29**	**0.38**	**0.53**
Xylenes (Total)	1000	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	**2.15**	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Semi-Volatiles												
2-Methylnaphthalene	30*	**3.28**	1.01 U	1.01 U	1.01 U	1.01 U	**40.51**	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
bis(2-Ethylhexyl)phthalate	3	1.28 U	1.28 U	1.28 U	1.28 U	**0.95 J**	1.28 U	1.28 U	1.28 U	1.28 U	**2.55**	**1.42**
Dibenzofuran	NLE	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Di-n-butylphthalate	700	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Fluorene	300	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	**1.97**	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Naphthalene	300	**1.00**	0.76 U	0.76 U	0.76 U	0.76 U	**23.40**	0.76 U	0.76 U	**4.01**	0.76 U	0.76 U
n-Nitrosodiphenylamine	10	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	**2.89**	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Phenanthrene	NLE	**1.94**	0.81 U	0.81 U	0.81 U	0.81 U	**3.75**	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

Table 3.12-7
Fort Monmouth Phase II Site Investigation, Parcel 51
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results										
	Sample ID:	P51-K3	P51-K5	P51-K7	P51-K7 DUP	P51-K9	P51-L9	P51-N9	P51-P9	P51-R3	P51-R3 DUP	P51-R9
	Lab ID:	7045505	7045506	7045507	7045503	7045508	7047110	7047109	7047108	7047104	7047103	7047107
	Date Sampled:	11/10/2007	11/10/2007	11/10/2007	11/10/2007	11/10/2007	11/17/2007	11/17/2007	11/17/2007	11/17/2007	11/17/2007	11/17/2007
	Depth (ft. bgs):	10-15'	10-15'	10-15'	10-15'	10-15'	3-8'	7-12'	5-10'	15-20'	15-20'	11-16'
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles												
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	**9.31 B**	0.85 U	**1.99 B**	**1.12 B**	0.85 U	**3.56 B**
Benzene	1	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
Carbon disulfide	700	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	**0.17 J**	0.44 U	**0.50**	0.44 U	0.44 U	**0.23 J**
Chloroform	70	**0.74**	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U
Chloromethane (Methyl chloride)	NLE	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	0.47 U	**0.34 J**
Ethylbenzene	700	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U	0.28 U
Methyl ethyl ketone (2-Butanone)	300	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	**1.58**	0.14 U	0.14 U	0.14 U	0.14 U	**0.76**
Methyl tertiary butyl ether (MTBE)	70	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	**4.31**	**33.79**	0.23 U	0.23 U	**15.92**
Tertiary butyl alcohol	100	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	**4.03**	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U
Toluene	600	**0.35**	**0.77**	0.27 U	0.27 U	**0.22 J**	**0.45**	**0.25 J**	**0.69**	0.27 U	0.27 U	0.27 U
Xylenes (Total)	1000	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Semi-Volatiles												
2-Methylnaphthalene	30*	1.01 U	**2.61**	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U	1.01 U
bis(2-Ethylhexyl)phthalate	3	1.28 U	1.28 U	**4.47**	**3.53**	1.28 U	1.28 U	1.28 U	**3.49**	1.28 U	1.28 U	1.28 U
Dibenzofuran	NLE	0.69 U	**0.30 J**	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U	0.69 U
Di-n-butylphthalate	700	0.92 U	**0.41 J**	**0.25 J**	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Fluorene	300	0.71 U	0.71 U	**0.42 J**	**0.51 J**	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U	0.71 U
Naphthalene	300	0.76 U	**18.24**	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U	0.76 U
n-Nitrosodiphenylamine	10	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U
Phenanthrene	200	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

JB = The concentration should be considered estimated due to blank contamination.

UB = The presence of the analyte in the sample is negated due to blank contamination.

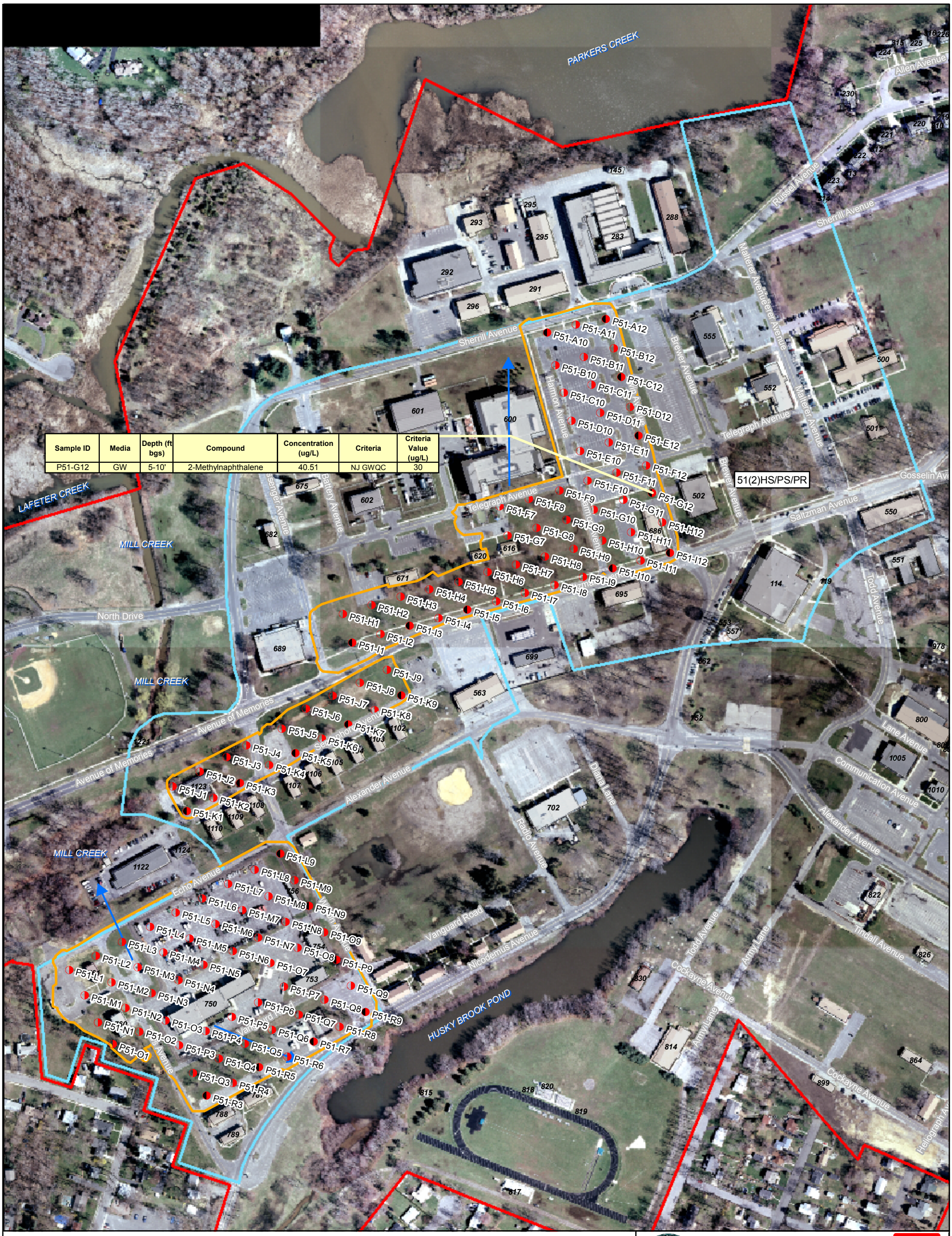
NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P51-G12	GW	5-10'	2-Methylnaphthalene	40.51	NJ GWQC	30

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Geophysical Investigation Area - Electromagnetic (EM) and Ground Penetrating Radar (GPR)
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 Areas where only release or disposal of petroleum products has occurred.

N

SCALE:
0 150 300 600 Feet

BRAC PARCEL LABEL DEFINITIONS

8(2)PS
- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

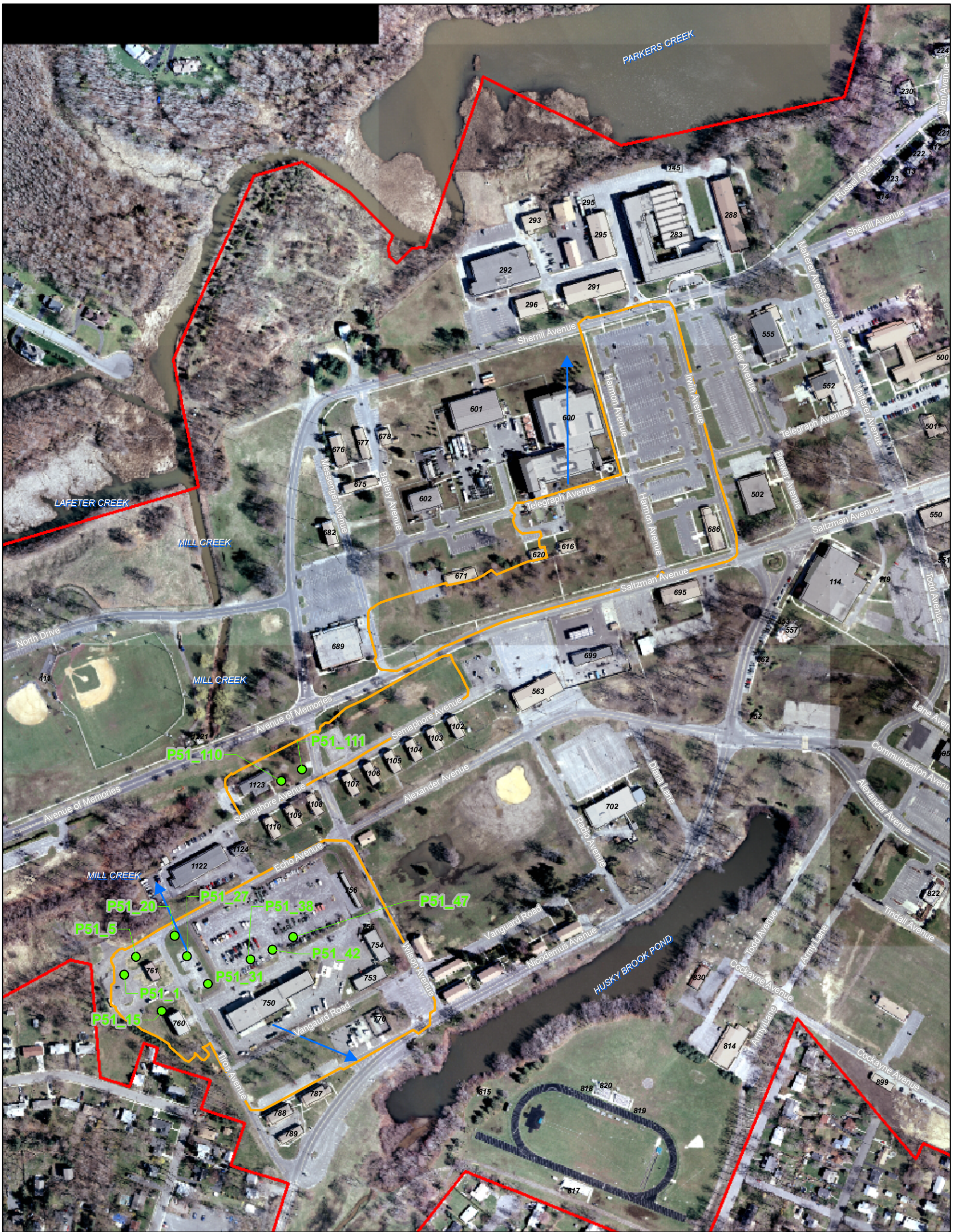
Shaw® Shaw Environmental, Inc.

FIGURE 3.12-1
FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 51 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_12-1_SI_P51_Exceeds_SampLoc.mxd (7/14/2008 12:49:34 PM)



LEGEND

- Subsurface Metallic Object (Suspected UST)
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Geophysical Investigation Area - Electromagnetic (EM) and Ground Penetrating Radar (GPR)
- Building
- Installation Boundary

N

SCALE:

0 150 300 600 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.12-2

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 51 SUSPECTED UST LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_12-2_SI_P51_Geophysics.mxd (7/14/2008 12:52:32 PM)

3.13 Parcel 52 – Bldg 699 – Army/Air Force Exchange Services Gas Station

3.13.1 Site Description

Bldg 699 is a full-service gas station and convenience store located on the south side of Saltzman Avenue in the central portion of the MP. Bldg 699 was constructed in 1953 and has been used as a service station since that time. Bldg 699 is a one-story building built on slab and is approximately 4,628 square feet in size. Additional information pertaining to this parcel can be found in Section 5.2.1.1, Section 5.4, Section 5.13.2, and Appendix G of the Phase I ECP (1).

3.13.2 Previous Investigations

The Bldg 699 tank system was comprised of six 10,000-gallon USTs with two remote pumping islands. The six USTs were removed in April 2007 and replaced with two 10,000-gallon ASTs. Prior to their removal in 2007, the USTs stored various grades of gasoline. On November 5, 1984, a tank tightness test identified a 0.333 gallon per hour leak in two of the USTs. No action was taken until 1989 when a line leak was identified; subsequently, the piping was excavated and replaced. Since that time, a groundwater pump system (to recover free product and to control the plume) has been operating in conjunction with a quarterly groundwater monitoring program under the IRP (FTMM-53). Thirteen monitoring wells were installed at the site in order to delineate the extent of the contaminant plume. Subsequently, consecutive quarterly rounds of groundwater samples have been collected for analysis. BTEX and MTBE have been detected both in soil and groundwater above NJDEP Direct Contact Soil Cleanup Criteria and GWQC. A remedial action work plan specifying the installation of an air sparging/SVE system, plus an expanded groundwater pump and treat system, was submitted and approved by the NJDEP. In addition, the use of enzyme enhanced bioremediation products was stipulated for the localized treatment of soils in dense silt and clay areas. Construction of the selected remedial alternative was completed in January 2001. Currently, as part of a monitoring program, 13 groundwater monitoring wells are sampled on a quarterly basis. The cleanup strategy is to continue remedial action operation (air sparge, SVE, pump and treat system) activities and monitoring efforts at the Bldg 699 site. Shutdown of the treatment system is expected in FY09, and quarterly groundwater monitoring of 13 wells will be performed for 2 years after shutdown.

3.13.3 Site Investigation Sampling

Through previous investigations, groundwater VO contamination has been identified in close proximity to Bldg 699 and is being addressed under the IRP. Per NJDEP guidance and consistent with USEPA policy, the NJDEP recommends investigation of VI where structures are within 100 ft horizontally or vertically of shallow groundwater contamination in excess of GWSLs. In the case of petroleum hydrocarbon contamination (particularly BTEX), a 30-ft distance criterion is utilized (12). These contaminants have been detected above the GWSLs within 30 ft of Bldg 699.

Therefore, VI at Bldg 699 was further evaluated through the collection of near-slab and sub-slab soil gas samples.

See **Table 3.13-1** for a summary of the field activities and **Figure 3.13-1** for sample locations. A summary of the analytical and sampling program, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.13-2**.

Table 3.13-1
Parcel 52 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
52SG-1 and 2 (2 samples)	Sub-slab soil gas	Two sub-slab soil gas samples were collected from under Bldg 699 biased to the north side of the building. Because this is an active service station with active fueling stations and automotive service bays, sub-slab soil gas was sampled in lieu of indoor air in order to minimize the potential exposure of collected samples to VOs present that are likely attributable operations conducted within Bldg 699.	NJDEP – SRWM Low Level USEPA TO-15 Method
52SG-3 and 4 (2 samples)	Near-slab soil gas	Two near-slab soil gas samples were collected at Bldg 699. Groundwater flow direction is to the south, and VOs have been detected above GWSLs north of the building. Therefore, the sample locations were biased to the north side of the building.	NJDEP – SRWM Low Level USEPA TO-15 Method

3.13.4 Site Investigation Results

A total of 21 VOs were detected in soil gas samples collected in Parcel 52. No VOs were detected in near-slab soil gas samples above comparison criteria. PCE was detected above comparison criteria in both sub-slab soil gas samples at concentrations of 151 $\mu g/m^3$ in sample 52SG-1 and 241 $\mu g/m^3$ in sample 52SG-2 (**Table 3.13-3**). No constituents present in groundwater above the GWSL at Bldg 699 were detected above the Soil Gas NRS.

3.13.5 Summary and Conclusions

One VO, PCE, exceeded NJDEP Soil Gas NRSs in sub-slab soil gas at Parcel 52. The detection of PCE in soil gas is unexpected given the extensive existing groundwater data set collected to date. This site is currently being addressed under the IRP, and groundwater will continue to be monitored. Evaluation of indoor air in Bldg 699 is recommended.

Table 3.13-2
Parcel 52 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SG	CANISTER	52SG-1	12/12/07	10:20	3.0	3.0		X							
SG	CANISTER	52SG-2	12/12/07	8:40	3.0	3.0		X							
SG	CANISTER	52SG-3	12/12/07	9:40	5.0	5.0		X							
SG	CANISTER	52SG-4	12/12/07	8:00	5.0	5.0		X							

X = Sample analyzed for the indicated analytical parameter suite

Table 3.13-3
Fort Monmouth ECP Site Investigation, Parcel 52
Summary of Analytical Parameters Detected Soil Gas (µg/m^3)

		Analytical Results			
	Sample ID:	52SG-1	52SG-2	52SG-3	52SG-4
	Lab ID:	J79249-4	J79249-3	J79249-2	J79249-1
	Date Sampled:	12/12/07	12/12/07	12/12/07	12/12/07
	Depth (ft. bgs):	3'	3'	5'	5'
Chemical	SG Non-residential[2]	Result	Result	Result	Result
Volatiles					
Acetone	230,000	**11**	**28.3**	**22**	**39.0**
Benzene	26	**3.5 J**	**8.0**	**3.2 J**	**12**
Carbon disulfide	51,000	**15**	<0.87	**10**	**21**
Chloroform	24	**5.4 J**	<1.7	<1.7	**4.2 J**
Ethanol	NLE	**10**	<2.3	**19.2**	**28.5**
Ethylbenzene	74,000	**4.3 J**	**6.9**	<0.65	**32**
4-Ethyltoluene	NLE	<0.69	**4.9 J**	<0.69	**30**
n-Heptane	NLE	<0.98	<0.98	<0.98	**9.0**
Isopropyl Alcohol	NLE	<1.2	<1.2	<1.2	**4.4**
Methyl ethyl ketone	360,000	<0.91	<0.91	**5.0**	**13**
Methyl tertiary butyl ether (MTBE)	180	<1.3	**3.5 J**	**4.3 J**	**19**
Propylene	NLE	**55.8**	<1	**62.5**	**54.5**
Tertiary Butyl Alcohol	4,600	<1.1	<1.1	<1.1	**4.9**
Tetrachloroethylene	36	**151**	**241**	**16**	**11**
Toluene	360,000	**15**	**35**	**7.9**	**76.9**
1,2,4-Trimethylbenzene	NLE	**15**	**22**	**15**	**145**
1,3,5-Trimethylbenzene	NLE	<0.69	**5.4 J**	**4.4 J**	**42**
2,2,4-Trimethylpentane	NLE	**4.5 J**	**78.5**	**14**	**2410**
Xylenes (m&p)	NLE	**21**	**35**	**15**	**164**
o-Xylene	NLE	**6.9**	**11**	**5.2 J**	**53.4**
Xylenes (total)	7,700	**28**	**46.0**	**20**	**217**

[1] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Residential, March 2007.

[2] NJDEP Generic Vapor Intrusion Screening Levels, Soil Gas Screening Levels, Nonresidential, March 2007. Results were compared to these levels.

(a) = Sum of cis-1,2-Dichloroethylene and trans-1,2-Dichloroethylene.

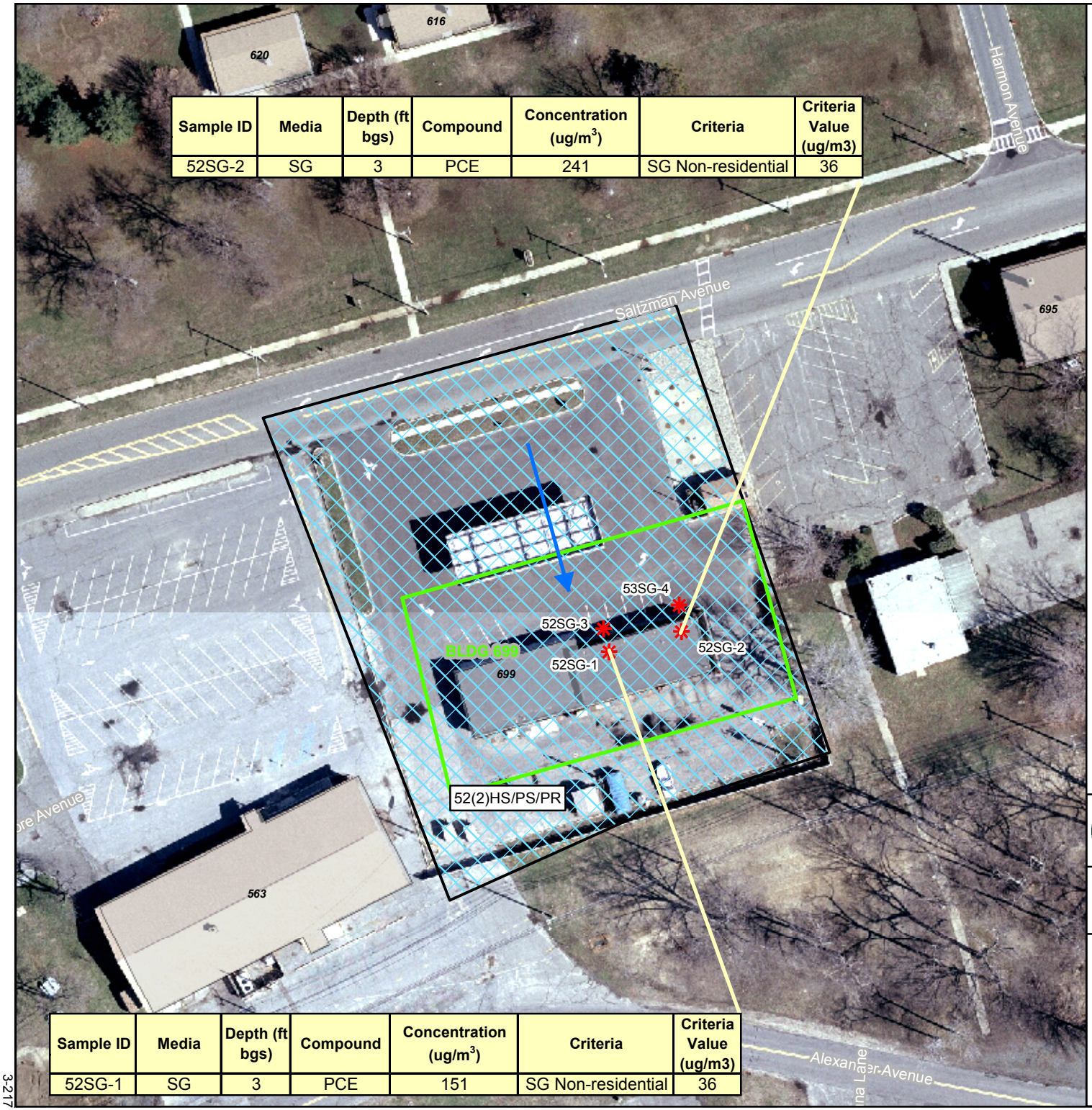
J = Indicates an estimated value.

DUP = Duplicate Sample

NLE = No Limit Established

Bold = Analyte detected.

Shaded = Concentration exceeds SG Nonresidential.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
52SG-2	SG	3	PCE	241	SG Non-residential	36

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/m^3)	Criteria	Criteria Value (ug/m3)
52SG-1	SG	3	PCE	151	SG Non-residential	36

LEGEND

- Soil-Gas Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 37.5 75 150 Feet

Base Realignment and Closure 2005

Shaw Environmental, Inc.

FIGURE 3.13-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 52 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_13-1_SI_P52_Exceeds_SampLoc.mxd (7/14/2008 4:00:05 PM)

3.14 Parcel 57 – Former Coal Storage and Railroad Unloading – 800 Area

3.14.1 Site Description

Parcel 57 is located in the south-central portion of the MP in the area of Bldgs 1007 and 801. Historic site plans, aerial photographs, and information obtained during personnel interviews indicate a coal storage area and fuel unloading area formerly existed in the south-central portion of the MP along the former RR in the vicinity of Bldgs 1007 and 801. The potential coal storage area was identified in photographs from 1947, 1957, and 1963 (18). A geothermal well field is present north of Bldg 800. Additional information pertaining to this parcel can be found in Section 3.3, Section 5.4, Section 5.13.1, and Appendix G of the Phase I ECP (1).

3.14.2 Previous Investigations

No previous investigations have been conducted in relation to the former coal storage area.

3.14.3 Site Investigation Sampling

In order to determine the impact of historic coal and fuel unloading and storage activities in the area of the former RR, the following soil and groundwater sampling was conducted.

Geoprobe® Investigation

Soil and groundwater samples were collected in December 2007 in Parcel 57 in order to determine if any contamination exists from previous activities associated with the former coal storage area. A total of 15 surface soil samples and 18 subsurface soil samples (including three duplicate samples) were collected from 15 distinct Geoprobe® borings (**Figure 3.14-1**) on 100-ft centers. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of the soil boring core was conducted using a PID/FID meter. No visual or olfactory evidence of soil contamination was noted.

A total of six groundwater samples (including one duplicate sample) were collected from five distinct temporary wells (**Figure 3.14.1**). Temporary wells were installed along the northern boundary of the soil boring grid in a downgradient hydrogeologic direction and were constructed of PVC and 5 to 10 ft of factory-slotted screen.

Table 3.14-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.14-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.14-2**.

Table 3.14-1
Parcel 57 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
57SS-A1 through 57SS-C9 (15 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from the Geoprobe® soil boring grid (conducted on 100-ft centers) to investigate the former coal storage location. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TCL+30 (w/o pesticides), TAL Metals
57SB-A1 through 57SB-C9 (18 samples – includes 3 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 3.5 to 8.0 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the former coal storage location. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TCL+30 (w/o pesticides), TAL Metals
57GW-A1, A3, A5, A7, A9 (6 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings in the grid to investigate the former location of coal storage.	TCL+30 (w/o pesticides/PCBs), TAL Metals

3.14.4 Site Investigation Results

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TCL+30 (without pesticides) and TAL metals. Groundwater samples were analyzed for TCL+30 (without pesticides/PCBs) and TAL metals.

Soil

As presented in **Table 3.14-3**, seven VOs, 22 B/Ns, and 19 metals were detected in Parcel 57 soil samples. All seven VOs were detected at concentrations below NJDEP NRDCSCC. Of the 17 B/Ns, four (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and benzo[k]fluoranthene) were detected in three surface soil samples, P57-A1-A, P57-C3-A, and P57-C5-A, at concentrations that exceeded NJDEP NRDCSCC and their respective MPBC. All 19 metals were detected at concentrations below NJDEP NRDCSCC. B/Ns are considered COCs in soil at Parcel 57.

Five soil samples contained TICs at elevated concentrations. 1,1-bis(1-methylethyl)-Hydrazine was detected at a concentration of 310 mg/kg in sample P57-A6-A and at a concentration of 330 mg/kg in the duplicate sample collected at P57-A9-C. It was not detected in sample P57-A9-C. 4-hydroxy-4-methyl 2-Pentanone was detected at concentrations of 220 mg/kg, 150 mg/kg, and 230 mg/kg in samples P57-A2-A, P57-A2-C, and P57-A4-C, respectively. Multiple semi-volatile constituents were identified in each of the five samples; however, no TCL organic constituents were identified at concentrations greater than the NRDCSCC in the five samples in which elevated TIC concentrations were identified.

Groundwater

As presented in **Table 3.14-4**, a total of five VOs (acetone, carbon disulfide, methyl ethyl ketone [2-butanone], TBA, and toluene) and one B/N (bis[2-ethylhexyl]phthalate) were detected at concentrations below the NJDEP GWQC in Parcel 57 groundwater samples.

A total of 20 metals were detected in Parcel 57 groundwater samples. Of the 20 metals detected, 11 (aluminum, arsenic, beryllium, cadmium, chromium, cobalt, iron, lead, manganese, nickel, and sodium) were detected above the respective GWQC.

Several natural and anthropogenic factors contribute to the wide range in concentrations of metals in soils, which further impact the concentration of metals in groundwater. Soils derived from glauconitic sands contain abundant aluminum, calcium, potassium, iron, magnesium, manganese, and sodium (among others), which are likely to be present at elevated concentrations in the groundwater, particularly when sediments are entrained in the collected groundwater samples. These native metals included aluminum, barium, calcium, iron, magnesium, manganese, potassium, sodium, and zinc (47). In addition, sodium concentrations can be influenced by saltwater intrusion. The non-native metals detected in groundwater samples collected from the temporary wells in Parcel 57 have been compared to the respective GWQC and MPBCs to determine COCs requiring further evaluation (**Figure 3.14-1**).

Four naturally occurring metal constituents commonly associated with the local soils/geology, aluminum, iron, manganese, and sodium were detected in Parcel 57 groundwater samples collected from temporary wells. As a result of these natural influences, aluminum, iron, manganese, and sodium are not considered COCs in groundwater.

Arsenic was detected at concentrations exceeding the NJDEP GWQC of 3 μg/L in four samples, P57-A3 (5.24 μg/L), P57-A5 (3.94 μg/L), P57-A7 (4.01 μg/L), and P57-A9 (6.73 μg/L). However, these concentrations did not exceed the MPBC of 89.3 μg/L. In addition, arsenic is associated with the native glauconitic sands (48). The elevated arsenic concentrations in the native soil in turn influence the arsenic levels in groundwater. Thus, arsenic is not considered a COC in groundwater. Beryllium was detected at concentrations exceeding the NJDEP GWQC of 1 μg/L in three samples, P57-A5 (2.12 μg/L), P57-A7 (1.98 μg/L), and P57-A9 (10.9 μg/L). Two of the three

beryllium concentrations also exceeded the MPBC of 2.1 μg/L. Cadmium was detected at a concentration exceeding the NJDEP GWQC of 4 μg/L and the MPBC of 9.5 μg/L in one sample, P57-A9 (14.3 μg/L). Chromium was detected at a concentration exceeding the NJDEP GWQC of 70 μg/L in one sample, P57-A7 (105 μg/L). The chromium concentration was below the MPBC of 191 μg/L. Cobalt was detected at a concentration exceeding the NJDEP GWQC of 100 μg/L and the MPBC of 18.3 μg/L in one sample, P57-A9 (147 μg/L). Lead was detected at a concentration exceeding the NJDEP GWQC of 5 μg/L and the MPBC of 22.7 μg/L in one sample, P57-A7 (829 μg/L). Nickel was detected at a concentration exceeding the NJDEP GWQC of 100 μg/L and the MPBC of 187 μg/L in one sample P57-A-9 (372 μg/L).

3.14.5 Summary and Conclusions

Soil samples that exceeded NJDEP NRDCSCC for B/Ns were collected from the 0- to 6-inch interval below the pavement sub-base. The four B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and benzo[k]fluoranthene) that were detected at concentrations above the NRDCSCC and the MPBC are considered COCs in soil.

Five common, naturally occurring metal constituents, aluminum, arsenic, iron, manganese, and sodium, were detected at concentrations greater than the NJDEP GWQC, but these native metals are attributed to the aquifer material and are not site-related. Therefore, these metals are not considered COCs. Five non-native metal constituents, beryllium, cadmium, cobalt, lead, and nickel, were detected at concentrations above the NJDEP GWQC and their respective MPBC. These five metals are considered COCs in Parcel 57 groundwater. Further evaluation of B/Ns identified in surface soil and metals in groundwater is recommended for Parcel 57. The B/N COCs identified in soil at Parcel 57 are PAHs. PAHs are contained in asphalt and are commonly detected in soil under asphalt pavement. Re-collection of samples at locations that are currently paved and/or were paved in the past will be conducted as part of the further evaluation to determine if the PAHs detected in soil are attributable to asphalt.

Table 3.14-2
Parcel 57 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	12/08/07	-	--	--		X							
SOIL	GEOPROBE	P57-B3-A	12/08/07	9:15	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-B3-B	12/08/07	9:15	1.5	2.0		X							
SOIL	GEOPROBE	P57-B3-C	12/08/07	9:35	7.0	7.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-B4-A	12/08/07	10:30	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-B4-B	12/08/07	10:30	1.5	2.0		X							
SOIL	GEOPROBE	P57-B4-C	12/08/07	10:45	6.5	7.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-C3-A	12/08/07	12:10	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-C3-B	12/08/07	12:10	1.5	2.0		X							
SOIL	GEOPROBE	P57-C3-C	12/08/07	12:20	6.5	7.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-C3-C DUPLICATE	12/08/07	12:20	6.5	7.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A2-A	12/08/07	12:55	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P57-A2-B	12/08/07	12:55	1.5	2.0		X							
SOIL	GEOPROBE	P57-A2-C	12/08/07	13:05	5.5	6.0		X	X	X	X				
BLANK	FIELD	FIELD BLANK-SO	12/08/07	13:15	--	--		X	X	X	X				
BLANK	TRIP	TRIP BLANK	12/10/07	-	--	--		X							
SOIL	GEOPROBE	P57-C5-A	12/10/07	8:25	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

Table 3.14-2
Parcel 57 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P57-C5-B	12/10/07	8:25	1.5	2.0		X							
SOIL	GEOPROBE	P57-C5-C	12/10/07	8:35	7.0	7.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-C4-A	12/10/07	9:20	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-C4-B	12/10/07	9:20	1.5	2.0		X							
SOIL	GEOPROBE	P57-C4-C	12/10/07	9:30	6.5	7.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-B5-A	12/10/07	13:35	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-B5-B	12/10/07	13:35	1.5	2.0		X							
SOIL	GEOPROBE	P57-B5-C	12/10/07	13:40	6.5	7.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-B5-C DUPLICATE	12/10/07	13:40	6.5	7.0		X	X	X	X				
SOIL	GEOPROBE	P57-A4-A	12/10/07	14:15	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A4-B	12/10/07	14:15	1.5	2.0		X							
SOIL	GEOPROBE	P57-A4-C	12/10/07	14:25	6.5	7.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A6-A	12/10/07	14:50	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A6-B	12/10/07	14:50	1.5	2.0		X							
SOIL	GEOPROBE	P57-A6-C	12/10/07	15:00	7.0	7.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

Table 3.14-2
Parcel 57 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P57-A8-A	12/10/07	15:35	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A8-B	12/10/07	15:35	1.5	2.0		X							
SOIL	GEOPROBE	P57-A8-C	12/10/07	15:50	6.0	6.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK	12/10/07	15:15	--	--		X	X	X	X				
BLANK	TRIP	TRIP BLANK-SO	12/11/07	-	--	--		X							
SOIL	GEOPROBE	P57-A1-A	12/11/07	7:50	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A1-B	12/11/07	7:50	1.5	2.0		X							
SOIL	GEOPROBE	P57-A1-C	12/11/07	8:00	7.5	8.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A3-A	12/11/07	8:30	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A3-B	12/11/07	8:30	1.5	2.0		X							
SOIL	GEOPROBE	P57-A3-C	12/11/07	8:40	4.0	4.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A5-A	12/11/07	9:25	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A5-B	12/11/07	9:25	1.5	2.0		X							
SOIL	GEOPROBE	P57-A5-C	12/11/07	14:05	7.5	8.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P57-A7-A	12/11/07	11:15	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P57-A7-B	12/11/07	11:15	1.5	2.0		X							
SOIL	GEOPROBE	P57-A7-C	12/11/07	11:35	5.5	6.0		X	X	X	X				

Table 3.14-2
Parcel 57 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P57-A9-A	12/11/07	13:10	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P57-A9-B	12/11/07	13:10	1.5	2.0		X							
SOIL	GEOPROBE	P57-A9-C	12/11/07	13:20	7.5	8.0		X	X	X	X				
SOIL	GEOPROBE	P57-A9-C DUPLICATE	12/11/07	13:20	7.5	8.0		X	X	X	X				
BLANK	FIELD	FIELD BLANK-SO	12/11/07	13:35	--	--		X	X	X	X				
BLANK	TRIP	TRIP BLANK-AQ	12/11/07	13:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/11/07	14:00	--	--		X	X		X				
GW	GEOPROBE	P57-A1	12/11/07	14:30	7.0	12.0		X	X		X				
GW	GEOPROBE	P57-A3	12/11/07	15:00	4.0	9.0		X	X		X				
GW	GEOPROBE	P57-A3 DUPLICATE	12/11/07	15:00	4.0	9.0		X	X		X				
GW	GEOPROBE	P57-A5	12/11/07	15:30	4.0	14.0		X	X		X				
GW	GEOPROBE	P57-A7	12/11/07	16:00	4.0	14.0		X	X		X				
GW	GEOPROBE	P57-A9	12/11/07	16:30	8.0	18.0		X	X		X				

X = Sample analyzed for the indicated analytical parameter suite

Table 3.14-3
Fort Monmouth Phase II Site Investigation, Parcel 57
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results												
		Sample ID:	P57-A1-A	P57-A1-B	P57-A1-C	P57-A2-A	P57-A2-B	P57-A2-C	P57-A3-A	P57-A3-B	P57-A3-C	P57-A4-A	P57-A4-B	P57-A4-C	P57-A5-A
		Lab ID:	7052503	7052504	7052505	7051712	7051713	7051714	7052506	7052507	7052508	7052112	7052113	7052114	7052509
		Date Sampled:	12/11/2007	12/11/2007	12/11/2007	12/08/2007	12/08/2007	12/08/2007	12/11/2007	12/11/2007	12/11/2007	12/10/2007	12/10/2007	12/10/2007	12/11/2007
		Depth (ft. bgs):	0.5-1.0	1.5-2.0	7.5-8.0	0.0-0.5	1.5-2.0	5.5-6.0	0.5-1.0	1.5-2.0	4.0-4.5	0.5-1.0	1.5-2.0	6.5-7.0	0.5-1.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles															
Acetone	1000	100	NT	0.260 U	**0.400**	NT	0.240 U	0.320 U	NT	**0.420**	**0.300**	NT	**0.043 J**	**0.450**	NT
Benzene	13	1	NT	0.260 U	0.330 U	NT	**0.017 J**	0.320 U	NT	0.260 U	0.250 U	NT	0.330 U	0.290 U	NT
Ethylbenzene	1000	100	NT	0.260 U	0.330 U	NT	**0.023 J**	0.320 U	NT	0.260 U	0.250 U	NT	0.330 U	0.290 U	NT
Toluene	1000	500	NT	0.260 U	0.330 U	NT	**0.077 J**	0.320 U	NT	0.260 U	0.250 U	NT	**0.069 J**	0.290 U	NT
Trichlorofluoromethane	NLE	NLE	NT	0.260 U	0.330 U	NT	0.240 U	0.320 U	NT	0.260 U	0.250 U	NT	0.330 U	0.290 U	NT
Vinyl Acetate	NLE	NLE	NT	0.260 U	0.330 U	NT	0.240 U	0.320 U	NT	0.260 U	0.250 U	NT	0.330 U	0.290 U	NT
Xylenes (Total)	1000	67	NT	0.780 U	0.990 U	NT	**0.350 J**	0.950 U	NT	0.780 U	0.750 U	NT	1.000 U	0.870 U	NT
Semi-Volatiles															
Acenaphthene	10000	100	**1.200**	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	**0.085 J**
Acenaphthylene	NLE	NLE	**0.760 J**	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	**0.077 J**	NT	1.100 U	**0.061 J**
Anthracene	10000	100	**5.600**	NT	1.300 U	**0.055 J**	NT	1.300 U	1.200 U	NT	1.100 U	**0.160 J**	NT	1.100 U	**0.180 J**
Benzo[a]anthracene	4	500	**9.500 JD**	NT	1.300 U	**0.220 J**	NT	1.300 U	**0.100 J**	NT	1.100 U	**0.310 J**	NT	1.100 U	**0.340 J**
Benzo[a]pyrene	0.66	100	**9.900**	NT	1.300 U	**0.210 J**	NT	1.300 U	1.200 U	NT	1.100 U	**0.350 J**	NT	1.100 U	1.100 U
Benzo[b]fluoranthene	4	50	**9.900 JD**	NT	1.300 U	**0.330 J**	NT	1.300 U	1.200 U	NT	1.100 U	**0.470 J**	NT	1.100 U	**0.520 J**
Benzo[g,h,i]perylene	NLE	NLE	**3.400**	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
Benzo[k]fluoranthene	4	500	**7.000**	NT	1.300 U	**0.110 J**	NT	1.300 U	1.200 U	NT	1.100 U	**0.160 J**	NT	1.100 U	**0.210 J**
bis(2-Ethylhexyl)phthalate	210	100	1.100 U	NT	**0.080 J**	**0.099 J**	NT	**0.052 J**	1.200 U	NT	**0.086 J**	**0.150 J**	NT	1.100 U	**3.200**
Butyl benzyl phthalate	10000	100	1.100 U	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
Chrysene	40	500	**10.000 JD**	NT	1.300 U	**0.270 J**	NT	1.300 U	**0.130 J**	NT	1.100 U	**0.390 J**	NT	1.100 U	**0.430 J**
Dibenzofuran	NLE	NLE	**1.800**	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	**0.032 J**	NT	1.100 U	**0.061 J**
Diethyl phthalate	10000	50	1.100 U	NT	**0.059 JB**	1.200 U	NT	1.300 U	1.200 U	NT	**0.053 JB**	**0.160 JB**	NT	1.100 U	1.100 U
Di-n-butylphthalate	10000	100	**0.210 J**	NT	**0.990 J**	**2.700 B**	NT	**1.800 B**	**0.820 J**	NT	**1.500**	**0.490 JB**	NT	**1.400 B**	**1.300**
Di-n-octyl phthalate	10000	100	1.100 U	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
Fluoranthene	10000	100	**25.000 D**	NT	**0.058 J**	**0.420 J**	NT	1.300 U	**0.280 J**	NT	1.100 U	**0.680 J**	NT	1.100 U	**0.900 J**
Fluorene	10000	100	**2.200**	NT	1.300 U	1.200 U	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
Indeno[1,2,3-cd]pyrene	4	500	**3.200**	NT	1.300 U	**0.082 J**	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
2-Methylnaphthalene	NLE	NLE	**1.400**	NT	1.300 U	**0.075 J**	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
Naphthalene	4200	100	**0.880 J**	NT	1.300 U	**0.051 J**	NT	1.300 U	1.200 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U
Phenanthrene	NLE	NLE	**19.000 D**	NT	1.300 U	**0.200 J**	NT	1.300 U	**0.140 J**	NT	1.100 U	**0.510 J**	NT	**0.041 J**	**0.660 J**
Pyrene	10000	100	**22.000 D**	NT	**0.050 J**	**0.410 J**	NT	1.300 U	**0.300 J**	NT	1.100 U	**0.820 J**	NT	**0.034 J**	**1.100 J**
Metals															
Aluminum	NLE	NLE	**7800 B**	NT	**16500 B**	**14500 B**	NT	**35200 B**	**21700 B**	NT	**6490 B**	**14400 B**	NT	**11500 B**	**11000 B**
Arsenic	20	NLE	**17.8**	NT	**9.11**	**7.39**	NT	**11.4**	**12.4**	NT	**2.73**	**6.16**	NT	**8.12**	**6.05**
Barium	47000	NLE	**35.3 B**	NT	**12.2 B**	**49.3 B**	NT	**148 B**	**50.1 B**	NT	**11.3 B**	**42.8 B**	NT	**17.2 B**	**49.1 B**
Beryllium	140	NLE	**0.769**	NT	**0.926**	**0.882**	NT	**1.54**	**1.35**	NT	**0.271**	**0.527**	NT	**1.61**	**0.520**
Cadmium	100	NLE	**0.325**	NT	**0.221**	**0.384**	NT	**0.311**	**0.426**	NT	**0.112**	**0.468**	NT	**0.497**	**0.425**
Calcium	NLE	NLE	**2180 B**	NT	**216 B**	**3190 B**	NT	**468 B**	**18800 B**	NT	**466 B**	**29000 B**	NT	**778 B**	**45400 B**
Chromium (Total)	NLE	NLE	**58.8 B**	NT	**106 B**	**53.5 B**	NT	**217 B**	**110 B**	NT	**22.8 B**	**40.9 B**	NT	**122 B**	**31.3 B**
Cobalt	NLE	NLE	**1.98**	NT	**0.526**	**3.48**	NT	**0.832**	**1.79**	NT	0.338 U	**8.52**	NT	**1.30**	**4.80**
Copper	45000	NLE	**28.6 B**	NT	**9.40 B**	**17.6 B**	NT	**26.4 B**	**12.8 B**	NT	**3.57 B**	**33.1 B**	NT	**7.01 B**	**25.3 B**
Iron	NLE	NLE	**27900 B**	NT	**22800 B**	**24500 B**	NT	**35100 B**	**34600 B**	NT	**8110 B**	**21600 B**	NT	**44000 B**	**19700 B**
Lead	800	NLE	**15.9**	NT	**0.525**	**22.8**	NT	**3.88**	**11.2**	NT	**3.01**	**21.0**	NT	0.351 U	**29.3**
Magnesium	NLE	NLE	**3240 B**	NT	**4000 B**	**3790 B**	NT	**5900 B**	**5000 B**	NT	**832 B**	**5240 B**	NT	**5250 B**	**4970 B**
Manganese	NLE	NLE	**57.7 B**	NT	**42.2 B**	**303 B**	NT	**54.8 B**	**85.9 B**	NT	**19.7 B**	**174 B**	NT	**27.9 B**	**154 B**
Mercury	270	NLE	0.100 U	NT	0.119 U	0.110 U	NT	0.122 U	0.116 U	NT	0.099 U	0.105 U	NT	0.109 U	0.113 U
Nickel (Soluble Salts)	2400	NLE	**7.56**	NT	**4.39**	**10.4**	NT	**50.3**	**14.6**	NT	**2.76**	**17.6**	NT	**44.1**	**11.5**
Potassium	NLE	NLE	**5200 B**	NT	**5190 B**	**4290 B**	NT	**9540 B**	**7720 B**	NT	**1430 B**	**3420 B**	NT	**11800 B**	**2360 B**
Sodium	NLE	NLE	**42.5**	NT	41.667 U	38.480 U	NT	43.926 U	42.214 U	NT	38.483 U	**904**	NT	37.586 U	**434**
Vanadium	7100	NLE	**45.7**	NT	**60.5**	**49.9**	NT	**86.1**	**77.6**	NT	**18.1**	**60.4**	NT	**70.2**	**43.3**
Zinc	1500	NLE	**39.1**	NT	**46.9**	**61.7**	NT	**72.6**	**70.2**	NT	**36.5**	**65.0**	NT	**165**	**74.4**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.14-3
Fort Monmouth Phase II Site Investigation, Parcel 57
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results												
		Sample ID:	P57-A5-B	P57-A5-C	P57-A6-A	P57-A6-B	P57-A6-C	P57-A7-A	P57-A7-B	P57-A7-C	P57-A8-A	P57-A8-B	P57-A8-C	P57-A9-A	P57-A9-B
		Lab ID:	7052510	7052511	7052115	7052116	7052117	7052512	7052513	7052514	7052118	7052119	7052120	7052515	7052516
		Date Sampled:	12/11/2007	12/11/2007	12/10/2007	12/10/2007	12/10/2007	12/11/2007	12/11/2007	12/11/2007	12/10/2007	12/10/2007	12/10/2007	12/11/2007	12/11/2007
		Depth (ft. bgs):	1.5-2.0	7.5-8.0	0.5-1.0	1.5-2.0	7.0-7.5	0.0-0.5	1.5-2.0	5.5-6.0	0.5-1.0	1.5-2.0	6.0-6.5	0.0-0.5	1.5-2.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles															
Acetone	1000	100	**0.340**	**0.420**	NT	**0.400**	**0.380**	NT	**0.610**	**0.340**	NT	**0.390**	**0.560**	NT	**0.510**
Benzene	13	1	0.250 U	0.280 U	NT	0.270 U	0.260 U	NT	0.270 U	0.280 U	NT	0.260 U	0.270 U	NT	0.260 U
Ethylbenzene	1000	100	0.250 U	0.280 U	NT	0.270 U	0.260 U	NT	0.270 U	0.280 U	NT	0.260 U	0.270 U	NT	0.260 U
Toluene	1000	500	0.250 U	0.280 U	NT	0.270 U	0.260 U	NT	0.270 U	**0.024 J**	NT	0.260 U	0.270 U	NT	0.260 U
Trichlorofluoromethane	NLE	NLE	**0.069 J**	0.280 U	NT	0.270 U	0.260 U	NT	0.270 U	0.280 U	NT	0.260 U	0.270 U	NT	0.260 U
Vinyl Acetate	NLE	NLE	0.250 U	0.280 U	NT	0.270 U	0.260 U	NT	0.270 U	0.280 U	NT	**0.210 J**	0.270 U	NT	0.260 U
Xylenes (Total)	1000	67	0.760 U	0.840 U	NT	0.810 U	0.780 U	NT	0.820 U	**0.021 J**	NT	0.770 U	0.810 U	NT	0.790 U
Semi-Volatiles															
Acenaphthene	10000	100	NT	1.200 U	**0.070 J**	NT	1.100 U	1.100 U	NT	1.100 U	4.400 U	NT	1.100 U	1.200 U	NT
Acenaphthylene	NLE	NLE	NT	1.200 U	**0.059 J**	NT	1.100 U	1.100 U	NT	**0.069 J**	**0.170 J**	NT	1.100 U	1.200 U	NT
Anthracene	10000	100	NT	1.200 U	**0.150 J**	NT	**0.030 J**	**0.058 J**	NT	**0.039 J**	**0.520 J**	NT	1.100 U	1.200 U	NT
Benzo[a]anthracene	4	500	NT	1.200 U	**0.350 J**	NT	**0.054 J**	**0.240 J**	NT	**0.100 J**	**1.100 J**	NT	1.100 U	**0.089 J**	NT
Benzo[a]pyrene	0.66	100	NT	1.200 U	1.100 U	NT	1.100 U	**0.240 J**	NT	**0.088 J**	4.400 U	NT	1.100 U	**0.080 J**	NT
Benzo[b]fluoranthene	4	50	NT	1.200 U	1.100 U	NT	**0.069 J**	**0.430 J**	NT	**0.072 J**	4.400 U	NT	1.100 U	**0.130 J**	NT
Benzo[g,h,i]perylene	NLE	NLE	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	4.400 U	NT	1.100 U	1.200 U	NT
Benzo[k]fluoranthene	4	500	NT	1.200 U	1.100 U	NT	**0.039 J**	**0.100 J**	NT	**0.077 J**	4.400 U	NT	1.100 U	1.200 U	NT
bis(2-Ethylhexyl)phthalate	210	100	NT	**0.067 J**	1.100 U	NT	**0.044 J**	**1.900**	NT	**0.730 J**	**1.200 J**	NT	**0.110 J**	**0.180 J**	NT
Butyl benzyl phthalate	10000	100	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	4.400 U	NT	1.100 U	1.200 U	NT
Chrysene	40	500	NT	1.200 U	**0.470 J**	NT	**0.077 J**	**0.320 J**	NT	**0.140 J**	**1.500 J**	NT	1.100 U	**0.120 J**	NT
Dibenzofuran	NLE	NLE	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	**0.170 J**	NT	1.100 U	1.200 U	NT
Diethyl phthalate	10000	50	NT	1.200 U	**0.080 JB**	NT	1.100 U	**0.065 JB**	NT	**0.054 JB**	**0.250 JB**	NT	1.100 U	**0.046 JB**	NT
Di-n-butylphthalate	10000	100	NT	**0.300 J**	**1.100 JB**	NT	**0.380 JB**	**1.500**	NT	**0.810 J**	**2.300 JB**	NT	**3.800 B**	**0.340 J**	NT
Di-n-octyl phthalate	10000	100	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	4.400 U	NT	**0.035 JB**	1.200 U	NT
Fluoranthene	10000	100	NT	**0.077 J**	**0.850 J**	NT	**0.130 J**	**0.580 J**	NT	**0.140 J**	**2.400 J**	NT	**0.055 J**	**0.170 J**	NT
Fluorene	10000	100	NT	1.200 U	**0.073 J**	NT	1.100 U	1.100 U	NT	1.100 U	**0.280 J**	NT	1.100 U	1.200 U	NT
Indeno[1,2,3-cd]pyrene	4	500	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	4.400 U	NT	1.100 U	1.200 U	NT
2-Methylnaphthalene	NLE	NLE	NT	1.200 U	**0.091 J**	NT	1.100 U	1.100 U	NT	1.100 U	4.400 U	NT	1.100 U	1.200 U	NT
Naphthalene	4200	100	NT	1.200 U	**0.043 J**	NT	1.100 U	1.100 U	NT	1.100 U	**0.160 J**	NT	1.100 U	1.200 U	NT
Phenanthrene	NLE	NLE	NT	**0.057 J**	**0.670 J**	NT	**0.100 J**	**0.270 J**	NT	**0.050 J**	**2.100 J**	NT	**0.031 J**	**0.100 J**	NT
Pyrene	10000	100	NT	**0.074 J**	**1.300**	NT	**0.150 J**	**0.550 J**	NT	**0.210 J**	**4.000 J**	NT	**0.051 J**	**0.200 J**	NT
Metals															
Aluminum	NLE	NLE	NT	**11000 B**	**10600 B**	NT	**14300 B**	**10300 B**	NT	**6810 B**	**7970 B**	NT	**6370 B**	**12500 B**	NT
Arsenic	20	NLE	NT	**6.04**	**4.58**	NT	**13.2**	**8.01**	NT	**4.58**	**2.84**	NT	**8.05**	**10.3**	NT
Barium	47000	NLE	NT	**45.9 B**	**35.5 B**	NT	**38.6 B**	**34.5 B**	NT	**14.6 B**	**19.0 B**	NT	**5.38 B**	**36.2 B**	NT
Beryllium	140	NLE	NT	**1.02**	**0.346**	NT	**1.23**	**0.529**	NT	**0.524**	**0.259**	NT	**0.556**	**0.933**	NT
Cadmium	100	NLE	NT	**0.203**	**0.435**	NT	**0.359**	**0.329**	NT	**0.185**	**0.247**	NT	**0.0843**	**0.306**	NT
Calcium	NLE	NLE	NT	**1140 B**	**25000 B**	NT	**2040 B**	**9430 B**	NT	**762 B**	**14300 B**	NT	**439 B**	**1720 B**	NT
Chromium	NLE	NLE	NT	**61.5 B**	**22.9 B**	NT	**108 B**	**33.3 B**	NT	**41.0 B**	**17.1 B**	NT	**72.2 B**	**58.9 B**	NT
Cobalt	NLE	NLE	NT	0.347 U	**5.53**	NT	**1.70**	**1.32**	NT	**0.876**	**6.60**	NT	0.337 U	**1.42**	NT
Copper	45000	NLE	NT	**3.02 B**	**26.8 B**	NT	**11.1 B**	**13.0 B**	NT	**7.19 B**	**33.3 B**	NT	**2.90 B**	**16.2 B**	NT
Iron	NLE	NLE	NT	**23100 B**	**16500 B**	NT	**33200 B**	**17800 B**	NT	**15600 B**	**14300 B**	NT	**14100 B**	**27200 B**	NT
Lead	800	NLE	NT	**3.05**	**15.7**	NT	**7.57**	**29.5**	NT	**7.00**	**9.78**	NT	**1.65**	**28.9**	NT
Magnesium	NLE	NLE	NT	**2670 B**	**3790 B**	NT	**4330 B**	**2280 B**	NT	**1780 B**	**3720 B**	NT	**1180 B**	**2850 B**	NT
Manganese	NLE	NLE	NT	**97.6 B**	**118 B**	NT	**73.1 B**	**95.7 B**	NT	**55.9 B**	**140 B**	NT	**9.25 B**	**110 B**	NT
Mercury	270	NLE	NT	0.101 U	0.099 U	NT	0.108 U	0.106 U	NT	0.101 U	0.104 U	NT	0.109 U	0.109 U	NT
Nickel	2400	NLE	NT	**5.57**	**20.0**	NT	**10.3**	**6.45**	NT	**4.43**	**14.5**	NT	**2.27**	**6.97**	NT
Potassium	NLE	NLE	NT	**4170 B**	**1920 B**	NT	**7580 B**	**1970 B**	NT	**3110 B**	**1010 B**	NT	**2750 B**	**5150 B**	NT
Sodium	NLE	NLE	NT	39.424 U	**539**	NT	41.362 U	36.479 U	NT	38.989 U	**429**	NT	38.358 U	38.584 U	NT
Vanadium	7100	NLE	NT	**40.9**	**46.8**	NT	**63.9**	**37.5**	NT	**29.7**	**70.6**	NT	**40.6**	**47.0**	NT
Zinc	1500	NLE	NT	**80.4**	**70.4**	NT	**58.2**	**76.4**	NT	**35.8**	**50.4**	NT	**14.4**	**57.8**	NT

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.14-3
Fort Monmouth Phase II Site Investigation, Parcel 57
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results												
		Sample ID:	P57-A9-C	P57-A9-C DUP	P57-B3-A	P57-B3-B	P57-B3-C	P57-B4-A	P57-B4-B	P57-B4-C	P57-B5-A	P57-B5-B	P57-B5-C	P57-B5-C DUP	P57-C3-A
		Lab ID:	7052517	7052502	7051703	7051704	7051705	7051706	7051707	7051708	7052109	7052110	7052111	7052102	7051709
		Date Sampled:	12/11/2007	12/11/2007	12/08/2007	12/08/2007	12/08/2007	12/08/2007	12/08/2007	12/08/2007	12/10/2007	12/10/2007	12/10/2007	12/10/2007	12/08/2007
		Depth (ft. bgs):	7.5-8.0	7.5-8.0	0.5-1.0	1.5-2.0	7.0-7.5	0.5-1.0	1.5-2.0	6.5-7.0	0.5-1.0	1.5-2.0	6.5-7.0	6.5-7.0	0.5-1.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles															
Acetone	1000	100	**0.490**	**0.730**	NT	0.260 U	0.330 U	NT	0.260 U	0.280 U	NT	0.270 U	0.350 U	**0.280 J**	NT
Benzene	13	1	0.250 U	0.290 U	NT	0.260 U	0.330 U	NT	0.260 U	0.280 U	NT	0.270 U	0.350 U	0.300 U	NT
Ethylbenzene	1000	100	0.250 U	0.290 U	NT	0.260 U	0.330 U	NT	0.260 U	0.280 U	NT	0.270 U	0.350 U	0.300 U	NT
Toluene	1000	500	0.250 U	0.290 U	NT	0.260 U	0.330 U	NT	0.260 U	0.280 U	NT	0.270 U	0.350 U	0.300 U	NT
Trichlorofluoromethane	NLE	NLE	0.250 U	0.290 U	NT	0.260 U	0.330 U	NT	0.260 U	0.280 U	NT	0.270 U	0.350 U	0.300 U	NT
Vinyl Acetate	NLE	NLE	0.250 U	**0.240 J**	NT	0.260 U	0.330 U	NT	0.260 U	0.280 U	NT	0.270 U	0.350 U	0.300 U	NT
Xylenes (Total)	1000	67	0.750 U	0.870 U	NT	0.790 U	0.980 U	NT	0.790 U	0.840 U	NT	0.810 U	1.060 U	0.900 U	NT
Semi-Volatiles															
Acenaphthene	10000	100	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.041 J**	NT	1.100 U	**0.066 J**	NT	1.200 U	1.200 U	**0.540 J**
Acenaphthylene	NLE	NLE	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.071 J**	NT	1.100 U	**0.039 J**	NT	1.200 U	1.200 U	**0.097 J**
Anthracene	10000	100	1.100 U	**0.110 J**	**0.049 J**	NT	1.200 U	**0.200 J**	NT	1.100 U	**0.200 J**	NT	1.200 U	1.200 U	**1.200**
Benzo[a]anthracene	4	500	1.100 U	**0.230 J**	**0.210 J**	NT	1.200 U	**0.600 J**	NT	1.100 U	**0.460 J**	NT	1.200 U	1.200 U	**2.900**
Benzo[a]pyrene	0.66	100	1.100 U	**0.150 J**	1.100 U	NT	1.200 U	**0.480 J**	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	**2.000**
Benzo[b]fluoranthene	4	50	1.100 U	**0.220 J**	1.100 U	NT	1.200 U	**0.790 J**	NT	1.100 U	**0.520 J**	NT	1.200 U	1.200 U	**3.100**
Benzo[g,h,i]perylene	NLE	NLE	1.100 U	**0.100 J**	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	**0.730 J**
Benzo[k]fluoranthene	4	500	1.100 U	**0.093 J**	1.100 U	NT	1.200 U	**0.360 J**	NT	1.100 U	**0.350 J**	NT	1.200 U	1.200 U	**1.900**
bis(2-Ethylhexyl)phthalate	210	100	**0.100 J**	**0.062 J**	**0.150 J**	NT	1.200 U	**0.130 J**	NT	1.100 U	**0.300 J**	NT	1.200 U	**0.087 J**	**0.220 J**
Butyl benzyl phthalate	10000	100	1.100 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	**0.130 J**	NT	1.200 U	1.200 U	1.100 U
Chrysene	40	500	1.100 U	**0.250 J**	**0.250 J**	NT	1.200 U	**0.690 J**	NT	1.100 U	**0.510 J**	NT	1.200 U	1.200 U	**3.000**
Dibenzofuran	NLE	NLE	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.064 J**	NT	1.100 U	**0.057 J**	NT	1.200 U	1.200 U	**0.260 J**
Diethyl phthalate	10000	50	1.100 U	**0.048 JB**	**0.043 JB**	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	**0.034 JB**	1.100 U
Di-n-butylphthalate	10000	100	**1.100 J**	**1.000 J**	**1.600 B**	NT	**0.630 JB**	**1.700 B**	NT	**0.610 JB**	**0.760 JB**	NT	**0.910 JB**	**2.700 B**	**2.000 B**
Di-n-octyl phthalate	10000	100	1.100 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	**0.380 JB**	NT	1.200 U	**0.060 JB**	1.100 U
Fluoranthene	10000	100	1.100 U	**0.680 J**	**0.320 J**	NT	1.200 U	**1.400**	NT	1.100 U	**0.990 J**	NT	1.200 U	1.200 U	**7.500**
Fluorene	10000	100	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.038 J**	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	**0.380 J**
Indeno[1,2,3-cd]pyrene	4	500	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.150 J**	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	**0.690 J**
2-Methylnaphthalene	NLE	NLE	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.080 J**	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	**0.075 J**
Naphthalene	4200	100	1.100 U	1.200 U	1.100 U	NT	1.200 U	**0.065 J**	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	**0.120 J**
Phenanthrene	NLE	NLE	1.100 U	**0.510 J**	**0.180 J**	NT	1.200 U	**0.750 J**	NT	1.100 U	**1.000 J**	NT	1.200 U	1.200 U	**4.700**
Pyrene	10000	100	1.100 U	**0.580 J**	**0.500 J**	NT	1.200 U	**1.600**	NT	1.100 U	**1.600**	NT	1.200 U	1.200 U	**9.400**
Metals															
Aluminum	NLE	NLE	**5540 B**	**5180 B**	**8850 B**	NT	**18800 B**	**10600 B**	NT	**8020 B**	**9520 B**	NT	**19400 B**	**20300 B**	**10400 B**
Arsenic	20	NLE	**2.42**	**1.70**	**7.58**	NT	**11.0**	**5.89**	NT	**6.21**	**5.03**	NT	**7.71**	**9.35**	**2.36**
Barium	47000	NLE	**19.9 B**	**17.0 B**	**20.6 B**	NT	**33.8 B**	**43.6 B**	NT	**39.3 B**	**32.9 B**	NT	**30.5 B**	**32.0 B**	**20.9 B**
Beryllium	140	NLE	**0.462**	**0.475**	**1.25**	NT	**0.917**	**0.517**	NT	**0.516**	**0.540**	NT	**1.06**	**1.18**	**0.494**
Cadmium	100	NLE	**0.135**	**0.126**	**0.193**	NT	**0.261**	**0.318**	NT	**0.414**	**0.289**	NT	**0.317**	**0.534**	**0.163**
Calcium	NLE	NLE	**677 B**	**605 B**	**18300 B**	NT	**467 B**	**42600 B**	NT	**34300 B**	**34400 B**	NT	**607 B**	**598 B**	**292 B**
Chromium	NLE	NLE	**28.0 B**	**28.3 B**	**92.2 B**	NT	**63.6 B**	**39.9 B**	NT	**35.6 B**	**58.4 B**	NT	**127 B**	**135 B**	**46.4 B**
Cobalt	NLE	NLE	0.332 U	0.333 U	**1.94**	NT	**2.47**	**2.82**	NT	**2.93**	**5.07**	NT	**1.64**	**1.58**	**0.756**
Copper	45000	NLE	**2.91 B**	**4.17 B**	**8.00 B**	NT	**12.2 B**	**14.4 B**	NT	**29.9 B**	**21.0 B**	NT	**5.56 B**	**6.99 B**	**4.84 B**
Iron	NLE	NLE	**13300 B**	**13300 B**	**36000 B**	NT	**15300 B**	**15800 B**	NT	**17400 B**	**18500 B**	NT	**37400 B**	**47400 B**	**8230 B**
Lead	800	NLE	**40.7**	**38.0**	**7.69**	NT	**7.04**	**20.3**	NT	**51.4**	**15.0**	NT	**3.03**	**2.82**	**4.81**
Magnesium	NLE	NLE	**1380 B**	**1460 B**	**4560 B**	NT	**2600 B**	**3970 B**	NT	**4980 B**	**4530 B**	NT	**5090 B**	**5330 B**	**1500 B**
Manganese	NLE	NLE	**36.2 B**	**26.9 B**	**58.4 B**	NT	**67.6 B**	**120 B**	NT	**118 B**	**102 B**	NT	**55.2 B**	**54.6 B**	**34.8 B**
Mercury	270	NLE	0.106 U	0.114 U	0.110 U	NT	0.116 U	0.102 U	NT	0.102 U	0.107 U	NT	0.114 U	0.110 U	**0.160**
Nickel	2400	NLE	**2.35**	**2.49**	**6.29**	NT	**11.0**	**8.92**	NT	**8.99**	**9.44**	NT	**8.71**	**8.98**	**5.59**
Potassium	NLE	NLE	**2500 B**	**2640 B**	**8710 B**	NT	**2780 B**	**2710 B**	NT	**2560 B**	**3170 B**	NT	**8330 B**	**8900 B**	**1940 B**
Sodium	NLE	NLE	37.822 U	37.867 U	37.752 U	NT	43.828 U	36.969 U	NT	39.984 U	**48.6**	NT	42.72 U	39.581 U	40.694 U
Vanadium	7100	NLE	**19.4**	**18.2**	**51.2**	NT	**62.7**	**40.8**	NT	**40.0**	**59.1**	NT	**85.3**	**91.4**	**30.9**
Zinc	1500	NLE	**29.4**	**28.8**	**72.5**	NT	**57.9**	**50.5**	NT	**84.8**	**46.2**	NT	**62.6**	**67.0**	**25.2**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.14-3
Fort Monmouth Phase II Site Investigation, Parcel 57
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results								
		Sample ID:	P57-C3-B	P57-C3-C	P57-C3-C DUP	P57-C4-A	P57-C4-B	P57-C4-C	P57-C5-A	P57-C5-B	P57-C5-C
		Lab ID:	7051710	7051711	7051702	7052106	7052107	7052108	7052103	7052104	7052105
		Date Sampled:	12/08/2007	12/08/2007	12/08/2007	12/10/2007	12/10/2007	12/10/2007	12/10/2007	12/10/2007	12/10/2007
		Depth (ft. bgs):	1.5-2.0	6.5-7.0	6.5-7.0	0.5-1.0	1.5-2.0	6.5-7.0	0.5-1.0	1.5-2.0	7.0-7.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles											
Acetone	1000	100	0.270 U	0.260 U	0.260 U	NT	0.310 U	0.270 U	NT	**0.280 J**	0.320 U
Benzene	13	1	0.270 U	0.260 U	0.260 U	NT	0.310 U	0.270 U	NT	0.300 U	0.320 U
Ethylbenzene	1000	100	**0.011 J**	0.260 U	0.260 U	NT	0.310 U	0.270 U	NT	0.300 U	0.320 U
Toluene	1000	500	0.270 U	0.260 U	0.260 U	NT	0.310 U	0.270 U	NT	0.300 U	0.320 U
Trichlorofluoromethane	NLE	NLE	0.270 U	0.260 U	0.260 U	NT	0.310 U	0.270 U	NT	0.300 U	0.320 U
Vinyl Acetate	NLE	NLE	0.270 U	0.260 U	0.260 U	NT	0.310 U	0.270 U	NT	0.300 U	0.320 U
Xylenes (Total)	1000	67	0.810 U	0.780 U	0.780 U	NT	0.920 U	0.810 U	NT	0.990 U	0.960 U
Semi-Volatiles											
Acenaphthene	10000	100	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	**0.078 J**	NT	1.100 U
Acenaphthylene	NLE	NLE	NT	1.100 U	1.100 U	**0.190 J**	NT	1.100 U	**0.100 J**	NT	1.100 U
Anthracene	10000	100	NT	1.100 U	1.100 U	**0.130 J**	NT	1.100 U	**0.430 J**	NT	1.100 U
Benzo[a]anthracene	4	500	NT	**0.100 J**	1.100 U	**0.420 J**	NT	1.100 U	**1.200**	NT	1.100 U
Benzo[a]pyrene	0.66	100	NT	**0.081 J**	1.100 U	**0.470 J**	NT	1.100 U	**0.950 J**	NT	1.100 U
Benzo[b]fluoranthene	4	50	NT	**0.110 J**	1.100 U	**0.650 J**	NT	1.100 U	**1.500**	NT	1.100 U
Benzo[g,h,i]perylene	NLE	NLE	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	1.100 U	NT	1.100 U
Benzo[k]fluoranthene	4	500	NT	**0.059 J**	1.100 U	**0.290 J**	NT	1.100 U	**0.480 J**	NT	1.100 U
bis(2-Ethylhexyl)phthalate	210	100	NT	**0.092 J**	**0.090 J**	**0.200 J**	NT	1.100 U	**1.100**	NT	1.100 U
Butyl benzyl phthalate	10000	100	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	1.100 U	NT	1.100 U
Chrysene	40	500	NT	**0.120 J**	1.100 U	**0.520 J**	NT	1.100 U	**1.300**	NT	1.100 U
Dibenzofuran	NLE	NLE	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	**0.058 J**	NT	1.100 U
Diethyl phthalate	10000	50	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	1.100 U	NT	1.100 U
Di-n-butylphthalate	10000	100	NT	**2.400 B**	**0.410 JB**	**0.770 JB**	NT	**0.570 JB**	**0.640 JB**	NT	**0.580 JB**
Di-n-octyl phthalate	10000	100	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	1.100 U	NT	1.100 U
Fluoranthene	10000	100	NT	**0.120 J**	**0.041 J**	**0.640 J**	NT	1.100 U	**2.600**	NT	1.100 U
Fluorene	10000	100	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	**0.110 J**	NT	1.100 U
Indeno[1,2,3-cd]pyrene	4	500	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	**0.330 J**	NT	1.100 U
2-Methylnaphthalene	NLE	NLE	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	1.100 U	NT	1.100 U
Naphthalene	4200	100	NT	1.100 U	1.100 U	1.000 U	NT	1.100 U	1.100 U	NT	1.100 U
Phenanthrene	NLE	NLE	NT	**0.033 J**	1.100 U	**0.260 J**	NT	1.100 U	**1.400**	NT	1.100 U
Pyrene	10000	100	NT	**0.160 J**	**0.041 J**	**1.200**	NT	1.100 U	**3.600**	NT	1.100 U
Metals											
Aluminum	NLE	NLE	NT	**11000 B**	**7000 B**	**13100 B**	NT	**11000 B**	**8990 B**	NT	**3580 B**
Arsenic	20	NLE	NT	**4.98**	**3.65**	**5.40**	NT	**11.4**	**4.64**	NT	**2.04**
Barium	47000	NLE	NT	**20.6 B**	**13.4 B**	**40.7 B**	NT	**15.9 B**	**32.7 B**	NT	**6.15 B**
Beryllium	140	NLE	NT	**0.637**	**0.508**	**0.590**	NT	**1.33**	**0.615**	NT	**0.326**
Cadmium	100	NLE	NT	**0.194**	**0.0962**	**0.362**	NT	**0.196**	**0.319**	NT	**0.0535**
Calcium	NLE	NLE	NT	**1660 B**	**1400 B**	**21100 B**	NT	**693 B**	**24100 B**	NT	**280 B**
Chromium	NLE	NLE	NT	**57.7 B**	**42.9 B**	**43.5 B**	NT	**96.4 B**	**54.5 B**	NT	**30.8 B**
Cobalt	NLE	NLE	NT	**1.11**	**1.43**	**8.68**	NT	**1.42**	**3.13**	NT	0.326 U
Copper	45000	NLE	NT	**8.57 B**	**7.79 B**	**29.3 B**	NT	**5.09 B**	**20.0 B**	NT	**3.28 B**
Iron	NLE	NLE	NT	**18400 B**	**16200 B**	**20100 B**	NT	**39500 B**	**19800 B**	NT	**8350 B**
Lead	800	NLE	NT	**5.10**	**4.66**	**30.1**	NT	**1.20**	**51.6**	NT	**1.40**
Magnesium	NLE	NLE	NT	**1940 B**	**1330 B**	**4740 B**	NT	**4300 B**	**3400 B**	NT	**871 B**
Manganese	NLE	NLE	NT	**52.7 B**	**96.2 B**	**127 B**	NT	**39.4 B**	**93.3 B**	NT	**15.3 B**
Mercury	270	NLE	NT	0.100 U	0.101 U	0.098 U	NT	0.096 U	0.099 U	NT	0.099 U
Nickel	2400	NLE	NT	**5.79**	**7.16**	**14.1**	NT	**5.97**	**9.05**	NT	**3.63**
Potassium	NLE	NLE	NT	**3070 B**	**1860 B**	**2760 B**	NT	**9520 B**	**2540 B**	NT	**1960 B**
Sodium	NLE	NLE	NT	35.244 U	37.691 U	**688**	NT	36.431 U	40.061 U	NT	37.124 U
Vanadium	7100	NLE	NT	**46.7**	**36.6**	**65.3**	NT	**60.0**	**65.3**	NT	**24.5**
Zinc	1500	NLE	NT	**39.8**	**43.6**	**53.6**	NT	**61.5**	**58.2**	NT	**28.0**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

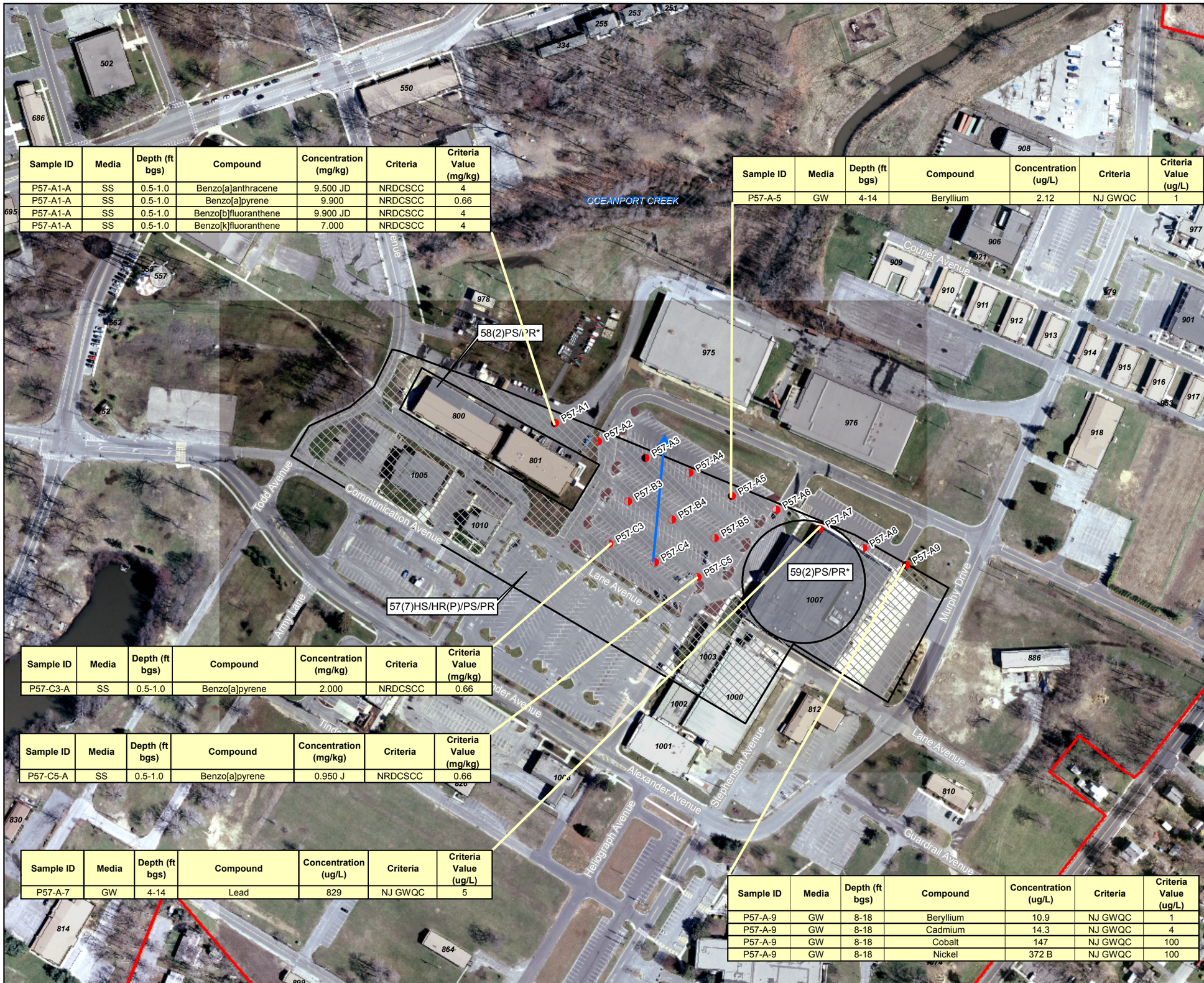
Table 3.14-4
Fort Monmouth Phase II Site Investigation, Parcel 57
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results					
	Sample ID:	P57-A-1	P57-A-3	P57-A-3 DUP	P57-A-5	P57-A-7	P57-A-9
	Lab ID:	7053104	7053105	7053103	7053106	7053107	7053108
	Date Sampled:	12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
	Screened Interval (ft. bgs):	7-12	4-9	4-9	4-14	4-14	8-18
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result
Volatiles							
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	**31.13 B**	0.85 U
Carbon disulfide	700	0.44 U	0.44 U	0.44 U	0.44 U	**0.28 J**	**0.10 J**
Methyl ethyl ketone (2-Butanone)	300	0.14 U	0.14 U	0.14 U	0.14 U	**4.14**	0.14 U
Tertiary butyl alcohol	100	1.82 U	**10.49**	1.82 U	1.82 U	1.82 U	1.82 U
Toluene	600	**0.23 J**	0.27 U	0.27 U	**1.02**	**0.77**	**0.21 J**
Semi-Volatiles							
bis(2-Ethylhexyl)phthalate	3	1.28 U	**1.94**	1.28 U	1.28 U	1.28 U	1.28 U
Metals							
Aluminum	200	**592 B**	**16100 B**	**266 B**	**13400 B**	**11000 B**	**43400 B**
Antimony	6	0.70 U	0.70 U	0.70 U	0.70 U	**1.13**	0.70 U
Arsenic	3	2.70 U	**5.24**	2.70 U	**3.94**	**4.01**	**6.73**
Barium	6000	**66.2**	**189**	**165**	**225**	**224**	**26.8**
Beryllium	1	**0.454**	**0.249**	0.100 U	**2.12**	**1.98**	**10.9**
Cadmium	4	**0.274**	**1.46**	**1.15**	**0.284**	**0.917**	**14.3**
Calcium	NLE	**3300 B**	**290000 B**	**284000 B**	**33200 B**	**63400 B**	**73300 B**
Chromium (Total)	70	**0.692 B**	**45.5 B**	**0.640 B**	**69.8 B**	**105 B**	**3.57 B**
Cobalt	100*	**3.79**	**1.75**	**0.755**	**9.62**	**10.5**	**147**
Copper	1300	**1.72**	**27.7**	**6.58**	**10.7**	**137**	**43.4**
Iron	300	323 U	**17100**	323 U	**138000**	**25200**	**17700**
Lead	5	0.700 U	**3.31**	0.700 U	0.700 U	**829**	**3.07**
Magnesium	NLE	**5370**	**14000**	**12900**	**22000**	**6600**	**37500**
Manganese	50	**46.4 B**	**62.7 B**	**43.5 B**	**502 B**	**765 B**	**2710 B**
Nickel (Soluble Salts)	100	**7.38 B**	**7.18 B**	0.300 U	**16.6 B**	**24.0 B**	**372 B**
Potassium	NLE	**2850 B**	**72600 B**	**68500 B**	**6720 B**	**2500 B**	**5480 B**
Selenium	40	**4.89 B**	2.70 U	2.70 U	2.70 U	2.70 U	2.70 U
Sodium	50000	**20900**	**3070000 E**	**3110000 E**	**156000**	**6790**	**26000**
Vanadium	NLE	0.500 U	**95.3**	**17.6**	**56.9**	**68.8**	**3.07**
Zinc	2000	**23.6**	**62.7**	**20.0**	**171**	**145**	**1580**

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.
ft. bgs = Feet below ground surface.
Bold = Analyte was detected.
Shaded = Concentration exceeds Quality Criteria.
µg/L = micrograms per liter.
NLE = No limit established.

B = The compound was found in the associated method blank as well as in the sample.
D = Sample was diluted.
E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.
J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.
U = The compound was analyzed for but not detected.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P57-A1-A	SS	0.5-1.0	Benzo[a]anthracene	9.500 JD	NRDCSCC	4
P57-A1-A	SS	0.5-1.0	Benzo[a]pyrene	9.900	NRDCSCC	0.66
P57-A1-A	SS	0.5-1.0	Benzo[b]fluoranthene	9.900 JD	NRDCSCC	4
P57-A1-A	SS	0.5-1.0	Benzo[k]fluoranthene	7.000	NRDCSCC	4

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P57-A-5	GW	4-14	Beryllium	2.12	NJ GWQC	1

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P57-C3-A	SS	0.5-1.0	Benzo[a]pyrene	2.000	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P57-C5-A	SS	0.5-1.0	Benzo[a]pyrene	0.950 J	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P57-A-7	GW	4-14	Lead	829	NJ GWQC	5

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P57-A-9	GW	8-18	Beryllium	10.9	NJ GWQC	1
P57-A-9	GW	8-18	Cadmium	14.3	NJ GWQC	4
P57-A-9	GW	8-18	Cobalt	147	NJ GWQC	100
P57-A-9	GW	8-18	Nickel	372 B	NJ GWQC	100

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS
- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.14-1

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 57 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_14-1_SI_P57_Exceeds_SampLoc.mxd (7/14/2008 12:54:25 PM)

3.15 Parcel 61 – Bldg 1075 – Patterson Army Health Clinic

3.15.1 Site Description

Parcel 61 is located in the south-central portion of the MP and encompasses Patterson Army Health Clinic (Bldg 1075) and the surrounding land. Bldg 1075 was constructed in 1961 to house Patterson Army Hospital. Bldg 1075 has been used continuously since that time, although it was downgraded to a health clinic in 1995. Operations in the 1960s, 1970s, and 1980s included X-ray processing and laboratory operations. Operations in the building extensively used mercury-containing equipment, developing chemicals, and other chemicals/waste associated with medical operations.

During the 2006 VSIs, numerous floor drains were observed in the basement that lead to the pneumatic sewage ejector and into the sanitary sewer (34). Additional information pertaining to this parcel can be found in Section 4.3.2.1.3, Section 4.3.2.1.4, Section 4.4.4.2, Table 4-3, Section 4.4.4.3, Table 4-4, Section 5.1.1.2.1, Section 5.1.9.1, Section 5.12, and Section 5.13.5 of the Phase I ECP (1).

3.15.2 Previous Investigations

One former UST associated with Bldg 1075 was removed under the FTMM UST Management Program and is summarized within the FTMM Phase I ECP Report (1). No previous investigations have been conducted in relation to former operations in Bldg 1075.

3.15.3 Site Investigation Sampling

A site reconnaissance and reviews of historical site plans, sanitary plans, and stormwater management plans were conducted to evaluate potential discharge locations throughout the parcel. It was determined that stormwater from Bldg 1075 discharges northwest of Bldg 975. In order to determine if any contamination exists due to previous operations conducted at Bldg 1075, the following soil and sediment sampling was performed in Parcel 61.

Surface Soil Investigation

Surface soil samples were collected in December 2007 in Parcel 61. A total of four surface soil samples were collected from one hand augered location (P61SS-1), and three Geoprobe® boring locations (P61SS-2;3;4). Samples were located along the southeast and northeast corners of Bldg 1075 (**Figure 3.15-1**). Sample P61SS-1 was collected in a grass-covered area near a door at the southeastern corner of Bldg 1075. Samples P61SS-2;3 were collected near the loading docks of Bldg 1075. Sample P61SS-4 was collected near the basement door at the northeast corner of Bldg 1075. Samples were taken in order to determine if any contamination exists from former hospital operations that took place in Bldg 1075. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For surface soil samples

located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. No visual or olfactory evidence of soil contamination was noted.

Sediment Investigation

Sediment samples were collected in December 2007 to evaluate Parcel 61. A total of four sediment samples were collected from two distinct hand augered borings to investigate potential historic discharges to stormwater from Bldg 1075. Sample 61SD-1 was collected at the stormwater outfall, MP17, located along the southeast bank of Oceanport Creek directly north to Bldg 975. This outfall was identified on facility engineering drawings to be the outfall at which stormwater from the area of Bldg 1075 is ultimately discharged. Sample 61SD-2 was collected downstream on the southeast bank of the tributary to Oceanport Creek (**Figure 3.15-1**). Sediment samples for non-VO and VO analysis were collected from the 0- to 6-inch interval bgs and the 18- to 24-inch interval bgs. No visual or olfactory evidence of impacted sediment was noted.

Table 3.15-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.15-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.15-2**.

Table 3.15-1
Parcel 61 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
61SD-1 and 2 (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential historic discharges to stormwater from Bldg 1075. 61SD-1 was collected directly at stormwater outfall MP 17, and 61SD-2 was collected downstream.	TCL+30 (w/o pesticides), TAL Metals
61SD-1D and 2D (2 samples)	Sediment	Sediment samples were collected from the 18- to 24-inch interval bgs to investigate potential historic discharges to stormwater from Bldg 1075.	TCL+30 (w/o pesticides), TAL Metals
61SS-1	Surface soil	A soil sample was collected from the 18- to 24-inch bgs interval located near a door at the southeastern corner of Bldg 1075 to investigate potential historical discharges from previous hospital operations. The 0- to 18-inch bgs interval contained sub-base that was likely associated with former pavement in the area.	TCL+30 (w/o pesticides), TAL Metals, cyanide
61SS-2 61SS-3	Surface soil	Soil samples were collected from the 18- to 24-inch bgs interval at loading docks of Bldg 1075 to investigate potential historical discharges from previous hospital operations and loading/unloading of chemicals and supplies in the area of the loading dock. This area is overlain by pavement and sub-base from 0 to 18 inches bgs.	TCL+30 (w/o pesticides), TAL Metals, cyanide

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
61SS-4	Surface soil	A soil sample was collected from the 0- to 6-inch bgs interval near basement doors at northeast corner of Bldg 1075 to investigate potential historical discharges from previous hospital operations.	TCL+30 (w/o pesticides), TAL Metals, cyanide

3.15.4 Site Investigation Results

Soil Investigation Results

Soil samples were for TCL+30 (minus pesticides), TAL metals, and cyanide.

As presented in **Table 3.15-3**, a total of 19 B/Ns and 18 metals were detected in Parcel 61 soil samples. Of the 19 B/Ns detected, three (benzo[a]anthracene, benzo[b]fluoranthene, and benzo[a]pyrene) were detected at concentrations exceeding NJDEP NRDCSCC and their respective MPBC in one surface soil sample (P61SS-1) and are considered COCs in soil at Parcel 61. Soil sample P61-SS1 was collected at a depth of 1.5 to 2.0 ft bgs (1.5 ft of former sub-base was present at this location suggesting the area was possibly covered with asphalt in the past). All 18 metals identified in soil were detected below NJDEP NRDCSCC. Cyanide was not detected in soil at Parcel 61.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. The tributary to Oceanport Creek in which sediment samples were collected is a tidal water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Marine/Estuarine Sediment Screening Guidelines-ER-L.

As presented in **Table 3.15-4**, a total of one VO, 16 B/Ns, and 18 metals were detected in Parcel 61 sediment samples. The one VO (toluene) was detected in one sample (P61SD-1D) at a concentration below the ER-L. Of the 16 B/Ns detected, 11 (acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[k]fluoranthene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene) were detected in one or more of the four sediment samples at concentrations that exceeded the ER-L. With the exception of benzo(k)fluoranthene, concentrations of all these B/Ns also exceeded their respective MPBC. Acenaphthene, benzo[a]anthracene, benzo[a]pyrene, fluorene, phenanthrene, and pyrene were detected above the ER-M. Of the 18 metals detected, four (arsenic, chromium, copper, and lead) were detected at concentrations that exceeded the ER-L. None of the metals were detected above the ER-M.

Arsenic was detected above the ER-L of 8.2 mg/kg in two sediment samples collected in Parcel 61 at concentrations of 13.3 mg/kg in sample P61-SD2 and 14.1 mg/kg in sample P61-SD1D. The arsenic concentrations did not exceed the MPBC of 14.5 mg/kg.

Chromium was detected above the ER-L of 81 mg/kg in one sediment sample collected in Parcel 61 at a concentration of 86 mg/kg in sample P61-SD2. The chromium concentration did not exceed the MPBC of 88.1 mg/kg.

Copper was detected above the ER-L of 34 mg/kg and the MPBC of 48.4 mg/kg in one sediment sample collected in Parcel 61 at a concentration of 48.7 mg/kg in sample P61-SD1D.

Lead was detected above the ER-L of 47 mg/kg and the MPBC of 64.1 mg/kg in one sediment sample collected in Parcel 61 at a concentration of 114 mg/kg in sample 61SD-1D.

Metals and B/Ns are considered COCs in sediment at Parcel 61.

3.15.5 Summary and Conclusions

Three B/Ns (benzo[a]anthracene, benzo[b]fluoranthene, and benzo[a]pyrene) were detected at concentrations exceeding the NJDEP NRDCSCC and MPBC in one surface soil sample, P61-SS1. Further evaluation of B/Ns identified above criteria in surface soil sample P61-SS1 is recommended in Parcel 61. The B/N COCs identified in soil at Parcel 61 are PAHs. PAHs are contained in asphalt and are commonly detected in soil under asphalt pavement. Re-collection of the sample at this location will be conducted as part of the further evaluation to determine if the PAHs detected in soil are attributable to the former asphalt pavement.

Two metals (copper and lead) and ten B/Ns (acenaphthene, anthracene, benzo[a]anthracene, benzo[a]pyrene, chrysene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene) were detected in sediment at concentrations greater than the NJDEP Marine/Estuarine Sediment Screening Guidelines-ER-L and MPBC. Sediment at Parcel 61 is recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

Table 3.15-2
Parcel 61 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	P61-SD1	12/20/07	12:40	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SD	HAND AUGER	P61-SD1D	12/20/07	12:50	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SD	HAND AUGER	P61-SD2	12/20/07	13:00	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SD	HAND AUGER	P61-SD2D	12/20/07	13:10	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SOIL	HAND AUGER	P61-SS1	12/20/07	14:50	0.0	0.5			X	X	X	X			Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SOIL	HAND AUGER	P61-SS1	12/27/07	12:00	1.5	2.0		X							Associated trip blank collected with P27. No field blank or duplicate collected 12/27/07.
SOIL	HAND AUGER	P61-SS2	12/20/07	14:20	1.5	2.0		X	X	X	X	X			Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SOIL	HAND AUGER	P61-SS3	12/20/07	13:50	1.5	2.0		X	X	X	X	X			Associated field and trip blanks collected with Parcel 39 cancelled by lab (except for cyanide).
SOIL	HAND AUGER	P61-SS4	12/20/07	15:20	0.5	1.0			X	X	X	X			Associated field and trip blank collected with Parcel 39 cancelled by lab (except for cyanide). Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	HAND AUGER	P61-SS4	12/27/07	12:05	1.5	2.0		X							Associated trip blank collected with Parcel 27. No field blank or duplicate collected 12/27/07.

X = Sample analyzed for the indicated analytical parameter suite

Table 3.15-3
Fort Monmouth Phase II Site Investigation, Parcel 61
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results			
		Sample ID:	P61-SS1	P61-SS2	P61-SS3	P61-SS4
		Lab ID:	7055205	7055206	7055207	7055208
		Date Sampled:	12/20/2007	12/20/2007	12/20/2007	12/20/2007
		Depth (ft. bgs):	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result
Semi-Volatiles						
Acenaphthene	10000	100	**2.300**	1.100 U	1.100 U	1.200 U
Anthracene	10000	100	**2.500**	1.100 U	1.100 U	1.200 U
Benzo[a]anthracene	4	500	**4.600**	1.100 U	1.100 U	1.200 U
Benzo[a]pyrene	0.66	100	**3.700**	1.100 U	1.100 U	1.200 U
Benzo[b]fluoranthene	4	50	**5.800**	1.100 U	1.100 U	1.200 U
Benzo[g,h,i]perylene	NLE	NLE	**1.100 J**	1.100 U	1.100 U	1.200 U
Benzo[k]fluoranthene	4	500	**2.200**	1.100 U	1.100 U	1.200 U
Butyl benzyl phthalate	10000	100	1.100 U	1.100 U	1.100 U	**0.300 J**
Chrysene	40	500	**5.000**	1.100 U	1.100 U	1.200 U
Dibenzofuran	NLE	NLE	**1.200**	1.100 U	1.100 U	1.200 U
Di-n-butylphthalate	10000	100	**0.082 JB**	**0.093 JB**	**0.110 JB**	**0.250 JB**
bis(2-Ethylhexyl)phthalate	210	100	**0.270 J**	1.100 U	**0.130 J**	**1.300**
Fluoranthene	10000	100	**13.000**	1.100 U	1.100 U	**0.085 J**
Fluorene	10000	100	**1.600**	1.100 U	1.100 U	1.200 U
Indeno[1,2,3-cd]pyrene	4	500	**1.100 J**	1.100 U	1.100 U	1.200 U
2-Methylnaphthalene	NLE	NLE	**0.540 J**	1.100 U	1.100 U	1.200 U
Naphthalene	4200	100	**1.200**	1.100 U	1.100 U	1.200 U
Phenanthrene	NLE	NLE	**14.000 E**	1.100 U	1.100 U	1.200 U
Pyrene	10000	100	**12.000**	1.100 U	1.100 U	**0.094 J**
Metals						
Aluminum	NLE	NLE	**10100 B**	**10400 B**	**9320 B**	**10700 B**
Arsenic	20	NLE	**7.40**	**5.31**	**4.24**	**15.8**
Barium	47000	NLE	**26.7 B**	**20.2 B**	**23.2 B**	**148 B**
Beryllium	140	NLE	**0.972**	**0.558**	**0.574**	**0.849**
Cadmium	100	NLE	**0.546**	**0.237**	**0.0446**	**0.900**
Calcium	NLE	NLE	**1410 B**	**4290 B**	**550 B**	**2850 B**
Chromium (Total)	NLE	NLE	**73.6 B**	**54.2 B**	**84.7 B**	**73.3 B**
Cobalt	NLE	NLE	**2.45**	**3.15**	**1.07**	**0.755**
Copper	45000	NLE	**32.4 B**	**22.5 B**	**5.96 B**	**81.8 B**
Iron	NLE	NLE	**29300 B**	**28800 B**	**18000 B**	**36200 B**
Lead	800	NLE	**33.3**	**3.75**	**1.90**	**14.6**
Magnesium	NLE	NLE	**3110**	**3220**	**1450**	**2980**
Manganese	NLE	NLE	**84.5 B**	**112 B**	**55.6 B**	**118 B**
Mercury	270	NLE	**0.61**	0.103 U	0.104 U	**0.20**
Nickel (Soluble Salts)	2400	NLE	**6.50**	**10.7**	**4.01**	**6.47**
Potassium	NLE	NLE	**6140 B**	**2910 B**	**3270 B**	**4660 B**
Vanadium	7100	NLE	**52.6**	**76.2**	**78.3**	**61.7**
Zinc	1500	NLE	**74.7 B**	**44.4 B**	**25.4 B**	**290 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.15-4
Fort Monmouth Phase II Site Investigation, Parcel 61
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results			
		Sample ID:	P61-SD1	P61-SD1D	P61-SD2	P61-SD2D
		Lab ID:	7055201	7055202	7055203	7055204
		Date Sampled:	12/20/2007	12/20/2007	12/20/2007	12/20/2007
		Depth (ft. bgs):	0.0-0.5	1.0-1.5	0.0-0.5	1.0-1.5
Chemical	ER-L[1]	ER-M[2]	Result	Result	Result	Result
Volatiles						
Toluene	NLE	NLE	0.290 U	**0.095 J**	0.340 U	0.340 U
Semi-Volatiles						
Acenaphthene	0.016	0.500	1.200 U	**0.210 J**	**1.600**	**7.600**
Anthracene	0.085	1.1	**0.160 J**	**0.800 J**	**0.290 J**	**0.340 J**
Benzo[a]anthracene	0.261	1.6	**0.490 J**	**2.000**	**0.740 J**	**0.660 J**
Benzo[a]pyrene	0.430	1.6	**0.430 J**	**1.800**	**0.650 J**	**0.580 J**
Benzo[b]fluoranthene	NLE	NLE	**0.990 J**	**3.000**	**1.000 J**	**0.880 J**
Benzo[k]fluoranthene	0.240	NLE	1.200 U	1.300 U	**0.380 J**	**0.310 J**
bis(2-Ethylhexyl)phthalate	NLE	NLE	**0.380 J**	1.300 U	**0.460 J**	**0.370 J**
Chrysene	0.384	2.8	**0.710 J**	**2.600**	**0.920 J**	**0.790 J**
Dibenzofuran	NLE	NLE	1.200 U	1.300 U	1.400 U	**0.420 J**
Di-n-butylphthalate	NLE	NLE	**0.280 JB**	1.300 U	**0.320 JB**	1.400 U
Fluoranthene	0.600	5.1	**1.300**	**4.500**	**1.700**	**1.700**
Fluorene	0.019	0.54	1.200 U	**0.560 J**	**0.140 J**	**0.200 J**
4-Methylphenol	NLE	NLE	1.200 U	**1.300**	1.400 U	1.400 U
Naphthalene	0.16	2.1	1.200 U	**0.280 J**	1.400 U	1.400 U
Phenanthrene	0.240	1.5	**0.680 J**	**1.500**	**1.200 J**	**1.100 J**
Pyrene	0.665	2.6	**1.500**	**7.200**	**2.200**	**1.800**
Metals						
Aluminum	NLE	NLE	**4390 B**	**9740 B**	**10000 B**	**3400 B**
Arsenic	8.2	70	**1.77**	**14.1**	**13.3**	**3.03**
Barium	NLE	NLE	**27.2 B**	**55.3 B**	**17.2 B**	**11.0 B**
Beryllium	NLE	NLE	**0.662**	**1.11**	**1.19**	**0.498**
Cadmium	1.2	9.6	**0.221**	**0.847**	**0.274**	**0.133**
Calcium	NLE	NLE	**553 B**	**938 B**	**1180 B**	**1170 B**
Chromium (Total)	81	370	**39.9 B**	**54.6 B**	**86.0 B**	**27.6 B**
Cobalt	NLE	NLE	**0.903**	**4.97**	**1.98**	**1.35**
Copper	34	270	**12.0 B**	**48.7 B**	**13.0 B**	**31.6 B**
Iron	NLE	NLE	**13000 B**	**20400 B**	**32300 B**	**13000 B**
Lead	47	218	**33.0**	**114**	**12.4**	**17.6**
Magnesium	NLE	NLE	**1820**	**2140**	**3910**	**1190**
Manganese	NLE	NLE	**13.0 B**	**29.8 B**	**62.6 B**	**40.9 B**
Mercury	0.15	0.71	0.118 U	**0.13**	0.130 U	0.134 U
Nickel (Soluble Salts)	21	52	**3.59**	**14.4**	**9.41**	**4.73**
Potassium	NLE	NLE	**4050 B**	**3980 B**	**6470 B**	**1970 B**
Vanadium	NLE	NLE	**24.8**	**41.7**	**49.9**	**20.7**
Zinc	150	410	**58.4 B**	**127 B**	**63.4 B**	**63.6 B**

[1] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Low, 1998.

[2] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Medium, 1998.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds LEL.

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P61SD-2	SD	0.0-0.5	Acenaphthene	1.600	ER-L/ER-M	0.016/0.500
P61SD-2	SD	0.0-0.5	Anthracene	0.290 J	ER-L/ER-M	0.085/1.1
P61SD-2	SD	0.0-0.5	Chrysene	0.920 J	ER-L/ER-M	0.384/2.8
P61SD-2	SD	0.0-0.5	Fluoranthene	1.700	ER-L/ER-M	0.600/5.1
P61SD-2	SD	0.0-0.5	Flourene	0.140 J	ER-L/ER-M	0.019/0.54
P61SD-2	SD	0.0-0.5	Phenanthrene	1.200 J	ER-L/ER-M	0.240/1.5
P61SD-2	SD	0.0-0.5	Pyrene	2.200	ER-L/ER-M	0.665/2.6
P61SD-2D	SD	1.0-1.5	Acenaphthene	7.600	ER-L/ER-M	0.016/0.500
P61SD-2D	SD	1.0-1.5	Anthracene	0.340 J	ER-L/ER-M	0.085/1.1
P61SD-2D	SD	1.0-1.5	Chrysene	0.790 J	ER-L/ER-M	0.384/2.8
P61SD-2D	SD	1.0-1.5	Fluoranthene	1.700	ER-L/ER-M	0.600/5.1
P61SD-2D	SD	1.0-1.5	Flourene	0.200 J	ER-L/ER-M	0.019/0.54
P61SD-2D	SD	1.0-1.5	Phenanthrene	1.100 J	ER-L/ER-M	0.240/1.5

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P61SD-1	SD	0.0-0.5	Anthracene	0.160 J	ER-L/ER-M	0.085/1.1
P61SD-1	SD	0.0-0.5	Chrysene	0.710 J	ER-L/ER-M	0.384/2.8
P61SD-1	SD	0.0-0.5	Fluoranthene	1.300	ER-L/ER-M	0.600/5.1
P61SD-1	SD	0.0-0.5	Phenanthrene	0.680 J	ER-L/ER-M	0.240/1.5
P61SD-1D	SD	1.0-1.5	Acenaphthene	0.210 J	ER-L/ER-M	0.016/0.500
P61SD-1D	SD	1.0-1.5	Anthracene	0.800 J	ER-L/ER-M	0.085/1.1
P61SD-1D	SD	1.0-1.5	Benzo[a]anthracene	2.000	ER-L/ER-M	0.261/1.6
P61SD-1D	SD	1.0-1.5	Benzo[a]pyrene	1.800	ER-L/ER-M	0.430/1.6
P61SD-1D	SD	1.0-1.5	Chrysene	2.600	ER-L/ER-M	0.384/2.8
P61SD-1D	SD	1.0-1.5	Fluoranthene	4.500	ER-L/ER-M	0.600/5.1
P61SD-1D	SD	1.0-1.5	Flourene	0.560 J	ER-L/ER-M	0.019/0.54
P61SD-1D	SD	1.0-1.5	Naphthalene	0.280 J	ER-L/ER-M	0.16/2.1
P61SD-1D	SD	1.0-1.5	Phenanthrene	1.500	ER-L/ER-M	0.240/1.5
P61SD-1D	SD	1.0-1.5	Pyrene	7.200	ER-L/ER-M	0.665/2.6
P61SD-1D	SD	1.0-1.5	Copper	48.7 B	ER-L/ER-M	34/270
P61SD-1D	SD	1.0-1.5	Lead	114	ER-L/ER-M	47/218

Sample ID	Media	Depth (ft bgs) *	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P61-SS1	SB	1.5-2.0	Benzo[a]anthracene	4.600	NRDCSCC	4
P61-SS1	SB	1.5-2.0	Benzo[a]pyrene	3.700	NRDCSCC	0.66
P61-SS1	SB	1.5-2.0	Benzo[b]fluoranthene	5.800	NRDCSCC	4

LEGEND

- Surface Soil Sample Location
- Sediment Sample Location
- Generalized Groundwater Flow Direction. Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

** Depth is from surface of paved area; soil collected from below subbase.

SCALE:

0 112.5 225 450 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.15-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 61 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_15-1_SI_P61_Exceeds_SampLoc.mxd (7/14/2008 12:55:24 PM)

3.16 Parcel 69 – Bldg 900 – Former Vehicle Repair/Motor Pool

3.16.1 Site Description

Parcel 69, Bldg 900, is a former tactical motor pool. It is located in the southeastern portion of the MP and has been utilized for general storage for approximately the past 10 years. The building formerly contained a waste oil tank immediately outside the building that was connected by a fill pipe originating from inside the building (removed). A storm sewer inlet was observed in the parking lot in close proximity to the building during the 2006 VSIs. A boiler was formerly located outside the building. A 1993 USAEHA report cites a TCE parts cleaner and 500-gallon aboveground waste oil tank being present at the building at the time of the 1993 site visit (35). The tank has been removed from the building. All TCE parts cleaners were eliminated from use (MP and CWA) in February 1994 under Environmental Program Requirements Project FM0094F088.

Solvents were previously used for cleaning vehicle parts at various locations throughout FTMM. Both the military and the contractors operated solvent parts cleaners. These solvent parts cleaners consisted of a tank and sink with nozzle. The military used Super Agitine for its parts cleaners while the contractor used Siloo Tyme II. Each parts cleaner held about 30 gallons of fluid, which was reused until it needed changing. Fluid changes occurred every 4 months to every 3 years depending on location and usage (35).

Additional information pertaining to this parcel can be found in Section 4.3.2.1.7, Section 5.4, Section 5.4.2, and Appendix G of the Phase I ECP (1).

3.16.2 Previous Investigations

Two former USTs associated with Bldg 900 have been removed under the FTMM UST Management Program and are summarized within the FTMM Phase I ECP Report (1). No previous investigations have been conducted in relation to former operations in Bldg 900.

3.16.3 Site Investigation Sampling

Review of historical site plans, sanitary plans, and stormwater management plans as well as a site reconnaissance were conducted to evaluate potential discharge locations throughout the parcel. It was determined that stormwater from Bldg 900 discharges to Oceanport Creek northwest of Bldg 977 and north of Bldg 908. In order to determine the absence/presence of contamination from potential releases to the environment, the following soil sampling, sediment sampling, and groundwater sampling were conducted throughout Parcel 69.

Geoprobe® Investigation

Soil and groundwater samples were collected in November 2007 in Parcel 69 in order to determine whether contamination exists from any previous discharges from a former waste oil AST or activities that occurred within Bldg 900. A total of four surface soil samples and five subsurface soil samples (including one duplicate sample) were collected from four distinct Geoprobe® borings (**Figure 3.16-1**). Three borings, P69SB1, 2, and 3, were located in the vicinity of the former waste oil AST. The other boring, P69SB-4, was located downgradient (north) of Bldg 900 to evaluate the absence/presence of contamination downgradient of the building. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores were conducted using PID/FID instruments. No visual or olfactory evidence of soil contamination was noted.

A total of three groundwater samples (including one duplicate sample) were collected from two distinct temporary wells that were installed with the Geoprobe® rig. One temporary well, P69GW-1, was installed in an area of the former waste oil AST east of Bldg 900, and the other well, P69GW-4, was installed downgradient (north) of Bldg 900. Temporary wells were constructed of PVC and 5 ft of factory-slotted screen.

Sediment Investigation

Sediment samples were collected in November 2007 in Parcel 69 in order to investigate any potential historic discharges to stormwater from Bldg 900. A total of five sediment samples (including one duplicate sample) were collected from two distinct hand augered borings located along the south bank of Oceanport Creek (**Figure 3.16-1**). One sample was collected directly at a stormwater outfall within Oceanport Creek upstream of Murphy Drive, and the other sample was collected at a stormwater outfall discharging to Oceanport Creek downstream of Murphy Drive. Sediment samples for non-VO and VO analysis were collected from the 0- to 6-inch and the 18- to 24-inch interval bgs. No visual or olfactory evidence of sediment contamination was noted.

Table 3.16-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.16-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.16-2**.

Table 3.16-1
Parcel 69 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
69SD-1 and 2 (2 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential historic discharges to stormwater from Bldg 900. Sample 69SD-1 was collected directly at a stormwater outfall within Oceanport Creek upstream of Murphy Drive. Sample 69SD-2 was collected from the stormwater outfall discharging to Oceanport Creek downstream of Murphy Drive.	TCL+30 (w/o pesticides), TAL Metals
69SD-1D and 2D (3 samples – includes 1 duplicate sample)	Sediment	Sediment samples were collected from the 18- to 24-inch interval bgs to investigate potential historic discharges to stormwater from Bldg 900.	TCL+30 (w/o pesticides), TAL Metals
69SS-1 through 69SS-4 (4 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings. The borings were located in the vicinity of the former waste oil AST (69GP-1), within the parking area directly outside Bldg 900 (69GP-2 and 69GP-3), and downgradient of Bldg 900 (69GP-4).	TCL+30 (w/o pesticides), TAL Metals, cyanide
69SB-1 through 69SB-4 (5 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 3.0 to 8.5 ft bgs) from Geoprobe® borings. The borings were located in the vicinity of the former waste oil AST (69GP-1), within the parking area directly outside Bldg 900 (69GP-2 and 69GP-3), and downgradient of Bldg 900 (69GP-4). Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals, cyanide
49GW-1, 49GW-4 (3 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the area of the former waste oil AST (69GP-1) and downgradient of Bldg 900 (69GP-4).	TCL+30 (w/o pesticides/PCBs)

3.16.4 Site Investigation Results

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TCL+30 (minus pesticides) and TAL metals. Groundwater samples were analyzed for TCL+30 (minus pesticides/PCBs).

Soil

A summary of analytes detected in soil at Parcel 69 is presented in **Table 3.16-3**. Two VOs, five B/Ns, and 17 metals were detected in Parcel 69 soil. All constituents were detected below the NJDEP NRDCSCC. No COCs were identified in soil at Parcel 69.

Groundwater

As shown in **Table 3.16-4**, a total of three VOs and one B/N were detected in Parcel 69 groundwater. One VO (PCE) was detected at a concentration that exceeds the NJDEP GWQC of 1.0 μg/L in a duplicate groundwater sample collected from temporary well P69GW-1 (1.02 μg/L). The concentration of PCE in the other sample collected at P69GW-1 was 0.97 μg/L. PCE was not detected in the downgradient groundwater sample (P69GW-4). The B/N bis(2-ethylhexyl)phthalate was detected at concentrations above the GWQC of 3 μg/L in sample P69GW-1 (8.54 μg/L) and the duplicate sample collected at this location P69GW-1DUP (3.08 μg/L). A commonly used plasticizer, bis(2-ethylhexyl)phthalate, is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected in the field blank associated with the Parcel 69 groundwater samples. Therefore, it is not considered a COC in groundwater at Parcel 69. PCE is a COC in groundwater at Parcel 69.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (minus pesticides) and TAL metals. Oceanport Creek is a tidally influenced water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the NJDEP Marine/Estuarine Sediment Screening Guideline-ER-L.

As presented in **Table 3.16-5**, four VOs, eight B/Ns, and 20 metals were detected in Parcel 69 sediment samples. All four VOs were detected at concentrations below the ER-L. Of the eight B/Ns detected, seven (acenaphthene, anthracene, benzo[a]anthracene, chrysene, fluoranthene, phenanthrene, and pyrene) were detected at concentrations that exceeded ER-L values. With the exception of benzo(a)anthracene, concentrations of these B/Ns exceeded their respective MPBC. Acenaphthene and pyrene were detected at concentrations in excess of the ER-M. Of the 20 metals detected, nine (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) were detected at concentrations that exceeded ER-L values. Cadmium, lead, mercury, nickel, silver, and zinc were detected at concentrations above the ER-M.

Arsenic was detected above the ER-L of 8.2 mg/kg and the MPBC of 14.5 mg/kg in one sediment sample collected in Parcel 69 at a concentration of 36.2 mg/kg in sample 69SD-2A.

Cadmium was detected above the ER-L of 1.2 mg/kg and the ER-M of 9.6 mg/kg in one sediment sample collected in Parcel 69 at a concentration of 14.1 mg/kg (sample 69SD-

2A). No background concentration has been established for cadmium. There were no other detections of cadmium in sediment at Parcel 69.

Chromium was detected above the ER-L of 81 mg/kg in three sediment samples collected in Parcel 69 at concentrations ranging from 83.3 mg/kg in sample 69SD-1B-DUP to 345 mg/kg in sample 69SD-2A. The chromium concentration detected in sample 69SD-2A also exceeded the MPBC of 88.1 mg/kg.

Copper was detected above the ER-L of 34 mg/kg in three sediment samples collected in Parcel 69 at concentrations of 37.3 mg/kg (sample 69SD-1B), 38.6 mg/kg (sample 69SD-1B Duplicate), and 203 mg/kg in sample 69SD-2A. The copper concentration detected in sample 69SD-2A also exceeded the MPBC of 48.4 mg/kg.

Lead was detected above the ER-L of 47 mg/kg in two sediment samples collected in Parcel 69 at concentrations of 53.7 mg/kg in sample 69SD-1B Duplicate and 410 mg/kg in sample 69SD-2A (**Table 3.16-5**). The detection of lead in sample 69SD-2A is also above the ER-M and MPBC. Lead was detected below the ER-L at a concentration of 44.4 mg/kg in sample 69SD-1B.

Mercury was detected above the ER-L of 0.15 mg/kg and ER-M of 0.71 mg/kg in one sediment sample collected in Parcel 69 at a concentration of 0.83 mg/kg in sample 69SD-2A. The mercury concentration did not exceed the MPBC of 1.7 mg/kg. Mercury was not detected in the other sediment samples collected in Parcel 69.

Nickel was detected above the ER-L of 21 mg/kg and ER-M of 52 mg/kg in one sediment sample collected in Parcel 69 at a concentration of 53.1 mg/kg (sample 69SD-2A). The nickel concentration did not exceed the MPBC of 131 mg/kg.

Silver was detected above the ER-L of 1 mg/kg and ER-M of 3.7 mg/kg in one sediment sample collected in Parcel 69 at a concentration of 9.99 mg/kg (sample 69SD-2A). No background concentration has been established for silver. Silver was not detected in the other sediment samples collected in Parcel 69.

Zinc was detected above the ER-L of 150 mg/kg in two sediment samples collected in Parcel 69 at concentrations of 515 mg/kg in sample 69SD-2A and 176 mg/kg in sample 69SD-2B. The detection of zinc in sample 69SD-2A is also above the ER-M.

B/Ns and seven metals are COCs in sediment at Parcel 69.

3.16.5 Summary and Conclusions

No COCs were identified in soil at concentrations greater than the NJDEP NRDCSCC or IGWSCC; therefore, NFA is recommended for soil within Parcel 69.

One COC, PCE, was detected slightly above the respective NJDEP GWQC in temporary well P69GW-1. Further evaluation of groundwater is recommended.

Six B/Ns COCs (acenaphthene, anthracene, chrysene, fluoranthene, phenanthrene, and pyrene) and seven metals COCs (arsenic, cadmium, chromium, copper, lead, silver, and zinc) were detected in sediment at concentrations greater than the NJDEP Marine/Estuarine Sediment Screening Guidelines-ER-L and MPBC. Sediment at Parcel 69 is recommended for further evaluation as part of a facility-wide baseline ecological evaluation.

Table 3.16-2
Parcel 69 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK	11/20/07	-	--	--									Volatile samples were cancelled due to holding time. Resampled 12/17/07.
BLANK	TRIP	TRIP BLANK	12/17/07	-	--	--		X							
SOIL	GEOPROBE	P69-1-A	11/20/07	9:10	0.5	1			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-1-B	11/20/07	9:10	1.5	2.0									Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SOIL	GEOPROBE	P69-1-B	12/17/07	13:15	1.5	2.0		X							
SOIL	GEOPROBE	P69-1-C	11/20/07	9:20	7.0	7.5			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-1-C	12/17/07	13:30	7.0	7.5		X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-2-A	11/20/07	10:20	0.5	1.0			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-2-B	11/20/07	10:20	1.5	2.0									Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SOIL	GEOPROBE	P69-2-B	12/17/07	14:00	1.5	2.0		X							
SOIL	GEOPROBE	P69-2-C	11/20/07	10:35	7.0	7.5			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-2-C	12/17/07	14:15	7.0	7.5		X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-3-A	11/20/07	11:00	0.5	1.0			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.

Table 3.16-2
Parcel 69 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P69-3-B	11/20/07	11:00	1.5	2.0									Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SOIL	GEOPROBE	P69-3-B	12/17/07	14:45	1.5	2.0		X							
SOIL	GEOPROBE	P69-3-C	11/20/07	11:05	3.5	4.0			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-3-C	12/17/07	15:00	3.5	4.0		X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-4-A	11/20/07	11:45	0.5	1.0			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-4-B	11/20/07	11:45	1.5	2.0									Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SOIL	GEOPROBE	P69-4-B	12/17/07	15:30	1.5	2.0		X							
SOIL	GEOPROBE	P69-4-C	11/20/07	12:00	8.5	9.0			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-4-C	12/17/07	15:45	8.5	9.0		X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-4-C DUPLICATE	11/20/07	12:00	8.5	9.0			X	X	X	X			Volatile samples were cancelled due to holding time. Resampled 12/17/07. Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P69-4-C DUPLICATE	12/17/07	15:45	8.5	9.0		X							Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK	11/20/07	12:15	--	--			X	X	X	X			Semi-Volatile sample extracted for Base Neutrals only. No acids reported. Volatile samples were cancelled due to holding time. Resampled 12/17/07.
BLANK	FIELD	FIELD BLANK	12/17/07	17:00	--	--		X							

Table 3.16-2
Parcel 69 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	P69-SD1-A	11/20/07	14:00	0.0	0.5			X	X	X				Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SD	HAND AUGER	P69-SD1-A	12/17/07	16:00	0.0	0.5		X							
SD	HAND AUGER	P69-SD1-B	11/20/07	14:10	1.5	2.0			X	X	X				Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SD	HAND AUGER	P69-SD1-B	12/17/07	16:15	1.5	2.0		X							
SD	HAND AUGER	P69-SD1-B DUPLICATE	11/20/07	14:10	1.5	2.0			X	X	X				Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SD	HAND AUGER	P69-SD1-B DUPLICATE	12/17/07	16:15	1.5	2.0		X							
SD	HAND AUGER	P69-SD2-A	11/20/07	14:50	0.0	0.5			X	X	X				Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SD	HAND AUGER	P69-SD2-A	12/17/07	16:30	0.0	0.5		X							
SD	HAND AUGER	P69-SD2-B	11/20/07	15:00	1.5	2.0			X	X	X				Volatile samples were cancelled due to holding time. Resampled 12/17/07.
SD	HAND AUGER	P69-SD2-B	12/17/07	16:45	1.5	2.0		X							
BLANK	TRIP	TRIP BLANK-AQ	11/21/07	8:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	11/21/07	9:30	--	--		X	X						Semi-volatiles extracted for Base Neutrals only. Recollected 11/27/07 for Acid Extractables.
GW	GEOPROBE	P-69-1	11/21/07	10:00	7.0	12.0		X	X						Semi-volatiles extracted for Base Neutrals only. Recollected 11/27/07 for Acid Extractables.
GW	GEOPROBE	P-69-1 DUPLICATE	11/21/07	10:00	7.0	12.0		X	X						Semi-volatiles extracted for Base Neutrals only. Recollected 11/27/07 for Acid Extractables.
GW	GEOPROBE	P-69-4	11/21/07	10:30	10.0	15.0		X	X						Semi-volatiles extracted for Base Neutrals only. Recollected 11/27/07 for Acid Extractables.
BLANK	FIELD	FIELD BLANK-AQ	11/27/07	8:30	--	--			X						
GW	GEOPROBE	P-69-1	11/27/07	9:00	7.0	12.0			X						
GW	GEOPROBE	P-69-1 DUPLICATE	11/27/07	9:00	7.0	12.0			X						
GW	GEOPROBE	P-69-4	11/27/07	9:30	10.0	15.0			X						

X = Sample analyzed for the indicated analytical parameter suite

Table 3.16-3
Fort Monmouth Phase II Site Investigation, Parcel 69
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results											
		Sample ID:	P69SB-1A	P69SB-1B	P69SB-1C	P69SB-1C	P69SB-2A	P69SB-2B	P69SB-2C	P69SB-2C	P69SB-3A	P69SB-3B	P69SB-3C	P69SB-3C
		Lab ID:	7048003	7053903	7048005	7053904	7048006	7053905	7048008	7053906	7048009	7053907	7048011	7053908
		Date Sampled	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007
		Depth (ft. bgs):	0.5-1.0	1.5-2.0	7.0-7.5	7.0-7.5	0.5-1.0	1.5-2.0	7.0-7.5	7.0-7.5	0.5-1.0	1.5-2.0	3.5-4.0	3.5-4.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result		Result	Result	Result		Result	Result	Result	Result
Volatiles														
Acetone	1000	100	NT	**0.410 B**	NT	**0.380**	NT	**0.590**	NT	**0.830**	NT	**0.860**	NT	**0.870**
Methylene Chloride	210	1	NT	0.250 U	NT	0.270 U	NT	0.250 U	NT	0.260 U	NT	0.250 U	NT	0.250 U
Semi-Volatiles														
Diethyl phthalate	10000	50	1.000 U	NT	**0.039 JB**	NT	1.100 U	NT	1.100 U	NT	1.000 U	NT	1.100 U	NT
Di-n-butylphthalate	10000	100	**1.100 B**	NT	**0.670 JB**	NT	**1.000 JB**	NT	**0.750 JB**	NT	**0.420 JB**	NT	**1.800 B**	**NT**
Fluoranthene	10000	100	1.000 U	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	**0.094 J**	NT	1.100 U	NT
Phenanthrene	NLE	NLE	1.000 U	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	**0.080 J**	NT	1.100 U	NT
Pyrene	10000	100	1.000 U	NT	1.100 U	NT	1.100 U	NT	1.100 U	NT	**0.170 J**	NT	1.100 U	NT
Metals														
Aluminum	NLE	NLE	**6760 B**	NT	**7300 B**	**NT**	**7890 B**	NT	**9440 B**	**NT**	**7880 B**	NT	**7170 B**	**NT**
Arsenic	20	NLE	**2.09**	NT	0.586 U	NT	**2.49**	NT	**1.98**	**NT**	**2.14**	NT	**1.09**	**NT**
Barium	47000	NLE	**23.0 B**	NT	**11.9 B**	**NT**	**21.5 B**	NT	**14.1 B**	**NT**	**28.0 B**	NT	**20.4 B**	**NT**
Beryllium	2	NLE	**0.768**	NT	**0.520**	**NT**	**0.827**	NT	**0.448**	**NT**	**0.885**	NT	**0.846**	**NT**
Calcium	NLE	NLE	**1230**	NT	**287**	**NT**	**1070**	NT	**247**	**NT**	**1420**	NT	**805**	**NT**
Chromium (Total)	NLE	NLE	**46.9**	NT	**55.8**	**NT**	**56.5**	NT	**44.1**	**NT**	**60.0**	NT	**56.2**	**NT**
Cobalt	NLE	NLE	**0.497**	NT	**0.536**	**NT**	**0.919**	NT	0.352 U	NT	**0.947**	NT	**0.690**	**NT**
Copper	600	NLE	**6.49 B**	NT	**7.33 B**	**NT**	**15.4 B**	NT	**6.41 B**	**NT**	**11.6 B**	NT	**7.12 B**	**NT**
Iron	NLE	NLE	**18600**	NT	**16500**	**NT**	**24700**	NT	**17600**	**NT**	**25100**	NT	**23600**	**NT**
Lead	600	NLE	**8.98 B**	NT	**5.58 B**	**NT**	**9.68 B**	NT	**4.20 B**	**NT**	**21.8 B**	NT	**11.1 B**	**NT**
Magnesium	NLE	NLE	**2200**	NT	**1910**	**NT**	**2960**	NT	**1650**	**NT**	**2960**	NT	**2580**	**NT**
Manganese	NLE	NLE	**36.7**	NT	**22.2**	**NT**	**43.8**	NT	**32.9**	**NT**	**46.2**	NT	**30.7**	**NT**
Mercury	270	NLE	0.107 U	NT	0.102 U	NT	0.095 U	NT	0.107 U	NT	0.103 U	NT	0.096 U	NT
Nickel (Soluble Salts)	2400	NLE	**4.50**	NT	**5.27**	**NT**	**4.96**	NT	**4.21**	**NT**	**5.16**	NT	**4.13**	**NT**
Potassium	NLE	NLE	**3320**	NT	**3660**	**NT**	**4780**	NT	**2620**	**NT**	**5400**	NT	**4800**	**NT**
Vanadium	7100	NLE	**31.3**	NT	**37.9**	**NT**	**37.1**	NT	**37.0**	**NT**	**37.8**	NT	**37.6**	**NT**
Zinc	1500	NLE	**45.3 B**	NT	**42.8 B**	**NT**	**42.5 B**	NT	**34.5 B**	**NT**	**74.9 B**	NT	**43.7 B**	**NT**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.16-3
Fort Monmouth Phase II Site Investigation, Parcel 69
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analyitical Results					
		Sample ID:	P69SB-4A	P69SB-4B	P69SB-4C	P69SB-4C	P69SB-4C DUP	P69SB-4C DUP
		Lab ID:	7048012	7053909	7048014	7053910	7048002	7053902
		Date Sampled	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007
		Depth (ft. bgs):	0.5-1.0	1.5-2.0	8.5-9.0	8.5-9.0	8.5-9.0	8.5-9.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result
Volatiles								
Acetone	1000	100	NT	**2.300 B**	NT	**2.800 B**	NT	**0.300 B**
Methylene Chloride	210	1	NT	**0.082 JB**	NT	**0.110 JB**	NT	0.280 U
Semi-Volatiles								
Diethyl phthalate	10000	50	1.100 U	NT	1.200 U	NT	1.200 U	NT
Di-n-butylphthalate	10000	100	**0.730 JB**	NT	**0.360 JB**	NT	**0.750 JB**	NT
Fluoranthene	10000	100	1.100 U	NT	1.200 U	NT	1.200 U	NT
Phenanthrene	NLE	NLE	1.100 U	NT	1.200 U	NT	1.200 U	NT
Pyrene	10000	100	1.100 U	NT	1.200 U	NT	1.200 U	NT
Metals								
Aluminum	NLE	NLE	**9190 B**	NT	**21600 B**	**NT**	**16700 B**	**NT**
Arsenic	20	NLE	**4.09**	NT	**5.17**	**NT**	**5.25**	**NT**
Barium	47000	NLE	**30.6 B**	NT	**51.3 B**	**NT**	**35.1 B**	**NT**
Beryllium	140	NLE	**0.796**	NT	**0.714**	**NT**	**0.608**	**NT**
Calcium	NLE	NLE	**1300**	NT	**795**	**NT**	**473**	**NT**
Chromium	NLE	NLE	**46.8**	NT	**59.4**	**NT**	**53.5**	**NT**
Cobalt	NLE	NLE	**0.837**	NT	**0.718**	**NT**	**0.882**	**NT**
Copper	45000	NLE	**46.8 B**	NT	**10.0 B**	**NT**	**10.2 B**	**NT**
Iron	NLE	NLE	**18100**	NT	**17800**	**NT**	**18300**	**NT**
Lead	800	NLE	**23.0 B**	NT	**6.69 B**	**NT**	**6.69 B**	**NT**
Magnesium	NLE	NLE	**2490**	NT	**2750**	**NT**	**2470**	**NT**
Manganese	NLE	NLE	**69.5**	NT	**88.2**	**NT**	**60.5**	**NT**
Mercury	270	NLE	**0.51**	NT	0.115 U	NT	0.106 U	NT
Nickel	2400	NLE	**5.52**	NT	**9.62**	**NT**	**9.46**	**NT**
Potassium	NLE	NLE	**3300**	NT	**3440**	**NT**	**2420**	**NT**
Vanadium	7100	NLE	**32.0**	NT	**50.0**	**NT**	**46.7**	**NT**
Zinc	1500	NLE	**55.9 B**	NT	**45.2 B**	**NT**	**45.9 B**	**NT**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.16-4
Fort Monmouth Phase II Site Investigation, Parcel 69
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results		
	Sample ID:	P69GW-1	P69GW-1 DUP	P69GW-4
	Lab ID:	7048104	7048103	7048105
	Date Sampled:	11/21/2007	11/21/2007	11/21/2007
	Screened Interval (ft. bgs):	7-12'	7-12'	10-15'
Chemical	Quality Criteria[1]	Result	Result	Result
Volatiles				
Acetone	6000	0.85 U	0.85 U	**1.09 B**
Tetrachloroethylene	1	**0.97**	**1.02**	0.34 U
Toluene	600	0.27 U	0.27 U	**0.14 J**
Semi-Volatiles				
bis(2-Ethylhexyl)phthalate	3	**8.54**	**3.08**	1.28 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

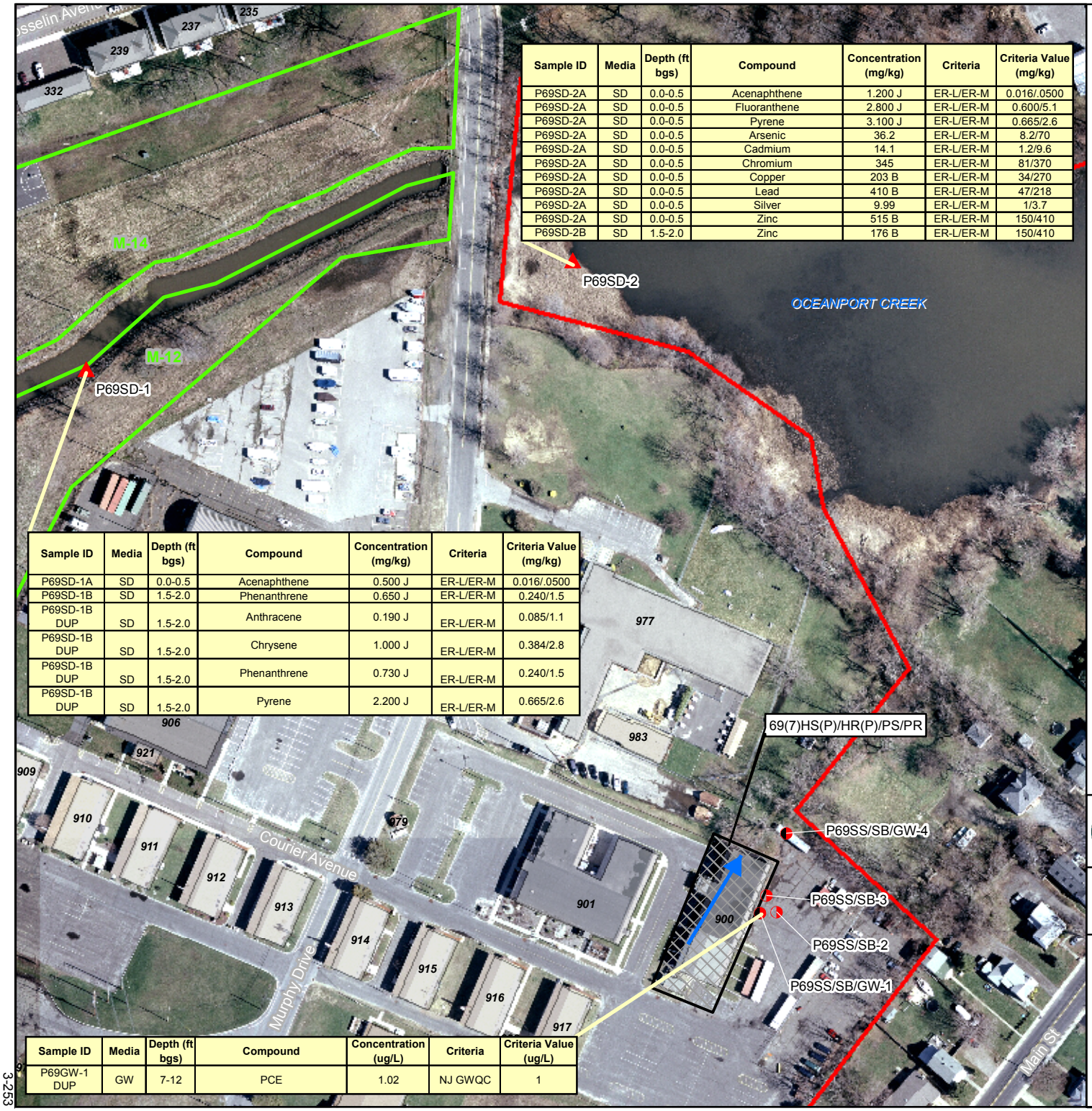
µg/L = micrograms per liter.

Table 3.16-5
Fort Monmouth Phase II Site Investigation, Parcel 69
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results									
		Sample ID:	P69SD-1A	P69SD-1A	P69SD-1B	P69SD-1B	P69SD-1B DUP	P69SD-1B DUP	P69SD-2A	P69SD-2A	P69SD-2B	P69SD-2B
		Lab ID:	7048017	7053911	7048018	7053912	7048016	7053915	7048019	7053913	7048020	7053914
		Date Sampled:	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007	11/20/2007	12/17/2007
		Depth (ft. bgs):	0.0-0.5	0.0-0.5	1.5-2.0	1.5-2.0	1.5-2.0	1.5-2.0	0.0-0.5	0.0-0.5	1.5-2.0	1.5-2.0
Chemical	ER-L[1]	ER-M[2]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles												
Acetone	NLE	NLE	NT	**4.000 B**	NT	**3.100 B**	NT	**3.400 B**	NT	**5.300 B**	NT	**5.600 B**
Carbon disulfide	NLE	NLE	NT	**0.130 J**	NT	**0.074 J**	NT	**0.069 J**	NT	**0.069 J**	NT	**0.071 J**
Methylene Chloride	NLE	NLE	NT	**0.160 JB**	NT	**0.130 JB**	NT	**0.110 JB**	NT	**0.190 JB**	NT	**0.210 JB**
Toluene	NLE	NLE	NT	0.440 U	NT	**0.023 J**	NT	0.320 U	NT	0.510 U	NT	0.590 U
Semi-Volatiles												
Acenaphthene	0.016	0.500	**0.500 J**	NT	3.100 U	NT	3.100 U	NT	**1.200 J**	NT	4.600 U	NT
Anthracene	0.085	1.1	2.800 U	NT	3.100 U	NT	**0.190 J**	NT	6.500 U	NT	4.600 U	NT
Benzo[a]anthracene	0.261	1.6	2.800 U	NT	3.100 U	NT	**0.560 J**	NT	6.500 U	NT	4.600 U	NT
Chrysene	0.384	2.8	2.800 U	NT	3.100 U	NT	**1.000 J**	NT	6.500 U	NT	4.600 U	NT
Di-n-butylphthalate	NLE	NLE	**4.800 B**	NT	**7.600 B**	NT	**4.100 B**	NT	**1.200 JB**	NT	**9.400 B**	NT
Fluoranthene	0.600	5.1	**0.790 J**	NT	**0.850 J**	NT	**1.200 J**	NT	**2.800 J**	NT	4.600 U	NT
Phenanthrene	0.240	1.5	**0.250 J**	NT	**0.650 J**	NT	**0.730 J**	NT	6.500 U	NT	4.600 U	NT
Pyrene	0.665	2.6	**1.100 J**	NT	**1.900 J**	NT	**2.200 J**	NT	**3.100 J**	NT	4.600 U	NT
Metals												
Aluminum	NLE	NLE	**7790 B**	NT	**8720 B**	NT	**7890 B**	NT	**41300 B**	NT	**12100 B**	NT
Arsenic	8.2	70	**2.59**	NT	**2.27**	NT	**1.85**	NT	**36.2**	NT	**6.12**	NT
Barium	NLE	NLE	**14.8 B**	NT	**23.5 B**	NT	**17.3 B**	NT	**89.6 B**	NT	**21.6 B**	NT
Beryllium	NLE	NLE	**0.876**	NT	**1.19**	NT	**1.14**	NT	**3.90**	NT	**1.36**	NT
Cadmium	1.2	9.6	0.063 U		0.061 U	NT	0.064 U	NT	**14.1**	NT	0.087 U	NT
Calcium	NLE	NLE	**1460**	NT	**2060**	NT	**1210**	NT	**3850**	NT	**1470**	NT
Chromium (Total)	81	370	**74.5**	NT	**87.6**	NT	**83.3**	NT	**345**	NT	**80.1**	NT
Cobalt	NLE	NLE	**2.05**	NT	**1.84**	NT	**2.07**	NT	**20.3**	NT	**4.61**	NT
Copper	34	270	**30.5 B**	NT	**37.3 B**	NT	**38.6 B**	NT	**203 B**	NT	**23.9 B**	NT
Iron	NLE	NLE	**23700**	NT	**26600**	NT	**26700**	NT	**92500**	NT	**33200**	NT
Lead	47	218	**35.9 B**	NT	**44.4 B**	NT	**53.7 B**	NT	**410 B**	NT	**44.8 B**	NT
Magnesium	NLE	NLE	**3550**	NT	**3660**	NT	**3480**	NT	**11300**	NT	**4130**	NT
Manganese	NLE	NLE	**55.4**	NT	**45.5**	NT	**39.6**	NT	**339**	NT	**93.1**	NT
Mercury	0.15	0.71	0.143 U	NT	0.158 U	NT	0.148 U	NT	**0.83**	NT	0.217 U	NT
Nickel (Soluble Salts)	21	52	**9.32**	NT	**8.56**	NT	**8.49**	NT	**53.1**	NT	**18.4**	NT
Potassium	NLE	NLE	**4880**	NT	**5900**	NT	**5610**	NT	**13900**	NT	**5090**	NT
Silver	1.0	3.7	0.252 U	NT	0.243 U	NT	0.255 U	NT	**9.99**	NT	0.347 U	NT
Sodium	NLE	NLE	57.316 U	NT	55.365 U	NT	57.923 U	NT	**9690**	NT	**5230**	NT
Vanadium	NLE	NLE	**45.6**	NT	**47.8**	NT	**47.1**	NT	**185**	NT	**49.6**	NT
Zinc	150	410	**126 B**	NT	**134 B**	NT	**140 B**	NT	**515 B**	NT	**176 B**	NT

[1] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Low, 1998.
[2] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Medium, 1998.
B = The compound was found in the associated method blank as well as in the sample.
D = Sample was diluted.
E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.
J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.
U = The compound was analyzed for but not detected.

Bold = Analyte detected.
Shaded = Concentration exceeds ER-L.
DUP = Duplicate Sample.
ft. bgs = Feet below ground surface.
NT = Not tested.
NLE = No limit established.
mg/kg = milligram per kilogram.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P69SD-2A	SD	0.0-0.5	Acenaphthene	1.200 J	ER-L/ER-M	0.016/.0500
P69SD-2A	SD	0.0-0.5	Fluoranthene	2.800 J	ER-L/ER-M	0.600/5.1
P69SD-2A	SD	0.0-0.5	Pyrene	3.100 J	ER-L/ER-M	0.665/2.6
P69SD-2A	SD	0.0-0.5	Arsenic	36.2	ER-L/ER-M	8.2/70
P69SD-2A	SD	0.0-0.5	Cadmium	14.1	ER-L/ER-M	1.2/9.6
P69SD-2A	SD	0.0-0.5	Chromium	345	ER-L/ER-M	81/370
P69SD-2A	SD	0.0-0.5	Copper	203 B	ER-L/ER-M	34/270
P69SD-2A	SD	0.0-0.5	Lead	410 B	ER-L/ER-M	47/218
P69SD-2A	SD	0.0-0.5	Silver	9.99	ER-L/ER-M	1/3.7
P69SD-2A	SD	0.0-0.5	Zinc	515 B	ER-L/ER-M	150/410
P69SD-2B	SD	1.5-2.0	Zinc	176 B	ER-L/ER-M	150/410

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P69SD-1A	SD	0.0-0.5	Acenaphthene	0.500 J	ER-L/ER-M	0.016/.0500
P69SD-1B	SD	1.5-2.0	Phenanthrene	0.650 J	ER-L/ER-M	0.240/1.5
P69SD-1B DUP	SD	1.5-2.0	Anthracene	0.190 J	ER-L/ER-M	0.085/1.1
P69SD-1B DUP	SD	1.5-2.0	Chrysene	1.000 J	ER-L/ER-M	0.384/2.8
P69SD-1B DUP	SD	1.5-2.0	Phenanthrene	0.730 J	ER-L/ER-M	0.240/1.5
P69SD-1B DUP	SD	1.5-2.0	Pyrene	2.200 J	ER-L/ER-M	0.665/2.6

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P69GW-1 DUP	GW	7-12	PCE	1.02	NJ GWQC	1

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Sediment Sample Location
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 — Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 75 150 300 Feet

Base Realignment and Closure 2005

Shaw Environmental, Inc.

FIGURE 3.16-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 69 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_16-1_SI_P69_Exceeds_SampLoc.mxd (7/14/2008 4:02:02 PM)

3.17 Parcel 70 – Bldg 551 – Former Photoprocessing

3.17.1 Site Description

Parcel 70, Bldg 551, is located in the central portion of the MP on Todd Avenue, directly north of Oceanport Creek. The building formerly housed a classroom and photoprocessing operation, which was located in the western portion of the building (22). Bldg 551 is currently utilized for administrative and classroom activities. Chemicals documented to have been utilized included carbon tetrachloride and photographic chemicals. Additional information pertaining to this parcel can be found in Section 4.3.2.1.6 and Section 5.13.6 of the Phase I ECP (1).

3.17.2 Previous Investigations

One former UST associated with Bldg 551 was removed under the FTMM UST Management Program and is summarized within the FTMM Phase I ECP Report (1). No previous investigations have been conducted in relation to former operations in Bldg 551.

3.17.3 Site Investigation Sampling

A review of historical site plans, sanitary plans, and stormwater management plans was conducted to evaluate potential discharge locations throughout the parcel, and a site reconnaissance was conducted in spring 2007 to evaluate potential discharge locations. Two cast-iron pipe outfalls were identified south of Bldg 551 along the north bank of Oceanport Creek during the 2007 site reconnaissance. In order to determine the absence/presence of contamination from potential releases to the environment, the following surface soil and sediment sampling was conducted in Parcel 70.

Surface Soil Investigation

Surface soil sampling was conducted in December 2007 and January 2008 within Parcel 70. One surface soil sample was collected from one hand augered location outside the exterior door to the former photoprocessing facility in the courtyard of Bldg 551 (**Figure 3.17-1**). This sample was collected to determine if any contamination exists from former photoprocessing operations. The surface soil sample for non-VO analysis was collected from the 0- to 6-inch interval bgs. The surface soil sample collected for VO analysis was collected from the 18- to 24-inch bgs interval. No visual or olfactory evidence of soil contamination was noted.

Sediment Investigation

Sediment samples were collected in December 2007 and January 2008 in Parcel 70. A total of four sediment samples were collected from two distinct hand augered borings located along the north bank of Oceanport Creek adjacent to Bldg 551 (**Figure 3.17-1**). Samples were collected at potential outfall locations to investigate any potential historic discharges from Bldg 551. Sediment samples for non-VO and VO analysis were

collected from the 0- to 6-inch interval bgs and the 18- to 24-inch interval bgs, respectively. No visual or olfactory evidence of sediment contamination was noted.

Table 3.17-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.17-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.17-2.**

Table 3.17-1
Parcel 70 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
70SS-1, 70SD-1, 70SD-1D (3 sample)	Surface soil	A soil sample was collected from the 0- to 6-inch bgs interval to investigate potential discharges associated with former photoprocessing operations at Bldg 551. The sample was located at the exterior door to the former photoprocessing facility in the courtyard of the building.	TCL+30 (w/o pesticides), TAL Metals
70SD-1 and 2 (1 samples)	Sediment	Sediment samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges from Bldg 551. Samples are located at the outfalls of 4-inch cast iron pipes present along the north bank of Oceanport Creek.	TCL+30 (w/o pesticides), TAL Metals
70SD-1D and 2D (1 samples)	Sediment	Sediment samples were collected from the 18- to 24-inch interval bgs to investigate potential discharges from Bldg 551.	TCL+30 (w/o pesticides), TAL Metals

3.17.4 Site Investigation Results

Soil Investigation Results

The soil sample was analyzed for TCL+30 (minus pesticides) and TAL metals. In addition to surface soil sample P70-SS1, samples P70-SD2 and P70-SD2D, which were originally intended to be sediment samples, were characterized as soil samples due to the lack of surface water at the sample location, the low moisture content of the samples, and the lack of recent depositional characteristics at the sample location. These two samples were also analyzed for TCL+30 (without pesticides) and TAL metals. As presented in **Table 3.17-3**, eight B/Ns, 17 metals, and one Aroclor were detected in the three samples.

B/Ns and Aroclor 1260 were not detected at concentrations above the NJDEP NRDCSCC. Of the 17 metals detected, arsenic was detected above the NRDCSCC of 20 mg/kg at a concentration of 26.3 mg/kg in sample P70-SD2. Sample P70-SD2 was collected from the 0- to 6-inch interval. The deeper sample P70-SD2D, collected from the 12- to 18-inch interval had an arsenic concentration below the NRDCSCC.

There are several factors both natural and anthropogenic that can have an influence on arsenic levels in the soil at FTMM. The primary natural influence on the chemical concentrations in the soil at FTMM is parent material. The parent material at FTMM is glauconitic soil of the Tinton and Red Bank sands and their fluvially- and tidally-reworked equivalents (47). Total arsenic levels in glauconite-bearing soils in New Jersey have been reported to range up to 131 mg/kg, with a median of 30 mg/kg (21). Anthropogenic influences on arsenic levels in the soil include the use of pesticides and herbicides. Arsenic was a common constituent of herbicides and pesticides in the past. As a result of these natural and anthropogenic influences, arsenic is not considered a COC in the soil. No COCs were identified in soil at Parcel 70.

Sediment Investigation Results

Sediment samples were analyzed for TCL+30 (without pesticides) and TAL metals. Oceanport Creek is a tidally influenced water body in this portion of the facility; therefore, sediment analytical results were evaluated in relation to the Marine/Estuarine Sediment Screening Guidelines-ER-L.

As presented in **Table 3.17-4**, a total of six B/Ns and 17 metals were detected in Parcel 70 sediment samples. The six B/Ns and 17 metals were detected at concentrations below the ER-L.

No COCs have been identified in sediment at Parcel 70.

3.17.5 Summary and Conclusions

No COCs were identified above applicable NJDEP criteria in surface soil. NFA is recommended for soil within Parcel 70.

No COCs were detected in sediment at concentrations greater than the NJDEP Marine/Estuarine Sediment Screening Guidelines-ER-L. NFA is recommended for sediment within Parcel 70.

Table 3.17-2
Parcel 70 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	HAND AUGER	DUPLICATE-SD	12/20/07	11:10	1.0	1.5									Cancelled by lab. Recollected 01/08/08.
SOIL	HAND AUGER	P70-SS1	12/20/07	10:50	0.0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P70-SD1	12/20/07	11:00	0.0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P70-SD1D	12/20/07	11:10	1.0	1.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P70-SD2	12/20/07	11:30	0.0	0.5									Cancelled by lab. Recollected 01/08/08.
SD	HAND AUGER	P70-SD2D	12/20/07	11:40	1.0	1.5									Cancelled by lab. Recollected 01/08/08.
SOIL	HAND AUGER	P70SS-1	12/27/07	11:50	1.5	2		X							Associated trip blank collected with Parcel 27. No field blank or duplicate collected 12/27/07.
SOIL	HAND AUGER	P70SS-1	01/08/08	15:30	0.0	0.5		X	X	X	X				VOCs not needed. 12/27 VOCs collected at correct depth. Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P70-SD1	01/08/08	14:45	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SD	HAND AUGER	P70-SD1D	01/08/08	15:00	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27.
SOIL	HAND AUGER	P70-SD2	01/08/08	15:10	0.0	0.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27. Sample determined to be classified as soil, not sediment.
SOIL	HAND AUGER	P70-SD2D	01/08/08	15:30	1.0	1.5		X	X	X	X				Associated field and trip blanks collected with Parcel 27. Sample determined to be classified as soil, not sediment.

X = Sample analyzed for the indicated analytical parameter suite

Table 3.17-3
Fort Monmouth Phase II Site Investigation, Parcel 70
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results		
		Sample ID:	P70-SS1	P70-SD2	P70-SD2D
		Lab ID:	8000905	8000903	8000904
		Date Sampled:	01/08/2008	01/08/2008	01/08/2008
		Depth (ft. bgs):	0.0-0.5	0.0-0.5	1.0-1.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result
Semi-Volatiles					
Benzo[a]anthracene	4	500	1.100 U	**0.400 J**	4.500 U
Benzo[b]fluoranthene	4	50	1.100 U	**0.760 J**	4.500 U
Benzoic acid	NLE	NLE	1.100 U	3.200 U	4.500 U
bis(2-Ethylhexyl)phthalate	210	100	**0.300 J**	3.200 U	4.500 U
Chrysene	40	500	1.100 U	**0.620 J**	4.500 U
Di-n-butylphthalate	10000	100	**1.100 B**	**1.200 JB**	**6.000 B**
Fluoranthene	10000	100	1.100 U	**0.840 J**	4.500 U
Phenanthrene	NLE	NLE	1.100 U	**0.440 J**	4.500 U
Pyrene	10000	100	1.100 U	**1.200 J**	4.500 U
Aroclor 1260	2	50	**0.86**	0.0041 U	0.0041 U
Aluminum	NLE	NLE	**9420 B**	**44500 B**	**20400 B**
Arsenic	20	NLE	**4.13**	**26.3**	**11.0**
Barium	47000	NLE	**39.7 B**	**218 B**	**93.4 B**
Beryllium	140	NLE	**0.315**	**5.10**	**2.22**
Cadmium	100	NLE	**1.28**	**3.19**	**0.742**
Calcium	NLE	NLE	**917 B**	**3510 B**	**7440 B**
Chromium (Total)	NLE	NLE	**21.7**	**232**	**114**
Cobalt	NLE	NLE	**1.97**	**10.0**	**1.99**
Copper	45000	NLE	**87.9 B**	**54.2 B**	**22.1 B**
Iron	NLE	NLE	**17300**	**62000**	**25200**
Lead	800	NLE	**40.8**	**115**	**10.6**
Magnesium	NLE	NLE	**951**	**7670**	**3400**
Manganese	NLE	NLE	**84.9**	**107**	**87.7**
Nickel (Soluble Salts)	2400	NLE	**9.39**	**48.8**	**26.7**
Potassium	NLE	NLE	**1610**	**12200**	**6160**
Vanadium	7100	NLE	**30.5**	**162**	**79.4**
Zinc	1500	NLE	**136 B**	**328 B**	**180 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.17-4
Fort Monmouth Phase II Site Investigation, Parcel 70
Summary of Analytical Parameters Detected in Sediment (mg/kg)

			Analytical Results	
		Sample ID:	P70-SD1	P70-SD1D
		Lab ID:	8000901	8000902
		Date Sampled:	01/08/2008	01/08/2008
		Depth (ft. bgs):	0.0-0.5	1.0-1.5
Chemical	ER-L[1]	ER-M[2]	Result	Result
Semi-Volatiles				
Benzoic acid	NLE	NLE	**3.100**	1.400 U
bis(2-Ethylhexyl)phthalate	NLE	NLE	**0.170 J**	1.400 U
Chrysene	0.384	2.8	**0.120 J**	1.400 U
Di-n-butylphthalate	NLE	NLE	**1.500 B**	**1.600 B**
Fluoranthene	0.600	5.1	**0.120 J**	1.400 U
Pyrene	0.665	2.6	**0.170 J**	1.400 U
Metals				
Aluminum	NLE	NLE	**4140 B**	**6640 B**
Arsenic	8.2	70	**3.43**	**3.17**
Barium	NLE	NLE	**12.4 B**	**28.2 B**
Beryllium	NLE	NLE	**0.432**	**0.591**
Cadmium	1.2	9.6	**0.197**	**0.184**
Calcium	NLE	NLE	**861 B**	**1110 B**
Chromium (Total)	81	370	**43.9**	**51.2**
Cobalt	NLE	NLE	**0.472**	0.394 U
Copper	34	270	**15.9 B**	**11.3 B**
Iron	NLE	NLE	**13200**	**11000**
Lead	47	218	**14.8**	**8.92**
Magnesium	NLE	NLE	**1460**	**1590**
Manganese	NLE	NLE	**33.5**	**24.2**
Nickel (Soluble Salts)	21	52	**4.26**	**4.25**
Potassium	NLE	NLE	**3000**	**3170**
Vanadium	NLE	NLE	**29.0**	**31.4**
Zinc	150	410	**76.4 B**	**100 B**

[1] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Low, 1998.

[2] NJDEP Marine/Estuarine Sediment Screening Guidelines, Effects Range - Medium, 1998.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte detected.

Shaded = Concentration exceeds ER-L.

LEGEND

- Surface and Subsurface Soil Sample Location
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- IRP Site Boundary
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 25 50 100 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.17-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 70 SAMPLE LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_17-1_SI_P70_SampleLocations.mxd (7/14/2008 4:22:11 PM)

3.18 Parcel 76 – 200 Area, 300 Area – Former Barracks

3.18.1 Site Description

Parcel 76 is located in the northern portion of the MP and encompasses the former 300 Area barracks and current residential housing within the 200 series of buildings. Plan No. 506, "Gas and Fuel Storage Tanks Distribution System" dated January 22, 1956, was reviewed for the MP as part of the Phase I ECP. The plan depicts numerous fuel oil USTs that existed within Parcel 76 in 1956 in association with the former barracks and current residential housing. Additional information pertaining to this parcel can be found in Section 5.4 and Appendix G of the Phase I ECP (1).

3.18.2 Previous Investigations

Numerous USTs associated with current residential buildings within the 200 Area have been removed under the FTMM UST program and are summarized within the FTMM Phase I ECP Report (1).

3.18.3 Site Investigation Sampling

A review of documented UST removal locations versus the location of former buildings and associated USTs within Parcel 76 was conducted. Based on this review, it was determined that no UST removals have been documented at the locations of numerous fuel oil USTs identified on Plan No. 506, "Gas and Fuel Storage Tanks Distribution System" dated January 22, 1956. This includes fuel oil USTs associated with former 300 Area barracks (currently an open maintained grass area) and existing Bldg 230. In order to determine the absence/presence of formerly utilized USTs and their potential releases to the environment, the following geophysical surveys, soil sampling, and groundwater sampling were conducted throughout Parcel 76.

Geophysical Survey Investigation

An EM survey was conducted over the former barracks area and also by Bldg 230 to determine if USTs are present. Follow-up GPR surveys were conducted at anomalies identified from the EM surveys.

Geoprobe® Investigation

Soil and groundwater samples were collected in November 2007 in Parcel 76 in order to determine if contamination exists from potential historical UST releases. A total of 29 surface soil samples and 35 subsurface soil samples (including five duplicate samples) were collected from 29 distinct Geoprobe® borings (**Figure 3.18-1**). Boring locations were conducted on approximate 100-ft centers in an open field that was once a barracks area. Two additional boring locations were placed near Bldg 230 in January 2008 to investigate a potential heating oil tank. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were

collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of the core was conducted using a PID/FID meter. Visual staining and olfactory evidence of impacted soil was noted at the 6-inch interval directly above the water table at boring location P76-B7. Visual staining and olfactory evidence of impacted soil was also noted at boring location P76-C4. One additional subsurface sample, P76-C4-D, was collected based on elevated results from field screening tests that were performed on the soil core at boring location P76-C4.

A total of six groundwater samples (including one duplicate sample) were collected from five distinct temporary wells that were installed with the Geoprobe® rig (**Figure 3.18-1**). Temporary wells were installed along the downgradient (northern) boundary of the soil grid. Two groundwater samples, 76GW-1 (including one duplicate), were also collected from a temporary well installed downgradient of Bldg 230 to investigate possible contamination from a potential heating oil tank that was associated with this building. Temporary wells were constructed of PVC and 5 to 10 ft of factory-slotted screen.

Table 3.18-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.18-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.18-2**.

Table 3.18-1
Parcel 76 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
225-ft x 825-ft former barracks area	A geophysical survey was conducted over the 225-ft x 825-ft former barracks area and a 80-ft x 80-ft area associated with the former UST associated with Bldg 230. The geophysical investigation consisted of an EM survey throughout the areas followed by targeted GPR scanning of anomalies identified by the EM survey.		
76SS-A1 through 76SS-C9 (27 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
76SB-A1 through 76SB-C9 (32 samples – includes 4 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (ranging from 2.5 to 12 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former barracks. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
76GW-A1, A3, A5, A7, A9 (6 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings in the grid to investigate the potential release from former heating oil USTs associated with the former barracks. Groundwater samples were collected on 200-ft centers in the downgradient portion of the sampling grid.	VO+10, B/N+15
76SS-1 and 2 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings to investigate the potential release from a former heating oil UST associated with existing Bldg 230.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
76SB-1 and 2 (3 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (3.5 to 4.0 ft bgs) from each Geoprobe® soil boring to investigate the potential release from a former heating oil UST associated with existing Bldg 230. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
76GW-1 (2 samples – includes 1 duplicate sample)	Groundwater	A groundwater sample was collected from the specified Geoprobe® soil boring to investigate the potential release from a former heating oil UST associated with Bldg 230.	VO+10, B/N+15

3.18.4 Site Investigation Results

Geophysical Survey Results

The geophysical survey identified a total of 24 target EM anomalies. The survey areas are presented on **Figure 3.18-2**. This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. Seven suspected USTs were identified in the 300 Area; the locations of the suspected USTs are presented on **Figure 3.18-2**. No suspected USTs were identified in the area of Bldg 230. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.18-3**, and full results of the geophysical surveys are included in **Appendix A**. In summary, GPR scanning of the 24 targets revealed:

- Fourteen targets that were associated with surface metal/debris (previously unaccounted for).
- Three targets with moderate-amplitude scattered reflections, possible small pieces of scattered metal debris.

- Seven targets with high-amplitude parabolic reflections indicative of a possible UST. The suspected USTs match up with former Bldgs 537, 538, 539, 541, 542, 543, and 544. Said buildings served as barracks officers quarters, housing structures, until the end of their life cycles. Supporting real property records are included in **Appendix I**.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis. Groundwater samples were analyzed for VO+10 and B/N+15.

Soil

Three additional subsurface soil samples, P76-B7-C, P76-C4-D and P76-C4-D-Duplicate, were collected for TPHC and contingency VO analysis based on elevated field screening measurements with a PID. Sample P76-B7-C had a PID reading of 50 ppm, and samples P76-C4-D and P76-C4-D-Duplicate had a PID reading of 55 ppm. As shown in **Table 3.18-4**, TPHC was detected in six of the 29 surface soil samples and in three of the 35 subsurface soil samples. No surface soil TPHC results exceeded 1,000 mg/kg; therefore, no VO analysis was conducted for surface soil. TPHC results exceeded 1,000 mg/kg in three subsurface soil samples (P76-B7-C contained 6,163 mg/kg TPHC, P76-C4-D contained 1,998 mg/kg TPHC, and P76-C4-D-Duplicate contained 1,498 mg/kg TPHC) and contingent VO analysis was conducted. As shown in **Table 3.18-5**, one VO (acetone) was detected at concentrations below the NJDEP NRDCSCC. No COCs were identified in soil at Parcel 76.

Groundwater

Three VOs were detected in Parcel 76 groundwater samples (**Table 3.18-6**). Acetone, chloroform, and toluene were detected at concentrations below the NJDEP GWQC.

Four B/Ns were detected in Parcel 76 groundwater samples. Of the four B/Ns detected, bis(2-ethylhexyl)phthalate was detected at concentrations above the NJDEP GWQC. A commonly used plasticizer, bis(2-ethylhexyl)phthalate, is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected in the field and method blanks associated the Parcel 76 groundwater samples. Thus, no COCs were identified in groundwater at Parcel 76.

3.18.5 Summary and Conclusions

A total of seven targets indicative of suspected USTs were identified by the geophysical investigation. No constituents were identified above applicable NJDEP NRDCSCC or RDCSCC in surface or subsurface soil, and no constituents were identified above NJDEP GWQC in groundwater.

Soil and groundwater analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for soil, groundwater, and the suspected USTs in Parcel 76 is recommended.

Table 3.18-2
Parcel 76 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	11/21/07	-	--	--	NA								
SOIL	GEOPROBE	P76-B1-A	11/21/07	10:10	0.0	0.5	X								
SOIL	GEOPROBE	P76-B1-B	11/21/07	10:10	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B1-C	11/21/07	10:30	5.0	5.5	X								
SOIL	GEOPROBE	P76-B2-A	11/21/07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P76-B2-B	11/21/07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B2-C	11/21/07	11:00	5.0	5.5	X								
SOIL	GEOPROBE	P76-B3-A	11/21/07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P76-B3-B	11/21/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B3-C	11/21/07	11:20	2.5	3.0	X								
SOIL	GEOPROBE	P76-B3-C DUPLICATE	11/21/07	11:20	2.5	3.0	X								
SOIL	GEOPROBE	P76-B4-A	11/21/07	11:50	0.0	0.5	X								
SOIL	GEOPROBE	P76-B4-B	11/21/07	11:50	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B4-C	11/21/07	11:55	2.5	3.0	X								
BLANK	FIELD	FIELD BLANK-SO	11/21/07	12:00	--	--	X								
BLANK	TRIP	TRIP BLANK	11/26/07	-	--	--		X							
SOIL	GEOPROBE	P76-B5-A	11/26/07	10:05	0.0	0.5	X								
SOIL	GEOPROBE	P76-B5-B	11/26/07	10:05	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B5-C	11/26/07	11:05	3.0	3.5	X								
SOIL	GEOPROBE	P76-B6-A	11/26/07	11:25	0.0	0.5	X								
SOIL	GEOPROBE	P76-B6-B	11/26/07	11:25	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B6-C	11/26/07	11:35	7.0	7.5	X								
SOIL	GEOPROBE	P76-B7-A	11/26/07	11:50	0.0	0.5	X								
SOIL	GEOPROBE	P76-B7-B	11/26/07	11:50	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B7-C	11/26/07	12:00	3.0	3.5	X	X							
SOIL	GEOPROBE	P76-B8-A	11/26/07	13:25	0.0	0.5	X								
SOIL	GEOPROBE	P76-B8-B	11/26/07	13:25	1.5	2.0	NA								

Table 3.18-2
Parcel 76 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P76-B8-C	11/26/07	13:40	7.0	7.5	X								
SOIL	GEOPROBE	P76-B9-A	11/26/07	14:00	0.0	0.5	X								
SOIL	GEOPROBE	P76-B9-B	11/26/07	14:00	1.5	2.0	NA								
SOIL	GEOPROBE	P76-B9-C	11/26/07	14:10	5.5	6.0	X								
SOIL	GEOPROBE	P76-A8-A	11/26/07	14:25	0.0	0.5	X								
SOIL	GEOPROBE	P76-A8-B	11/26/07	14:25	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A8-C	11/26/07	14:25	3.0	3.5	X								
SOIL	GEOPROBE	P76-A6-A	11/26/07	14:45	0.0	0.5	X								
SOIL	GEOPROBE	P76-A6-B	11/26/07	14:45	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A6-C	11/26/07	14:50	5.5	6.0	X								
SOIL	GEOPROBE	P76-A6-C DUPLICATE	11/26/07	14:50	5.5	6.0	X								
BLANK	FIELD	FIELD BLANK	11/26/07	15:00	--	--	X	X							
BLANK	TRIP	TRIP BLANK	11/27/07	-	--	--	NA								
SOIL	GEOPROBE	P76-A1-A	11/27/07	8:35	0.0	0.5	X								
SOIL	GEOPROBE	P76-A1-B	11/27/07	8:35	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A1-C	11/27/07	9:05	11.5	12.0	X								
SOIL	GEOPROBE	P76-A2-A	11/27/07	10:10	0.0	0.5	X								
SOIL	GEOPROBE	P76-A2-B	11/27/07	10:10	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A2-C	11/27/07	10:15	6.5	7.0	X								
SOIL	GEOPROBE	P76-A3-A	11/27/07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P76-A3-B	11/27/07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A3-C	11/27/07	11:00	11.5	12.0	X								
SOIL	GEOPROBE	P76-A4-A	11/27/07	11:15	0.0	0.5	X								
SOIL	GEOPROBE	P76-A4-B	11/27/07	11:15	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A4-C	11/27/07	11:35	7.5	8.0	X								
BLANK	FIELD	FIELD BLANK	11/27/07	13:30	--	--	X								
SOIL	GEOPROBE	P76-A5-A	11/27/07	13:40	0.0	0.5	X								

Table 3.18-2
Parcel 76 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P76-A5-B	11/27/07	13:40	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A5-C	11/27/07	14:00	5.0	5.5	X								
SOIL	GEOPROBE	P76-A5-C DUPLICATE	11/27/07	14:00	5.0	5.5	X								
SOIL	GEOPROBE	P76-A7-A	11/27/07	14:20	0.0	0.5	X								
SOIL	GEOPROBE	P76-A7-B	11/27/07	14:20	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A7-C	11/27/07	14:40	7.5	8.0	X								
SOIL	GEOPROBE	P76-A9-A	11/27/07	15:00	0.0	0.5	X								
SOIL	GEOPROBE	P76-A9-B	11/27/07	15:00	1.5	2.0	NA								
SOIL	GEOPROBE	P76-A9-C	11/27/07	15:35	11.5	12.0	X								
BLANK	TRIP	TRIP BLANK-SO	11/28/07	-	--	--		X							
SOIL	GEOPROBE	P76-C1-A	11/28/07	8:40	0.0	0.5	X								
SOIL	GEOPROBE	P76-C1-B	11/28/07	8:40	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C1-C	11/28/07	9:00	5.0	5.5	X								
SOIL	GEOPROBE	P76-C2-A	11/28/07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P76-C2-B	11/28/07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C2-C	11/28/07	9:30	7.0	7.5	X								
SOIL	GEOPROBE	P76-C3-A	11/28/07	9:55	0.0	0.5	X								
SOIL	GEOPROBE	P76-C3-B	11/28/07	9:55	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C3-C	11/28/07	10:05	3.5	4.0	X								
SOIL	GEOPROBE	P76-C4-A	11/28/07	10:15	0.0	0.5	X								
SOIL	GEOPROBE	P76-C4-B	11/28/07	10:15	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C4-C	11/28/07	10:25	3.5	4.0	X								
SOIL	GEOPROBE	P76-C4-D	11/28/07	10:40	7.5	8.5	X	X							TPHC collected due to elevated field screening results.
SOIL	GEOPROBE	P76-C4-D DUPLICATE	11/28/07	10:40	7.5	8.5	X	X							
SOIL	GEOPROBE	P76-C5-A	11/28/07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P76-C5-B	11/28/07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C5-C	11/28/07	11:10	3.0	3.5	X								

Table 3.18-2
Parcel 76 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P76-C6-A	11/28/07	11:25	0.0	0.5	X								
SOIL	GEOPROBE	P76-C6-B	11/28/07	11:25	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C6-C	11/28/07	11:30	2.5	3.0	X								
SOIL	GEOPROBE	P76-C7-A	11/28/07	11:40	0.0	0.5	X								
SOIL	GEOPROBE	P76-C7-B	11/28/07	11:40	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C7-C	11/28/07	11:45	3.0	3.5	X								
SOIL	GEOPROBE	P76-C8-A	11/28/07	14:05	0.0	0.5	X								
SOIL	GEOPROBE	P76-C8-B	11/28/07	14:05	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C8-C	11/28/07	14:10	2.5	3.0	X								
SOIL	GEOPROBE	P76-C9-A	11/28/07	14:20	0.0	0.5	X								
SOIL	GEOPROBE	P76-C9-B	11/28/07	14:20	1.5	2.0	NA								
SOIL	GEOPROBE	P76-C9-C	11/28/07	14:30	5.0	5.5	X								
BLANK	FIELD	RINSE BLANK-SO	11/28/07	13:45	--	--	X	X							
BLANK	TRIP	TRIP BLANK-AQ	11/28/07	9:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	11/28/07	12:45	--	--		X	X						
GW	GEOPROBE	P76-A1	11/28/07	13:00	11.0	16.0		X	X						
GW	GEOPROBE	P76-A1 DUPLICATE	11/28/07	13:00	11.0	16.0		X	X						
GW	GEOPROBE	P76-A3	11/28/07	13:30	11.0	16.0		X	X						
GW	GEOPROBE	P76-A5	11/28/07	14:00	7.0	12.0		X	X						
GW	GEOPROBE	P76-A7	11/28/07	14:30	7.0	12.0		X	X						
GW	GEOPROBE	P76-A9	11/28/07	15:00	11.0	16.0		X	X						
BLANK	TRIP	TRIP BLANK	01/17/08	-	--	--	NA								
BLANK	FIELD	FIELD BLANK	01/17/08	11:45	--	--	X								
SOIL	GEOPROBE	P76SS-2A	01/17/08	10:45	0.0	0.5	X								
SOIL	GEOPROBE	P76SS-2B	01/17/08	10:45	1.5	2.0	NA								
SOIL	GEOPROBE	P76SS-2C	01/17/08	11:00	3.5	4.0	X								
SOIL	GEOPROBE	P76SS-1A	01/17/08	11:25	0.0	0.5	X								

Table 3.18-2
Parcel 76 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P76SS-1B	01/17/08	11:25	1.5	2.0	NA								
SOIL	GEOPROBE	P76SS-1C	01/17/08	11:35	3.5	4.0	X								
SOIL	GEOPROBE	P76SS-1C DUPLICATE	01/17/08	11:35	3.5	4.0	X								
BLANK	TRIP	TRIP BLANK	01/17/08	13:00	--	--		X							
BLANK	FIELD	FIELD BLANK	01/18/08	8:30	--	--		X	X						
GW	GEOPROBE	P76GW-1 DUPLICATE	01/18/08	9:00	4.0	9.0		X	X						
GW	GEOPROBE	P76GW-1	01/18/08	9:00	4.0	9.0		X	X						

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg. TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.
X = Sample analyzed for the indicated analytical parameter suite

Table 3.18-3
Parcel 76 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P76_1	Both	N/A	N/A	N/A	Surface metal.	619701	541088
P76_2	Both	N/A	N/A	N/A	Surface metal.	619706	541022
P76_3	Both	N/A	N/A	N/A	Surface metal.	619734	541123
P76_4	Inphase	Yes	7 x 12	4 x 11	High-amplitude anomaly indicative of a UST.	619762	541086
P76_5	Conductivtiy	N/A	N/A	N/A	Surface metal.	619773	541088
P76_6	Inphase	N/A	N/A	N/A	Surface metal.	619809	541136
P76_7	Inphase	N/A	N/A	N/A	Surface metal.	619828	541107
P76_8	Conductivtiy	Yes	7 x 12	4 x 11	High-amplitude anomaly indicative of a UST.	619873	541158
P76_9	Inphase	Yes	7 x 12	4 x 10	High-amplitude anomaly indicative of a UST.	619942	541136
P76_10	Both	N/A	N/A	N/A	Surface metal.	619972	541165
P76_11	Both	N/A	N/A	N/A	Surface metal.	620013	541140
P76_12	Both	Yes	7 x 13	4 x 11	High-amplitude anomaly indicative of a UST.	620046	541205
P76_13	Both	Yes	8 x 12	4 x 11	High-amplitude anomaly indicative of a UST.	620110	541182
P76_14	Both	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	620158	541290
P76_15	Inphase	N/A	N/A	N/A	Surface metal.	620182	541241
P76_16	Both	Yes	8 x 10	4 x 7	High-amplitude anomaly indicative of a UST.	620221	541257
P76_17	Both	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	620221	541310
P76_18	Both	N/A	N/A	N/A	Surface metal.	620256	541333
P76_19	Both	N/A	N/A	N/A	Surface metal.	620274	541243
P76_20	Inphase	Yes	7 x 10	4 x 7	High-amplitude anomaly indicative of a UST.	620288	541231
P76_21	Both	Yes	5 x 7	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	620327	541282
P76_22	Both	N/A	N/A	N/A	Surface metal.	620363	541237
P76_23	Both	N/A	N/A	N/A	Surface metal.	620417	541290
P76_24	Both	N/A	N/A	N/A	Surface metal.	620442	541272

Table 3.18-4
Fort Monmouth Phase II Site Investigation, Parcel 76
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP RDCSCC[1] (mg/kg)	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P76-A4-A	7049112	11/27/07	0.0-0.5	102	75	10000	10000	10000
P76-A6-A	7048821	11/26/07	0.0-0.5	288	76	10000	10000	10000
P76-A7-A	7049119	11/27/07	0.0-0.5	85	74	10000	10000	10000
P76-B1-A	7048303	11/21/07	0.0-0.5	265	71	10000	10000	10000
P76-B7-C	7048811	11/26/07	3.0-3.5	6163	75	10000	10000	10000
P76-C4-D	7049215	11/28/07	7.5-8.5	1998	83	10000	10000	10000
P76-C4-D DUP	7049202	11/28/07	7.5-8.5	1498	81	10000	10000	10000
P76-C8-A	7049225	11/28/07	0.0-0.5	395	75	10000	10000	10000
P76-C9-A	7049228	11/28/07	0.0-0.5	784	74	10000	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.18-5
Fort Monmouth Phase II Site Investigation, Parcel 76
Summary of Analytical Parameters Detected in Soil (mg/kg)

				Analytical Results		
			Sample ID:	P76-B7-C	P76-C4-D	P76-C4-D DUP
			Lab ID:	7048811	7049215	7049202
			Date Sampled:	11/26/2007	11/28/2007	11/28/2007
			Depth (ft. bgs):	3.0-3.5	7.5-8.5	7.5-8.5
Chemical	RDCSCC[1]	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result
Volatiles						
Acetone	1000	1000	100	**0.650 B**	**0.390 B**	**0.480 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

Table 3.18-6
Fort Monmouth Phase II Site Investigation, Parcel 76
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results							
	Sample ID:	P76-A1	P76-A1 DUP	P76-A3	P76-A5	P76-A7	P76-A9	P76GW-1	P76GW-1 DUP
	Lab ID:	7049404	7049403	7049405	7049406	7049407	7049408	8002604	8002603
	Date Sampled:	11/28/2007	11/28/2007	11/28/2007	11/28/2007	11/28/2007	11/28/2007	1/18/2008	1/18/2008
	Screened Interval (ft. bgs):	11-16	11-16	11-16	7-12	7-12	11-16	4.0-9.0	4.0-9.0
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles									
Acetone	6000	0.85 U	0.850 U	0.850 U	**2.12 B**	**2.79 B**	**2.51 B**	2.00 U	2.00 U
Chloroform	70	**0.65**	**0.68**	0.320 U	0.320 U	0.320 U	0.320 U	2.00 U	2.00 U
Toluene	600	0.27 U	0.270 U	0.270 U	0.270 U	0.270 U	**0.210 J**	2.00 U	2.00 U
Semi-Volatiles									
bis(2-Ethylhexyl)phthalate	3	1.28 U	**5.21 B**	**4.10 B**	**3.99 B**	**1.46 B**	**3.02 B**	**2.00 J**	10.0 U
Butyl benzyl phthalate	100	0.860 U	**0.780 J**	0.860 U	0.860 U	0.860 U	0.860 U	10.0 U	10.0 U
Diethyl phthalate	6000	0.960 U	0.960 U	0.960 U	0.960 U	0.960 U	**0.350 J**	10.0 U	10.0 U
Di-n-butylphthalate	700	**1.18 B**	**1.06 B**	**0.930 B**	**0.830 JB**	**0.800 JB**	**0.930 B**	10.0 U	10.0 U

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Water Body
- Building
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 — Areas where only release or disposal of petroleum products has occurred.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.18-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 76 SAMPLE LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_18-1_SI_P76_SampleLocations.mxd (7/14/2008 12:58:22 PM)

LEGEND

- Subsurface Metallic Object (Suspected UST)
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Water Body
- Building
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- Installation Boundary

N

SCALE:

0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.18-2

FORT MONMOUTH ECP
SITE INVESTIGATION

PARCEL 76
SUSPECTED UST LOCATIONS
MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_18-2_SI_P76_Geophysics.mxd (7/14/2008 12:59:23 PM)

3.19 Parcel 79 – 400 Area Former Buildings

3.19.1 Site Description

Parcel 79 is located on the MP east of Oceanport Avenue and encompasses the 400 Bldg Area. Plan No. 506, "Gas and Fuel Storage Tanks Distribution System" dated January 22, 1956, was reviewed for the MP as part of the Phase I ECP. The plan depicts numerous fuel oil USTs that existed within Parcel 79 in 1956 in association with the former 400 Area buildings. Additional information pertaining to this parcel can be found in Section 3.4.1.1, Table 3-3, Section 4.3.2.1.7, Section 5.4, Section 5.4.2, Section 5.9, Section 5.13.1, Section 5.17, and Appendix G of the Phase I ECP (1).

3.19.2 Previous Investigations

Numerous USTs associated with former buildings, current buildings, and former bulk petroleum storage within Parcel 79 have been removed under the FTMM UST program and are summarized within the FTMM Phase I ECP Report (1).

A soil investigation and remedial action was recently conducted in portions of the 400, 700, and 800 Bldg Areas. The portion of Parcel 79 that was included within this investigation was south of Leonard Avenue (34). No data gaps were identified in association with the documented UST removals or the remedial action conducted south of Leonard Avenue.

3.19.3 Site Investigation Sampling

A review of documented UST removal locations versus the location of former buildings within Parcel 79 was conducted. Based on this review, it was determined that no UST removals have been documented at the locations of numerous former buildings within Parcel 79 in the vicinity of the baseball field bound by Fisher Avenue to the north, Cesar Avenue to the east, Leonard Avenue to the south, and Oceanport Avenue to the west. In order to determine the absence/presence of formerly utilized USTs and their potential releases to the environment, the following geophysical surveys, soil sampling, and groundwater sampling were conducted within the former buildings area located in Parcel 79.

Geophysical Survey Investigation

An EM survey was conducted throughout the current baseball field, located within Parcel 79, to determine the absence or presence of formerly utilized USTs. Follow-up GPR was performed where anomalies were identified as a result of the EM survey.

Geoprobe® Investigation

Soil and groundwater samples were collected in November and December 2007 in Parcel 79 in order to determine if contamination exists from potential historic heating oil UST releases. A total of 32 surface soil samples and 36 subsurface soil samples (including four duplicate samples) were collected from 32 distinct Geoprobe® borings

(**Figure 3.19-1**). Boring locations were conducted on 100-ft centers in an open field where the 400 Area buildings existed. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores was conducted using PID/FID instruments. No visual or olfactory evidence of impacted soil was noted.

A total of nine groundwater samples (including one duplicate sample) were collected from eight distinct temporary wells that were installed via the Geoprobe® rig (**Figure 3.19-1**). Temporary wells were installed along the north (Fisher Avenue), east (Cesar Avenue), and south (Leonard Avenue) boundaries of the soil boring grid. Temporary wells were constructed of PVC and 5 ft of factory-slotted screen.

Table 3.19-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.19-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.19-2**.

Table 3.19-1
Parcel 79 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
A 400-ft x 600-ft Former Buildings Area	A geophysical survey was conducted throughout the current baseball field area to determine the presence/absence of USTs associated with former 400 Area buildings. The geophysical investigations consisted of an EM survey followed by targeted GPR of anomalies identified by the EM survey.		
79SS-A2 through A7, 79SS-B2 through B7, 79SS-C2 through C7, 79SS-D1 through D7, 79SS-E1 through E7 (32 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former 400 Area buildings in the area of the current baseball field. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)
79SB-A1 through 79SB-E7 (36 samples – includes 4 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 2.5 to 7.5 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former 400 Area buildings. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TPHC, VO+10 (25% of TPHC > 1,000 mg/kg)

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
79GW-A2, A4, A6, B7, D7, E6, E4, E2 (9 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® borings to investigate the groundwater downgradient of potential heating oil tanks associated with the former buildings. Groundwater samples were collected on 200-ft centers in the downgradient portion of the sampling grid.	VO+10, B/N+15

3.19.4 Site Investigation Results

Geophysical Survey Results

The geophysical survey identified a total of 33 target EM anomalies. The survey area is presented on **Figure 3.19-2**. This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. Four suspected USTs were identified within this Parcel; the locations of the suspected USTs are presented on **Figure 3.19-2**. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.19-3**. In summary, GPR scanning of the 34 targets revealed:

- Six targets that were associated with surface metal/debris (previously unaccounted for).
- Two targets that could not be relocated with the TW-6 because the targets were too small to be re-occupied, and therefore are most likely small pieces of scrap metallic debris.
- Six targets with the characteristics of a utility.
- Eight targets with moderate-amplitude near-surface scattered reflections indicative of scattered pieces of small metallic debris.
- Seven target with moderate-amplitude point target/anomalies indicative of small debris; not indicative of a UST.
- Three targets with the high-amplitude parabolic reflections indicative of a possible UST. The suspected USTs match up with former Bldgs 437, 440 or 444, and 441. Said buildings served as financial administrative buildings, non-housing structures, until the end of their life cycles. Supporting real property records are included in **Appendix I**.

- One target with the moderate-amplitude parabolic reflections indicating a possible UST. The suspected UST matches up with former Bldg 445. Said buildings served as financial administrative buildings, non-housing structures, until the end of its life cycle. Supporting real property records are included in **Appendix I**.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis. Groundwater samples were analyzed for VO+10 and B/N+15.

Soil

As presented in **Table 3.19-4**, TPHC was detected in 12 of the 32 surface soil samples and in two of the 36 subsurface soil samples. All 14 TPHC samples were detected at concentrations below 1,000 mg/kg; therefore, no contingency VOs were analyzed. There were no exceedances of NJDEP NRDCSCC or RDCSCC in any of the surface soil or subsurface soil samples collected in Parcel 79. No COCs were identified for soil in Parcel 79.

Groundwater

As presented in **Table 3.19-5**, three VOs and two B/Ns were detected at concentrations below NJDEP GWQC in Parcel 79 groundwater samples. No constituents were detected above the NJDEP GWQC and no COCs were identified in groundwater in Parcel 79.

3.19.5 Summary and Conclusions

Four targets indicative of suspected USTs were identified as part of the geophysical investigation. No constituents were identified above applicable NJDEP NRDCSCC or RDCSCC in surface or subsurface soil, and no constituents were identified above NJDEP GWQC in groundwater.

Soil and groundwater analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for soil, groundwater, and the suspected USTs in Parcel 79 is recommended.

Table 3.19-2
Parcel 79 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK	11/29/07	-	--	--	NA								
SOIL	GEOPROBE	P79-D1-A	11/29/07	9:50	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-D1-B	11/29/07	9:50	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D1-C	11/29/07	10:00	7.5	8.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-E1-A	11/29/07	10:20	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-E1-B	11/29/07	10:20	1.5	2.0	NA								
SOIL	GEOPROBE	P79-E1-C	11/29/07	10:30	6.5	7.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-B2-A	11/29/07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P79-B2-B	11/29/07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P79-B2-C	11/29/07	10:50	3.0	3.5	X								
SOIL	GEOPROBE	P79-C2-A	11/29/07	11:05	0.0	0.5	X								
SOIL	GEOPROBE	P79-C2-B	11/29/07	11:05	1.5	2.0	NA								
SOIL	GEOPROBE	P79-C2-C	11/29/07	11:20	6.5	7.0	X								
SOIL	GEOPROBE	P79-D2-A	11/29/07	11:30	0.0	0.5	X								
SOIL	GEOPROBE	P79-D2-B	11/29/07	11:30	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D2-C	11/29/07	11:40	6.0	6.5	X								
SOIL	GEOPROBE	P79-A3-A	11/29/07	13:25	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-A3-B	11/29/07	13:25	1.5	2.0	NA								
SOIL	GEOPROBE	P79-A3-C	11/29/07	13:35	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
BLANK	FIELD	FIELD BLANK	11/29/07	13:30	--	--	X								

Table 3.19-2
Parcel 79 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P79-B3-A	11/29/07	13:50	0.0	0.5	X								
SOIL	GEOPROBE	P79-B3-B	11/29/07	13:50	1.5	2.0	NA								
SOIL	GEOPROBE	P79-B3-C	11/29/07	14:00	3.5	4.0	X								
SOIL	GEOPROBE	P79-B3-C DUPLICATE	11/29/07	14:00	3.5	4.0	X								
SOIL	GEOPROBE	P79-C3-A	11/29/07	14:40	0.0	0.5	X								
SOIL	GEOPROBE	P79-C3-B	11/29/07	14:40	1.5	2.0	NA								
SOIL	GEOPROBE	P79-C3-C	11/29/07	14:50	5.0	5.5	X								
SOIL	GEOPROBE	P79-D3-A	11/29/07	15:05	0.0	0.5	X								
SOIL	GEOPROBE	P79-D3-B	11/29/07	15:05	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D3-C	11/29/07	15:30	6.5	7.0	X								
BLANK	TRIP	TRIP BLANK	11/30/07	-	--	--	NA								
SOIL	GEOPROBE	P79-A2-A	11/30/07	7:55	0.0	0.5	X								
SOIL	GEOPROBE	P79-A2-B	11/30/07	7:55	1.5	2.0	NA								
SOIL	GEOPROBE	P79-A2-C	11/30/07	8:15	6.0	6.5	X								
SOIL	GEOPROBE	P79-A4-A	11/30/07	8:55	0.0	0.5	X								
SOIL	GEOPROBE	P79-A4-B	11/30/07	8:55	1.5	2.0	NA								
SOIL	GEOPROBE	P79-A4-C	11/30/07	9:15	5.5	6.0	X								
SOIL	GEOPROBE	P79-A6-A	11/30/07	9:35	0.0	0.5	X								
SOIL	GEOPROBE	P79-A6-B	11/30/07	9:35	1.5	2.0	NA								
SOIL	GEOPROBE	P79-A6-C	11/30/07	9:45	6.0	6.5	X								
SOIL	GEOPROBE	P79-B7-A	11/30/07	10:20	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-B7-B	11/30/07	10:20	1.5	2.0	NA								
SOIL	GEOPROBE	P79-B7-C	11/30/07	10:30	5.0	5.5	X								
SOIL	GEOPROBE	P79-D7-A	11/30/07	10:50	0.0	0.5	X								
SOIL	GEOPROBE	P79-D7-B	11/30/07	10:50	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D7-C	11/30/07	11:00	6.0	6.5	X								

Table 3.19-2
Parcel 79 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P79-E6-A	11/30/07	13:35	0.0	0.5	X								
SOIL	GEOPROBE	P79-E6-B	11/30/07	13:35	1.5	2.0	NA								
SOIL	GEOPROBE	P79-E6-C	11/30/07	13:45	2.5	3.0	X								
SOIL	GEOPROBE	P79-E6-C DUPLICATE	11/30/07	13:45	2.5	3.0	X								
SOIL	GEOPROBE	P79-E4-A	11/30/07	14:10	0.0	0.5	X								
SOIL	GEOPROBE	P79-E4-B	11/30/07	14:10	1.5	2.0	NA								
SOIL	GEOPROBE	P79-E4-C	11/30/07	14:20	5.0	5.5	X								
BLANK	FIELD	FIELD BLANK	11/30/07	14:30	--	--	X								
SOIL	GEOPROBE	P79-E2-A	11/30/07	14:45	0.0	0.5	X								
SOIL	GEOPROBE	P79-E2-B	11/30/07	14:45	1.5	2.0	NA								
SOIL	GEOPROBE	P79-E2-C	11/30/07	15:05	6.0	6.5	X								
BLANK	TRIP	TRIP BLANK-SO	12/01/07	-	--	--	NA								
SOIL	GEOPROBE	P79-E3-A	12/01/07	8:00	0.0	0.5	X								
SOIL	GEOPROBE	P79-E3-B	12/01/07	8:00	1.5	2.0	NA								
SOIL	GEOPROBE	P79-E3-C	12/01/07	8:15	3.0	3.5	X								
SOIL	GEOPROBE	P79-B4-A	12/01/07	8:25	0.0	0.5	X								
SOIL	GEOPROBE	P79-B4-B	12/01/07	8:25	1.6	2.0	NA								
SOIL	GEOPROBE	P79-B4-C	12/01/07	8:35	5.0	5.5	X								
SOIL	GEOPROBE	P79-C4-A	12/01/07	8:55	0.0	0.5	X								
SOIL	GEOPROBE	P79-C4-B	12/01/07	8:55	1.5	2.0	NA								
SOIL	GEOPROBE	P79-C4-C	12/01/07	9:00	3.0	3.5	X								
SOIL	GEOPROBE	P79-D4-A	12/01/07	9:15	0.0	0.5	X								
SOIL	GEOPROBE	P79-D4-B	12/01/07	9:15	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D4-C	12/01/07	9:20	6.0	6.5	X								
SOIL	GEOPROBE	P79-A5-A	12/01/07	10:15	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-A5-B	12/01/07	10:15	1.5	2.0	NA								

Table 3.19-2
Parcel 79 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P79-A5-C	12/01/07	10:20	6.0	6.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-B5-A	12/01/07	10:35	0.0	0.5	X								
SOIL	GEOPROBE	P79-B5-B	12/01/07	10:35	1.5	2.0	NA								
SOIL	GEOPROBE	P79-B5-C	12/01/07	10:45	6.0	6.5	X								
SOIL	GEOPROBE	P79-C5-A	12/01/07	11:10	0.0	0.5	X								
SOIL	GEOPROBE	P79-C5-B	12/01/07	11:10	1.5	2.0	NA								
SOIL	GEOPROBE	P79-C5-C	12/01/07	11:25	4.5	5.0	X								
SOIL	GEOPROBE	P79-C5-C DUPLICATE	12/01/07	11:25	4.5	5.0	X								
BLANK	FIELD	FIELD BLANK-SO	12/01/07	11:00	--	--	X								
BLANK	TRIP	TRIP BLANK-AQ	12/01/07	7:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/01/07	8:00	--	--		X	X						
GW	GEOPROBE	P79-E2	12/01/07	8:30	5.0	10.0		X	X						
GW	GEOPROBE	P79-E2 DUPLICATE	12/01/07	8:30	5.0	10.0		X	X						
GW	GEOPROBE	P79-E4	12/01/07	9:00	3.5	8.5		X	X						
GW	GEOPROBE	P79-E6	12/01/07	9:30	3.5	8.5		X	X						
GW	GEOPROBE	P79-D7	12/01/07	10:00	5.0	8.0		X	X						
GW	GEOPROBE	P79-B7	12/01/07	10:30	5.0	10.0		X	X						
GW	GEOPROBE	P79-A6	12/01/07	11:00	5.0	10.0		X	X						
GW	GEOPROBE	P79-A4	12/01/07	11:30	5.0	10.0		X	X						
GW	GEOPROBE	P79-A2	12/01/07	12:00	6.0	11.0		X	X						
BLANK	TRIP	TRIP BLANK	12/03/07	-	--	--	NA								
SOIL	GEOPROBE	P79-D5-A	12/03/07	8:55	0.0	0.5	X								
SOIL	GEOPROBE	P79-D5-B	12/03/07	8:55	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D5-C	12/03/07	9:05	3.5	4.0	X								
SOIL	GEOPROBE	P79-E5-A	12/03/07	9:45	0.0	0.5	X								
SOIL	GEOPROBE	P79-E5-B	12/03/07	9:45	1.5	2.0	NA								

Table 3.19-2
Parcel 79 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P79-E5-C	12/03/07	9:50	3.0	3.5	X								
SOIL	GEOPROBE	P79-B6-A	12/03/07	10:05	0.0	0.5	X								
SOIL	GEOPROBE	P79-B6-B	12/03/07	10:05	1.5	2.0	NA								
SOIL	GEOPROBE	P79-B6-C	12/03/07	10:10	3.5	4.0	X								
SOIL	GEOPROBE	P79-C6-A	12/03/07	10:30	0.0	0.5	X								
SOIL	GEOPROBE	P79-C6-B	12/03/07	10:30	1.5	2.0	NA								
SOIL	GEOPROBE	P79-C6-C	12/03/07	10:45	5.0	5.5	X								
SOIL	GEOPROBE	P79-D6-A	12/03/07	11:00	0.0	0.5	X								
SOIL	GEOPROBE	P79-D6-B	12/03/07	11:00	1.5	2.0	NA								
SOIL	GEOPROBE	P79-D6-C	12/03/07	11:05	3.5	4.0	X								
SOIL	GEOPROBE	P79-A7-A	12/03/07	11:30	0.0	0.5	X								
SOIL	GEOPROBE	P79-A7-B	12/03/07	11:30	1.5	2.0	NA								
SOIL	GEOPROBE	P79-A7-C	12/03/07	11:35	3.5	4.0	X								
SOIL	GEOPROBE	P79-C7-A	12/03/07	13:40	0.5	1.0	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-C7-B	12/03/07	13:40	1.5	2.0	NA								
SOIL	GEOPROBE	P79-C7-C	12/03/07	13:50	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-C7-C DUPLICATE	12/03/07	13:50	4.0	4.5	X								Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P79-E7-A	12/03/07	14:10	0.0	0.5	X								
SOIL	GEOPROBE	P79-E7-B	12/03/07	14:10	1.5	2.0	NA								
SOIL	GEOPROBE	P79-E7-C	12/03/07	14:15	3.5	4.0	X								
BLANK	FIELD	FIELD BLANK	12/03/07	14:00	--	--	X								

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg. TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.
X = Sample analyzed for the indicated analytical parameter suite

Table 3.19-3
Parcel 79 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results

Anomaly	Anomaly Type: Inphase, Conductivity, Both	Anomaly Re-Acquired by Small Area Metal Detection	Metal Detection (MD) Anomaly Size (feet)	GPR Anomaly Size (feet)	Description	Easting	Northing
P79_1	Inphase	Yes	10 x 10	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622024	541442
P79_2	Both	Yes	`	see notes	Suspected utility.	622032	541602
P79_3	Both	N/A	N/A	N/A	Surface metal.	622044	541397
P79_4	Both	Yes	see notes	see notes	Suspected utility.	622047	541637
P79_5	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622054	541533
P79_6	Both	Yes	6 x 10	4 x 7	High-amplitude anomaly indicative of a UST.	622067	541369
P79_7	Conductivity	Yes	50 x 50	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622093	541381
P79_8	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622111	541477
P79_9	Conductivity	Yes	see P79_7	see P79_7	see P79_7.	622121	541397
P79_10	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622214	541526
P79_11	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622214	541587
P79_12	Both	Yes	7 x 11	4 x 11	High-amplitude anomaly indicative of a UST.	622217	541689
P79_13	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622241	541579
P79_14	Both	Yes	5 x 5	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622247	541682
P79_15	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622251	541562
P79_16	Inphase	Yes	5 x 8	4 x 7	Low-amplitude anomaly indicative of a possible UST.	622290	541548
P79_17	Inphase	Yes	4 x4	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622290	541594
P79_18	Both	Yes	8 x 12	4 x 11	High-amplitude anomaly indicative of a UST.	622293	541636
P79_19	Inphase	Yes	< 3 x 3	< 3 x 3	Moderate-amplitude point target/anomaly, possible debris.	622310	541512
P79_20	Inphase	Yes	8 x 7	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622329	541484
P79_21	Both	Yes	8 x10	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622338	541743
P79_22	Both	Yes	7 x 7	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622361	541725
P79_23	Conductivity	N/A	N/A	N/A	Surface metal.	622377	541616
P79_24	Conductivity	Yes	see notes	see notes	Suspected utility.	622384	541823
P79_25	Inphase	Yes	4 x 4	see notes	Moderate-amplitude scattered anomalies, possible scattered debris.	622389	541664.9
P79_26	Conductivity	Yes	see notes	see notes	Suspected utility.	622420.3	541718.3
P79_27	Inphase	N/A	N/A	N/A	Surface metal.	622438.8	541631.7
P79_28	Conductivity	Yes	see notes	see notes	Suspected utility.	622450.5	541656.8
P79_29	Both	N/A	N/A	N/A	Surface metal.	622474.8	541466.6
P79_30	Both	N/A	N/A	N/A	Surface metal.	622499.3	541649.8
P79_31	Inphase	Yes	see notes	see notes	Suspected utility.	622501.5	541684.6
P79_32	Both	N/A	N/A	N/A	Surface metal.	622511.1	541631.9
P79_33	Conductivity	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	622576.9	541597.6
P79_34	Both	No	N/A	N/A	No MD anomaly found associated with EM anomaly.	622602.4	541616.2

Table 3.19-4
Fort Monmouth Phase II Site Investigation, Parcel 79
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P79-A2-A	7049803	11/30/07	0.0-0.5	226	68	10000	10000
P79-A3-A	7049518	11/29/07	0.5-1.0	92	72	10000	10000
P79-A4-A	7049806	11/30/07	0.0-0.5	121	77	10000	10000
P79-A5-A	7050115	12/01/07	0.5-1.0	120	67	10000	10000
P79-B2-A	7049509	11/29/07	0.0-0.5	201	76	10000	10000
P79-B3-A	7049522	11/29/07	0.0-0.5	111	75	10000	10000
P79-B7-A	7049812	11/30/07	0.5-1.0	78	69	10000	10000
P79-C3-A	7049525	11/29/07	0.0-0.5	84	75	10000	10000
P79-C5-C	7050123	12/01/07	4.5-5.0	130	78	10000	10000
P79-E1-A	7049506	11/29/07	0.5-1.0	346	74	10000	10000
P79-E3-A	7050103	12/01/07	0.0-0.5	86	77	10000	10000
P79-E5-A	7050306	12/03/07	0.0-0.5	242	79	10000	10000
P79-E6-C	7049820	11/30/07	2.5-3.0	133	77	10000	10000
P79-E7-A	7050324	12/03/07	0.0-0.5	110	74	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.19-5
Fort Monmouth Phase II Site Investigation, Parcel 79
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results								
	Sample ID:	P79-A2	P79-A4	P79-A6	P79-B7	P79-D7	P79-E2	P79-E2 DUP	P79-E4	P79-E6
	Lab ID:	7050011	7050010	7050009	7050008	7050007	7050004	7050003	7050005	7050006
	Date Sampled:	12/1/2007	12/1/2007	12/1/2007	12/1/2007	12/1/2007	12/1/2007	12/1/2007	12/1/2007	12/1/2007
	Screened Interval (ft. bgs):	6-11	5-10	5-10	5-10	5-8	5-10	5-10	3.5-8.5	3.5-8.5
Chemical	Quality Criteria[1]	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles										
Acetone	6000	0.85 U	0.85 U	0.85 U	**3.58 B**	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Benzene	1	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	**0.15 J**	0.17 U	0.17 U	0.17 U
Toluene	600	0.27 U	0.27 U	0.27 U	**0.15 J**	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Semi-Volatiles										
bis(2-Ethylhexyl)phthalate	3	1.28 U	1.28 U	**0.76 JB**	**1.54**	**1.00 JB**	1.28 U	1.28 U	1.28 U	1.28 U
Di-n-butylphthalate	700	**0.65 JB**	**0.40 JB**	**0.37 JB**	**0.34 JB**	**0.64 JB**	**0.43 JB**	**0.79 JB**	**0.52 JB**	**0.35 JB**

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

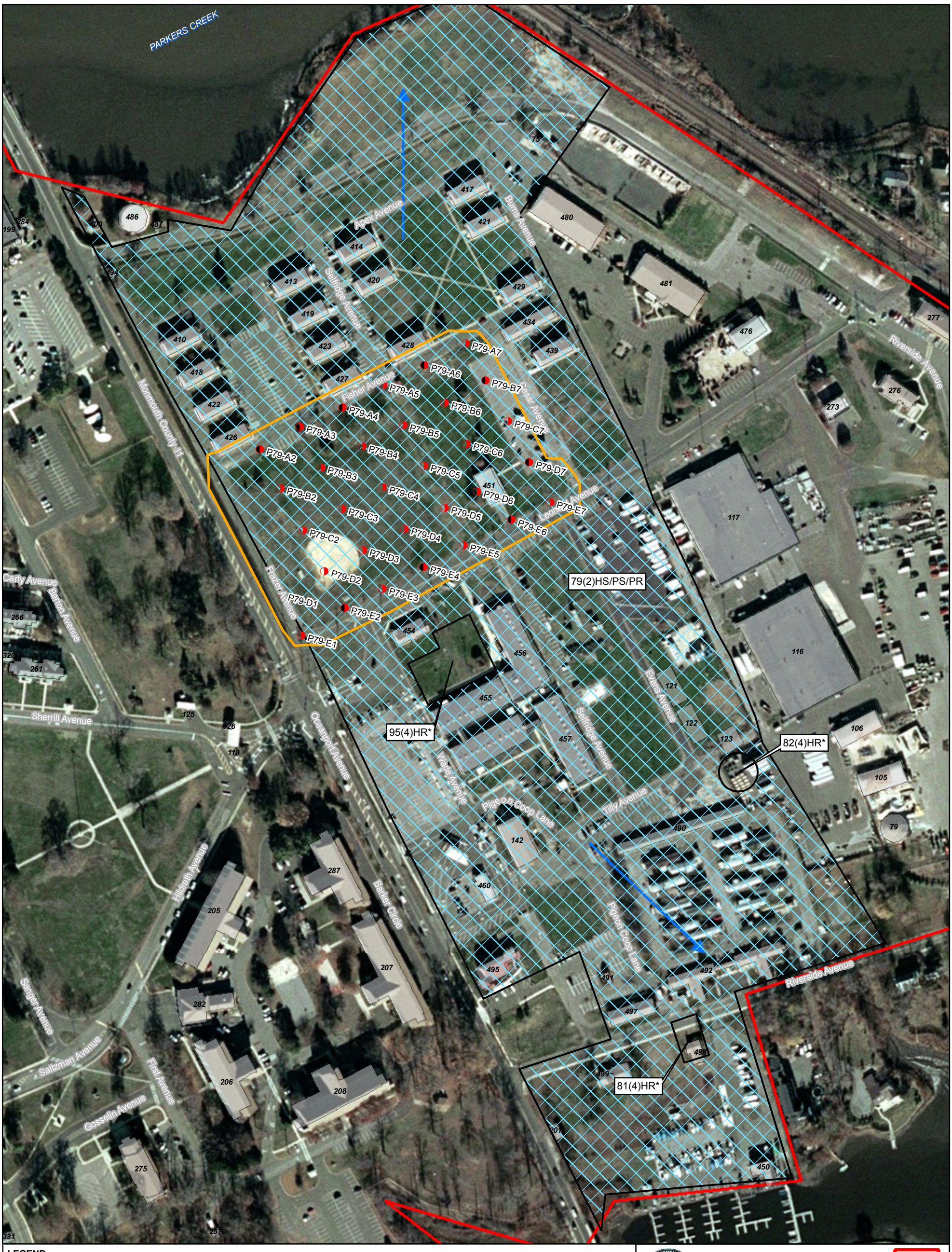
NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.



LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

2 Areas where only release or disposal of petroleum products has occurred.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

Aerial photography (0.5-meter resolution), dated January 15, 2006, was obtained from ESRI ArcOnline Map Services, July 2008.

SCALE: 0 100 200 400 Feet

N

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.19-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 79 SAMPLE LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_19-1_SI_P79_SampleLocations.mxd (3/8/2007 6:43:16 PM)

LEGEND

- Subsurface Metallic Object (Suspected UST)
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Pentrating Radar of Anomalies)
- Installation Boundary

Aerial photography (0.5-meter resolution), dated January 15, 2006, was obtained from ESRI ArcOnline Map Services, July 2008.

N

SCALE:
0 100 200 400 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.19-2
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 79
SUSPECTED UST LOCATIONS
MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_19-2_SI_P79_Geophysics.mxd (7/14/2008 1:01:50 PM)

3.20 Parcel 80 – Former Bldgs 105 and 106 – Former Photoprocessing

3.20.1 Site Description

Parcel 80 includes former Bldgs 105 and 106. Bldgs 105 and 106 were formerly located northeast of Oceanport Avenue, directly southeast of the current credit union (Bldg 495). Locations of the former buildings are depicted on Plan 506 – Gas and Fuel Storage Tanks Distribution System (**Appendix G**). These buildings served as photoprocessing facilities from the 1940s until they were demolished in the 1980s. An open-grassed area is present southeast of Bldg 495 where Bldgs 105 and 106 previously existed.

Bldg 105 was listed as part of the Printing Plant in 1975 and 1986 (36,37). Operations in Bldg 105 included the use of PCE during 1981 (38). Operations noted at Bldg 106 in 1950 and 1958 included arc lamp photography, letter press printing, photograph developing, and carbon arc sensitizing (39). Additional information pertaining to this parcel can be found in Appendix A of the Phase I ECP (1).

3.20.2 Previous Investigations

One former UST associated with former Bldg 106 was removed under the FTMM UST Management Program and is summarized within the FTMM Phase I ECP Report (1). No previous investigations have been conducted in relation to former operations in Bldgs 105 and 106.

3.20.3 Site Investigation Sampling

In order to determine the impact of historic building operations in the area of former Bldgs 105 and 106, the following soil sampling and groundwater sampling was conducted.

Geoprobe® Investigation

Soil and groundwater samples were collected in December 2007 in Parcel 80 in order to investigate the location of former Bldgs 105 and 106 and any associated historic releases. A total of four surface soil samples and five subsurface soil samples (including one duplicate sample) were collected from four distinct Geoprobe® borings (**Figure 3.20-1**). Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores were conducted using PID/FID instruments. No visual or olfactory evidence of impacted soil was noted.

A total of three groundwater samples (including one duplicate sample) were collected from two distinct temporary wells (**Figure 3.20-1**). Temporary wells were installed in the

vicinity of former Bldgs 105 and 106 and were constructed of PVC and 5 ft of factory-slotted screen.

Table 3.20-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.20-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.20-2**.

Table 3.20-1
Parcel 80 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
80SS-1 through 80SS-4 (4 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings to investigate the location of former printing plant Bldgs 105 and 106.	TCL+30 (w/o pesticides), TAL Metals
80SB-1 through 80SS-4 (5 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 4.5 to 6.0 ft bgs) from each Geoprobe® soil boring to investigate the location of former printing plant Bldgs 105 and 106. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals
80GW-1 and 2 (3 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings to investigate the former location of printing plant Bldgs 105 and 106.	TCL+30 (w/o pesticides/PCBs), TAL Metals

3.20.4 Site Investigation Results

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TCL+30 (minus pesticides) and TAL metals. Groundwater samples were analyzed for TCL+30 (minus pesticides/PCBs) and TAL metals.

Soil

As summarized in **Table 3.20-3**, seven VOs, 14 B/Ns and 19 metals were detected in Parcel 80 soil samples. No constituents were identified in soil at concentrations greater than the NJDEP NRDCSCC or IGWSCC, and no COCs were identified in soil at Parcel 80.

Groundwater

As shown in **Table 3.20-4**, one B/N, bis(2-ethylhexyl)phthalate, was detected at concentrations below respective GWQC in Parcel 80 groundwater samples. No VOs were detected in Parcel 80 groundwater. A total of 18 metals were detected in Parcel 80 groundwater samples. Of the 18 metals detected, four (aluminum, beryllium, iron, and manganese) were detected above the respective GWQC.

Several natural and anthropogenic factors contribute to the wide range in concentrations of metals in soils, which further impact the concentration of metals in groundwater. Soils derived from glauconitic sands contain abundant aluminum, calcium, potassium, iron, magnesium, manganese (among others), which are likely to be present at elevated concentrations in the groundwater, particularly when sediments are entrained in the collected groundwater samples. Due to the naturally elevated levels of these native metals in the groundwater, aluminum, iron, and manganese are not considered COCs. The non-native metals detected in the groundwater samples from the temporary wells have been compared to the respective GWQC and MBCs, presented in **Appendix H** to determine COCs requiring further evaluation.

Beryllium was detected at a concentration exceeding the NJDEP GWQC of 1 μg/L in three samples, P80GW-1 (5.67 μg/L), P80GW-1DUP (5.71 μg/L), and P80-GW2 (2.02 μg/L). The beryllium concentrations detected in P80GW-1 and P80GW-1DUP also exceeded the MPBC of 2.1 μg/L. Thus, beryllium was identified as a COC in groundwater at Parcel 80.

3.20.5 Summary and Conclusions

No COCs were identified above NJDEP criteria in surface or subsurface soil. NFA is recommended for soil within Parcel 80. Three naturally occurring metal constituents, aluminum, iron, and manganese, were detected at concentrations greater than the NJDEP GWQC, but these native metals are attributed to the aquifer material and are not site-related. Therefore, these metals are not considered to be COCs. One metal constituent not commonly identified at elevated levels in native soil, beryllium, was detected at concentrations above the NJDEP GWQC and MPBC. Further evaluation of beryllium in groundwater is recommended.

Table 3.20-2
Parcel 80 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TP HC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK	12/13/07	-	--	--		X							
SOIL	GEOPROBE	P80-SB1-A	12/13/07	8:25	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P80-SB1-B	12/13/07	8:25	1.5	2.0		X							
SOIL	GEOPROBE	P80-SB1-C	12/13/07	8:50	5.5	6.0		X	X	X	X				
SOIL	GEOPROBE	P80-SB2-A	12/13/07	9:05	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P80-SB2-B	12/13/07	9:05	1.5	2.0		X							
SOIL	GEOPROBE	P80-SB2-C	12/13/07	9:10	4.5	5.0		X	X	X	X				
SOIL	GEOPROBE	P80-SB3-A	12/13/07	9:25	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P80-SB3-B	12/13/07	9:25	1.5	2.0		X							
SOIL	GEOPROBE	P80-SB3-C	12/13/07	9:30	5.0	5.5		X	X	X	X				
SOIL	GEOPROBE	P80-SB3-C DUPLICATE	12/13/07	9:30	5.0	5.5		X	X	X	X				
BLANK	FIELD	FIELD BLANK	12/13/07	9:40	--	--		X	X	X	X				
SOIL	GEOPROBE	P80-SB4-A	12/13/07	9:55	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P80-SB4-B	12/13/07	9:55	1.5	2.0		X							
SOIL	GEOPROBE	P80-SB4-C	12/13/07	10:05	6.0	6.5		X	X	X	X				
BLANK	TRIP	TRIP BLANK-AQ	12/14/07	10:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/14/07	11:00	--	--		X	X		X				
GW	GEOPROBE	P80-GW-1	12/14/07	11:30	5.0	10.0		X	X		X				
GW	GEOPROBE	P80-GW-1 DUPLICATE	12/14/07	11:30	5.0	10.0		X	X		X				
GW	GEOPROBE	P80-GW-2	12/14/07	12:00	5.0	10.0		X	X		X				

X = Sample analyzed for the indicated analytical parameter suite

Table 3.20-3
Fort Monmouth Phase II Site Investigation, Parcel 80
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results												
		Sample ID:	P80-SB1-A	P80-SB1-B	P80-SB1-C	P80-SB2-A	P80-SB2-B	P80-SB2-C	P80-SB3-A	P80-SB3-B	P80-SB3-C	P80-SB3-C DUP	P80-SB4-A	P80-SB4-B	P80-SB4-C
		Lab ID:	7053003	7053004	7053005	7053006	7053007	7053008	7053009	7053010	7053011	7053002	7053013	7053014	7053015
		Date Sampled:	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007	12/13/2007
		Depth (ft. bgs):	0.0-0.5	1.5-2.0	5.5-6.0	0.0-0.5	1.5-2.0	4.5-5.0	0.0-0.5	1.5-2.0	5.0-5.5	5.0-5.5	0.0-0.5	1.5-2.0	6.0-6.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles															
Acetone	1000	100	NT	**0.390**	**0.250 J**	NT	**0.200 J**	**0.200 J**	NT	0.300 U	0.280 U	**0.440**	NT	0.280 U	**0.100 J**
Benzene	13	1	NT	0.290 U	0.310 U	NT	**0.019 J**	**0.022 J**	NT	0.300 U	0.280 U	0.280 U	NT	0.280 U	0.300 U
Carbon disulfide	NLE	NLE	NT	0.290 U	0.310 U	NT	0.260 U	0.310 U	NT	0.300 U	0.280 U	0.280 U	NT	0.280 U	**0.049 J**
Ethylbenzene	1000	100	NT	0.290 U	0.310 U	NT	**0.020 J**	0.310 U	NT	0.300 U	0.280 U	0.280 U	NT	0.280 U	0.300 U
Tetrachloroethylene	6	1	NT	0.290 U	0.310 U	NT	**0.061 J**	**0.095 J**	NT	**0.076 J**	0.280 U	0.280 U	NT	0.280 U	0.300 U
Toluene	1000	500	NT	0.290 U	0.310 U	NT	**0.091 J**	**0.044 J**	NT	0.300 U	0.280 U	0.280 U	NT	0.280 U	0.300 U
Xylenes (Total)	1000	67	NT	0.860 U	0.930 U	NT	**0.305 J**	0.940 U	NT	0.900 U	0.830 U	0.830 U	NT	0.850 U	0.890 U
Semi-Volatiles															
Anthracene	10000	100	**0.073 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.024 J**	NT	**0.036 J**	1.200 U	**0.120 J**	NT	1.200 U
Benzo[a]anthracene	4	500	**0.170 J**	NT	1.200 U	1.200 U	NT	**0.047 J**	**0.083 J**	NT	**0.120 J**	1.200 U	**0.280 J**	NT	1.200 U
Benzo[a]pyrene	0.66	100	**0.140 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.065 J**	NT	**0.096 J**	1.200 U	**0.200 J**	NT	1.200 U
Benzo[b]fluoranthene	4	50	**0.230 J**	NT	1.200 U	1.200 U	NT	**0.049 J**	**0.092 J**	NT	**0.150 J**	1.200 U	**0.350 J**	NT	1.200 U
Benzo[g,h,i]perylene	NLE	NLE	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	1.300 U	NT	**0.056 J**	1.200 U	1.200 U	NT	1.200 U
Benzo[k]fluoranthene	4	500	**0.083 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.041 J**	NT	**0.050 J**	1.200 U	**0.140 J**	NT	1.200 U
bis(2-Ethylhexyl)phthalate	210	100	**0.095 J**	NT	**0.077 J**	**0.081 J**	NT	1.200 U	**0.069 J**	NT	1.200 U	**0.055 J**	**0.073 J**	NT	1.200 U
Chrysene	40	500	**0.180 J**	NT	1.200 U	**0.066 J**	NT	**0.051 J**	**0.084 J**	NT	**0.130 J**	1.200 U	**0.290 J**	NT	1.200 U
Diethyl phthalate	10000	50	1.200 U	NT	**0.056 JB**	1.200 U	NT	**0.039 JB**	**0.039 JB**	NT	1.200 U	**0.050 JB**	1.200 U	NT	1.200 U
Di-n-butylphthalate	10000	100	**0.800 J**	NT	**0.750 J**	**0.430 J**	NT	**0.440 J**	**0.740 J**	NT	**0.440 J**	**0.530 J**	**0.450 J**	NT	**0.290 J**
Fluoranthene	10000	100	**0.410 J**	NT	1.200 U	**0.099 J**	NT	**0.120 J**	**0.190 J**	NT	**0.300 J**	1.200 U	**0.610 J**	NT	1.200 U
Fluorene	10000	100	1.200 U	NT	1.200 U	1.200 U	NT	1.200 U	1.300 U	NT	1.200 U	1.200 U	**0.051 J**	NT	1.200 U
Phenanthrene	NLE	NLE	**0.270 J**	NT	1.200 U	**0.054 J**	NT	**0.046 J**	**0.093 J**	NT	**0.120 J**	1.200 U	**0.510 J**	NT	1.200 U
Pyrene	10000	100	**0.350 J**	NT	1.200 U	**0.140 J**	NT	**0.090 J**	**0.160 J**	NT	**0.260 J**	1.200 U	**0.750 J**	NT	1.200 U
Metals															
Aluminum	NLE	NLE	**6730 B**	NT	**17500 B**	**13100 B**	NT	**13500 B**	**7950 B**	NT	**16100 B**	**16600 B**	**12600 B**	NT	**13800 B**
Arsenic	20	NLE	**4.79**	NT	**10.5**	**10.1**	NT	**11.0**	**5.47**	NT	**11.1**	**11.9**	**9.38**	NT	**12.7**
Barium	47000	NLE	**25.7 B**	NT	**33.4 B**	**44.5 B**	NT	**40.3 B**	**20.4 B**	NT	**47.7 B**	**51.7 B**	**55.1 B**	NT	**44.2 B**
Beryllium	140	NLE	**0.518**	NT	**1.93**	**0.895**	NT	**1.10**	**0.579**	NT	**1.50**	**1.45**	**0.582**	NT	**1.18**
Cadmium	100	NLE	0.0799 B	NT	**0.0625 B**	**0.114 B**	NT	**0.0840 B**	**0.0657 B**	NT	0.048 U	**0.163 B**	**0.230 B**	NT	0.048 U
Calcium	NLE	NLE	**4540 B**	NT	**890 B**	**1660 B**	NT	**1890 B**	**1700 B**	NT	**2360 B**	**2500 B**	**4520 B**	NT	**1730 B**
Chromium (Total)	NLE	NLE	**57.3 B**	NT	**159 B**	**69 B**	NT	**77.5 B**	**86.0 B**	NT	**133 B**	**106 B**	**53.3 B**	NT	**83.6 B**
Cobalt	NLE	NLE	**0.658**	NT	**0.987**	**1.83**	NT	**1.06**	0.365 U	NT	**0.983**	**0.987**	**1.95**	NT	**0.704**
Copper	45000	NLE	**11.8 B**	NT	**7.86 B**	**15.5 B**	NT	**7.78 B**	**8.78 B**	NT	**10.9 B**	**15.4 B**	**33.2 B**	NT	**7.31 B**
Iron	NLE	NLE	**20000**	NT	**58000**	**28600**	NT	**30700**	**24600**	NT	**44900**	**42900**	**23200**	NT	**34900**
Lead	800	NLE	**43.6**	NT	**0.811**	**42.2**	NT	**10.3**	**21.3**	NT	**21.5**	**46.1**	**39.1**	NT	**9.03**
Magnesium	NLE	NLE	**1710 B**	NT	**7130 B**	**2480 B**	NT	**3660 B**	**1240 B**	NT	**5210 B**	**4850 B**	**3400 B**	NT	**3990 B**
Manganese	NLE	NLE	**41.5 B**	NT	**34.0 B**	**99.9 B**	NT	**60.5 B**	**25.7 B**	NT	**44.5 B**	**56.4 B**	**110 B**	NT	**46.3 B**
Mercury	270	NLE	0.102 U	NT	0.108 U	0.114 U	NT	**0.137**	0.110 U	NT	0.109 U	**0.139**	0.104 U	NT	**0.392**
Nickel (Soluble Salts)	2400	NLE	**4.60**	NT	**9.32**	**9.25**	NT	**7.52**	**5.05**	NT	**10.4**	**10.0**	**10.5**	NT	**7.49**
Potassium	NLE	NLE	**2820**	NT	**17300**	**4080**	NT	**6860**	**2780**	NT	**11500**	**10000**	**3340**	NT	**7710**
Sodium	NLE	NLE	40.55 U	NT	44.674 U	42.119 U	NT	38.771 U	41.548 U	NT	43.26 U	44.387 U	**389**	NT	43.522 U
Vanadium	7100	NLE	**48.1**	NT	**89.2**	**60.0**	NT	**49.1**	**71.4**	NT	**65.6**	**66.6**	**48.0**	NT	**52.9**
Zinc	1500	NLE	**47.1**	NT	**56.6**	**67.8**	NT	**70.0**	**40.7**	NT	**113**	**146**	**81.6**	NT	**43.3**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Table 3.20-4
Fort Monmouth Phase II Site Investigation, Parcel 80
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results		
	Sample ID:	P80GW-1	P80GW-1 DUP	P80GW-2
	Lab ID:	7053304	7053303	7053305
	Date Sampled:	12/14/2007	12/14/2007	12/14/2007
	Screened Interval (ft. bgs):	5-10'	5-10'	5-10'
Chemical	Quality Criteria[1]	Result	Result	Result
Semi-Volatiles				
bis(2-Ethylhexyl)phthalate	3	**1.33**	1.28 U	**1.65**
Metals				
Aluminum	200	**8510 B**	**9230 B**	**3490 B**
Arsenic	3	**2.93**	2.70 U	2.70 U
Barium	6000	**65.6**	**68.0**	**55.9**
Beryllium	1	**5.67**	**5.71**	**2.02**
Cadmium	4	**1.22**	**1.18**	**0.433**
Calcium	NLE	**61600 B**	**64300 B**	**39600 B**
Chromium (Total)	70	**1.68 B**	**1.70 B**	**1.03 B**
Cobalt	100*	**30.1**	**30.5**	**15.9**
Copper	1300	**11.0**	**12.9**	**6.58**
Iron	300	**1010**	**1100**	**39700**
Magnesium	NLE	**34000**	**34800**	**12800**
Manganese	50	**403 B**	**420 B**	**303 B**
Nickel (Soluble Salts)	100	**67.3 B**	**69.2 B**	**25.9 B**
Potassium	NLE	**14700 B**	**15100 B**	**6060 B**
Selenium	40	**3.66 B**	**5.82 B**	2.70 U
Sodium	50000	**46600**	**48200**	**25400**
Vanadium	NLE	**1.02**	**1.02**	**0.794**
Zinc	2000	**230**	**234**	**251**

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

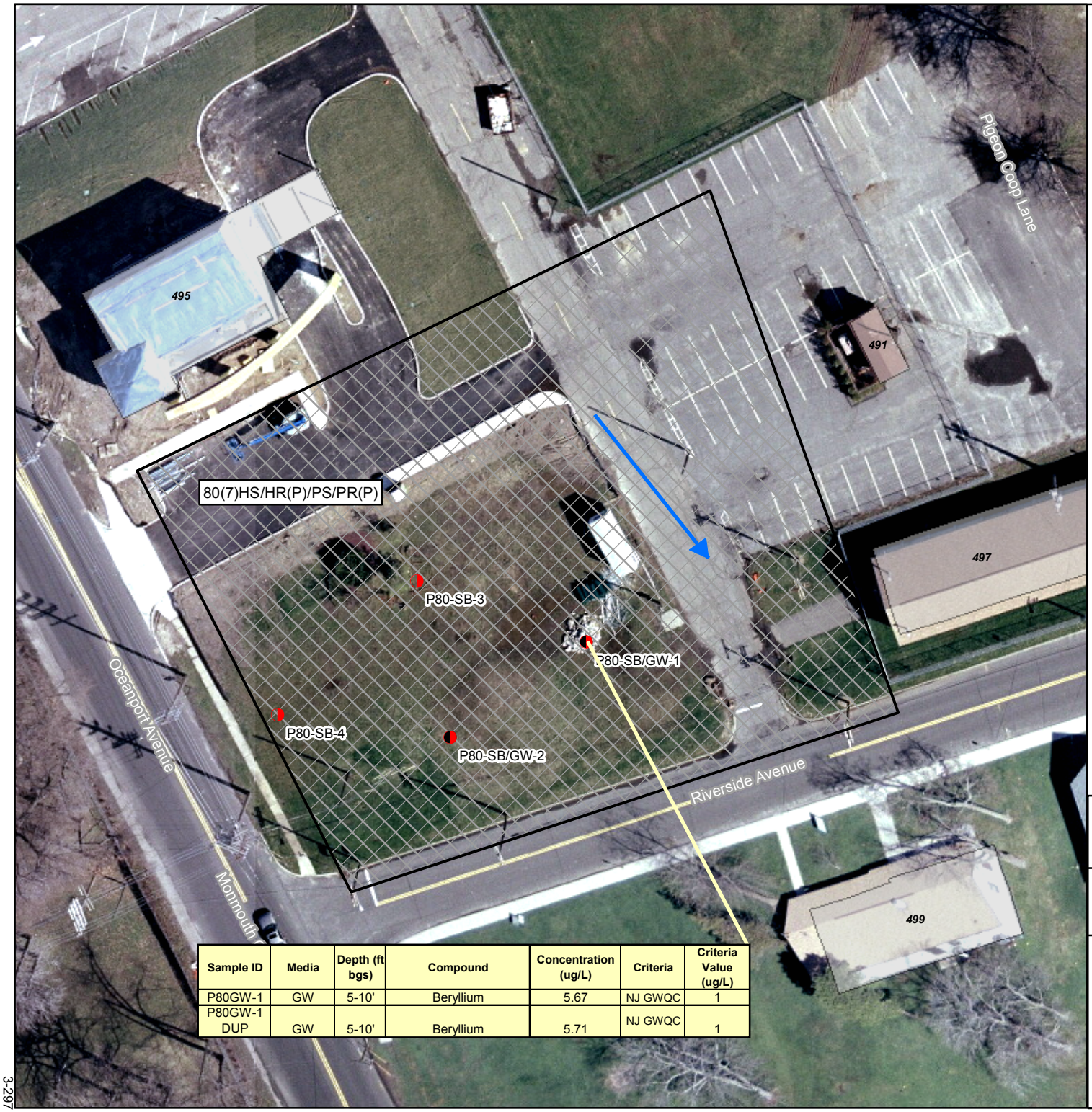
NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration (ug/L)	Criteria	Criteria Value (ug/L)
P80GW-1	GW	5-10'	Beryllium	5.67	NJ GWQC	1
P80GW-1 DUP	GW	5-10'	Beryllium	5.71	NJ GWQC	1

LEGEND

- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Road Centerline
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

8(2)PS

- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

SCALE:

0 25 50 100 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.20-1

FORT MONMOUTH ECP SITE INVESTIGATION

PARCEL 80 SAMPLE LOCATIONS AND CONSTITUENTS OF CONCERN

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_20-1_SI_P80_Exceeds_SampLoc.mxd (7/14/2008 4:24:41 PM)

3.21 Parcel 83 – Northeast MP – Former Photoprocessing, Former Vehicle Maintenance, Former Coal Storage and Railroad Unloading, Maintenance Shops

3.21.1 Site Description

This parcel is located in the northeastern portion of the MP and is associated with numerous current and former industrial processes and motor pool operations, including: former vehicle wash platforms; former photoprocessing and printing plants; current and former vehicle maintenance areas; former heating plants; former refrigerant repair; former coal storage; and current and former carpentry, plumbing, and electrical shops.

Historic motor pool operations associated with this parcel include activities at former Bldg 44; former Bldgs 64, 159, 161, and 163; and Bldg 166. Former building locations are depicted on Plan No. 504 – Sanitary Sewer System (1944) provided in **Appendix G**. Former Bldg 44 was a motor vehicle maintenance and repair facility per the 1980 Installation Assessment (40). The building was located directly east of the southeast corner of Bldg 116. No other information was obtained for this former building during record searches. Former Bldg 64, located north of Bldg 167, was identified as a motor vehicle and heavy equipment repair facility in the 1950s (16,25). Former Bldgs 159, 159a, 159b were the roads and grounds shop with motor vehicle and large equipment repair facilities located in the northeast corner of the MP behind Bldgs 167 and 173. U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) archive reports noted motor pool operations in this building including testing and tuning of engines, cleaning of parts with kerosene, steam cleaning using alkali products, acetylene welding, and general automotive maintenance (24,25). Former Bldgs 161 and 163 served as the Post transportation motor pool and were located directly south of Bldg 159. USACHPPM archives noted motor pool operations in this building, including testing and tuning engines, battery charging, acetylene welding, parts cleaning with kerosene, and outdoor steam cleaning of vehicles with alkaline cleaners (16,24,25,41). Bldg 166 was formerly a motor vehicle repair shop for maintenance and repair of large diesel engines, including charging and filling of batteries with sulfuric acid.

Former Bldg 197 was utilized for lawn mower repair, and a 1993 USAEHA air report lists a TCE parts cleaner having been present at this facility (35). Bldg 197 was formerly located across the street from Bldg 280 in the northern portion of the MP.

Bldg 279 is a former vehicle repair shop and currently houses heating, ventilation, and air conditioning (HVAC) and plumbing shops. The HVAC portion of the building is where vehicle maintenance was formerly conducted. Operations described included vehicle testing and repair, parts cleaning and battery charging (15,16,24,25,30,39). Motor Pool operations included former waste oil ASTs and TCE parts cleaners. All TCE parts cleaners were eliminated from use (MP and CWA) in February 1994 under Environmental Program Requirements Project FM0094F088.

Historically, Bldg 280 has been used as a carpentry shop in support of post maintenance. The building has also been used as a paint shop including use and storage of paint thinner, lead-based paint, oil-based paint, aerosol paint cans, and aerosol solvent cans. According to the 1999 chemical inventory, this building also housed a welding shop. Machining, grinding, welding, soldering, and blacksmithing have also been reported in Bldg 280 since the 1950s (15,24). At the time of the 2006 VSIs, Bldg 280 was still utilized as carpentry and metals/welding shops.

Bldg 281 was used for repairing refrigerant-containing equipment from the 1950s into the 1970s. Chemicals utilized included carbon tetrachloride, Freon (and other refrigerants), methyl chloride, sulfur dioxide, Varsol, and methyl chloroform (trichloroethane). Bldg 281 also housed a machine shop where machining and blacksmithing was performed, and silver brazing occasionally using cadmium-containing brazing wire was reported in 1973.

Bldg 483 was historically used for soldering and parts cleaning using organic solvents and dry cleaning fluid. Bldg 483 was demolished prior to 1997. Bldg 485 was used for the cleaning and repair of electrical equipment. Historical operational use of the building included using organic solvents (15,16,25,39). Bldg 485 was demolished in 1997 (42).

Solvents were previously used for cleaning vehicle parts at various locations throughout FTMM. Both the military and its contractors operated solvent parts cleaners. These solvent parts cleaners consisted of a tank and sink with a nozzle. The military used Super Agitine in its parts cleaners, while the contractor used Siloo Tyme II. Each parts cleaner held about 30 gallons of fluid, which was reused until it needed changing. Fluid changes occurred every 4 months to every 3 years depending on location and usage (35).

The potential for a release to the environment from shop operations includes the use of solvents, petroleum products, and metals when waste handling procedures may not have been sufficiently protective to preclude a release to the environment. Additional information pertaining to this parcel can be found in Section 3.3, Section 3.4.1.1, Table 3-3, Section 4.3.2.1.1, Section 4.3.2.1.2, Section 4.3.2.1.3, Section 4.3.2.1.7, Section 5.1.1, Section 5.1.1.2, Section 5.1.1.2.1, Section 5.1.1.2.3, Section 5.2.1, Section 5.4.2, Section 5.5.2, Section 5.8, Section 5.12, Section 5.13.1, Section 5.13.3, Section 5.13.8, Table 5-2, Table 5-5, Table 5-16, Appendix E, Appendix G, and Appendix J of the Phase I ECP (1).

Historic site plans, aerial photographs, and information obtained during personnel interviews indicate a coal storage area formerly existed adjacent to the RR in the northern-most portion of the Parcel 83 in the vicinity of Bldg 75. The potential coal storage area was identified along the RR line in aerial photographs taken in 1940, 1947, 1969, 1970, and 1974.

Electrical transformers were previously stored in an area east of Bldg 173 in the early to mid-1990s. The transformers were either new or in workable condition and classified as

Non-PCB. All transformers were removed from the area in the mid-1990s, but no environmental sampling has been conducted in the area.

Data gaps identified to be investigated in Parcel 83 include potential historic releases from former motor vehicle maintenance and repair facilities (Bldg 166 and former Bldgs 44, 64, 159, 161, 163, 197, and 483), previous shop activities (Bldgs 279, 280, 281, and former Bldg 485), the previous coal storage area, and the former electrical transformer storage location east of Bldg 173.

3.21.2 Previous Investigations

Specific activities and buildings identified in this parcel have not been previously investigated.

3.21.3 Site Investigation Sampling

The following soil and groundwater sampling was conducted in order to determine the impact of historic building operations in the area of former vehicle maintenance and shop facilities. See **Table 3.21-1** for a summary of field activities and **Figure 3.21-1** for sample locations.

Geoprobe® Investigation

Soil and groundwater samples were collected in December 2007 throughout Parcel 83. A total of 27 surface and 33 subsurface soil samples (including five duplicate samples) were collected from 27 distinct Geoprobe® borings (**Figure 3.21-1**). Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch bgs interval. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores was conducted using a PID/FID meter. Olfactory evidence of impacted soil was noted at boring location P83-SB10 and one additional subsurface sample P83-SB10-D was collected.

A total of 14 groundwater samples (including two duplicate samples) were collected from 12 distinct temporary wells that were installed with the Geoprobe® rig (**Figure 3.21-1**), and one groundwater sample was collected from existing well 161MW01. Temporary wells were installed downgradient of site-specific AOCs and were constructed of PVC with 5 ft of factory-slotted screen.

Surface Soil Investigation

Surface soil samples were collected in December 2007 in Parcel 83. Samples were collected in order to determine if any contamination exists from potential electrical transformer releases. A total of four surface soil samples were collected from four distinct hand augered borings located east of Bldg 173 at a former electrical transformer

storage location (**Figure 3.21-1**). Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs.

Table 3.21-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.21-1**. A summary of sampling activities, including sample IDs, collection dates, analytical parameters, and methods of analysis, is provided in **Table 3.21-2**.

Table 3.21-1
Parcel 83 Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
83SS-A1 through 83SS-B5 (10 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from the Geoprobe® soil boring grid (conducted on 100-ft centers) to investigate the former coal storage location. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base.	TCL+30 (w/o pesticides), TAL Metals
83SB-A1 through 83SB-B5 (12 samples – includes 2 duplicate samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 2.0 to 6.0 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the former coal storage location. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals
83GW-A1, A3, A5 (4 samples – includes 1 duplicate sample)	Groundwater	Groundwater samples were collected from the specified Geoprobe® soil borings in the grid to investigate the former location of coal storage.	TCL+30 (w/o pesticides/PCBs), TAL Metals
83SS-1 and 2 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located in the vicinity of former Bldg 44 – motor vehicle maintenance and repair facility.	TCL+30 (w/o pesticides), TAL Metals
83SB-1 and 2 (3 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples collected from the 6-inch interval directly above the water table (depth 5.0 to 5.5 ft bgs) from Geoprobe® borings located in the vicinity of former Bldg 44 – motor vehicle maintenance and repair facility. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters.	TCL+30 (w/o pesticides), TAL Metals
83GW-1 (2 samples – includes 1 duplicate sample)	Groundwater	A groundwater sample was collected from the vicinity of former Bldg 44 – motor vehicle maintenance and repair facility.	TCL+30 (w/o pesticides/PCBs), TBA

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
83SS-3:7 (5 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located south of Bldg 159 and east of Bldgs 167 and 173 to evaluate previous motor repair and fueling activities at former Bldgs 64, 159, 161 and 163.	TCL+30 (w/o pesticides), TAL Metals
83SB-3 through 83SB-7 (6 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 2.5 to 4.0 ft bgs) from Geoprobe® borings located south of Bldg 159 and east of Bldgs 167 and 173 to evaluate previous motor repair and fueling activities at former Bldgs 64, 159, 161, and 163. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TCL+30 (w/o pesticides), TAL Metals
83GW-3, 5, 7 and monitoring well 161MW01 (4 samples)	Groundwater	Groundwater samples were collected from the vicinity of former motor repair and fueling activities at former Bldgs 64, 159, 161 and 163.	TCL+30 (w/o pesticides/PCBs), TBA 161MW01 also included PCBs but not pesticides
83SS-8 (1 sample)	Surface soil	A soil sample was collected from the 0- to 6-inch bgs interval from Geoprobe® borings located directly east of service door entrance to Bldg 166 to evaluate potential release from historical motor vehicle maintenance and repair activities that occurred in the building.	TCL+30 (w/o pesticides), TAL Metals
83SB-8 (1 sample)	Subsurface soil	A soil sample was collected from the 6-inch interval directly above the water table (depth 3.5 to 4.0 ft bgs) from Geoprobe® borings located directly east of service door entrance to Bldg 166 to evaluate potential release from historical motor vehicle maintenance and repair activities that occurred in the building. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TCL+30 (w/o pesticides), TAL Metals
83GW-8 (1 sample)	Groundwater	A groundwater sample was collected from a Geoprobe® boring located directly east of service door entrance to Bldg 166 to evaluate potential release from historical motor vehicle maintenance and repair activities that occurred in the building.	TCL+30 (w/o pesticides/PCBs), TBA
83SS-9:11 (3 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located in vicinity of service entrances to Bldgs 279 and 280 to evaluate potential releases from previous vehicle maintenance and shop activities.	TCL+30 (w/o pesticides), TAL Metals

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
83SB-9, 10, and 11 (4 samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 3.0 to 7.0 ft bgs) from Geoprobe® borings located in vicinity of service entrances to Bldgs 279 and 280 to evaluate potential releases from previous vehicle maintenance and shop activities. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TCL+30 (w/o pesticides), TAL Metals
83GW-10 (1 sample)	Groundwater	A groundwater sample was collected from a Geoprobe® boring located in vicinity of service entrances to Bldg 279 to evaluate potential releases from previous vehicle maintenance and shop activities.	TCL+30 (w/o pesticides/PCBs), TBA
83SS-12 and 13 (2 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located in vicinity of Bldg 281 and former Bldg 485 to evaluate potential releases from previous HVAC maintenance and solvent cleaning activities.	TCL+30 (w/o pesticides), TAL Metals
83SB-12 and 13 (2 samples)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 3.0 to 4.0 ft bgs) from Geoprobe® borings located in vicinity of Bldg 281 and former Bldg 485 to evaluate potential releases from previous HVAC maintenance and solvent cleaning activities. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TCL+30 (w/o pesticides), TAL Metals
83GW-12 (1 sample)	Groundwater	A groundwater sample was collected from a Geoprobe® boring located in vicinity of Bldg 281 and former Bldg 485 to evaluate potential releases from previous HVAC maintenance and solvent cleaning activities.	TCL+30 (w/o pesticides/PCBs)
83SS-14 through 83SS-17 (4 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® borings located in vicinity of former Bldgs 197 and 483 to evaluate potential releases from previous engine maintenance and solvent cleaning activities.	TCL+30 (w/o pesticides), TAL Metals
83SB-14 through 83SB-17 (5 samples – includes 1 duplicate sample)	Subsurface soil	Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 2.0 to 6.0 ft bgs) from Geoprobe® borings located in vicinity of former Bldgs 197 and 483 to evaluate potential releases from previous engine maintenance and solvent cleaning activities. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters.	TCL+30 (w/o pesticides), TAL Metals

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
83GW-14, 83GW-17 (2 samples)	Groundwater	Groundwater samples were collected from Geoprobe® borings located in vicinity of former Bldgs 197 and 483 to evaluate potential releases from previous engine maintenance solvent cleaning activities.	TCL+30 (w/o pesticides/PCBs), TBA
83SS-18 through 83SS-21 (4 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval to investigate the former electrical transformer storage location east of Bldg 173.	PCBs, TPHC

Geoprobe® Investigation Results

Soil

As summarized in **Table 3.21-4**, a total of nine VOs, 25 B/Ns, and 21 metals were detected in Parcel 83 soil samples. The VOs were detected at concentrations below the NJDEP NRDCSCC. Four of the 25 B/Ns detected in soil (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene) were detected in nine soil samples (P83-A1-A, P83-A2-A, P83-A3-A, P83-A4-A, P83-B3-A, P83-B5-A, P83-SB4-A, P83-SB9-C, and P83-SB12-A) at concentrations exceeding NJDEP NRDCSCC and their respective MPBC. Of the 21 metals detected, two (arsenic and lead) were detected at concentrations exceeding NJDEP NRDCSCC and their respective MPBC. The parent material at FTMM is glauconitic soil of the Tinton and Red Bank sands and their fluvially- and tidally-reworked equivalents (47). Total arsenic levels in glauconite-bearing soils in New Jersey have been reported to range up to 131 mg/kg, with a median concentration of 30 mg/kg (21). Anthropogenic influences on arsenic levels in the soil include the use of pesticides and herbicides. Arsenic was a common constituent of herbicides and pesticides in the past. As a result of these natural and anthropogenic influences, arsenic is not considered a COC in soil. One metal (lead) and four B/Ns (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenzo[a]anthracene) are identified as COCs in soil at Parcel 83.

Groundwater

As shown in **Table 3.21-5**, seven VOs were detected in Parcel 83 groundwater samples. All seven VOs (acetone, carbon disulfide, 1,2-dichloroethane, MTBE, TBA, toluene, and xylenes) were detected at concentrations below the NJDEP GWQC.

A total of 13 B/Ns were detected in Parcel 83 groundwater samples. Of the 13 B/Ns detected, bis(2-ethylhexyl)phthalate was the only compound detected above the GWQC of 3 μg/L. It was detected in P83-A1 at a concentration of 5.00 μg/L and in the duplicate sample from this location P83-A1DUP at a concentration of 4.00 μg/L. A commonly used plasticizer, bis(2-ethylhexyl)phthalate, is present in a wide variety of plastic products, is commonly detected in field and laboratory QC samples, and was detected

at a low concentration in the field and method blanks associated with P83-A1. Therefore, it is not considered a COC in groundwater at Parcel 83.

A total of 18 metals were detected in Parcel 83 groundwater samples. Of the 18 metals detected, five (aluminum, arsenic, iron, manganese, and sodium) were detected above the respective GWQC.

Four common, naturally occurring metal constituents, aluminum, iron, manganese, and sodium, were detected in Parcel 83 groundwater samples. Due to the naturally elevated levels of these native metals in the groundwater, aluminum, iron, and manganese are not considered COCs..

Arsenic was detected at a concentration exceeding the NJDEP GWQC of 3 μg/L in one sample, P83-A1 DUP (5.04 μg/L). The other groundwater sample collected at this location had an arsenic detection below the GWQC. The arsenic concentrations did not exceed the MPBC of 89.3 μg/L. In addition, arsenic is associated with the native glauconitic sands (48). The elevated arsenic concentrations in the native soil in turn influence the arsenic levels in groundwater. Thus, arsenic is not considered a COC in groundwater.

Surface Soil (hand auger) Investigation Results

Surface soil samples collected via hand auger were analyzed for PCBs and TPHC.

As summarized in **Table 3.21-3**, TPHC was detected in three of the four surface soil samples. TPHC was detected at concentrations below the NJDEP NRDCSCC and RDCSCC in all three surface soil samples. No PCBs were detected in the four samples.

3.21.4 Summary and Conclusions

Further evaluation is recommended for COCs identified in soil (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and lead). No COCs were identified in groundwater within Parcel 83. Benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, and dibenz[a,h]anthracene are PAHs. PAHs are contained in asphalt and are commonly detected in soil under asphalt pavement. Re-collection of samples at locations that are currently paved and/or were paved in the past will be conducted as part of the further evaluation to determine if the PAHs detected in soil are attributable to asphalt.

Table 3.21-2
Parcel 83 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
BLANK	TRIP	TRIP BLANK-SO	12/14/07	-	--	--		X							
SOIL	GEOPROBE	P83-A1-A	12/14/07	8:20	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-A1-B	12/14/07	8:25	1.5	2.0		X							
SOIL	GEOPROBE	P83-A1-C	12/14/07	8:30	2.5	3.0		X	X	X	X				
SOIL	GEOPROBE	P83-A2-A	12/14/07	9:40	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-A2-B	12/14/07	9:50	1.5	2.0		X							
SOIL	GEOPROBE	P83-A2-C	12/14/07	10:00	3.5	4.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-A3-A	12/14/07	10:40	0.5	1.0			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-A3-B	12/14/07	10:50	1.5	2.0		X							
SOIL	GEOPROBE	P83-A3-C	12/14/07	11:00	3.0	3.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-A4-A	12/14/07	11:35	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-A4-B	12/14/07	11:45	1.5	2.0		X							
SOIL	GEOPROBE	P83-A4-C	12/14/07	11:55	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-A5-A	12/14/07	12:20	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-A5-B	12/14/07	12:30	1.5	2.0		X							
SOIL	GEOPROBE	P83-A5-C	12/14/07	12:40	6.0	6.5		X	X	X	X				
SOIL	GEOPROBE	P83-B1-A	12/14/07	13:50	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-B1-B	12/14/07	14:00	1.5	2.0		X							
SOIL	GEOPROBE	P83-B1-C	12/14/07	14:10	2.0	2.5		X	X	X	X				
SOIL	GEOPROBE	P83-B1-C DUPLICATE	12/14/07	14:10	2.0	2.5		X	X	X	X				
BLANK	FIELD	FIELD BLANK-SO	12/14/07	14:20	--	--		X	X	X	X				
SOIL	GEOPROBE	P83-B2-A	12/14/07	14:40	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-B2-B	12/14/07	14:50	1.5	2.0		X							
SOIL	GEOPROBE	P83-B2-C	12/14/07	15:00	2.5	3.0		X	X	X	X				

Table 3.21-2
Parcel 83 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P83-B3-A	12/15/07	8:40	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-B3-B	12/15/07	8:50	1.5	2.0		X							
SOIL	GEOPROBE	P83-B3-C	12/15/07	9:00	3.0	3.5		X	X	X	X				
BLANK	TRIP	TRIP BLANK	12/15/07	-	--	--		X							
SOIL	GEOPROBE	P83-B4-A	12/15/07	9:30	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-B4-B	12/15/07	9:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-B4-C	12/15/07	9:50	5.5	6.0		X	X	X	X				
SOIL	GEOPROBE	P83-B5-A	12/15/07	10:30	1.0	1.5			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-B5-B	12/15/07	10:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-B5-C	12/15/07	10:50	7.0	7.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-B5-C DUPLICATE	12/15/07	10:50	7.0	7.5		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-SB10-A	12/15/07	11:50	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB10-B	12/15/07	12:00	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB10-C	12/15/07	12:10	5.0	5.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB10-D	12/15/07	12:20	6.5	7.0		X	X	X	X				TPHC collected due to elevated field screening results.
BLANK	FIELD	FIELD BLANK	12/15/07	12:15	--	--		X	X	X	X				Mercury analyzed out of holding time.
BLANK	TRIP	TRIP BLANK-SO	12/17/07	8:30	--	--		X							
BLANK	FIELD	FIELD BLANK-SO	12/17/07	16:00	--	--		X	X	X	X				
SOIL	GEOPROBE	P83-SB9-A	12/17/07	10:50	1.0	1.5			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-SB9-B	12/17/07	11:00	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB9-C	12/17/07	11:10	4.5	5.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-SB13-A	12/17/07	11:40	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB13-B	12/17/07	11:50	1.5	2.0		X							

Table 3.21-2
Parcel 83 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P83-SB13-C	12/17/07	12:00	3.5	4.0		X	X	X	X				
SOIL	GEOPROBE	P83-SB12-A	12/17/07	13:40	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB12-B	12/17/07	13:50	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB12-C	12/17/07	14:00	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB3-A	12/17/07	14:30	1.0	1.5			X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-SB3-B	12/17/07	14:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB3-C	12/17/07	14:50	3.5	4.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-SB3-C DUPLICATE	12/17/07	14:50	3.5	4.0		X	X	X	X				Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base.
SOIL	GEOPROBE	P83-SB4-A	12/17/07	15:30	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB4-B	12/17/07	15:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB4-C	12/17/07	15:50	3.5	4.0		X	X	X	X				
BLANK	TRIP	TRIP BLANK-AQ	12/17/07	6:30	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/17/07	7:30	--	--		X	X		X				
GW	GEOPROBE	P83-A1	12/17/07	8:00	3.0	8.0		X	X		X				
GW	GEOPROBE	P83-A1 DUPLICATE	12/17/07	8:00	3.0	8.0		X	X		X				
GW	GEOPROBE	P83-A3	12/17/07	8:30	3.0	8.0		X	X		X				
GW	GEOPROBE	P83-A5	12/17/07	9:00	5.0	10.0		X	X		X				
BLANK	TRIP	TRIP BLANK	12/18/07	8:30	--	--		X							
BLANK	FIELD	FIELD BLANK	12/18/07	15:55	--	--		X	X	X	X				TPHC field blank not collected.
SOIL	GEOPROBE	P83-SB11-A	12/18/07	8:45	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB11-B	12/18/07	8:55	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB11-C	12/18/07	9:05	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB5-A	12/18/07	10:50	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB5-B	12/18/07	11:00	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB5-C	12/18/07	11:10	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB6-A	12/18/07	11:30	0.0	0.5			X	X	X				

Table 3.21-2
Parcel 83 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P83-SB6-B	12/18/07	11:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB6-C	12/18/07	11:50	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB7-A	12/18/07	12:10	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB7-B	12/18/07	12:20	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB7-C	12/18/07	12:30	2.5	3.0		X	X	X	X				
SOIL	GEOPROBE	P83-SB14-A	12/18/07	14:45	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB14-B	12/18/07	14:55	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB14-C	12/18/07	15:05	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB14-C DUPLICATE	12/18/07	15:05	3.0	3.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB15-A	12/18/07	15:30	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB15-B	12/18/07	15:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB15-C	12/18/07	15:50	3.0	3.5		X	X	X	X				
SOIL	HAND AUGER	P83-SS21	12/18/07	13:15	0.0	0.5	X			X					
SOIL	HAND AUGER	P83-SS20	12/18/07	13:25	0.0	0.5	X			X					
SOIL	HAND AUGER	P83-SS19	12/18/07	13:35	0.0	0.5	X			X					
SOIL	HAND AUGER	P83-SS18	12/18/07	13:45	0.0	0.5	X			X					
BLANK	TRIP	TRIP BLANK	12/19/07	8:50	--	--		X							
BLANK	FIELD	FIELD BLANK	12/19/07	16:00	--	--		X	X	X	X				
SOIL	GEOPROBE	P83-SB16-A	12/19/07	8:30	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB16-B	12/19/07	8:40	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB16-C	12/19/07	8:50	2.0	2.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB17-A	12/19/07	9:15	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB17-B	12/19/07	9:25	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB17-C	12/19/07	9:35	5.5	6.0		X	X	X	X				
SOIL	GEOPROBE	P83-SB1-A	12/19/07	10:20	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB1-B	12/19/07	10:30	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB1-C	12/19/07	10:40	5.0	5.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB1-C DUPLICATE	12/19/07	10:40	5.0	5.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB2-A	12/19/07	11:30	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB2-B	12/19/07	11:40	1.5	2.0		X							

Table 3.21-2
Parcel 83 Sample and Analytical Summary

Media	Type	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	BN+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	GEOPROBE	P83-SB2-C	12/19/07	11:50	5.0	5.5		X	X	X	X				
SOIL	GEOPROBE	P83-SB8-A	12/19/07	13:10	0.0	0.5			X	X	X				
SOIL	GEOPROBE	P83-SB8-B	12/19/07	13:20	1.5	2.0		X							
SOIL	GEOPROBE	P83-SB8-C	12/19/07	13:30	3.5	4.0		X	X	X	X				
BLANK	TRIP	TRIP BLANK-AQ	12/20/07	8:00	--	--		X							
BLANK	FIELD	FIELD BLANK-AQ	12/20/07	10:00	--	--		X	X	X					
GW	GEOPROBE	P83-GW-1	12/20/07	10:30	5.0	10.0		X	X						
GW	GEOPROBE	P83-GW-1 DUPLICATE	12/20/07	10:30	5.0	10.0		X	X						
GW	GEOPROBE	P83-GW-3	12/20/07	11:00	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-5	12/20/07	11:30	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-7	12/20/07	12:00	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-8	12/20/07	13:30	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-10	12/20/07	14:00	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-12	12/20/07	14:30	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-14	12/20/07	15:00	4.0	9.0		X	X						
GW	GEOPROBE	P83-GW-17	12/20/07	15:30	6.0	11.0		X	X						
GW	MONITORING WELL	161-MW-01	12/20/07	16:00	5.2	15.2		X	X	X					

X = Sample analyzed for the indicated analytical parameter suite

Table 3.21-3
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of TPHC Detected in Soil (mg/kg)

Sample ID	Lab ID	Sample Date	Depth (ft. bgs)	Result	MDL	NJDEP NRDCSCC[2] (mg/kg)	NJDEP IGWSCC[3] (mg/kg)
P83-SS18	7054025	12/18/07	0.0-0.5	181	81	10000	10000
P83-SS19	7054024	12/18/07	0.0-0.5	111	82	10000	10000
P83-SS20	7054023	12/18/07	0.0-0.5	117	77	10000	10000

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

Table 3.21-4
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results														
		Sample ID:	P83-A1-A	P83-A1-B	P83-A1-C	P83-A2-A	P83-A2-B	P83-A2-C	P83-A3-A	P83-A3-B	P83-A3-C	P83-A4-A	P83-A4-B	P83-A4-C	P83-A5-A	P83-A5-B	P83-A5-C
		Lab ID:	7053203	7053204	7053205	7053206	7053207	7053208	7053209	7053210	7053211	7053212	7053213	7053214	7053215	7053216	7053217
		Date Sampled:	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007
		Depth (ft. bgs):	0.0-0.5	1.5-2.0	2.5-3.0	0.5-1.0	1.5-2.0	3.5-4.0	0.5-1.0	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	6.0-6.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																	
Acetone	1000	100	NT	0.280 U	0.290 U	NT	**0.260 JB**	**1.300 B**	NT	**1.300 B**	**0.170 JB**	NT	**0.320 B**	**0.370 B**	NT	**0.460 B**	**0.220 JB**
Benzene	13	1	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	0.290 U	0.290 U
Carbon disulfide	NLE	NLE	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	**0.023 J**	0.290 U
1,2-Dichloroethane	24	1	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	0.290 U	0.290 U
Ethylbenzene	1000	100	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	0.290 U	0.290 U
Methylene Chloride	210	1	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	0.290 U	0.290 U
Toluene	1000	500	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	**0.029 J**	0.290 U
Trichloroethylene	54	1	NT	0.280 U	0.290 U	NT	0.270 U	0.300 U	NT	0.280 U	0.280 U	NT	0.250 U	0.280 U	NT	0.290 U	0.290 U
Xylenes (Total)	1000	67	NT	0.850 U	0.880 U	NT	0.800 U	0.890 U	NT	0.830 U	0.830 U	NT	0.740 U	0.840 U	NT	0.860 U	0.870 U
Semi-Volatiles																	
Acenaphthene	10000	100	1.100 U	NT	1.100 U	**0.120 J**	NT	1.100 U	**0.530 J**	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
Acenaphthylene	NLE	NLE	**1.500**	NT	1.100 U	**1.300**	NT	1.100 U	**0.550 J**	NT	1.200 U	**0.810 J**	NT	1.200 U	**0.065 J**	NT	1.200 U
Anthracene	10000	100	**1.200**	NT	1.100 U	**1.200**	NT	1.100 U	**1.100**	NT	1.200 U	**0.810 J**	NT	**0.075 J**	**0.110 J**	NT	1.200 U
Benzo[a]anthracene	4	500	**7.000**	NT	**0.110 J**	**5.500**	NT	**0.075 J**	**2.22**	NT	**0.110 J**	**4.100**	NT	**0.230 J**	**0.530 J**	NT	1.200 U
Benzo[a]pyrene	0.66	100	**7.500**	NT	**0.120 J**	**5.000**	NT	1.100 U	**1.900**	NT	**0.100 J**	**3.700**	NT	**0.210 J**	**0.440 J**	NT	1.200 U
Benzo[b]fluoranthene	4	50	**9.700**	NT	**0.160 J**	**7.700**	NT	1.100 U	**2.900**	NT	**0.180 J**	**5.000**	NT	**0.280 J**	**0.940 J**	NT	1.200 U
Benzo[g,h,i]perylene	NLE	NLE	**3.400**	NT	1.100 U	**1.700**	NT	1.100 U	**0.600 J**	NT	1.200 U	**1.600**	NT	1.200 U	1.100 U	NT	1.200 U
Benzo[k]fluoranthene	4	500	**3.800**	NT	**0.052 J**	**2.400**	NT	1.100 U	**0.860 J**	NT	1.200 U	**2.000**	NT	**0.092 J**	**0.230 J**	NT	1.200 U
bis(2-chloroethyl)ether	3	10	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
bis(2-Ethylhexyl)phthalate	210	100	1.100 U	NT	**0.290 J**	**0.330 J**	NT	**0.330 J**	**0.350 J**	NT	**0.310 J**	1.200 U	NT	**0.370 J**	**0.380 J**	NT	**0.270 J**
Butyl benzyl phthalate	10000	100	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
4-Chloroaniline	4200	NLE	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
Chrysene	40	500	**8.600**	NT	**0.150 J**	**6.500**	NT	**0.096 J**	**2.500**	NT	**0.150 J**	**5.000**	NT	**0.320 J**	**0.740 J**	NT	1.200 U
Dibenz[a,h]anthracene	0.66	100	1.100 U	NT	1.100 U	**0.680 J**	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
Dibenzofuran	NLE	NLE	1.100 U	NT	1.100 U	**0.087 J**	NT	1.100 U	**0.380 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.075 J**	NT	1.200 U
Diethyl phthalate	10000	50	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
Di-n-butylphthalate	10000	100	**1.200 B**	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	**0.360 JB**	NT	1.200 U	1.100 U	NT	1.200 U
Di-n-octyl phthalate	10000	100	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
Fluoranthene	10000	100	**8.700**	NT	**0.150 J**	**9.400**	NT	**0.140 J**	**4.600**	NT	**0.260 J**	**7.100**	NT	**0.530 J**	**1.000 J**	NT	1.200 U
Fluorene	10000	100	1.100 U	NT	1.100 U	**0.087 J**	NT	1.100 U	**1.100 J**	NT	1.200 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U
Indeno[1,2,3-cd]pyrene	4	500	**3.100**	NT	1.100 U	**1.700**	NT	1.100 U	**0.510 J**	NT	1.200 U	**1.400**	NT	1.200 U	**0.190 J**	NT	1.200 U
2-Methylnaphthalene	NLE	NLE	1.100 U	NT	1.100 U	**0.200 J**	NT	1.100 U	**0.640 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.270 J**	NT	1.200 U
Naphthalene	4200	100	**0.260 J**	NT	1.100 U	**0.280 J**	NT	1.100 U	**0.300 J**	NT	1.200 U	**0.250 J**	NT	**0.250 J**	**0.250 J**	NT	1.200 U
Phenanthrene	NLE	NLE	**2.220**	NT	1.100 U	**3.000**	NT	1.100 U	**5.000**	NT	**0.260 J**	**2.600**	NT	**0.380 J**	**0.570 J**	NT	1.200 U
Pyrene	10000	100	**12.000**	NT	**0.210 J**	**13.000**	NT	**0.160 J**	**6.200**	NT	**0.320 J**	**9.300**	NT	**0.700 J**	**1.100 J**	NT	1.200 U
PCBs																	
Aroclor 1260	2	50	0.0041 U	NT	0.0041 U	0.0041 U	NT	0.0042 U	0.0042 U	NT	0.0040 U	0.0040 U	NT	0.0041 U	0.0041 U	NT	0.0042 U
Metals																	
Aluminum	NLE	NLE	**11200 B**	NT	**8860 B**	**5880 B**	NT	**5400 B**	**5520 B**	NT	**10900 B**	**6810 B**	NT	**14700 B**	**8300 B**	NT	**17200 B**
Antimony	340	NLE	0.438 U	NT	0.449 U	0.433 U	NT	0.438 U	0.424 U	NT	0.421 U	0.463 U	NT	0.485 U	0.479 U	NT	0.429 U
Arsenic	20	NLE	**16.0**	NT	**4.63**	**3.59**	NT	**2.77**	**2.77**	NT	**6.49**	**7.04**	NT	**9.15**	**7.49**	NT	**9.99**
Barium	47000	NLE	**34.2 B**	NT	**14.4 B**	**18.0 B**	NT	**22.2 B**	**18.3 B**	NT	**21.1 B**	**26.0 B**	NT	**59.6 B**	**124 B**	NT	**22.0 B**
Beryllium	140	NLE	**1.08**	NT	**1.22**	**0.184**	NT	**0.766**	**0.341**	NT	**1.35**	**0.410**	NT	**1.68**	**0.927**	NT	**2.39**
Cadmium	100	NLE	0.042 U	NT	0.043 U	**0.289 B**	NT	0.042 U	**0.217 B**	NT	0.040 U	**0.660**	NT	**0.443**	**0.707**	NT	**0.760**
Calcium	NLE	NLE	**889 B**	NT	**490 B**	**10400 B**	NT	**837 B**	**1490 B**	NT	**1060 B**	**2970 B**	NT	**1880 B**	**2060 B**	NT	**1730 B**
Chromium (Total)	NLE	NLE	**103 B**	NT	**102 B**	**17.3 B**	NT	**40.1 B**	**33.8 B**	NT	**110 B**	**35.9 B**	NT	**98.2 B**	**65.5 B**	NT	**171 B**
Cobalt	NLE	NLE	**0.353**	NT	**0.639**	**1.77**	NT	**0.605**	**0.952**	NT	**0.629**	**4.15**	NT	**1.28**	**2.15**	NT	**2.19**
Copper	45000	NLE	**18.8 B**	NT	**5.72 B**	**18.0 B**	NT	**3.05 B**	**17.8 B**	NT	**4.62 B**	**52.2 B**	NT	**8.36 B**	**34.5 B**	NT	**5.95 B**
Iron	NLE	NLE	**39800 B**	NT	**40000 B**	**11000 B**	NT	**18500 B**	**13400 B**	NT	**45500 B**	**19100**	NT	**39900**	**27200**	NT	**72900**
Lead	800	NLE	**18.6**	NT	0.363 U	**11.7**	NT	**2.17**	**35.2**	NT	**0.935**	**95.8**	NT	**7.79**	**252**	NT	0.347 U
Magnesium	NLE	NLE	**4300 B**	NT	**4140 B**	**1300 B**	NT	**1610 B**	**1280 B**	NT	**4520 B**	**3340 B**	NT	**5170 B**	**2920 B**	NT	**8770 B**
Manganese	NLE	NLE	**22.5 B**	NT	**29.8 B**	**52.1 B**	NT	**56.9 B**	**44.9 B**	NT	**32.0 B**	**127 B**	NT	**86.0 B**	**76.0 B**	NT	**49.0 B**
Mercury	270	NLE	0.107 U	NT	0.108 U	0.111 U	NT	0.114 U	0.112 U	NT	0.116 U	0.118 U	NT	0.114 U	**0.13**	NT	0.110 U
Nickel (Soluble Salts)	2400	NLE	**7.11**	NT	**5.80**	**6.73**	NT	**4.08**	**6.21**	NT	**5.76**	0.661 U	NT	**8.82 B**	**9.23 B**	NT	**16.8 B**
Potassium	NLE	NLE	**9600**	NT	**9870**	**710**	NT	**3300**	**2060**	NT	**10700**	**1970 B**	NT	**10000 B**	**5830 B**	NT	**20100 B**
Selenium	3100	NLE	0.646 U	NT	0.663 U	0.640 U	NT	0.647 U	0.626 U	NT	0.622 U	0.683 U	NT	0.716 U	0.707 U	NT	0.633 U
Sodium	NLE	NLE	37.939 U	NT	38.914 U	37.559 U	NT	37.979 U	36.747 U	NT	36.52 U	40.086 U	NT	42.037 U	41.486 U	NT	37.168 U
Vanadium	7100	NLE	**52.4**	NT	**53.3**	**20.5**	NT	**28.1**	**24.0**	NT	**59.1**	**49.5**	NT	**57.6**	**40.5**	NT	**92.1**
Zinc	1500	NLE	**67.5**	NT	**54.6**	**299**	NT	**35.6**	**193**	NT	**47.4**	**230 B**	NT	61.6 B	**199 B**	NT	**74.8 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

mg/kg = milligram per kilogram.

Table 3.21-4
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results														
		Sample ID:	P83-B1-A	P83-B1-B	P83-B1-C	P83-B1-C DUP	P83-B2-A	P83-B2-B	P83-B2-C	P83-B3-A	P83-B3-B	P83-B3-C	P83-B4-A	P83-B4-B	P83-B4-C	P83-B5-A	P83-B5-B
		Lab ID:	7053218	7053219	7053220	7053202	7053222	7053223	7053224	7053401	7053402	7053403	7053406	7053407	7053408	7053409	7053410
		Date Sampled:	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/14/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007
		Depth (ft. bgs):	0.0-0.5	1.5-2.0	2.0-2.5	2.0-2.5	0.0-0.5	1.5-2.0	2.5-3.0	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	5.5-6.0	1.0-1.5	1.5-2.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																	
Acetone	1000	100	NT	**0.580 B**	0.280 U	0.340 U	NT	**0.500 B**	**0.150 JB**	NT	**0.880**	**1.200**	NT	**1.300**	**1.300**	NT	**1.200**
Benzene	13	1	NT	**0.330**	0.280 U	0.340 U	NT	0.300 U	0.310 U	NT	0.260 U	0.300 U	NT	**0.015 J**	0.280 U	NT	0.270 U
Carbon disulfide	NLE	NLE	NT	**0.015 J**	0.280 U	0.340 U	NT	0.300 U	0.310 U	NT	0.260 U	0.300 U	NT	0.270 U	0.280 U	NT	0.270 U
1,2-Dichloroethane	24	1	NT	0.260 U	0.280 U	0.340 U	NT	0.300 U	0.310 U	NT	0.260 U	0.300 U	NT	0.270 U	0.280 U	NT	0.270 U
Ethylbenzene	1000	100	NT	**0.220 J**	0.280 U	0.340 U	NT	0.300 U	0.310 U	NT	0.260 U	0.300 U	NT	**0.023 J**	0.280 U	NT	0.270 U
Methylene Chloride	210	1	NT	0.260 U	0.280 U	0.340 U	NT	0.300 U	0.310 U	NT	0.260 U	0.300 U	NT	0.270 U	0.280 U	NT	0.270 U
Toluene	1000	500	NT	**1.200**	0.280 U	0.340 U	NT	0.300 U	**0.038 J**	NT	0.260 U	0.300 U	NT	**0.067 J**	0.280 U	NT	0.270 U
Trichloroethylene	54	1	NT	0.260 U	0.280 U	0.340 U	NT	0.300 U	0.310 U	NT	0.260 U	0.300 U	NT	0.270 U	0.280 U	NT	0.270 U
Xylenes (Total)	1000	67	NT	**1.400**	0.850 U	1.020 U	NT	0.910 U	0.920 U	NT	0.790 U	0.910 U	NT	**0.307 J**	0.840 U	NT	0.800 U
Semi-Volatiles																	
Acenaphthene	10000	100	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
Acenaphthylene	NLE	NLE	1.000 U	NT	1.200 U	1.100 U	**0.140 J**	NT	1.200 U	**0.072 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.130 J**	NT
Anthracene	10000	100	1.000 U	NT	1.200 U	1.100 U	**0.100 J**	NT	1.200 U	**0.110 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.140 J**	NT
Benzo[a]anthracene	4	500	1.000 U	NT	1.200 U	**0.130 J**	**0.500 J**	NT	1.200 U	**0.770 J**	NT	1.200 U	**0.250 J**	NT	**0.100 J**	**0.690 J**	NT
Benzo[a]pyrene	0.66	100	1.000 U	NT	1.200 U	**0.110 J**	1.200 U	NT	1.200 U	**0.730 J**	NT	1.200 U	**0.270 J**	NT	1.200 U	**0.680 J**	NT
Benzo[b]fluoranthene	4	50	1.000 U	NT	**0.120 J**	**0.160 J**	**1.000 J**	NT	1.200 U	**1.300**	NT	1.200 U	**0.480 J**	NT	**0.140 J**	**1.000 J**	NT
Benzo[g,h,i]perylene	NLE	NLE	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
Benzo[k]fluoranthene	4	500	1.000 U	NT	1.200 U	**0.072 J**	1.200 U	NT	1.200 U	**0.410 J**	NT	1.200 U	**0.130 J**	NT	1.200 U	**0.710 J**	NT
bis(2-chloroethyl)ether	3	10	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	**0.240 J**	NT
bis(2-Ethylhexyl)phthalate	210	100	**0.740 J**	NT	**0.310 J**	1.100 U	**0.510 J**	NT	**0.300 J**	**0.480 JB**	NT	**0.410 JB**	**0.500 JB**	NT	**0.180 JB**	**0.660 JB**	NT
Butyl benzyl phthalate	10000	100	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
4-Chloroaniline	4200	NLE	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
Chrysene	40	500	1.000 U	NT	**0.100 J**	**0.180 J**	**0.850 J**	NT	1.200 U	**0.970 J**	NT	1.200 U	**0.290 J**	NT	**0.100 J**	**0.970 J**	NT
Dibenz[a,h]anthracene	0.66	100	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
Dibenzofuran	NLE	NLE	1.000 U	NT	1.200 U	1.100 U	**0.240 J**	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	**0.070 J**	NT
Diethyl phthalate	10000	50	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	**0.073 JB**	1.200 U	NT	1.200 U	1.000 U	NT
Di-n-butylphthalate	10000	100	1.000 U	NT	1.200 U	**2.22 B**	1.200 U	NT	1.200 U	**0.460 JB**	NT	**0.460 JB**	**0.290 JB**	NT	**0.760 JB**	**0.410 JB**	NT
Di-n-octyl phthalate	10000	100	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
Fluoranthene	10000	100	1.000 U	NT	**0.190 J**	**0.280 J**	**0.710 J**	NT	1.200 U	**1.300**	NT	1.200 U	**0.390 J**	NT	**0.200 J**	**1.000 J**	NT
Fluorene	10000	100	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
Indeno[1,2,3-cd]pyrene	4	500	1.000 U	NT	1.200 U	1.100 U	1.200 U	NT	1.200 U	**0.260 J**	NT	1.200 U	1.200 U	NT	1.200 U	1.000 U	NT
2-Methylnaphthalene	NLE	NLE	**0.190 J**	NT	1.200 U	1.100 U	**0.860 J**	NT	1.200 U	**0.230 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.140 J**	NT
Naphthalene	4200	100	**0.090 J**	NT	1.200 U	1.100 U	**0.550 J**	NT	1.200 U	**0.160 J**	NT	1.200 U	1.200 U	NT	1.200 U	**0.140 J**	NT
Phenanthrene	NLE	NLE	**0.100 J**	NT	**0.090 J**	**0.130 J**	**0.910 J**	NT	1.200 U	**0.520 J**	NT	1.200 U	**0.120 J**	NT	**0.160 J**	**0.760 J**	NT
Pyrene	10000	100	1.000 U	NT	**0.190 J**	**0.290 J**	**1.900**	NT	1.200 U	**1.700**	NT	1.200 U	**0.500 J**	NT	**0.210 J**	**1.500**	NT
PCBs																	
Aroclor 1260	2	50	0.0042 U	NT	0.0041 U	0.0041 U	0.0041 U	NT	0.0041 U	0.0041 U	NT	0.0041 U	0.0041 U	NT	0.0040 U	**0.80**	NT
Metals																	
Aluminum	NLE	NLE	**15800 B**	NT	**9660 B**	**8880 B**	**10400 B**	NT	**13500 B**	**8880 B**	NT	**12800 B**	**8910 B**	NT	**18500 B**	**11300 B**	NT
Antimony	340	NLE	0.435 U	NT	0.443 U	0.465 U	0.543 U	NT	0.440 U	0.423 U	NT	0.501 U	0.463 U	NT	0.48 U	**6.50**	NT
Arsenic	20	NLE	**4.87**	NT	**13.4**	**9.69**	**10.8**	NT	**7.93**	**7.12**	NT	**6.41**	**6.04**	NT	**5.93**	**7.34**	NT
Barium	47000	NLE	**28.3 B**	NT	**34.3 B**	**35.5 B**	**52.1 B**	NT	**18.4 B**	**81.4 B**	NT	**32.5 B**	**33.7 B**	NT	**24.6 B**	**182 B**	NT
Beryllium	140	NLE	**0.282**	NT	**1.03**	**0.996**	**0.931**	NT	**1.88**	**0.752**	NT	**1.63**	**0.582**	NT	**1.91**	**0.942**	NT
Cadmium	100	NLE	**0.564**	NT	**0.312**	0.044 U	**0.709**	NT	**0.633**	**1.01**	NT	**0.277**	**0.445**	NT	**0.476**	**3.15**	NT
Calcium	NLE	NLE	**12800 B**	NT	**875 B**	**757 B**	**2490 B**	NT	**947 B**	**8590 B**	NT	**430 B**	**3620 B**	NT	**2320 B**	**979 B**	NT
Chromium	NLE	NLE	**29.4 B**	NT	**80.4 B**	**80.5 B**	**83.3 B**	NT	**150 B**	**28.4 B**	NT	**105 B**	**45.1 B**	NT	**168 B**	**105 B**	NT
Cobalt	NLE	NLE	**10.1**	NT	**0.571**	**0.824**	**2.78**	NT	**1.83**	**5.07**	NT	**1.13**	**1.31**	NT	**1.25**	**2.06**	NT
Copper	45000	NLE	**61.8 B**	NT	**10.4 B**	**10.1 B**	**39.4 B**	NT	**15.3 B**	**109 B**	NT	**10.4 B**	**33.0 B**	NT	**8.35 B**	**2930 EB**	NT
Iron	NLE	NLE	**23000**	NT	**38700**	**36400 B**	**31800**	NT	**56800**	**16200**	NT	**46500**	**18700**	NT	**62900**	**38400**	NT
Lead	800	NLE	**7.95**	NT	**15.5**	**17.1**	**111**	NT	**0.869**	**103**	NT	**1.47**	**45.2**	NT	**1.57**	**972**	NT
Magnesium	NLE	NLE	**8580 B**	NT	**4050 B**	**3760 B**	**3240 B**	NT	**6730 B**	**4450 B**	NT	**5350 B**	**2190 B**	NT	**8360 B**	**3240 B**	NT
Manganese	NLE	NLE	**266 B**	NT	**24.7 B**	**16.4 B**	**122 B**	NT	**44.7 B**	**292 B**	NT	**32.3 B**	**111 B**	NT	**55.2 B**	**110 B**	NT
Mercury	270	NLE	0.105 U	NT	0.108 U	0.114 U	0.119 U	NT	0.115 U	0.110 U	NT	0.118 U	0.112 U	NT	0.114 U	**4.06**	NT
Nickel	2400	NLE	**23.2 B**	NT	**5.52 B**	**7.25**	**12.0 B**	NT	**20.2 B**	**18.7 B**	NT	**7.41 B**	**9.75 B**	NT	**7.96 B**	**46.1 B**	NT
Potassium	NLE	NLE	**1800 B**	NT	**8460 B**	**8330**	**5020 B**	NT	**14900 B**	**1540 B**	NT	**11600 B**	**3430 B**	NT	**18000 B**	**6820 B**	NT
Selenium	3100	NLE	0.642 U	NT	0.654 U	0.686 U	0.802 U	NT	0.649 U	0.624 U	NT	0.739 U	0.684 U	NT	0.708 U	0.669 U	NT
Sodium	NLE	NLE	**1390 B**	NT	38.387 U	40.273 U	47.093 U	NT	38.122 U	36.662 U	NT	43.403 U	40.166 U	NT	41.585 U	39.258 U	NT
Vanadium	7100	NLE	**123**	NT	**49.8**	**45.9**	**60.2**	NT	**73.8**	**34.5**	NT	**58.0**	**47.8**	NT	**92.7**	**44.8**	NT
Zinc	1500	NLE	**41.0 B**	NT	**39.0 B**	**46.9**	**136 B**	NT	**112 B**	**148 B**	NT	**59.5 B**	**77.8 B**	NT	**64.8 B**	**1100 B**	NT

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

mg/kg = milligram per kilogram.

Table 3.21-4
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results														
		Sample ID:	P83-B5-C	P83-B5-C DUP	P83-SB1-A	P83-SB1-B	P83-SB1-C	P83-SB1-C DUP	P83-SB2-A	P83-SB2-B	P83-SB2-C	P83-SB3-A	P83-SB3-B	P83-SB3-C	P83-SB3-C DUP	P83-SB4-A	P83-SB4-B
		Lab ID:	7053411	7053405	7054710	7054711	7054712	7054703	7054713	7054714	7054715	7053613	7053614	7053615	7053602	7053616	7053617
		Date Sampled:	12/15/2007	12/15/2007	12/19/2007	12/19/2007	12/19/2007	12/18/2007	12/19/2007	12/19/2007	12/19/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007
		Depth (ft. bgs):	7.0-7.5	7.0-7.5	0.0-0.5	1.5-2.0	5.0-5.5	5.0-5.5	0.0-0.5	1.5-2.0	5.0-5.5	1.0-1.5	1.5-2.0	3.5-4.0	3.5-4.0	0.0-0.5	1.5-2.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																	
Acetone	1000	100	**1.200**	**1.500**	NT	**0.710**	0.270 U	**1.000**	NT	0.250 U	0.280 U	NT	**3.200 B**	**3.300 B**	**3.100 B**	NT	**3.000 B**
Benzene	13	1	0.270 U	0.380 U	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	0.250 U	0.260 U	0.270 U	NT	0.250 U
Carbon disulfide	NLE	NLE	0.270 U	0.380 U	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	0.250 U	0.260 U	0.270 U	NT	0.250 U
1,2-Dichloroethane	24	1	0.270 U	0.380 U	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	0.250 U	0.260 U	0.270 U	NT	0.250 U
Ethylbenzene	1000	100	0.270 U	0.380 U	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	0.250 U	**0.036 J**	0.270 U	NT	**0.028 J**
Methylene Chloride	210	1	0.270 U	0.380 U	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	**0.073 JB**	**0.077 JB**	**0.089 JB**	NT	**0.056 JB**
Toluene	1000	500	0.270 U	**0.033 J**	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	0.250 U	**0.022 J**	0.270 U	NT	0.250 U
Trichloroethylene	54	1	0.270 U	0.380 U	NT	0.250 U	0.270 U	0.300 U	NT	0.250 U	0.280 U	NT	0.250 U	0.260 U	0.270 U	NT	0.250 U
Xylenes (Total)	1000	67	0.810 U	1.150 U	NT	0.760 U	0.810 U	0.900 U	NT	0.750 U	0.850 U	NT	0.740 U	**0.050 J**	**0.060 J**	NT	**0.047 J**
Semi-Volatiles																	
Acenaphthene	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
Acenaphthylene	NLE	NLE	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**0.310 J**	NT
Anthracene	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**0.280 J**	NT
Benzo[a]anthracene	4	500	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**1.800**	NT
Benzo[a]pyrene	0.66	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**1.900**	NT
Benzo[b]fluoranthene	4	50	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**3.100**	NT
Benzo[g,h,i]perylene	NLE	NLE	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**0.710 J**	NT
Benzo[k]fluoranthene	4	500	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**1.100 J**	NT
bis(2-chloroethyl)ether	3	10	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
bis(2-Ethylhexyl)phthalate	210	100	**0.160 JB**	**0.410 JB**	**0.200 JB**	NT	**0.180 JB**	**0.120 JB**	**0.120 JB**	NT	**0.210 JB**	**0.240 JB**	NT	**0.290 JB**	1.200 U	**0.240 JB**	NT
Butyl benzyl phthalate	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
4-Chloroaniline	4200	NLE	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	**0.470 J**	1.100 U	NT
Chrysene	40	500	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**1.900**	NT
Dibenz[a,h]anthracene	0.66	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
Dibenzofuran	NLE	NLE	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
Diethyl phthalate	10000	50	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
Di-n-butylphthalate	10000	100	**0.580 JB**	**0.290 JB**	**0.084 JB**	NT	**0.061 JB**	1.200 U	1.000 U	NT	**0.059 JB**	**0.510 JB**	NT	**1.300 B**	**0.380 JB**	**0.750 JB**	NT
Di-n-octyl phthalate	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	**0.092 J**	NT	**0.090 J**	1.200 U	1.100 U	NT
Fluoranthene	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	**0.059 J**	**2.220**	NT
Fluorene	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.100 U	NT
Indeno[1,2,3-cd]pyrene	4	500	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**0.690 J**	NT
2-Methylnaphthalene	NLE	NLE	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	**1.300**	**1.200**	1.100 U	NT
Naphthalene	4200	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	**1.600**	**1.300**	1.100 U	NT
Phenanthrene	NLE	NLE	**0.091 J**	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	**0.088 J**	**0.081 J**	**0.490 J**	NT
Pyrene	10000	100	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.200 U	1.000 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	**3.200**	NT
PCBs																	
Aroclor 1260	2	50	0.0041 U	0.0039 U	0.004 U	NT	0.0042 U	0.0041 U	0.0040 U	NT	0.0040 U	0.0040 U	NT	0.0041 U	0.0040 U	0.0040 U	NT
Metals																	
Aluminum	NLE	NLE	**19400 B**	**18500 B**	**8360 B**	NT	**15000 B**	**15000 B**	**5530 B**	NT	**13600 B**	**9120 B**	NT	**13800 B**	**12400 B**	**10700 B**	NT
Antimony	340	NLE	0.485 U	0.483 U	0.434 U	NT	0.448 U	0.48 U	0.472 U	NT	0.498 U	0.422 U	NT	0.476 U	0.468 U	0.490 U	NT
Arsenic	20	NLE	**10.3**	**10.8**	**3.07**	NT	**10.2**	**10.2**	**3.13**	NT	**11.4**	**5.09**	NT	**8.03**	**7.93**	**11.6**	NT
Barium	47000	NLE	**24.4 B**	**23.8 B**	**16.6 B**	NT	**24.1 B**	**22.6 B**	**9.06 B**	NT	**22.2 B**	**20.5 B**	NT	**43.3 B**	**38.0 B**	**33.1 B**	NT
Beryllium	140	NLE	**2.68**	**2.57**	**0.228**	NT	**2.06**	**2.10**	**0.191**	NT	**1.74**	**0.379**	NT	**1.40**	**1.22**	**0.647**	NT
Cadmium	100	NLE	**0.862**	**0.874**	**0.105**	NT	**0.312**	**0.250**	0.045 U	NT	**0.0789**	**0.196 B**	NT	**0.370 B**	**0.352 B**	**0.307 B**	NT
Calcium	NLE	NLE	**725 B**	**741 B**	**471 B**	NT	**407 B**	**430 B**	**289 B**	NT	**544 B**	**335 B**	NT	**1710 B**	**1320 B**	**2250 B**	NT
Chromium	NLE	NLE	**207 B**	**202 B**	**23.6**	NT	**157**	**156**	**22.0**	NT	**136**	**91.9**	NT	**78.3**	**71.8**	**37.9**	NT
Cobalt	NLE	NLE	**2.16**	**2.27**	**0.849**	NT	**1.57**	**1.88**	0.359 U	NT	**1.68**	0.321 U	NT	**0.510**	**0.507**	**1.31**	NT
Copper	45000	NLE	**9.46 B**	**10.4 B**	**5.95 B**	NT	**6.43 B**	**7.27 B**	**6.04 B**	NT	**5.92 B**	**5.86 B**	NT	**8.57 B**	**8.44 B**	**14.9 B**	NT
Iron	NLE	NLE	**83200**	**80300**	**10400 B**	NT	**59600 B**	**61800 B**	**10700**	NT	**52700**	**17300 B**	NT	**35900 B**	**32000 B**	**24400 B**	NT
Lead	800	NLE	0.392 U	0.391 U	**5.57**	NT	0.363 U	0.389 U	**4.18**	NT	0.403 U	**3.57**	NT	**11.8**	**12.2**	**35.2**	NT
Magnesium	NLE	NLE	**10200 B**	**9470 B**	**626 B**	NT	**6800 B**	**7030 B**	**537**	NT	**5730**	**1080 B**	NT	**4100 B**	**3690 B**	**1950 B**	NT
Manganese	NLE	NLE	**32.0 B**	**30.2 B**	**39.2 B**	NT	**50.5 B**	**52.7 B**	**29.8 B**	NT	**51.9 B**	**23.3**	NT	**66.8**	**59.6**	**90.8**	NT
Mercury	270	NLE	0.107 U	0.113 U	0.103 U	NT	0.117 U	0.112 U	0.118 U	NT	0.112 U	0.095 U	NT	0.104 U	0.105 U	0.107 U	NT
Nickel	2400	NLE	**8.96 B**	**9.70 B**	**3.70**	NT	**7.32**	**7.65**	**3.09**	NT	**6.57**	**11.6**	NT	9.17	11.3	9.44	NT
Potassium	NLE	NLE	**23900 B**	**22200 B**	**1190 B**	NT	**16700 B**	**16900 B**	**844 B**	NT	**13000 B**	**2200**	NT	**7860**	**6830**	**2650**	NT
Selenium	3100	NLE	0.716 U	0.713 U	0.641 U	NT	0.662 U	0.709 U	0.696 U	NT	0.735 U	0.623 U	NT	0.703 U	0.691 U	0.723 U	NT
Sodium	NLE	NLE	42.017 U	41.831 U	37.606 U	NT	38.884 U	41.602 U	40.873 U	NT	43.13 U	**62.0 B**	NT	**475 B**	**581 B**	42.434 U	NT
Vanadium	7100	NLE	**104**	**99.7**	**26.2**	NT	**84.8**	**82.7**	**21.8**	NT	**74.8**	**42.8**	NT	**51.8**	**47.1**	**46.9**	NT
Zinc	1500	NLE	**79.1 B**	**84.2 B**	**14.3 B**	NT	**65.0 B**	**66.0 B**	**24.0 B**	NT	**50.2 B**	**37.8**	NT	**47.5**	**59.6**	**59.1**	NT

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

mg/kg = milligram per kilogram.

Table 3.21-4
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results														
		Sample ID:	P83-SB4-C	P83-SB5-A	P83-SB5-B	P83-SB5-C	P83-SB6-A	P83-SB6-B	P83-SB6-C	P83-SB7-A	P83-SB7-B	P83-SB7-C	P83-SB8-A	P83-SB8-B	P83-SB8-C	P83-SB9-A	P83-SB9-B
		Lab ID:	7053618	7054007	7054008	7054009	7054010	7054011	7054012	7054013	7054014	7054015	7054716	7054717	7054718	7053604	7053605
		Date Sampled:	12/17/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/19/2007	12/19/2007	12/19/2007	12/17/2007	12/17/2007
		Depth (ft. bgs):	3.5-4.0	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	2.5-3.0	0.0-0.5	1.5-2.0	3.5-4.0	1.0-1.5	1.5-2.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																	
Acetone	1000	100	**3.800 B**	NT	**0.110 J**	**0.110 J**	NT	**0.076 J**	0.270 U	NT	**0.150 J**	**0.180 J**	NT	0.300 U	0.290 U	NT	**5.000 B**
Benzene	13	1	0.280 U	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	0.300 U	0.290 U	NT	0.390 U
Carbon disulfide	NLE	NLE	0.280 U	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	**0.098 J**	0.290 U	NT	0.390 U
1,2-Dichloroethane	24	1	0.280 U	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	**0.330**	0.290 U	NT	0.390 U
Ethylbenzene	1000	100	0.280 U	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	0.300 U	0.290 U	NT	0.390 U
Methylene Chloride	210	1	**0.068 JB**	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	0.300 U	0.290 U	NT	**0.120 JB**
Toluene	1000	500	0.280 U	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	0.300 U	0.290 U	NT	0.390 U
Trichloroethylene	54	1	0.280 U	NT	0.320 U	0.290 U	NT	0.250 U	0.270 U	NT	0.240 U	0.270 U	NT	0.300 U	0.290 U	NT	**5.800**
Xylenes (Total)	1000	67	0.850 U	NT	0.790 U	0.870 U	NT	0.760 U	0.820 U	NT	0.720 U	0.810 U	NT	0.900 U	0.870 U	NT	1.160 U
Semi-Volatiles																	
Acenaphthene	10000	100	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Acenaphthylene	NLE	NLE	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Anthracene	10000	100	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Benzo[a]anthracene	4	500	1.100 U	**0.062 J**	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	**0.093 J**	1.100 U	NT	1.200 U	**0.240 J**	NT
Benzo[a]pyrene	0.66	100	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	**0.470 J**	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Benzo[b]fluoranthene	4	50	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Benzo[g,h,i]perylene	NLE	NLE	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Benzo[k]fluoranthene	4	500	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
bis(2-chloroethyl)ether	3	10	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
bis(2-Ethylhexyl)phthalate	210	100	1.100 U	**0.510 J**	NT	**0.430 J**	1.100 U	NT	**0.410 J**	**0.390 J**	NT	**0.440 J**	**0.220 JB**	NT	**0.150 JB**	**0.390 JB**	NT
Butyl benzyl phthalate	10000	100	1.100 U	**0.220 J**	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
4-Chloroaniline	4200	NLE	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Chrysene	40	500	1.100 U	**0.089 J**	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	**0.120 J**	1.100 U	NT	1.200 U	**0.360 J**	NT
Dibenz[a,h]anthracene	0.66	100	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Dibenzofuran	NLE	NLE	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Diethyl phthalate	10000	50	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Di-n-butylphthalate	10000	100	**0.350 J**	**0.084 JB**	NT	**0.220 JB**	**0.530 JB**	NT	**0.250 JB**	**0.280 JB**	NT	**0.091 JB**	**0.074 JB**	NT	1.200 U	**0.920 JB**	NT
Di-n-octyl phthalate	10000	100	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Fluoranthene	10000	100	**0.054 J**	**0.110 J**	NT	1.200 U	**0.140 J**	NT	1.200 U	**0.096 J**	NT	**0.170 J**	1.100 U	NT	1.200 U	**0.490 J**	NT
Fluorene	10000	100	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Indeno[1,2,3-cd]pyrene	4	500	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
2-Methylnaphthalene	NLE	NLE	1.100 U	1.100 U	NT	1.200 U	**0.370 J**	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Naphthalene	4200	100	1.100 U	1.100 U	NT	1.200 U	**0.180 J**	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U	NT	1.200 U	1.100 U	NT
Phenanthrene	NLE	NLE	1.100 U	1.100 U	NT	1.200 U	**0.170 J**	NT	1.200 U	1.200 U	NT	**0.094 J**	1.100 U	NT	1.200 U	**0.290 J**	NT
Pyrene	10000	100	1.100 U	**0.140 J**	NT	1.200 U	**0.280 J**	NT	1.200 U	**0.130 J**	NT	**0.180 J**	1.100 U	NT	1.200 U	**0.580 J**	NT
PCBs																	
Aroclor 1260	2	50	0.0041 U	0.0041 U	NT	0.0041 U	0.0041 U	NT	0.0041 U	0.0041 U	NT	0.0041 U	0.0040 U	NT	0.0042 U	0.0040 U	NT
Metals																	
Aluminum	NLE	NLE	**16900 B**	**9970 B**	NT	**12100 B**	**5070 B**	NT	**12900 B**	**5250 B**	NT	**10800 B**	**9520 B**	NT	**18700 B**	**17500 B**	NT
Antimony	340	NLE	0.459 U	0.418 U	NT	0.467 U	**1.85**	NT	0.492 U	0.472 U	NT	0.479 U	0.414 U	NT	0.453 U	**8.42**	NT
Arsenic	20	NLE	**9.24**	**5.85**	NT	**8.74**	**5.65**	NT	**7.41**	**4.40**	NT	**8.94**	**6.18**	NT	**10.0**	**27.6**	NT
Barium	47000	NLE	**53.1 B**	**23.3 B**	NT	**41.3 B**	**78.0 B**	NT	**44.8 B**	**19.4 B**	NT	**33.1 B**	**21.7 B**	NT	**38.6 B**	**357 B**	NT
Beryllium	140	NLE	**1.44**	**1.27**	NT	**1.12**	**0.442**	NT	**0.960**	**0.397**	NT	**0.940**	**0.440**	NT	**1.52**	**1.38**	NT
Cadmium	100	NLE	**0.384 B**	**0.216**	NT	**0.113**	**0.335**	NT	**0.0591**	**0.152**	NT	**0.0948**	**0.403**	NT	**0.287**	**0.896 B**	NT
Calcium	NLE	NLE	**2280 B**	**1460 B**	NT	**1360 B**	**1550 B**	NT	**1090 B**	**1650 B**	NT	**2320 B**	**1050 B**	NT	**1330 B**	**16300 B**	NT
Chromium	NLE	NLE	**89.6**	**99.9**	NT	**61.4**	**20.9**	NT	**54.1**	**33.4**	NT	**94.9**	**53.7**	NT	**104**	**55.6**	NT
Cobalt	NLE	NLE	0.350 U	**1.82**	NT	**0.596**	**3.33**	NT	**0.629**	0.359 U	NT	**0.364**	**1.98**	NT	**1.17**	**7.35**	NT
Copper	45000	NLE	**11.7 B**	**21.1 B**	NT	**8.76 B**	**118 B**	NT	**6.65 B**	**11.0 B**	NT	**27.0 B**	**29.3 B**	NT	**9.52 B**	**1370 B**	NT
Iron	NLE	NLE	**37300 B**	**37700 B**	NT	**27100 B**	**17900 B**	NT	**21800 B**	**13000 B**	NT	**27800 B**	**17400**	NT	**51100**	**36600 B**	NT
Lead	800	NLE	**8.74**	**20.5**	NT	**15.5**	**103**	NT	**14.4**	**16.0**	NT	**27.7**	**44.1**	NT	**4.15**	**1300**	NT
Magnesium	NLE	NLE	**4490 B**	**4110 B**	NT	**3030 B**	**775 B**	NT	**2480 B**	**1290 B**	NT	**3900 B**	**1270**	NT	**4990**	**3310 B**	NT
Manganese	NLE	NLE	**75.5**	**51.5 B**	NT	**142 B**	**69.5 B**	NT	**69.5 B**	**60.6 B**	NT	**48.1 B**	**42.4 B**	NT	**104 B**	**230**	NT
Mercury	270	NLE	0.105 U	0.113 U	NT	0.115 U	**0.16**	NT	0.110 U	0.118 U	NT	0.111 U	0.097 U	NT	0.107 U	0.110 U	NT
Nickel	2400	NLE	**9.56**	**6.91**	NT	**6.20**	**11.9**	NT	**7.61**	**3.59**	NT	**5.86**	**5.91**	NT	**8.19**	**31.0**	NT
Potassium	NLE	NLE	**8740**	**9390 B**	NT	**4910 B**	**1300 B**	NT	**3280 B**	**2320 B**	NT	**6910 B**	**2400 B**	NT	**12900 B**	**3260**	NT
Selenium	3100	NLE	0.677 U	0.617 U	NT	0.689 U	0.636 U	NT	0.727 U	0.696 U	NT	0.707 U	0.611 U	NT	0.669 U	**1.32 B**	NT
Sodium	NLE	NLE	39.769 U	36.221 U	NT	40.462 U	37.365 U	NT	**306 B**	40.873 U	NT	41.505 U	35.851 U	NT	39.303 U	35.868 U	NT
Vanadium	7100	NLE	**58.5**	**61.1**	NT	**41.9**	**21.9**	NT	**39.2**	**23.6**	NT	**54.2**	**47.8**	NT	**71.3**	**53.8**	NT
Zinc	1500	NLE	**56.4**	**107 B**	NT	**47.5 B**	**63.2 B**	NT	**43.7 B**	**45.7 B**	NT	**61.3 B**	**58.2 B**	NT	**51.1 B**	**393**	NT

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

mg/kg = milligram per kilogram.

Table 3.21-4
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results														
		Sample ID:	P83-SB9-C	P83-SB10-A	P83-SB10-B	P83-SB10-C	P83-SB10-D	P83-SB11-A	P83-SB11-B	P83-SB11-C	P83-SB12-A	P83-SB12-B	P83-SB12-C	P83-SB13-A	P83-SB13-B	P83-SB13-C	P83-SB14-A
		Lab ID:	7053606	7053412	7053413	7053414	7053415	7054004	7054005	7054006	7053610	7053611	7053612	7053607	7053608	7053609	7054016
		Date Sampled:	12/17/2007	12/15/2007	12/15/2007	12/15/2007	12/15/2007	12/18/2007	12/18/2007	12/18/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007	12/18/2007
		Depth (ft. bgs):	4.5-5.0	0.0-0.5	1.5-2.0	5.0-5.5	6.5-7.0	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	3.5-4.0	0.0-0.5
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles																	
Acetone	1000	100	**4.300 B**	NT	**1.000**	**1.000**	**1.100**	NT	**0.081 J**	**0.092 J**	NT	**4.200 B**	**3.400 B**	NT	**4.100 B**	**3.700 B**	NT
Benzene	13	1	0.260 U	NT	0.240 U	0.270 U	0.250 U	NT	0.260 U	0.270 U	NT	0.340 U	**0.016 J**	NT	0.300 U	0.280 U	NT
Carbon disulfide	NLE	NLE	0.260 U	NT	0.240 U	0.270 U	0.250 U	NT	0.260 U	0.270 U	NT	0.340 U	0.270 U	NT	0.300 U	0.280 U	NT
1,2-Dichloroethane	24	1	0.260 U	NT	0.240 U	0.270 U	0.250 U	NT	0.260 U	0.270 U	NT	0.340 U	0.270 U	NT	0.300 U	0.280 U	NT
Ethylbenzene	1000	100	0.260 U	NT	0.240 U	0.270 U	0.250 U	NT	0.260 U	0.270 U	NT	0.340 U	**0.077 J**	NT	0.300 U	**0.020 J**	NT
Methylene Chloride	210	1	**0.055 JB**	NT	0.240 U	**0.023 J**	0.250 U	NT	0.260 U	0.270 U	NT	**0.110 JB**	**0.072 JB**	NT	**0.093 JB**	**0.099 JB**	NT
Toluene	1000	500	0.260 U	NT	0.240 U	0.270 U	0.250 U	NT	0.260 U	0.270 U	NT	0.340 U	**0.110 J**	NT	0.300 U	**0.061 J**	NT
Trichloroethylene	54	1	0.260 U	NT	0.240 U	0.270 U	0.250 U	NT	0.260 U	0.270 U	NT	0.340 U	0.270 U	NT	0.300 U	0.280 U	NT
Xylenes (Total)	1000	67	0.780 U	NT	0.720 U	0.800 U	0.760 U	NT	0.790 U	0.810 U	NT	1.020 U	**0.294 J**	NT	0.890 U	**0.063 J**	NT
Semi-Volatiles																	
Acenaphthene	10000	100	**0.160 J**	1.100 U	NT	**0.210 J**	**0.440 J**	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Acenaphthylene	NLE	NLE	**0.140 J**	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	**0.230 J**	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Anthracene	10000	100	**0.920 J**	1.100 U	NT	1.100 U	**0.310 J**	1.200 U	NT	1.200 U	**0.400 J**	NT	1.200 U	**0.097 J**	NT	1.100 U	**0.210 J**
Benzo[a]anthracene	4	500	**2.800**	1.100 U	NT	1.100 U	1.100 U	**0.095 J**	NT	1.200 U	**2.400**	NT	1.200 U	**0.410 J**	NT	**0.180 J**	**0.200 J**
Benzo[a]pyrene	0.66	100	**2.400**	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	**2.000**	NT	1.200 U	**0.350 J**	NT	**0.160 J**	**0.250 J**
Benzo[b]fluoranthene	4	50	**3.500**	1.100 U	NT	1.100 U	1.100 U	**0.130 J**	NT	1.200 U	**3.000**	NT	1.200 U	**0.610 J**	NT	**0.260 J**	**0.410 J**
Benzo[g,h,i]perylene	NLE	NLE	**0.900 J**	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Benzo[k]fluoranthene	4	500	**1.300**	1.100 U	NT	1.100 U	1.100 U	**0.054 J**	NT	1.200 U	**1.200**	NT	1.200 U	**0.160 J**	NT	**0.120 J**	**0.180 J**
bis(2-chloroethyl)ether	3	10	1.000 U	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
bis(2-Ethylhexyl)phthalate	210	100	**0.250 JB**	1.100 U	NT	1.100 U	1.100 U	**0.110 J**	NT	**0.350 J**	**0.480 JB**	NT	**0.280 JB**	**0.240 JB**	NT	**0.220 JB**	**0.430 J**
Butyl benzyl phthalate	10000	100	1.000 U	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
4-Chloroaniline	4200	NLE	1.000 U	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Chrysene	40	500	**2.900**	1.100 U	NT	1.100 U	1.100 U	**0.120 J**	NT	1.200 U	**2.500**	NT	1.200 U	**0.510 J**	NT	**0.260 J**	**0.250 J**
Dibenz[a,h]anthracene	0.66	100	1.000 U	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Dibenzofuran	NLE	NLE	**0.140 J**	1.100 U	NT	**0.180 J**	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Diethyl phthalate	10000	50	1.000 U	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Di-n-butylphthalate	10000	100	**0.490 JB**	**0.850 JB**	NT	**0.300 JB**	**0.580 JB**	**0.330 JB**	NT	**0.280 JB**	**0.670 JB**	NT	**0.850 JB**	**0.760 JB**	NT	**0.800 JB**	**0.079 JB**
Di-n-octyl phthalate	10000	100	1.000 U	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	**0.092 J**	1.100 U
Fluoranthene	10000	100	**5.500**	0.190 J	NT	1.100 U	**0.760 J**	**0.160 J**	NT	1.200 U	**3.400**	NT	1.200 U	**0.850 J**	NT	**0.340 J**	**0.280 J**
Fluorene	10000	100	**0.210 J**	1.100 U	NT	**0.190 J**	**0.330 J**	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Indeno[1,2,3-cd]pyrene	4	500	**0.950 J**	1.100 U	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
2-Methylnaphthalene	NLE	NLE	1.000 U	**4.300**	NT	**1.100 J**	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Naphthalene	4200	100	1.000 U	**2.220**	NT	1.100 U	1.100 U	1.200 U	NT	1.200 U	1.100 U	NT	1.200 U	1.200 U	NT	1.100 U	1.100 U
Phenanthrene	NLE	NLE	**3.200**	0.360 J	NT	**0.470 J**	**0.600 J**	**0.080 J**	NT	1.200 U	**1.400**	NT	**0.073 J**	**0.470 J**	NT	**0.200 J**	**0.210 J**
Pyrene	10000	100	**6.300**	0.350 J	NT	1.100 U	**0.610 J**	**0.190 J**	NT	1.200 U	**6.500**	NT	**0.078 J**	**0.950 J**	NT	**0.400 J**	**0.360 J**
PCBs																	
Aroclor 1260	2	50	0.0041 U	0.0040 U	NT	0.0039 U	0.0039 U	**0.20**	NT	0.0041 U	0.0039 U	NT	0.0040 U	0.0040 U	NT	0.0042 U	**0.07**
Metals																	
Aluminum	NLE	NLE	**9100 B**	**7040 B**	NT	**24600 B**	**15600 B**	**12700 B**	NT	**16800 B**	**7970 B**	NT	**19100 B**	**16000 B**	NT	**19100 B**	**6480 B**
Antimony	340	NLE	0.419 U	**2.64**	NT	0.431 U	0.428 U	0.460 U	NT	0.460 U	0.434 U	NT	0.462 U	0.460 U	NT	0.433 U	0.417 U
Arsenic	20	NLE	**6.09**	**27.1**	NT	**9.81**	**11.9**	**8.96**	NT	**9.50**	**5.13**	NT	**8.73**	**12.8**	NT	**9.88**	**5.22**
Barium	47000	NLE	**45.2 B**	**148 B**	NT	**54.1 B**	**27.2 B**	**44.8 B**	NT	**25.6 B**	**61.3 B**	NT	**45.6 B**	**53.0 B**	NT	**67.3 B**	**23.8 B**
Beryllium	140	NLE	**0.498**	**0.539**	NT	**1.73**	**1.38**	**1.18**	NT	**2.07**	**0.312**	NT	**1.60**	**1.27**	NT	**2.02**	**0.295**
Cadmium	100	NLE	**0.344 B**	**1.08**	NT	**0.627**	**0.613**	**0.222**	NT	**0.353**	**0.467 B**	NT	**0.422 B**	**0.520 B**	NT	**0.716 B**	**0.207**
Calcium	NLE	NLE	**5990 B**	**3210 B**	NT	**1140 B**	**486 B**	**1670 B**	NT	**2080 B**	**39400 B**	NT	**1750 B**	**2970 B**	NT	**2060 B**	**590 B**
Chromium	NLE	NLE	**33.6**	**41.8 B**	NT	**125 B**	**105 B**	**73.7**	NT	**156**	**21.5**	NT	**97.4**	**81.1**	NT	**149**	**23.9**
Cobalt	NLE	NLE	**0.985**	**4.96**	NT	**0.876**	**3.68**	**1.78**	NT	**1.82**	**1.44**	NT	**1.71**	**0.725**	NT	**1.78**	0.317 U
Copper	45000	NLE	**12.6 B**	**244 B**	NT	**7.17 B**	**6.60 B**	**23.8 B**	NT	**6.77 B**	**44.0 B**	NT	**7.87 B**	**21.4 B**	NT	**13.1 B**	**11.8 B**
Iron	NLE	NLE	**17300 B**	**24600**	NT	**49800**	**47800**	**33300 B**	NT	**66600 B**	**14100 B**	NT	**45300 B**	**37200 B**	NT	**67000 B**	**16700 B**
Lead	800	NLE	**14.4**	**401**	NT	**2.72**	**1.13**	**49.9**	NT	**0.754**	**63.0**	NT	**4.24**	**44.4**	NT	**62.8**	**25.7**
Magnesium	NLE	NLE	**3270 B**	**1840 B**	NT	**6520 B**	**5170 B**	**3620 B**	NT	**7130 B**	**3730 B**	NT	**4950 B**	**4120 B**	NT	**7330 B**	**719 B**
Manganese	NLE	NLE	**113**	**53.1 B**	NT	**99.5 B**	**62.4 B**	**119 B**	NT	**35.3 B**	**177**	NT	**174**	**151**	NT	**89.0**	**51.4 B**
Mercury	270	NLE	0.097 U	0.113 U	NT	0.104 U	0.108 U	0.121 U	NT	0.104 U	0.098 U	NT	0.116 U	0.107 U	NT	0.101 U	**0.11**
Nickel	2400	NLE	**9.42**	**13.3 B**	NT	**9.34 B**	**7.75 B**	**8.87**	NT	**7.65**	**12.7**	NT	**13.9**	**13.1**	NT	**9.41**	**4.51**
Potassium	NLE	NLE	**2100**	**1800 B**	NT	**12600 B**	**11300 B**	**6720 B**	NT	**16100 B**	**1210**	NT	**7370**	**7910**	NT	**16500**	**1210 B**
Selenium	3100	NLE	0.619 U	0.657 U	NT	0.637 U	0.632 U	0.679 U	NT	0.680 U	0.640 U	NT	0.683 U	0.679 U	NT	0.640 U	0.615 U
Sodium	NLE	NLE	36.33 U	**68.8 B**	NT	37.391 U	37.122 U	39.868 U	NT	39.898 U	37.577 U	NT	40.074 U	39.869 U	NT	37.554 U	36.115 U
Vanadium	7100	NLE	**36.9**	**27.4**	NT	**81.1**	**76.6**	**52.5**	NT	**81.8**	**32.8**	NT	**64.0**	**60.4**	NT	**88.5**	**30.9**
Zinc	1500	NLE	**38.9**	**49.6 B**	NT	**51.2 B**	**47.9 B**	**82.2 B**	NT	**65.9 B**	**116**	NT	**66.7**	**97.5**	NT	**113**	**52.0 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

mg/kg = milligram per kilogram.

Table 3.21-4
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Soil (mg/kg)

			Analytical Results											
		Sample ID:	P83-SB14-B	P83-SB14-C	P83-SB14-C DUP	P83-SB15-A	P83-SB15-B	P83-SB15-C	P83-SB16-A	P83-SB16-B	P83-SB16-C	P83-SB17-A	P83-SB17-B	P83-SB17-C
		Lab ID:	7054017	7054018	7054003	7054019	7054020	7054021	7054704	7054705	7054706	7054707	7054708	7054709
		Date Sampled:	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/18/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007	12/19/2007
		Depth (ft. bgs):	1.5-2.0	3.0-3.5	3.0-3.5	0.0-0.5	1.5-2.0	3.0-3.5	0.0-0.5	1.5-2.0	2.0-2.5	0.0-0.5	1.5-2.0	5.5-6.0
Chemical	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Volatiles														
Acetone	1000	100	**0.200 J**	0.370 U	0.330 U	NT	**0.930**	0.270 U	NT	**1.200**	0.290 U	NT	0.280 U	0.260 U
Benzene	13	1	0.300 U	0.370 U	0.330 U	NT	0.290 U	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
Carbon disulfide	NLE	NLE	0.300 U	0.370 U	0.330 U	NT	**0.039 J**	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
1,2-Dichloroethane	24	1	0.300 U	0.370 U	0.330 U	NT	0.290 U	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
Ethylbenzene	1000	100	0.300 U	0.370 U	0.330 U	NT	0.290 U	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
Methylene Chloride	210	1	0.300 U	0.370 U	0.330 U	NT	0.290 U	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
Toluene	1000	500	0.300 U	0.370 U	0.330 U	NT	0.290 U	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
Trichloroethylene	54	1	0.300 U	0.370 U	0.330 U	NT	0.290 U	0.270 U	NT	0.310 U	0.290 U	NT	0.280 U	0.260 U
Xylenes (Total)	1000	67	0.900 U	1.120 U	0.980 U	NT	0.870 U	0.810 U	NT	0.920 U	0.860 U	NT	0.850 U	0.780 U
Semi-Volatiles														
Acenaphthene	10000	100	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Acenaphthylene	NLE	NLE	NT	**0.130 J**	**0.340 J**	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Anthracene	10000	100	NT	**0.095 J**	**0.091 J**	**0.060 J**	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Benzo[a]anthracene	4	500	NT	**0.550 J**	**0.570 J**	**0.290 J**	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Benzo[a]pyrene	0.66	100	NT	**0.580 J**	**0.730 J**	**0.310 J**	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Benzo[b]fluoranthene	4	50	NT	**0.720 J**	**1.100 J**	**0.500 J**	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Benzo[g,h,i]perylene	NLE	NLE	NT	**0.500 J**	**0.530 J**	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Benzo[k]fluoranthene	4	500	NT	**0.310 J**	**0.420 J**	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
bis(2-chloroethyl)ether	3	10	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
bis(2-Ethylhexyl)phthalate	210	100	NT	**0.470 J**	1.200 U	**0.520 J**	NT	**0.260 J**	1.100 U	NT	**0.140 JB**	**0.200 JB**	NT	**0.210 JB**
Butyl benzyl phthalate	10000	100	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
4-Chloroaniline	4200	NLE	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Chrysene	40	500	NT	**0.570 J**	**0.800 J**	**0.370 J**	NT	1.200 U	**0.260 J**	NT	1.100 U	1.100 U	NT	1.100 U
Dibenz[a,h]anthracene	0.66	100	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Dibenzofuran	NLE	NLE	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Diethyl phthalate	10000	50	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Di-n-butylphthalate	10000	100	NT	**0.280 JB**	**0.380 JB**	**0.270 JB**	NT	**0.310 JB**	1.100 U	NT	**0.055 JB**	**0.110 JB**	NT	**0.068 JB**
Di-n-octyl phthalate	10000	100	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Fluoranthene	10000	100	NT	**0.690 J**	**0.580 J**	**0.480 J**	NT	1.200 U	**0.240 J**	NT	1.100 U	**0.086 J**	NT	1.100 U
Fluorene	10000	100	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
Indeno[1,2,3-cd]pyrene	4	500	NT	**0.440 J**	**0.520 J**	1.100 U	NT	1.200 U	1.100 U	NT	1.100 U	1.100 U	NT	1.100 U
2-Methylnaphthalene	NLE	NLE	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	**0.250 J**	NT	1.100 U	1.100 U	NT	1.100 U
Naphthalene	4200	100	NT	1.200 U	1.200 U	1.100 U	NT	1.200 U	**0.160 J**	NT	1.100 U	1.100 U	NT	1.100 U
Phenanthrene	NLE	NLE	NT	**0.240 J**	**0.100 J**	**0.170 J**	NT	1.200 U	**0.230 J**	NT	1.100 U	1.100 U	NT	1.100 U
Pyrene	10000	100	NT	**0.800 J**	**0.800 J**	**0.670 J**	NT	1.200 U	**0.290 J**	NT	1.100 U	**0.094 J**	NT	1.100 U
PCBs														
Aroclor 1260	2	50	NT	0.0040 U	0.0041 U	0.0041 U	NT	0.0041 U	0.0041 U	NT	0.0042 U	0.0041 U	NT	0.0039 U
Metals														
Aluminum	NLE	NLE	NT	**19000 B**	**16900 B**	**8030 B**	NT	**19800 B**	**6520 B**	NT	**17000 B**	**17100 B**	NT	**9680 B**
Antimony	340	NLE	NT	0.458 U	0.433 U	0.436 U	NT	0.476 U	0.421 U	NT	0.451 U	0.443 U	NT	0.428 U
Arsenic	20	NLE	NT	**10.2**	**8.87**	**4.51**	NT	**14.3**	**4.17**	NT	**7.93**	**9.08**	NT	**8.88**
Barium	47000	NLE	NT	**45.6 B**	**43.2 B**	**50.9 B**	NT	**32.5 B**	**50.7 B**	NT	**46.5 B**	**53.9 B**	NT	**19.5 B**
Beryllium	140	NLE	NT	**1.84**	**1.82**	**0.0474**	NT	**1.90**	**0.497**	NT	**1.52**	**1.88**	NT	**0.983**
Cadmium	100	NLE	NT	**0.366**	**0.154**	**0.426**	NT	**0.377**	**0.276**	NT	**0.129**	**0.429**	NT	**0.118**
Calcium	NLE	NLE	NT	**1830 B**	**1960 B**	**5490 B**	NT	**1410 B**	**3300 B**	NT	**1020 B**	**1410 B**	NT	**326 B**
Chromium	NLE	NLE	NT	**138**	**130**	**203**	NT	**136**	**21.4**	NT	**107**	**124**	NT	**60.2**
Cobalt	NLE	NLE	NT	**1.97**	**2.64**	**1.50**	NT	**3.25**	**2.66**	NT	**1.99**	**3.24**	NT	**0.938**
Copper	45000	NLE	NT	**13.6 B**	**16.8 B**	**39.9 B**	NT	**9.34 B**	**39.5 B**	NT	**7.24 B**	**8.35 B**	NT	**4.28 B**
Iron	NLE	NLE	NT	**55600 B**	**52500**	**25300 B**	NT	**64400 B**	**15700 B**	NT	**43300 B**	**52700 B**	NT	**35800 B**
Lead	800	NLE	NT	**9.67**	**12.5**	**15.5**	NT	**2.23**	**55.1**	NT	**1.51**	**10.3**	NT	**0.498**
Magnesium	NLE	NLE	NT	**6150 B**	**6030 B**	**2670 B**	NT	**6850 B**	**835 B**	NT	**5070 B**	**5740 B**	NT	**2320 B**
Manganese	NLE	NLE	NT	**126 B**	**158 B**	**1240 B**	NT	**87.2 B**	**51.7 B**	NT	**136 B**	**90.8 B**	NT	**83.6 B**
Mercury	270	NLE	NT	0.108 U	0.111 U	0.116 U	NT	0.115 U	0.107 U	NT	0.115 U	0.104 U	NT	0.105 U
Nickel	2400	NLE	NT	**9.23**	**9.94**	**7.76**	NT	**11.1**	**12.0**	NT	**10.4**	**12.5**	NT	**5.82**
Potassium	NLE	NLE	NT	**12900 B**	**12300 B**	**2400 B**	NT	**13300 B**	**1440 B**	NT	**9040 B**	**13000 B**	NT	**5190 B**
Selenium	3100	NLE	NT	0.677 U	0.639 U	0.644 U	NT	0.702 U	0.621 U	NT	0.666 U	0.655 U	NT	0.632 U
Sodium	NLE	NLE	NT	39.729 U	37.506 U	37.78 U	NT	41.224 U	36.446 U	NT	39.087 U	38.426 U	NT	37.117 U
Vanadium	7100	NLE	NT	**82.5**	**75.7**	**37.3**	NT	**84.6**	**39.4**	NT	**65.9**	**74.9**	NT	**60.9**
Zinc	1500	NLE	NT	**79.2 B**	**81.8 B**	**173 B**	NT	**150 B**	**54.4 B**	NT	**63.5 B**	**83.3 B**	NT	**40.3 B**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

mg/kg = milligram per kilogram.

Table 3.21-5
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results								
	Sample ID:	P83-161MW-01	P83-A1	P83-A1 DUP	P83-A3	P83-A5	P83GW-1	P83GW-1 DUP	P83GW-3	P83GW-5
	Lab ID:	7055713	7053804	7053803	7053805	7053806	7055704	7055703	7055705	7055706
	Date Sampled:	12/20/2007	12/17/2007	12/17/2007	12/17/2007	12/17/2007	12/20/2007	12/20/2007	12/20/2007	12/20/2007
	Screened Interval (ft. bgs):	5.2-15.2	3-8	3-8	3-8	5-10	5-10	5-10	4-9	4-9
Chemical	Quality Criteria[1]	Results	Results	Results	Results	Results	Results	Results	Results	Results
Volatiles										
Acetone	6000	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U	0.85 U
Carbon disulfide	700	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.20 J	0.44 U
1,2-Dichloroethane	2	0.30 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Methyl tertiary butyl ether (MTBE)	70	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	**1.03**	0.23 U
Tertiary butyl alcohol	100	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	**23.38**	1.82 U
Toluene	600	0.27 U	0.27 U	0.27 U	**0.84**	0.27 U	0.27 U	0.27 U	0.27 U	0.27 U
Xylenes (Total)	1000	0.49 U	0.49 U	0.49 U	**0.24 J**	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Semi-Volatiles										
Acenaphthene	400	10 U	11 U	11 U	**1 J**	10 U	10 U	10 U	10 U	10 U
Anthracene	2000	10 U	11 U	11 U	**0.40 J**	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	3	10 U	**5 JB**	**4 JB**	10 U	**0.60 JB**	**2 JB**	10 U	**0.90 JB**	**1 JB**
Dibenzofuran	NLE	10 U	11 U	11 U	**0.70 J**	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	6000	10 U	11 U	11 U	**0.50 JB**	10 U	10 U	10 U	10 U	10 U
Di-n-butyl phthalate	700	10 U	**4 JB**	**1 JB**	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-octyl phthalate	100	**0.50 JB**	**1 J**	**1 J**	10 U	10 U	10 U	10 U	10 U	10 U
Fluoranthene	300	10 U	11 U	11 U	**0.50 J**	10 U	10 U	10 U	10 U	10 U
Fluorene	300	10 U	11 U	11 U	**2 J**	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	30	10 U	11 U	11 U	**4 J**	10 U	10 U	10 U	10 U	10 U
Naphthalene	300	10 U	11 U	11 U	**5 J**	10 U	10 U	10 U	10 U	10 U
Phenanthrene	NLE	10 U	11 U	11 U	**3 J**	10 U	10 U	10 U	10 U	10 U
Pyrene	200	10 U	**0.50 J**	11 U	**0.40 J**	10 U	10 U	10 U	10 U	10 U
Metals										
Aluminum	200	NT	**2460 B**	**1440 B**	**1710 B**	**884 B**	NT	NT	NT	NT
Arsenic	3	NT	2.70 U	**5.04**	2.70 U	2.70 U	NT	NT	NT	NT
Barium	6000	NT	**58.7**	**107**	**26.1**	**16.3**	NT	NT	NT	NT
Beryllium	1	NT	**0.794**	**0.788**	**0.437**	**0.132**	NT	NT	NT	NT
Cadmium	4	NT	**0.358**	**0.672**	0.20 U	**0.219**	NT	NT	NT	NT
Calcium	NLE	NT	**16000 B**	**27700 B**	**5710 B**	**17800 B**	NT	NT	NT	NT
Chromium (Total)	70	NT	**6.13 B**	**2.57 B**	**10 B**	**2.37 B**	NT	NT	NT	NT
Cobalt	100*	NT	**1.50**	**2.08**	0.20 U	**0.805**	NT	NT	NT	NT
Copper	1300	NT	**12.1**	**13.8**	**5.76**	**3.34**	NT	NT	NT	NT
Iron	300	NT	**3520**	**3860**	**11100**	**516**	NT	NT	NT	NT
Magnesium	NLE	NT	**1290**	**2050**	**626**	**2520**	NT	NT	NT	NT
Manganese	50	NT	**89 B**	**140 B**	**113 B**	**18.1 B**	NT	NT	NT	NT
Nickel (Soluble Salts)	100	NT	**4 B**	**6.43 B**	**0.56 B**	**3.16 B**	NT	NT	NT	NT
Potassium	NLE	NT	**2290 B**	**3230 B**	**281 B**	**1050 B**	NT	NT	NT	NT
Selenium	40	NT	**5.34 B**	**4.76 B**	2.70 U	**7.16 B**	NT	NT	NT	NT
Sodium	50000	NT	**90000**	**94800**	**4630**	**18500**	NT	NT	NT	NT
Vanadium	NLE	NT	**20.5**	**9.07**	**25.9**	**1.75**	NT	NT	NT	NT
Zinc	2000	NT	**120**	**142**	**9.55**	**13.1**	NT	NT	NT	NT

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.
ft. bgs = Feet below ground surface.
NLE = No limit established.
Bold = Analyte was detected.
Shaded = Concentration exceeds Quality Criteria.
µg/L = micrograms per liter.

B = The compound was found in the associated method blank as well as in the sample.
D = Sample was diluted.
E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.
J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.
U = The compound was analyzed for but not detected.
NT = Not tested.

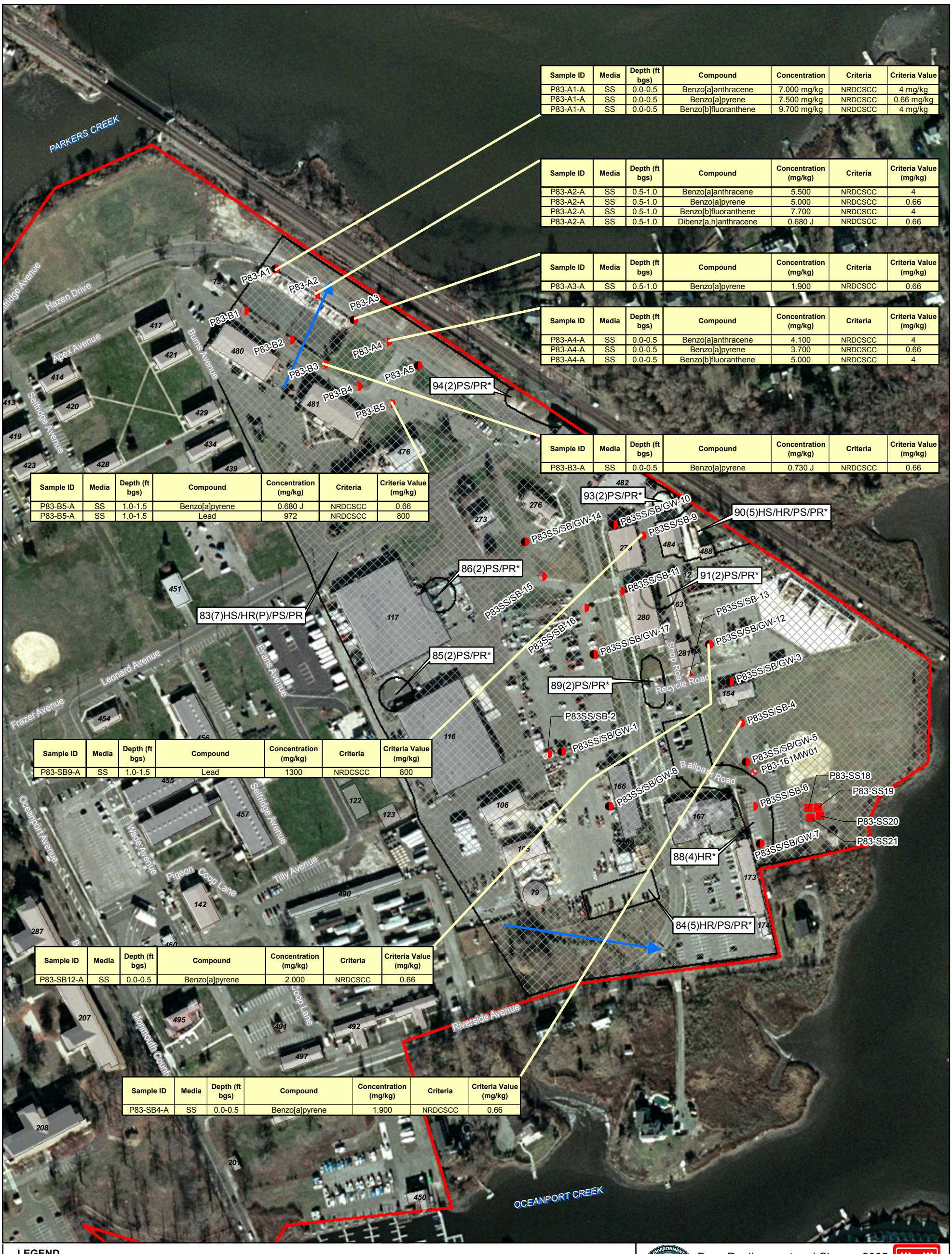
Table 3.21-5
Fort Monmouth Phase II Site Investigation, Parcel 83
Summary of Analytical Parameters Detected in Groundwater (µg/L)

		Analytical Results					
	Sample ID:	P83GW-7	P83GW-8	P83GW-10	P83GW-12	P83GW-14	P83GW-17
	Lab ID:	7055707	7055708	7055709	7055710	7055711	7055712
	Date Sampled:	12/20/2007	12/20/2007	12/20/2007	12/20/2007	12/20/2007	12/20/2007
	Depth (ft. bgs):	4-9	4-9	4-9	4-9	4-9	6-11
Chemical	Quality Criteria[1]	Results	Results	Results	Results	Results	Results
Volatiles							
Acetone	6000	0.85 U	**1.65**	**2.31**	**1.63**	**1.33**	0.85 U
Carbon disulfide	700	0.44 U	0.44 U	**0.66**	0.44 U	0.44 U	0.44 U
1,2-Dichloroethane	2	0.33 U	**1.81**	0.33 U	0.33 U	0.33 U	0.33 U
Methyl tertiary butyl ether (MTBE)	70	0.23 U	**0.77**	0.23 U	0.23 U	0.23 U	0.23 U
Tertiary butyl alcohol	100	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U	1.82 U
Toluene	600	0.27 U	0.27 U	**0.46**	0.27 U	0.27 U	0.27 U
Xylenes (Total)	1000	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U
Semi-Volatiles							
Acenaphthene	400	10 U	10 U	10 U	10 U	10 U	10 U
Anthracene	2000	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	3	**2 JB**	**0.60 JB**	10 U	10 U	**0.70 JB**	**0.90 JB**
Dibenzofuran	NLE	10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate	6000	10 U	10 U	10 U	10 U	10 U	**0.50 J**
Di-n-butyl phthalate	700	10 U	**0.40 J**	10 U	10 U	10 U	10 U
Di-n-octyl phthalate	100	**1 JB**	10 U	10 U	**0.80 JB**	**0.50 JB**	**0.50 JB**
Fluoranthene	300	10 U	10 U	10 U	10 U	10 U	10 U
Fluorene	300	10 U	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	30	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	300	10 U	10 U	10 U	10 U	10 U	10 U
Phenanthrene	NLE	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	200	10 U	10 U	10 U	10 U	10 U	10 U
Metals							
Aluminum	200	NT	NT	NT	NT	NT	NT
Arsenic	3	NT	NT	NT	NT	NT	NT
Barium	6000	NT	NT	NT	NT	NT	NT
Beryllium	1	NT	NT	NT	NT	NT	NT
Cadmium	4	NT	NT	NT	NT	NT	NT
Calcium	NLE	NT	NT	NT	NT	NT	NT
Chromium	70	NT	NT	NT	NT	NT	NT
Cobalt	100*	NT	NT	NT	NT	NT	NT
Copper	1300	NT	NT	NT	NT	NT	NT
Iron	300	NT	NT	NT	NT	NT	NT
Magnesium	NLE	NT	NT	NT	NT	NT	NT
Manganese	50	NT	NT	NT	NT	NT	NT
Nickel	100	NT	NT	NT	NT	NT	NT
Potassium	NLE	NT	NT	NT	NT	NT	NT
Selenium	40	NT	NT	NT	NT	NT	NT
Sodium	50000	NT	NT	NT	NT	NT	NT
Vanadium	NLE	NT	NT	NT	NT	NT	NT
Zinc	2000	NT	NT	NT	NT	NT	NT

[1] Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6 (* Interim GWQC).

DUP = Duplicate Sample.
ft. bgs = Feet below ground surface.
NLE = No limit established.
Bold = Analyte was detected.
Shaded = Concentration exceeds Quality Criteria.
µg/L = micrograms per liter.

B = The compound was found in the associated method blank as well as in the sample.
D = Sample was diluted.
E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.
J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.
U = The compound was analyzed for but not detected.
NT = Not tested.



Sample ID	Media	Depth (ft bgs)	Compound	Concentration	Criteria	Criteria Value
P83-A1-A	SS	0.0-0.5	Benzo[a]anthracene	7.000 mg/kg	NRDCSCC	4 mg/kg
P83-A1-A	SS	0.0-0.5	Benzo[a]pyrene	7.500 mg/kg	NRDCSCC	0.66 mg/kg
P83-A1-A	SS	0.0-0.5	Benzo[b]fluoranthene	9.700 mg/kg	NRDCSCC	4 mg/kg

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-A2-A	SS	0.5-1.0	Benzo[a]anthracene	5.500	NRDCSCC	4
P83-A2-A	SS	0.5-1.0	Benzo[a]pyrene	5.000	NRDCSCC	0.66
P83-A2-A	SS	0.5-1.0	Benzo[b]fluoranthene	7.700	NRDCSCC	4
P83-A2-A	SS	0.5-1.0	Dibenz[a,h]anthracene	0.680 J	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-A3-A	SS	0.5-1.0	Benzo[a]pyrene	1.900	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-A4-A	SS	0.0-0.5	Benzo[a]anthracene	4.100	NRDCSCC	4
P83-A4-A	SS	0.0-0.5	Benzo[a]pyrene	3.700	NRDCSCC	0.66
P83-A4-A	SS	0.0-0.5	Benzo[b]fluoranthene	5.000	NRDCSCC	4

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-B3-A	SS	0.0-0.5	Benzo[a]pyrene	0.730 J	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-B5-A	SS	1.0-1.5	Benzo[a]pyrene	0.680 J	NRDCSCC	0.66
P83-B5-A	SS	1.0-1.5	Lead	972	NRDCSCC	800

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-SB9-A	SS	1.0-1.5	Lead	1300	NRDCSCC	800

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-SB12-A	SS	0.0-0.5	Benzo[a]pyrene	2.000	NRDCSCC	0.66

Sample ID	Media	Depth (ft bgs)	Compound	Concentration (mg/kg)	Criteria	Criteria Value (mg/kg)
P83-SB4-A	SS	0.0-0.5	Benzo[a]pyrene	1.900	NRDCSCC	0.66

LEGEND

- Groundwater Sample Location at Existing Monitoring Well Location
- Geoprobe Soil Sample Location
- Geoprobe Soil & Groundwater Sample Location
- Surface Soil Sampling Location
- Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
- Building
- Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

7 Areas that are not evaluated or require additional evaluation.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

8(2)PS
- CONTAMINATION DESCRIPTION
  - HS - Hazardous Substance Storage
  - HR - Hazardous Substance Release
  - PS - Petroleum Storage
  - PR - Petroleum Release
  - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER

N

Aerial photography (0.5-meter resolution), dated January 15, 2006, was obtained from ESRI ArcOnline Map Services, July 2008.

SCALE:
0 112.5 225 450 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.21-1
FORT MONMOUTH
ECP SITE INVESTIGATION
PARCEL 83 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN
MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_21-1_SI_P83_Exceeds_SampLoc.mxd (7/14/2008 2:21:54 PM)

3.22 Sanitary Sewer System

3.22.1 Site Description

FTMM currently maintains a sewage collection system that consists of approximately 23 miles of underground distribution lines and 20 sewage pump stations. Five of the pump stations are located at CWA and the remainder of the pump stations are located throughout the MP (33). The sewage collection system ultimately connects to the local sewerage authority (Two Rivers Water Reclamation Authority) at two connection points, one at the MP and one at CWA (43). Analytical sampling conducted in mid-2002 of the sewage discharge at both junction points indicated that FTMM is not a significant industrial user and does not require any treatment of the discharge, nor does FTMM require a significant industrial user permit from the NJDEP.

Prior to the current configuration of the sewage system, FTMM maintained two government-owned STPs (one STP on the MP and the other on CWA). The MP had a pre-1941 STP and a second STP constructed in 1941 when the former was taken offline. The CWA STP was constructed in 1942. Sewage was treated at government-owned plants until 1975 when the FTMM collection system was tied into the regional system. Additional information can be found in Section 5.13.11 of the Phase I ECP (1).

3.22.2 Previous Investigations

The MP STP was investigated as part of the IRP (FTMM-19), and the NJDEP approved the recommendation for NFA in 1996. The CWA STP was investigated as part of the IRP (FTMM-27), and NFA was approved by the NJDEP. A pre-1941 STP operated at the MP has been investigated as part of the IRP (FTMM-20), and an RI report was submitted to the NJDEP in March 2004. No response has been received from the NJDEP.

A USAEHA 1976 Water Quality Engineering Special Study stated that effluents from the Myer Center posed a threat to the acceptability of waste discharged from the CWA of FTMM to the regional sewer authority. Strong acids and bases discharged from the facility were a cause for concern, should the connection to the regional sewer authority occur (20).

Following the initial visits by USAEHA in 1975 and 1976, an extensive effort was undertaken to locate sources of industrial waste in the Myer Center. Various samples from shops were forwarded by the U.S. Army Electronics Command Environmental Office to USAEHA for chemical analysis and walk-through inspections of labs were made. Disposal recommendations were made by USAEHA. The Facilities Engineer also worked with USAEHA on options for use of the CWA STP as a pre-treatment facility. According to FTMM personnel, no chemical wastes have been discharged to the sanitary sewer since the mid-1980s. Activities at Bldg 2700 have since been converted primarily to administrative functions. Current waste management practices prohibit the discharge of any materials, other than water and biodegradable soaps, into the sanitary sewer system.

3.22.3 Site Investigation Sampling

In order to determine the potential release of mercury from former laboratory activities and miscellaneous industrial processes, sampling of the existing sanitary sewer waste stream was conducted at select locations. All samples were collected from the sanitary sewer system at the first available location downgradient of the building or specified former activity to be investigated. Sample locations included manhole access and clean-out locations. Final sample locations were selected utilizing the advice of qualified personnel familiar with the system and were biased towards locations of potential historic sediment deposition.

Sanitary System Investigation

Sanitary aqueous samples were collected at various manhole locations on the MP and one at the CWA in December 2007. A total of nine aqueous samples (including one duplicate sample) were collected from the sanitary sewer lines. A manhole located downgradient of Bldg 285 was concrete capped and abandoned. Therefore, investigation at this location could not be conducted.

The methodology followed during sanitary sampling is presented in **Section 2.3**.

Table 3.22.1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.22-1, Figure 3.22-2,** and **Figure 3.22-3**. A summary of sampling activities, including sample IDs, collection dates, analytical parameters, and methods of analysis, is provided in **Table 3.22-2**.

Table 3.22-1
Sanitary Sewer System Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
680SAN-1 (2 samples – includes 1 duplicate sample)	Sanitary waste	A sample was collected downgradient of former Bldg 680 to investigate potential mercury discharge into the sanitary sewer resulting from the former storage and use of mercury bichloride.	Mercury
283SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of Bldg 283 to investigate potential mercury discharge into the sanitary sewer resulting from the former use of mercury in various laboratory instruments and physical chemistry measurements using mercury. The sample location will serve to investigate potential discharges due to historic mercury reclamation at former Bldgs S-5 and S-12 and heating of mercury compounds at Bldg 288.	Mercury

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
292SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of Bldg 292 to investigate potential mercury discharge into the sanitary sewer resulting from the former storage and use of mercury in various instruments and manufacture of mercury electrodes. The selected sampling location also serves to investigate potential mercury discharges from former mercury use at Bldg 293 in battery testing and former Bldg 294 in the development of plastics and rubber.	Mercury
814SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of Bldg 814 to investigate potential mercury discharge into the sanitary sewer resulting from the former use of mercury related to routine dental work.	Mercury
834SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of former Bldgs 834 and 835 to investigate potential mercury discharge into the sanitary sewer resulting from the former use of mercury related to routine dental work.	Mercury
1075SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of Bldg 1075 to investigate potential mercury discharge into the sanitary sewer resulting from the use of mercury in the development of x-rays and other medical imaging.	Mercury
209SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of Bldg 209 to investigate potential mercury discharge into the sanitary sewer resulting from the former use of mercury containing equipment during the time the building served as a hospital.	Mercury
285SAN-1	Sanitary waste	Manhole was sealed and concrete capped. Therefore, no sample was taken.	Not collected
2700SAN-1 (1 sample)	Sanitary waste	A sample was collected downgradient of Bldg 2700 to investigate potential mercury discharges into the sanitary sewer resulting from the former storage and use of mercury in various laboratories, including the Photographic Branch, Electrochemical Research, ETD&L, and mercuric chloride use and disposal from the Printed Circuit Manufacturing Shop. The sample location was selected encompassing all sanitary sewer connections from Bldg 2700, including the former acid neutralization tank connections.	Mercury

3.22.4 Site Investigation Results

Mercury was not detected in any of the collected sanitary aqueous samples.

3.22.5 Summary and Conclusions

Mercury was not identified in any samples. NFA is recommended.

Table 3.22-2
Sanitary System Sample and Analytical Summary

Media	Type	Building	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SD	SANITARY	2700	2700SAN-1	12/12/07	9:25	--	--							X		
SD	SANITARY	1075	1075SAN-1	12/12/07	10:20	--	--							X		
SD	SANITARY	834	834SAN-1	12/12/07	10:35	--	--							X		
SD	SANITARY	814	814SAN-1	12/12/07	10:50	--	--							X		
SD	SANITARY	292	292SAN-1	12/12/07	11:25	--	--							X		
SD	SANITARY	680	680SAN-1	12/12/07	11:40	--	--							X		
SD	SANITARY	680	680SAN-1 DUPLICATE	12/12/07	11:40	--	--							X		
BLANK	FIELD	ALL SAN	FIELD BLANK	12/12/07	11:40	--	--							X		
SD	SANITARY	283	283SAN-1	12/12/07	11:55	--	--							X		
SD	SANITARY	285	285SAN-1	--	--	--	--									Manhole was sealed and capped. No sample collected.
SD	SANITARY	209	209SAN-1	12/12/07	13:15	--	--							X		

X = Sample analyzed for the indicated analytical parameter suite

LEGEND

- Sanitary Water Sample Location
- Building
- Installation Boundary

N

SCALE:

0 125 250 500 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.22-1

FORT MONMOUTH ECP
SITE INVESTIGATION

SANITARY SEWER SAMPLE LOCATIONS
BUILDINGS 814, 1075, AND FORMER
BUILDING 834

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_22-1_SI_B814_B1075_FB834_Sanitary_SampLoc.mxd (7/14/2008 4:26:52 PM)

LEGEND

- Sanitary Water Sample Location
- Building
- Installation Boundary

N

SCALE:

0 130 260 520 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.22-2

FORT MONMOUTH ECP
SITE INVESTIGATION

SANITARY SEWER SAMPLE LOCATIONS
BUILDINGS 209, 283, 292, AND
FORMER BUILDING 680

MAIN POST
FORT MONMOUTH
NEW JERSEY

ArcGIS File: MP_Fig3_22-2_SI_B209_B283_etc_Sanitary_SampLoc.mxd (7/14/2008 1:06:31 PM)

LEGEND

- Sanitary Water Sample Location
- Building
- IRP Site Boundary
- Installation Boundary

N

SCALE:

0 62.5 125 250 Feet

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw® Shaw Environmental, Inc.

FIGURE 3.22-3

FORT MONMOUTH ECP
SITE INVESTIGATION

SANITARY SEWER SAMPLE LOCATIONS
BUILDING 2700

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

ArcGIS File: CWA_Fig3_22-3_SI_B2700_Sanitary_SampLoc.mxd (7/14/2008 4:28:05 PM)

3.23 Electrical Substations

3.23.1 Site Description

Presently, five electrical substations are maintained and operated by the DPW. Three substations are located on the MP and two substations are located in the CWA. Secondary containment is provided at all five substations, and each site is managed under the DPW's Spill Prevention, Control and Countermeasures program (28).

MP – Bldg 288. This facility is a modern electrical substation, constructed following discontinuation of PCB-contaminated electrical equipment, located northeast of Bldg 288. The substation consists of a 34,500-volt, 3,000 kilovolt-amperes (kVA) transformer and a 4,160-volt air switch. The transformer contains 520 gallons of non-PCB oil. The air switch is a dry unit and contains no oil.

MP – Bldg 978. This facility is an electrical substation located adjacent to Bldg 978 and also serves as the delivery point for metering of electrical power to the MP. The substation consists of three 34,500-volt, 5,000 kVA transformers, and six voltage regulators. The first 5,000 kVA transformer, manufactured by General Electric, contains 2,155 gallons of non-PCB oil. The second 5,000 kVA transformer, also manufactured by General Electric, contains 1,540 gallons of non-PCB oil. The third 5,000 kVA transformer, manufactured by Allis Chalmers, contains 1,313 gallons of non-PCB oil. The six voltage regulators each contain 546 gallons of non-PCB oil.

MP – Bldg 1231. This facility is an electrical substation located adjacent to Bldg 1231. The substation consists of two 34,500-volt, 5,000 kVA transformers, one large circuit breaker, and one pole mounted type transformer (50 kVA). One 5,000 kVA transformer contains 2,704 gallons of non-PCB oil. The second 5,000 kVA transformer contains 3,100 gallons of non-PCB oil. The circuit breaker contains 220 gallons of non-PCB oil. The 50 kVA transformer contains approximately 40 gallons of non-PCB oil.

CWA – Bldg 2700. This facility is a modern electrical substation that supports the Myer Center (Bldg 2700) facility. The substation consists of two 12,500-volt, 7,500 kVA transformers. Each transformer contains 1,523 gallons of non-PCB oil. The current electrical substation at Bldg 2700, constructed following discontinuation of PCB-contaminated electrical equipment, replaced a pre-existing electrical substation located to the southeast.

CWA – Bldg 2716. This facility is an electrical substation located adjacent to Bldg 2704. The substation consists of two 34,500-volt, 10,000 kVA transformers that both contain 2,142 gallons of non-PCB oil. Additional information pertaining to this parcel can be found in Section 4.4.4 of the Phase I ECP (1).

3.23.2 Previous Investigations

No previous investigative activities have been conducted at the electrical substations.

3.23.3 Site Investigation Sampling

Based on the period of operation of electrical substations located adjacent to Bldgs 978, 1231, 2716 and the former substation east of the Myer Center (southeast of the current substation serving this facility), it is likely that previous operations included the use of PCB-containing equipment. In order to determine if historic use of potential PCB-containing equipment has resulted in the release of PCBs from electrical substations at FTMM, soil samples were collected from substation transformer yards adjacent to Bldgs 978, 1231, 2716, and the former Myer Center substation. Substations adjacent to Bldgs 288 and 2700 were constructed following discontinuation of PCB-containing electrical equipment; therefore, no sampling of these facilities was required.

Surface Soil Investigation

Surface soil samples were collected in December 2007 at electrical transformer substations located throughout FTMM.

MP – Bldg 978. A total of ten surface soil samples were collected (including one duplicate sample) from nine distinct hand auger sample locations in and around Bldg 978 substation (**Figure 3.23-1**). Surface soil samples for PCB analysis were collected from the 0- to 6-inch interval bgs. If sample locations were within gravel-covered areas, samples were collected from the 0- to 6-inch interval below the gravel sub-base.

MP – Bldg 1231. A total of nine surface soil samples were collected from nine distinct hand augered sample locations in and around the Bldg 1231 substation (**Figure 3.23-2**). Surface soil samples for PCB analysis were collected from the 0- to 6-inch interval bgs. If sample locations were within gravel-covered areas, samples were collected from the 0- to 6-inch interval below the gravel sub-base.

CWA – Bldg 2700. A total of 14 surface soil samples were collected (including one duplicate sample) from 13 distinct hand auger boring locations in an open field east of Bldg 2700 and Laboratory Road. Samples were spaced within a 50-ft sample grid configuration (**Figure 3.23-3**). Surface soil samples for PCB analysis were collected from the 0- to 6-inch interval bgs.

CWA – Bldg 2716. A total of nine surface soil samples were collected from nine distinct hand auger boring locations in and around the Bldg 2716 substation (**Figure 3.23-4**). Surface soil samples for PCB analysis were collected from the 0- to 6-inch interval bgs. If sample locations were within gravel-covered areas, samples were collected from the 0- to 6-inch interval below the gravel sub-base.

Table 3.23-1 presents a summary of all field activities, and all sample locations are provided on **Figures 3.23-1 through 3.23-4**. A summary of sampling activities, including sample IDs, collection dates, analytical parameters, and methods of analysis, is provided in **Table 3.23-2**.

Table 3.23-1
Electrical Substations Sampling Location, Rationale and Analytical

Sample Location	Sample Media	Sample Location Rationale	Analytical Suite
978SS-1:9 (10 samples – includes 1 duplicate sample)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges associated with former PCB-containing electrical equipment. Samples were located on the perimeter of the substation yard and one sample at the outfall of the yard drain. If samples were located over gravel, the sample was collected from the 0- to 6-inch interval below the gravel sub-base.	PCBs
1231SS-1:9 (9 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges associated with former PCB-containing electrical equipment. Samples were located around the perimeter of the substation yard and one sample at the outfall of the yard drain. If samples were located over gravel, then the sample was collected from the 0- to 6-inch interval below the gravel sub-base.	PCBs
2700SS-A1:D4 (14 samples – includes 1 duplicate sample)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval from a sampling grid (on 50-ft centers) to investigate potential discharges associated with former PCB-containing electrical equipment.	PCBs
2716SS-1:9 (9 samples)	Surface soil	Soil samples were collected from the 0- to 6-inch bgs interval to investigate potential discharges associated with former PCB-containing electrical equipment. Two samples were located on each side of the substation yard and one sample at the outfall of the yard drain. If samples were located over gravel, then the sample was collected from the 0- to 6-inch interval below the gravel sub-base.	PCBs

Soil Investigation Results

As summarized in **Table 3.23-3**, PCBs were not detected above the NJDEP NRDCSCC. Two samples contained Aroclor 1260 at concentrations above the RDCSCC of 0.49 mg/kg. Samples 978SS-2 and 2700SS-D2 contained the PCB Aroclor 1260 at concentrations of 0.84 mg/kg and 0.65 mg/kg, respectively. No other samples contained PCBs at concentrations greater than the RDCSCC.

3.23.4 Summary and Conclusions

No constituents were identified above the NRDCSCC in soil at any of the four substations. NFA is recommended.

Table 3.23-2
Electrical Substation Sample and Analytical Summary

Media	Type	Building	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	HAND AUGER	978	978SS-1	12/26/07	11:20	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-2	12/26/07	11:23	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-3	12/26/07	11:25	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-4	12/26/07	11:30	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-5	12/26/07	11:35	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-6	12/26/07	11:40	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-6 DUPLICATE	12/26/07	11:40	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-7	12/26/07	11:45	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-8	12/26/07	11:55	0.0	0.5				X					
SOIL	HAND AUGER	978	978SS-9	12/26/07	12:00	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-1	12/26/07	12:55	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-2	12/26/07	13:05	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-3	12/26/07	13:10	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-4	12/26/07	13:25	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-5	12/26/07	13:30	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-6	12/26/07	13:40	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-7	12/26/07	13:50	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-8	12/26/07	14:00	0.0	0.5				X					
SOIL	HAND AUGER	1231	1231SS-9	12/26/07	14:05	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-D1	12/27/07	9:45	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-D2	12/27/07	9:50	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-D3	12/27/07	9:55	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-D3 DUPLICATE	12/27/07	9:55	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-D4	12/27/07	10:00	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-C1	12/27/07	10:05	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-C2	12/27/07	10:10	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-C3	12/27/07	10:12	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-C4	12/27/07	10:15	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-B1	12/27/07	10:20	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-B2	12/27/07	10:25	0.0	0.5				X					

Table 3.23-2
Electrical Substation Sample and Analytical Summary

Media	Type	Building	Field Sample #	Sample Date	Sample Time	Begin Depth	End Depth	TPHC	VO+15	B\N+15	PCBs	TAL Metals	Cyanide	Mercury	Ammonia/ Nitrate/ Nitrite	COMMENTS/VARIANCES
SOIL	HAND AUGER	2700	2700SS-B3	12/27/07	10:30	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-B4	12/27/07	10:32	0.0	0.5				X					
SOIL	HAND AUGER	2700	2700SS-A2	12/27/07	10:35	0.0	0.5				X					
BLANK	FIELD	2700	FIELD BLANK	12/27/07	11:10	--	--				X					
SOIL	HAND AUGER	2716	2716SS-1	12/26/07	14:55	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-2	12/26/07	15:00	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-3	12/26/07	15:05	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-4	12/26/07	15:15	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-5	12/26/07	15:20	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-6	12/26/07	15:25	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-7	12/26/07	15:30	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-8	12/26/07	15:35	0.0	0.5				X					
SOIL	HAND AUGER	2716	2716SS-9	12/26/07	15:40	0.0	0.5				X					
BLANK	FIELD	2716	FIELD BLANK	12/26/07	15:50	--	--				X					

X = Sample analyzed for the indicated analytical parameter suite

Table 3.23-3
Fort Monmouth Phase II Site Investigation, Substations
Summary of Analytical Parameters Detected in Soil (mg/kg)

				Analytical Results								
			Sample ID:	978SS-1	978SS-2	978SS-3	978SS-4	978SS-5	978SS-6	978SS-6 DUP	978SS-8	2700SS-A2
			Lab ID:	7056101	7056102	7056103	7056104	7056105	7056106	7056110	7056108	7056201
			Date Sampled	12/26/2007	12/26/2007	12/26/2007	12/26/2007	12/26/2007	12/26/2007	12/26/2007	12/26/2007	12/27/2007
			Depth (ft. bgs):	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	RDCSCC[1]	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result
PCBs												
Aroclor 1260	0.49	2	50	**0.07**	**0.84**	**0.32**	**0.15**	**0.04**	**0.06**	**0.04**	**0.05**	**0.05**

				Analytical Results								
			Sample ID:	2700SS-B2	2700SS-B3	2700SS-B4	2700SS-C1	2700SS-D2	2716SS-1	2716SS-6	2716SS-7	2716SS-8
			Lab ID:	7056204	7056205	7056206	7056207	7056212	7056120	7056125	7056126	7056127
			Date Sampled	12/27/2007	12/27/2007	12/27/2007	12/27/2007	12/27/2007	12/26/2007	12/26/2007	12/26/2007	12/26/2007
			Depth (ft. bgs):	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Chemical	RDCSCC[1]	NRDCSCC[2]	IGWSCC[3]	Result	Result	Result	Result	Result	Result	Result	Result	Result
PCBs												
Aroclor 1260	0.49	2	50	**0.04**	**0.07**	**0.12**	**0.04**	**0.65**	**0.07**	**0.04**	**0.09**	**0.07**

[1] NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999.

[2] NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999.

[3] NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

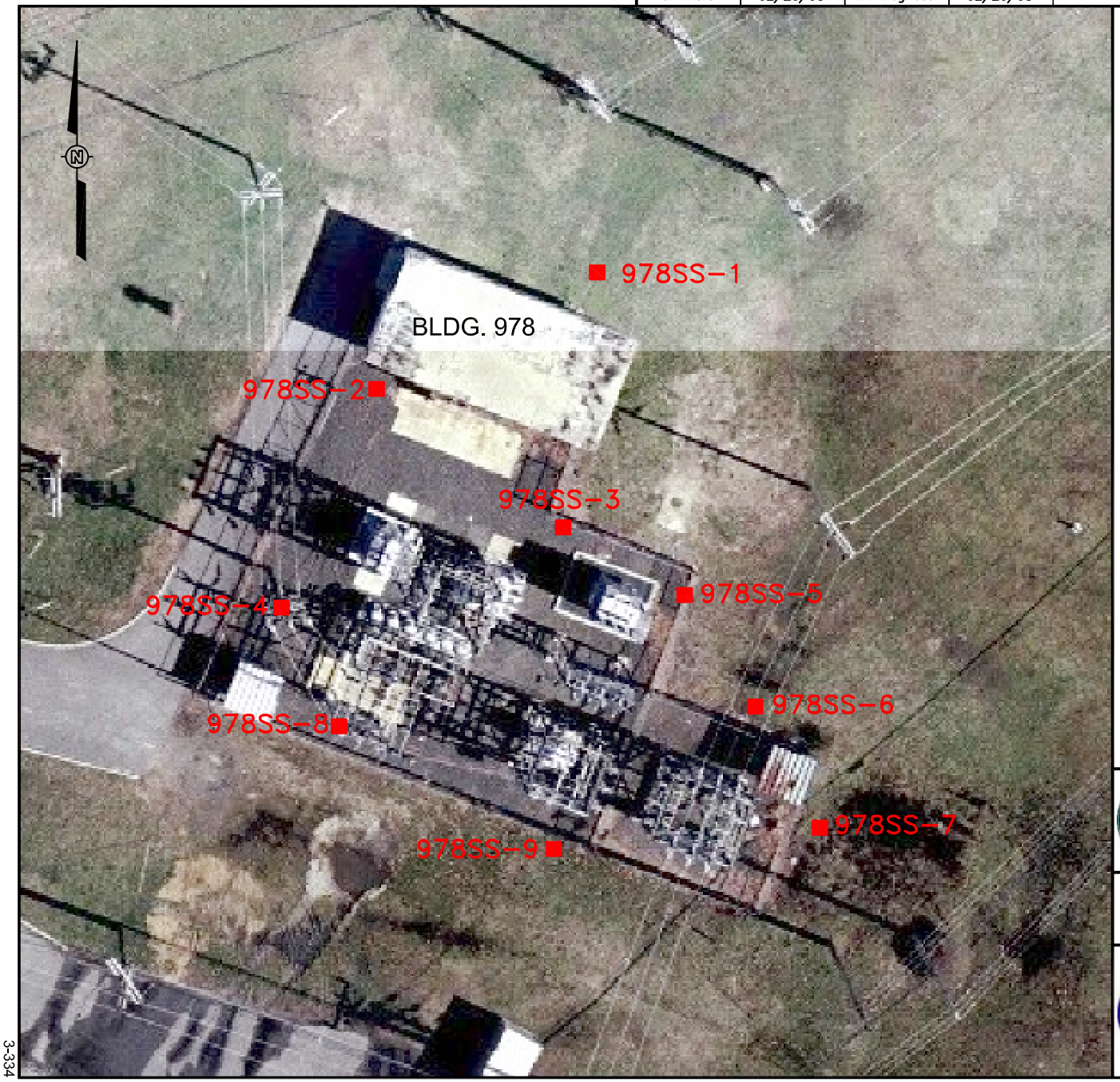
mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern.
(Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

File: N:\cad\CAD drawings\USAEC\Ft.Monmouth\2008-REVISIONS_FT.MON\Proposed_Soil_Sample.dwg
Plot Date/Time: Jul 14, 2008 - 4:21pm
Plotted By: stephen.Wiafe

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	Soil-Sample-1.dwg
S. Wiafe	02/20/08	M. Magness	02/20/08	--	--		



LEGEND

- SURFACE SOIL SAMPLE LOCATION- SAMPLES COLLECTED AT 0-6" BGS
- ROAD
- BUILDING

SCALE

0 30 60 FEET

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3-23-1

BLDG 978 SAMPLE LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

File: N:\cad\CAD drawings\USAEC\Ft.Monmouth\2008-REVISIONS_FT.MON\Proposed_Soil-Sample.dwg
Plot Date/Time: Jul 14, 2008 - 4:22pm
Plotted By: stephen.Wiafe

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	Soil-Sample-1.dwg
S. Wiafe	02/20/08	M. Magness	02/20/08	--	--		

LEGEND

- SURFACE SOIL SAMPLE LOCATION SAMPLES COLLECTED AT 0-6" BGS
- ROAD
- BUILDING

SCALE

0 20 40 FEET

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

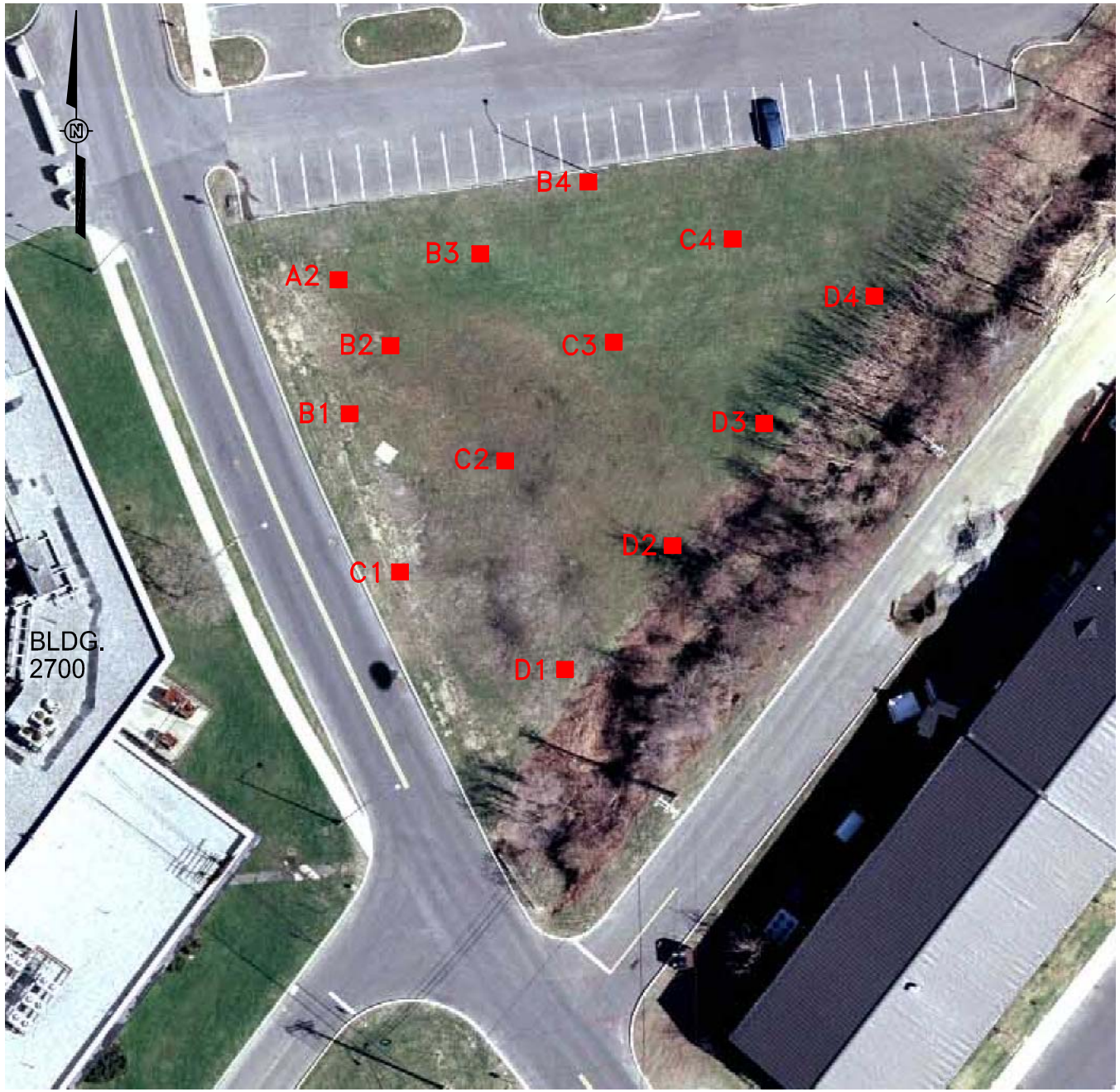
FIGURE 3-23-2

BLDG 1231 SAMPLE LOCATIONS

MAIN POST
FORT MONMOUTH
NEW JERSEY

File: N:\cad\CAD drawings\USAEC\Ft.Monmouth\2008-REVISIONS_FT.MON\Photomap3.dwg
Plot Date/Time: Jul 14, 2008 - 4:43pm
Plotted By: stephen.Wiafe

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	Soil-Sample-1.dwg
S. Wiafe	02/20/08	M. Magness	02/20/08	--	--		



LEGEND

- SURFACE SOIL SAMPLE LOCATION- SAMPLES COLLECTED AT 0-6" BGS
- STREAM
- ROAD
- BUILDING

SCALE

0 50 100 FEET

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3-23-3

BLDG 2700 SAMPLE LOCATIONS

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

File: N:\cad\CAD drawings\USAEC\Ft.Monmouth\2008-REVISIONS_FT.MON\Photomap3.dwg
Plot Date/Time: Jul 14, 2008 - 4:50pm
Plotted By: stephen.Wiafe

DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	Soil-Sample-1.dwg
S. Wiafe	02/20/08	M. Magness	02/20/08	--	--		

LEGEND

- SURFACE SOIL SAMPLE LOCATION- SAMPLES COLLECTED AT 0-6" BGS
- STREAM
- ROAD
- BUILDING

SCALE

0 20 40 FEET

Base Realignment and Closure 2005

U.S. Army Corps of Engineers

Shaw Environmental, Inc.

FIGURE 3-23-4

BLDG 2716 SAMPLE LOCATIONS

CHARLES WOOD AREA
FORT MONMOUTH
NEW JERSEY

4 Conclusions and Recommendations

The purpose of the SI is to close data gaps identified during the Phase I ECP. This investigation report can be used to augment the Phase I ECP report in documenting the environmental condition of FTMM. The goals of the SI are to provide information to aide in the further assessment of the level of environmental liability of each parcel and to close data gaps that were identified from the Phase I ECP.

4.1 Conclusions

Based on field sampling activities and laboratory results, the following conclusions were reached.

4.1.1 Geophysical Surveys

Geophysical surveys conducted at FTMM revealed that site conditions at all of the Parcels are consistent with expected conditions based on previous historical use. The areas in which geophysical surveys were conducted have been developed for many years and in most locations multiple generations of buildings have existed in these areas. As a result, small pieces of metal and other small remnants from previous uses are likely to be dispersed throughout the areas. The objectives of the geophysical surveys were to determine the absence/presence of USTs, septic tanks and in one location, a possible burial area. No anomalies indicative of burial areas were identified during the geophysical surveys. Results of the geophysical surveys of note include the identification of 24 suspected USTs and two suspected septic tanks (one tank also contained suspected associated piping) as follows:

- CWA:
  - Parcel 14 – One suspected UST was identified.
  - Parcel 28 – One suspected UST, one suspected septic tank, and one suspected septic distribution box with piping were identified.
- MP:
  - Parcel 51 – Eleven suspected USTs were identified.
  - Parcel 76 – Seven suspected USTs were identified.
  - Parcel 79 – Four suspected USTs were identified.

4.1.2 Surface and Subsurface Soil Investigations

Surface and subsurface soil investigations conducted at FTMM identified a total of 17 soil samples that contained B/Ns at concentrations greater than NJDEP NRDCSCC, 2

soil samples that contained one or more metals at concentrations greater than the NJDEP NRDCSCC and the CW/MPBC, and one sample that contained Aroclor 1260 (a PCB) at a concentration greater than the NJDEP NRDCSCC. Parcels at which COCs were identified in soil at concentrations greater than the NRDCSCC are the following:

- Parcel 49 – Five surface soil samples contained B/Ns at concentrations above the NJDEP NRDCSCC, and one surface soil sample contained Aroclor 1260 (a PCB) at a concentration above the NJDEP NRDCSCC. Further evaluation is recommended.
- Parcel 57 – Three surface soil samples contained B/Ns at concentrations above the NJDEP NRDCSCC. Further evaluation is recommended.
- Parcel 61 – One surface soil sample contained B/Ns at concentrations above the NJDEP NRDCSCC. Further evaluation is recommended.
- Parcel 83 – Eight surface soil samples contained B/Ns at concentrations above the NJDEP NRDCSCC. Two surface soil samples contain lead at concentrations above the NJDEP NRDCSCC and MPBC. Further evaluation is recommended.

4.1.3 Groundwater Investigations

Groundwater investigations conducted at FTMM revealed a total of three groundwater samples containing VO COCs at concentrations exceeding NJDEP GWQC, one sample containing a B/N COC exceeding the NJDEP GWQC, and four groundwater samples containing metals COCs at concentrations exceeding NJDEP GWQC and FTMM MBCs. Parcels at which groundwater COCs were identified include the following:

- CWA – no COCs were identified in groundwater. NFA is recommended.
- MP:
  - Parcel 49 – Two groundwater samples contained VO COCs at concentrations slightly above the GWQC. Groundwater at Parcel 49 is recommended for inclusion in the M-18 CEA.
  - Parcel 51 – One groundwater sample contained a B/N COC at a concentration above the NJDEP GWQC. Further evaluation is recommended.
  - Parcel 57 – Three groundwater samples contained COCs (metals) at concentrations above the NJDEP GWQC and FTMM MPBCs. Further evaluation is recommended.
  - Parcel 69 – One groundwater sample contained a VO COC at a concentration above the NJDEP GWQC. Further evaluation is recommended.

- Parcel 80 – One groundwater sample contained a COC (beryllium) at a concentration above the NJDEP GWQC and FTMM MBCs. Further evaluation is recommended.

4.1.4 Sediment Investigations

Sediment investigations conducted at FTMM revealed sediment samples that contained B/Ns and metals at concentrations greater than applicable NJDEP criteria. Parcels at which sediment COCs were identified and are recommended for further evaluation as part of a facility-wide baseline ecological evaluation are the following:

- CWA:
  - Parcel 15 – Three samples contained metals and one sample contained B/Ns at concentrations above the NJDEP LEL and CWBC but below the SEL.
  - Parcel 27 – Four samples contained metals at concentrations above the NJDEP LEL and CWBC; two of which contained one metal at concentrations above the NJDEP SEL.
  - Parcel 28 – Three samples contained one metal (chromium) at concentrations above the NJDEP LEL and CWBC but below the SEL.
- MP:
  - Parcel 39 – Two samples contained B/Ns at concentrations above the NJDEP LEL and MPBC but below the SEL. Four samples contained metals at concentrations above the NJDEP LEL and MPBC; two samples contained one metal above the SEL.
  - Parcel 43 – Two samples contained B/Ns at concentrations above the NJDEP ER-L and MPBC. Six samples contained metals at concentrations above the NJDEP ER-L and MPBC, and one sample contained one metal at a concentration above the ER-M.
  - Parcel 49 – Seven samples (including one duplicate) contained metals at concentrations above the NJDEP ER-L and MPBC; three samples contained metals at concentrations above the ER-M.
  - Parcel 61 – Four samples contained B/Ns at concentrations above the NJDEP ER-L and MPBC, and one sample contained metals at concentrations above the NJDEP ER-L and MPBC. Three samples contained a B/N above the ER-M. No metals were present at concentrations above the ER-M.
  - Parcel 69 – Two samples contained metals at concentrations above the NJDEP ER-L and MPBC, and one sample contained metals at concentrations above the ER-M. Three samples contained B/Ns at concentrations above the NJDEP ER-L and MPBC. One sample contained a B/N above the ER-M.

4.1.5 Vapor Intrusion Investigations

VI is the migration of organic compounds from the subsurface into overlying buildings (11). Soil gas and indoor air samples were collected at five parcels to evaluate the potential for the intrusion of COCs present in groundwater in close proximity to existing facilities. Even though the groundwater VOs identified as COCs in groundwater were the targeted analytes being investigated, samples were analyzed for the comprehensive VO analytical list, which includes the targeted compounds as well as others that have not been detected in groundwater. No groundwater constituents were identified at concentrations greater than applicable comparison criteria in indoor air in the buildings investigated as detailed below in **Section 4.1.5.2**.

4.1.5.1 Soil Gas

A total of 27 soil gas samples contained one or more VOs at concentrations exceeding NJDEP Soil Gas NRS. Parcels at which soil gas constituents were detected at concentrations greater than applicable NJDEP criteria are the following:

- CWA:
  - Parcel 15 – Fourteen soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
  - Parcel 34 – Two soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
- MP:
  - Parcel 43 – Five soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
  - Parcel 50 – Four soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.
  - Parcel 52 – Two soil gas samples contained VOs at concentrations greater than the NJDEP NRSGSLs.

4.1.5.2 Indoor Air

Indoor Air investigations conducted at FTMM revealed one indoor air sample contained two VOs at concentrations greater than the NJDEP Non-Residential Indoor Air Screening Levels (NRIASLs). The compounds benzene and dichloromethane were detected in indoor air at Parcel 43 (Bldg 1122). Neither compound was detected above criteria in soil gas and/or groundwater and both are suspected to be attributable to activities within the building. No VOs were detected above Immediate Action Levels in any indoor air samples, and no VOs were detected at concentrations above the NRIASLs in indoor air samples collected in Parcel 15 (Bldg 2700) or Parcel 50 (Bldg

283). One additional round of indoor air sampling is recommended for Parcels 15, 34, 43, 50, and 52.

4.1.6 Other Investigations

Results of other investigations conducted as part of this SI include the following:

- Substation surface soil investigations conducted at FTMM revealed that all concentrations of PCBs were below NJDEP NRDCSCC. NFA is recommended.
- Sanitary aqueous investigations conducted at FTMM revealed that mercury was not detected in aqueous samples collected from the sanitary sewer system. NFA is recommended.

4.2 Recommendations

Table 4-1 summarizes recommendations for all parcels investigated. Based upon field sampling activities and information collected to date, further evaluation of COCs identified in soil is recommended for the following parcels on MP:

- Parcel 49
- Parcel 57
- Parcel 61
- Parcel 83

Further evaluation of COCs identified in groundwater is recommended for the following parcels on MP:

- Parcel 51
- Parcel 57
- Parcel 69
- Parcel 80

COCs identified in Parcel 49 groundwater are recommended to be captured in the existing M-18 CEA.

Sediment is recommended for further evaluation and will be addressed as part of a facility-wide baseline ecological evaluation for the following parcels:

- CWA:
  - Parcel 15
  - Parcel 27
  - Parcel 28

- MP:
    - Parcel 39
    - Parcel 43
    - Parcel 49
    - Parcel 61
    - Parcel 69

One additional round of indoor air sampling is recommended to confirm constituents present in groundwater are not present above applicable criteria in indoor air the following Parcels:

- CWA:
    - Parcel 15
    - Parcel 34
- MP:
    - Parcel 43
    - Parcel 50
    - Parcel 52

NFA is recommended for soil in the following parcels:

- CWA:
    - Parcel 13
    - Parcel 14
    - Parcel 15
    - Parcel 27
    - Parcel 28
- MP:
    - Parcel 38
    - Parcel 39
    - Parcel 51
    - Parcel 69
    - Parcel 70
    - Parcel 76
    - Parcel 79
    - Parcel 80
    - Substation soils

NFA is recommended for groundwater in the following parcels:

- CWA:
  - Parcel 13
  - Parcel 14
  - Parcel 15
  - Parcel 28
- MP:
  - Parcel 76
  - Parcel 79
  - Parcel 83

Table 4-1
Summary of Parcel Recommendations

Parcel	Area	Soil		Groundwater		Sediment		Soil Gas		Indoor Air		Geophysical Surveys		Aqueous Sanitary	
		NFA	Further Evaluation	NFA	Further Evaluation	NFA	Further Evaluation	NFA	Further Evaluation	NFA	Further Evaluation	NFA	Further Evaluation	NFA	Further Evaluation
Parcel 13	CWA	x	-	x	-	-	-	-	-	-	-	x	-	-	-
Parcel 14	CWA	x	-	x	-	-	-	-	-	-	-	x	-	-	-
Parcel 15	CWA	x	-	x	-	-	x	x	-		x	x	-	-	-
Parcel 27	CWA	x	-	-	-	-	x	-	-	-	-	x	-	-	-
Parcel 28	CWA	x	-	x	-	-	x	-	-	-	-	x	-	-	-
Parcel 34	CWA	-	-	-	-	-	-	x	-	-	x	-	-	-	-
Parcel 38	MP	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Parcel 39	MP	x	-	-	-	-	x	-	-	-	-	-	-	-	-
Parcel 43	MP	-	-	-	-	-	x	x	-	-	x	-	-	-	-
Parcel 49	MP	-	x	-	x	-	x	-	-	-	-	-	-	-	-
Parcel 50	MP	-	-	-	-	-	-	x	-	-	x	-	-	-	-
Parcel 51	MP	x	-	-	x	-	-	-	-	-	-	x	-	-	-
Parcel 52	MP	-	-	-	-	-	-	x	-	-	x	-	-	-	-
Parcel 57	MP	-	x	-	x	-	-	-	-	-	-	-	-	-	-
Parcel 61	MP	-	x	-	-	-	x	-	-	-	-	-	-	-	-
Parcel 69	MP	x	-	-	x	-	x	-	-	-	-	-	-	-	-
Parcel 70	MP	x	-	-	-	x	-	-	-	-	-	-	-	-	-
Parcel 76	MP	x	-	x	-	-	-	-	-	-	-	x	-	-	-
Parcel 79	MP	x	-	x	-	-	-	-	-	-	-	x	-	-	-
Parcel 80	MP	x	-	-	x	-	-	-	-	-	-	-	-	-	-
Parcel 83	MP	-	x	x	-	-	-	-	-	-	-	-	-	-	-
Substations	MP	x	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanitary	MP	-	-	-	-	-	-	-	-	-	-	-	-	x	-

5 References

(1) U.S. Army BRAC, 2007. Environmental Condition of Property Report - Fort Monmouth, Monmouth County, New Jersey. Final. January 29, 2007.

(2) U.S. Army BRAC, 2007. Site Investigation Work Plan - Fort Monmouth, Monmouth County, New Jersey. Final. September 25, 2007.

(3) Cabrera Services, Inc., 2007. Historical Site Assessment and Addendum to Environmental Conditions of Property Report, Fort Monmouth, Eatontown, New Jersey. January 2007.

(4) U.S. Army Corps of Engineers (USACE) Mobile District, 2003. Integrated Cultural Resources Management Plan, Fort Monmouth, New Jersey. Prepared by John Milner Associates, Inc.

(5) USACE Mobile District, 1999. Final Integrated Natural Resources Management Plan, Fort Monmouth, New Jersey.

(6) Brown, Louis, 2006. Interview. December 7, 2006.

(7) Fort Monmouth Base Realignment and Closure Plans, Analysis, and Integration Office. December 8, 2006.

(8) U.S. Army Communications-Electronics Life Cycle Management Command, Office of the Deputy Chief of Staff for Operations and Plans, July 2005. “A Concise History of the U.S. Army Communications-electronics Life Cycle Management Command and Fort Monmouth, New Jersey,” Fort Monmouth, New Jersey.

(9) Kozlowski, Melissa, Summer 2004, Fort Monmouth: Landmarks and Place Names, DCSOPS, Fort Monmouth, New Jersey.

(10) New Jersey Administrative Code. Technical Requirements for Site Remediation (N.J.A.C. 7:26E). July 2005.

(11) U.S. Environmental Protection Agency (USEPA), 2002. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils [Draft Subsurface Vapor Intrusion Guidance]. Office of Solid Waste and Emergency Response, Washington D.C. USEPA530-F-02-052.

(12) New Jersey Department of Environmental Protection (NJDEP), 2005. Vapor Intrusion Guidance. Prepared by staff in the NJDEP Site Remediation and Waste Management Program (SRWMP) and the Division of Science, Research and Technology (DSRT). October 2005.

(13) NJDEP, 2005. Field Sampling Procedures Manual.

(14) Environmental Research, Inc., 1993. Aerial Photographic Site Analysis, Evans Area, Charles Wood Area, Fort Monmouth, New Jersey. December 1993.

(15) U.S. Army Environmental Health Laboratory, 1955. Industrial Hygiene Survey No. 2019 S039-55-5, Signal Corps Center and Fort Monmouth, Fort Monmouth, New Jersey. March 28-April 1, 1955.

(16) U.S. Army Environmental Health Laboratory, 1958. Industrial Hygiene Survey No. 3188 S014-58-9, U.S. Army Signal Corps Center, Fort Monmouth, New Jersey. December 8-15, 1958.

(17) Department of the Army, Office of the Surgeon General, 1972. Occupational Health Survey No. 32-088-72, Fort Monmouth, New Jersey. May 22-25, 1972.

(18) USEPA, 1985. Installation Assessment Relook Program, Working Document, Fort Monmouth Complex, Long Branch, New Jersey. September 1985.

(19) Master Plot Plan – Watson Laboratories, War Department, Army Air Forces, Air Technical Service Command, Office of the Post Engineer. July 30, 1945, last revised August 2, 1950.

(20) U.S. Army Environmental Hygiene Agency (USAEHA), 1976. Water Quality Engineering Special Study No. 24-016-75-76, Sanitary and Industrial Wastewater, Fort Monmouth, New Jersey. September 23-October 9, 1974; April 15-17, 1975; June 10-12, 1975.

(21) Paul F. Sanders, Ph.D., 2003. Ambient Levels of Metals in New Jersey Soils; In Environmental Assessment and Risk Analysis Element. May 2003.

(22) Matthews, Terry (Fort Monmouth employee), 2007. Personal Communication.

(23) Eatontown Area, Fort Monmouth, NJ, Field Laboratory, All Buildings, Plumbing Layout & Sections, Plan Number 6148/1033. September 26, 1941.

(24) U.S. Army Environmental Health Laboratory, 1952. Industrial Hygiene Survey No. 1033 S083-52-2, Fort Monmouth Signal Laboratories, Fort Monmouth, New Jersey. April 7-11, 1952.

(25) U.S. Army Environmental Health Laboratory, 1954. Industrial Hygiene Survey No. 1559 S181-53-3, Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey. January 4-8, 1954.

(26) USAEHA, 1976. Industrial Hygiene Survey No. 35-0001-78, Fort Monmouth, New Jersey. October 17-November 5, 1976.

(27) Revitalize Bays 3 and 5, BLDG. 2525, Kitchens & Bathroom Plumbing Plan, Drawing Number 10913-12, PR. NO.: 99-0697.

(28) Fort Monmouth, 2005. Spill Prevention Control and Countermeasures Plan (SPCCP) and Installation Spill Contingency Plan (ISCP). Revision Date February 2005.

(29) Malcolm Pirnie, Inc., 2006. Final Historical Records Review Fort Monmouth, Fort Monmouth, New Jersey.

(30) USAEHA, 1973. Industrial Hygiene Survey No. 35-050-73-74, Fort Monmouth, New Jersey. July 9-27, 1973.

(31) Parsons Engineering, Inc., 2003. Final Fort Monmouth Pollution Prevention Plan. June 2003.

(32) Skill Development Center/Autocraft Shop, Heating & Plumbing Floor Plan, Project No. 00913.00, Drawing No. M1. April 9, 1993.

(33) Fort Monmouth, 2006. Stormwater Pollution Prevention Plan (SPPP) Public Complex Permit (R-11), Main Post and Charles Wood Areas. March 2006.

(34) Tetra Tech EM, Inc., 2005. Final Remedial Action Report for the 800, 700, and 400 Areas, U.S. Army Installation Fort Monmouth, Fort Monmouth, New Jersey. October 2005.

(35) USAEHA, 1993. Air Pollution Emission Statement No. 43-21-N1W1-93, USAG Fort Monmouth. May 17-21, 1993.

(36) USAEHA, 1978. Hearing Conservation Survey No. 51-34-0102-79, Fort Monmouth, New Jersey. August 28-September 1, 1978.

(37) USAEHA, 1983. Hearing Conservation Survey No. 51-34-0075-83, Fort Monmouth, New Jersey. June 20-23, 1983.

(38) USAEHA, 1981. Hazardous Waste Management Survey No. 37-26-0137-81, Fort Monmouth, New Jersey. January 26-30, 1981.

(39) Army Industrial Hygiene Laboratory, 1950. Industrial Hygiene Survey No. 0481 S094-50-0, Signal Corps Engineering Laboratories, Fort Monmouth, New Jersey. June 29-July 7, 1950.

(40) U.S. Army Toxic and Hazardous Materials Agency, 1980. Installation Assessment of Fort Monmouth, Report No. 171. May 1980.

(41) USAEHA, 1957. Industrial Hygiene Survey No. 2578 S023-57-7, The Signal Corps Center and Fort Monmouth, Fort Monmouth, New Jersey. April 8-12, 1957.

(42) Fort Monmouth DPW, Master Planning, Facilities Reduction Program database, December 2006.

(43) Guernsey, 1998. Procurement Sensitive Privatization Study, Potable Water Utility System, Wastewater Utility System. April 1998.

(44) Versar, Inc., 2003. Remedial Investigation Report - M-18 Landfill Site. Prepared for U.S. Army DPW, Fort Monmouth, New Jersey. October 2003.

(45) Cabrera Services, Inc., 2007. Radiological Scoping Survey Plan, Fort Monmouth, Eatontown, New Jersey. June 2007.

(46) Roy F. Weston, Inc., 1993. Underground Storage Tank Closure and Site Investigation Report, Building 1122, NJDEPE UST Registration No. 81533-199. October 28, 1993.

(47) Roy F. Weston, Inc., 1995. Site Investigation Report. December 1995.