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TRANSMITTAL FOR CHANGES TO RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT ZONE H CNC CHARLESTON SC
7/6/1998
NAVFAC SOUTHERN

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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5090/11
Code 1877
6 July, 1998

Mr. John Litton, P.E.
Director, Division of Hazardous and Infectious Waste Management
Bureau of Land and Waste Management
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

Subj: SUBMITTAL OF CHANGES TO ZONE H RCRA FACILITY INVESTIGATION REPORT

Dear Mr. Litton,

The purpose of this letter is to submit changes to the Zone H RCRA Facility Investigation Report for Naval Base Charleston. The Report was previously submitted to fulfill the requirements of condition IV.B.2 of the RCRA Part B permit issued to the Navy by the South Carolina Department of Health and Environmental Control and U.S. Environmental Protection Agency.

The Zone H RFI report was previously approved by the Department. These changes incorporate data that has been collected after the report submittal on AOC 667/SWMU 138 and provide an update on the nature and extent delineation for these sites. We request that the Department and the EPA incorporate this information into the existing document. If you should have any questions, please contact Bill Drawdy or myself at (843) 743-9985 and (843) 820-5525 respectively.

Sincerely,

M.A. Hunt

M.A.HUNT, P.E.
Environmental Engineer
Installation Restoration III

Copy to:
SCDHEC (Paul Bergstrand, Johnny Tapia), USEPA (Dann Spariosu), SOUTHNAVFACENGCOM (Matthew Hunt), CSO Naval Base Charleston (Billy Drawdy, Daryle Fontenot), SPORTENVDETCHASN (Bobby Dearhart)

FILING INSTRUCTIONS

The following is a list of pages in the *Final RCRA Facility Investigation Report for Zone H, dated July 5, 1996*, that have been revised. The obsolete pages presently in your binders are listed in the column headed "Remove." New and replacement pages are listed in the column headed "Replace." Please file this instruction cover sheet preceding the Table of Content of *Final RCRA Facility Investigation Report for Zone H.*

If you have any questions, please call 843-884-0029.

List of Changes/Revisions		Remove Pages	Replace Pages
Front Cover, Spine, and Front Page	Volume I	—	—
Table of Contents - updated.	Volume I	i - xliii	i - xliv
Section 4.19	Volume I	4-287 - 4-298	4-287 - 4-298(g)

FINAL RCRA
FACILITY INVESTIGATION REPORT
FOR ZONE H
NAVAL BASE CHARLESTON

VOLUME I
SECTIONS 1-4

CONTRACT N62467-89-D-0318
CTO-029

Prepared for:

Comprehensive Long-Term
Environmental Action Navy
(CLEAN)
Charleston Naval Shipyard
Charleston, South Carolina

Prepared by:

EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134
(901) 372-7962

June 18, 1998
Revision No: 1

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Table of Contents

EXECUTIVE SUMMARY 1

1.0 INTRODUCTION 1-1
- 1.1 NAVBASE Description and Background 1-1
- 1.2 Base Closure Process for Environmental Cleanup 1-9
- 1.3 Investigative Zone Delineation 1-11
- 1.4 Current Investigation 1-12
- 1.5 Previous Investigations 1-20

2.0 FIELD INVESTIGATION 2-1
- 2.1 Sample Identification 2-2
- 2.2 Soil Sampling 2-2
  - 2.2.1 Soil Sample Locations 2-2
  - 2.2.2 Soil Sample Collection 2-3
  - 2.2.3 Soil Sample Preparation, Packaging, and Shipment 2-4
  - 2.2.4 Soil Sample Analysis 2-5
- 2.3 Monitoring Well Installation and Development 2-6
  - 2.3.1 Shallow Monitoring Well Installation 2-7
  - 2.3.2 Deep Monitoring Well Installation 2-9
  - 2.3.3 Monitoring Well Protector Construction 2-12
  - 2.3.4 Monitoring Well Development 2-13
- 2.4 Groundwater Sampling 2-14
  - 2.4.1 Groundwater Sampling Locations 2-15
  - 2.4.2 Groundwater Sample Collection 2-15
  - 2.4.3 Groundwater Sample Preparation, Packaging, and Shipment . . . 2-19
  - 2.4.4 Groundwater Sample Analysis 2-20
- 2.5 Sediment and Surface Water Sampling 2-21
  - 2.5.1 Sediment and Surface Water Sample Locations 2-21
  - 2.5.2 Sediment and Surface Water Sample Collection 2-22
  - 2.5.3 Sediment and Surface Water Sample Preparation, Packaging, and Shipment 2-22
  - 2.5.4 Sediment and Surface Water Sample Analysis 2-23
- 2.6 Aquifer Characterization 2-24
- 2.7 Vertical and Horizontal Surveying 2-26
- 2.8 Trenching 2-27
- 2.9 Soil-Gas and Geophysical Surveys 2-27
- 2.10 Decontamination Procedures 2-28
  - 2.10.1 Decontamination Area Setup 2-28
  - 2.10.2 Cross-Contamination Prevention 2-28
  - 2.10.3 Nonsampling Equipment 2-29
  - 2.10.4 Sampling Equipment 2-29

3.0 PHYSICAL SETTING 3-1
3.1 Geology 3-1
3.1.1 Regional Physiographic and Geologic Background 3-1
3.1.2 NAVBASE Geologic Investigation 3-2
3.1.3 Ashley Formation 3-10
3.1.4 Wando Formation 3-19
3.1.5 Fill Deposits 3-20
3.2 NAVBASE Hydrogeology 3-21
3.2.1 Regional Hydrologic and Hydrogeologic Background 3-21
3.2.2 NAVBASE Hydrogeologic Investigation 3-22
3.2.3 Lower Confining Unit 3-22
3.2.4 Shallow Aquifer 3-22
3.2.5 Groundwater Flow Direction 3-23
3.2.6 Vertical Hydraulic Gradient 3-24
3.2.7 Horizontal Hydraulic Gradient 3-33
3.2.8 Hydraulic Conductivity 3-33
3.2.9 Horizontal Groundwater Velocity 3-35
3.2.10 Zone H Groundwater Usage and Ambient Water Quality 3-36
3.3 Tidal Influence Investigation 3-40
3.3.1 Objective 3-40
3.3.2 Methodology 3-40
3.3.3 Results 3-43
3.3.4 Discussion 3-47
3.3.5 Conclusions 3-49
3.4 Climate 3-50
3.5 Habitat/Biota Survey 3-53

4.0 NATURE OF CONTAMINATION 4-1
4.1 SWMU 9 (Includes Groundwater, Surface Water, and Sediment for SWMUs 19, 20, and 121, and AOCs 649, 650, 651, and 654) 4-31
4.1.1 Soil Sampling and Analysis 4-35
4.1.1.1 Volatile Organic Compounds in Soil 4-36
4.1.1.2 Semivolatile Organic Compounds in Soil 4-36
4.1.1.3 Pesticides and PCBs in Soil 4-37
4.1.1.4 Other Organic Compounds in Soil 4-38
4.1.1.5 Inorganic Elements in Soil 4-38
4.1.2 Groundwater Sampling and Analysis (Includes SWMUs 19, 20, and 121; and AOCs 649, 650, 651, and 654) 4-39
4.1.2.1 Volatile Organic Compounds in Groundwater 4-40
4.1.2.2 Semivolatile Organic Compounds in Groundwater . 4-42
4.1.2.3 Pesticides and PCBs in Groundwater 4-43
4.1.2.4 Other Organic Compounds in Groundwater 4-44
4.1.2.5 Inorganic Elements in Groundwater 4-44

4.1.3 Sediment Sampling and Analysis 4-46
4.1.3.1 Volatile Organic Compounds in Sediment 4-47
4.1.3.2 Semivolatile Organic Compounds in Sediment 4-47
4.1.3.3 Pesticides and PCBs in Sediment 4-48
4.1.3.4 Other Organic Compounds in Sediment 4-48
4.1.3.5 Inorganic Elements in Sediment 4-49
4.1.4 Surface Water Sampling and Analysis 4-49
4.1.4.1 Volatile Organic Compounds in Surface Water . . . 4-50
4.1.4.2 Semivolatile Organic Compounds in Surface Water 4-50
4.1.4.3 Pesticides and PCBs in Surface Water 4-50
4.1.4.4 Other Organic Compounds in Surface Water 4-50
4.1.4.5 Inorganic Elements in Surface Water 4-51
4.1.5 Deviations from Final Zone H RFI Work Plan 4-51
4.2 SWMU 13 4-77
4.2.1 Soil Sampling and Analysis 4-77
4.2.1.1 Volatile Organic Compounds in Soil 4-78
4.2.1.2 Semivolatile Organic Compounds in Soil 4-78
4.2.1.3 Pesticides and PCBs in Soil 4-78
4.2.1.4 Other Organic Compounds in Soil 4-81
4.2.1.5 Inorganic Elements in Soil 4-82
4.2.2 Groundwater Sampling and Analysis 4-83
4.2.2.1 Volatile Organic Compounds in Groundwater 4-83
4.2.2.2 Semivolatile Organic Compounds in Groundwater 4-83
4.2.2.3 Pesticides and PCBs in Groundwater 4-83
4.2.2.4 Other Organic Compounds in Groundwater 4-84
4.2.2.5 Inorganic Elements in Groundwater 4-84
4.2.3 Deviations from Final Zone H RFI Work Plan 4-85
4.3 SWMU 14 (Includes SWMU 15 and AOCs 670 and 684) 4-93
4.3.1 Soil Sampling and Analysis 4-93
4.3.1.1 Volatile Organic Compounds in Soil 4-94
4.3.1.2 Semivolatile Organic Compounds in Soil 4-94
4.3.1.3 Pesticides and PCBs in Soil 4-97
4.3.1.4 Other Organic Compounds in Soil 4-97
4.3.1.5 Inorganic Elements in Soil 4-98
4.3.2 Groundwater Sampling and Analysis 4-99
4.3.2.1 Volatile Organic Compounds in Groundwater 4-99
4.3.2.2 Semivolatile Organic Compounds in Groundwater 4-100
4.3.2.3 Pesticides and PCBs in Groundwater 4-100
4.3.2.4 Other Organic Compounds in Groundwater 4-101
4.3.2.5 Inorganic Elements in Groundwater 4-102

4.3.3 Sediment Sampling and Analysis 4-104
4.3.3.1 Volatile Organic Compounds in Sediment 4-105
4.3.3.2 Semivolatile Organic Compounds in Sediment 4-105
4.3.3.3 Pesticides and PCBs in Sediment 4-105
4.3.3.4 Other Organic Compounds in Sediment 4-105
4.3.3.5 Inorganic Elements in Sediment 4-106
4.3.4 Surface Water Data 4-107
4.3.4.1 Volatile Organic Compounds in Surface Water . . . 4-107
4.3.4.2 Semivolatile Organic Compounds in Surface Water 4-107
4.3.4.3 Pesticides and PCBs in Surface Water 4-107
4.3.4.4 Other Organic Compounds in Surface Water 4-108
4.3.4.5 Inorganic Elements in Surface Water 4-108
4.3.5 Deviations from Final Zone H RFI Work Plan 4-108
4.4 SWMU 17 4-125
4.4.1 Soil Sampling and Analysis 4-125
4.4.1.1 Volatile Organic Compounds in Soil 4-126
4.4.1.2 Semivolatile Organic Compounds in Soil 4-126
4.4.1.3 Pesticides and PCBs in Soil 4-126
4.4.1.4 Other Organic Compounds in Soil 4-129
4.4.1.5 Inorganic Elements in Soil 4-130
4.4.2 Groundwater Sampling and Analysis 4-130
4.4.2.1 Volatile Organic Compounds in Groundwater 4-131
4.4.2.2 Semivolatile Organic Compounds in Groundwater 4-131
4.4.2.3 Pesticides and PCBs in Groundwater 4-132
4.4.2.4 Other Organic Compounds in Groundwater 4-132
4.4.2.5 Inorganic Elements in Groundwater 4-132
4.4.3 Deviations from Final Zone H RFI Work Plan 4-133
4.5 SWMU 19 4-141
4.5.1 Soil Sampling and Analysis 4-141
4.5.1.1 Volatile Organic Compounds in Soil 4-141
4.5.1.2 Semivolatile Organic Compounds in Soil 4-142
4.5.1.3 Pesticides and PCBs in Soil 4-142
4.5.1.4 Other Organic Compounds in Soil 4-145
4.5.1.5 Inorganic Elements in Soil 4-145
4.5.2 Deviations from Final Zone H RFI Work Plan 4-146
4.6 SWMU 20 4-153
4.6.1 Soil Sampling and Analysis 4-153
4.6.1.1 Volatile Organic Compounds in Soil 4-153
4.6.1.2 Semivolatile Organic Compounds in Soil 4-154
4.6.1.3 Pesticides and PCBs in Soil 4-154
4.6.1.4 Other Organic Compounds in Soil 4-154
4.6.1.5 Inorganic Elements in Soil 4-157
4.6.2 Deviations from Final Zone H RFI Work Plan 4-157

4.7 SWMU 121 4-159
4.7.1 Soil Sampling and Analysis 4-159
4.7.1.1 Volatile Organic Compounds in Soil 4-160
4.7.1.2 Semivolatile Organic Compounds in Soil 4-160
4.7.1.3 Pesticides and PCBs in Soil 4-160
4.7.1.4 Other Organic Compounds in Soil 4-163
4.7.1.5 Inorganic Elements in Soil 4-163
4.7.2 Deviations from Final Zone H RFI Work Plan 4-164
4.8 SWMU 178 4-169
4.8.1 Soil Sampling and Analysis 4-169
4.8.1.1 Volatile Organic Compounds in Soil 4-169
4.8.1.2 Semivolatile Organic Compounds in Soil 4-170
4.8.1.3 Pesticides and PCBs in Soil 4-170
4.8.1.4 Other Organic Compounds in Soil 4-170
4.8.1.5 Inorganic Elements in Soil 4-173
4.8.2 Groundwater Sampling and Analysis 4-173
4.8.2.1 Volatile Organic Compounds in Groundwater 4-173
4.8.2.3 Pesticides and PCBs in Groundwater 4-174
4.8.2.4 Other Organic Compounds in Groundwater 4-174
4.8.2.5 Inorganic Elements in Groundwater 4-174
4.8.3 Deviations from Final Zone H RFI Work Plan 4-174
4.9 AOCs 649, 650, and 651 4-181
4.9.1 Soil Sampling and Analysis 4-181
4.9.1.1 Volatile Organic Compounds in Soil 4-182
4.9.1.2 Semivolatile Organic Compounds in Soil 4-182
4.9.1.3 Pesticides and PCBs in Soil 4-182
4.9.1.4 Other Organic Compounds in Soil 4-185
4.9.1.5 Inorganic Elements in Soil 4-185
4.9.2 Deviations from Final Zone H RFI Work Plan 4-185
4.10 AOC 656 4-191
4.10.1 Soil Sampling and Analysis 4-191
4.10.1.1 Volatile Organic Compounds in Soil 4-192
4.10.1.2 Semivolatile Organic Compounds in Soil 4-192
4.10.1.3 Pesticides and PCBs in Soil 4-192
4.10.1.4 Other Organic Compounds in Soil 4-192
4.10.1.5 Inorganic Elements in Soil 4-195
4.10.2 Groundwater Sampling and Analysis 4-195
4.10.2.1 Volatile Organic Compounds in Groundwater 4-196
4.10.2.2 Semivolatile Organic Compounds in Groundwater 4-196
4.10.2.3 Pesticides and PCBs in Groundwater 4-196
4.10.2.4 Other Organic Compounds in Groundwater 4-196
4.10.2.5 Inorganic Elements in Groundwater 4-196
4.10.3 Deviations from Final Zone H RFI Work Plan 4-197
4.11 AOC 653 4-203

4.11.1 Soil Sampling and Analysis 4-203
4.11.1.1 Volatile Organic Compounds in Soil 4-203
4.11.1.2 Semivolatile Organic Compounds in Soil 4-204
4.11.1.3 Pesticides and PCBs in Soil 4-204
4.11.1.4 Other Organic Compounds in Soil 4-207
4.11.1.5 Inorganic Elements in Soil 4-207
4.11.2 Groundwater Sampling and Analysis 4-207
4.11.2.1 Volatile Organic Compounds in Groundwater 4-208
4.11.2.2 Semivolatile Organic Compounds in Groundwater 4-208
4.11.2.3 Pesticides and PCBs in Groundwater 4-208
4.11.2.4 Other Organic Compounds in Groundwater 4-208
4.11.2.5 Inorganic Elements in Groundwater 4-209
4.11.3 Deviations from Final Zone H RFI Work Plan 4-209
4.12 AOC 654 4-215
4.12.1 Soil Sampling and Analysis 4-215
4.12.1.1 Volatile Organic Compounds in Soil 4-215
4.12.1.2 Semivolatile Organic Compounds in Soil 4-216
4.12.1.3 Pesticides and PCBs in Soil 4-216
4.12.1.4 Other Organic Compounds in Soil 4-216
4.12.1.5 Inorganic Elements in Soil 4-219
4.12.2 Deviations from Final Zone H RFI Work Plan 4-219
4.13 AOC 655 4-223
4.13.1 Soil Sampling and Analysis 4-223
4.13.1.1 Volatile Organic Compounds in Soil 4-224
4.13.1.2 Semivolatile Organic Compounds in Soil 4-224
4.13.1.3 Pesticides and PCBs in Soil 4-227
4.13.1.4 Other Organic Compounds in Soil 4-227
4.13.1.5 Inorganic Elements in Soil 4-228
4.13.2 Groundwater Sampling and Analysis 4-228
4.13.2.1 Volatile Organic Compounds in Groundwater 4-229
4.13.2.2 Semivolatile Organic Compounds in Groundwater 4-229
4.13.2.3 Pesticides and PCBs in Groundwater 4-229
4.13.2.4 Other Organic Compounds in Groundwater 4-229
4.13.2.5 Inorganic Elements in Groundwater 4-229
4.13.3 Deviations from Final Zone H RFI Work Plan 4-230
4.14 AOC 659 4-237
4.14.1 Soil Sampling and Analysis 4-237
4.14.1.1 Volatile Organic Compounds in Soil 4-237
4.14.1.2 Semivolatile Organic Compounds in Soil 4-238
4.14.1.3 Pesticides and PCBs in Soil 4-238
4.14.1.4 Other Organic Compounds in Soil 4-238
4.14.1.5 Inorganic Elements in Soil 4-241
4.14.2 Deviations from Final Zone H RFI Work Plan 4-241

4.15 AOC 660 4-245
4.15.1 Soil Sampling and Analysis 4-245
4.15.1.1 Volatile Organic Compounds in Soil 4-245
4.15.1.2 Semivolatile Organic Compounds in Soil 4-246
4.15.1.3 Pesticides and PCBs in Soil 4-246
4.15.1.4 Other Organic Compounds in Soil 4-246
4.15.1.5 Inorganic Elements in Soil 4-249
4.15.2 Groundwater Sampling and Analysis 4-249
4.15.2.1 Volatile Organic Compounds in Groundwater . . . 4-249
4.15.2.2 Semivolatile Organic Compounds in Groundwater 4-249
4.15.2.3 Pesticides and PCBs in Groundwater 4-249
4.15.2.4 Other Organic Compounds in Groundwater 4-249
4.15.2.5 Inorganic Elements in Groundwater 4-250
4.15.3 Deviations from Final Zone H RFI Work Plan 4-250
4.16 AOC 662 4-255
4.16.1 Soil Sampling and Analysis 4-255
4.16.1.1 Volatile Organic Compounds in Soil 4-255
4.16.1.2 Semivolatile Organic Compounds in Soil 4-256
4.16.1.3 Pesticides and PCBs in Soil 4-256
4.16.1.4 Other Organic Compounds in Soil 4-256
4.16.1.5 Inorganic Elements in Soil 4-256
4.16.2 Groundwater Sampling and Analysis 4-259
4.16.2.1 Volatile Organic Compounds in Groundwater 4-259
4.16.2.2 Semivolatile Organic Compounds in Groundwater 4-259
4.16.2.3 Pesticides and PCBs in Groundwater 4-259
4.16.2.4 Other Organic Compounds in Groundwater 4-259
4.16.2.5 Inorganic Elements in Groundwater 4-259
4.16.3 Deviations from Final Zone H RFI Work Plan 4-260
4.17 AOC 663 and SWMU 136 4-265
4.17.1 Soil Sampling and Analysis 4-265
4.17.1.1 Volatile Organic Compounds in Soil 4-266
4.17.1.2 Semivolatile Organic Compounds in Soil 4-266
4.17.1.3 Pesticides and PCBs in Soil 4-269
4.17.1.4 Other Organic Compounds in Soil 4-269
4.17.1.5 Inorganic Elements in Soil 4-270
4.17.2 Groundwater Sampling and Analysis 4-270
4.17.2.1 Volatile Organic Compounds in Groundwater 4-271
4.17.2.2 Semivolatile Organic Compounds in Groundwater 4-271
4.17.2.3 Pesticides and PCBs in Groundwater 4-271
4.17.2.4 Other Organic Compounds in Groundwater 4-272
4.17.2.5 Inorganic Elements in Groundwater 4-272
4.17.3 Deviations from Final Zone H RFI Work Plan 4-273

4.18 AOC 665 4-279
4.18.1 Soil Sampling and Analysis 4-279
4.18.1.1 Volatile Organic Compounds in Soil 4-279
4.18.1.2 Semivolatile Organic Compounds in Soil 4-280
4.18.1.3 Pesticides and PCBs in Soil 4-280
4.18.1.4 Other Organic Compounds in Soil 4-280
4.18.1.5 Inorganic Elements in Soil 4-283
4.18.2 Deviations from Final Zone H RFI Work Plan 4-283
4.19 AOC 667 and SWMU 138 4-287
4.19.1 Soil Sampling and Analysis 4-288
4.19.1.1 Volatile Organic Compounds in Soil 4-288
4.19.1.2 Semivolatile Organic Compounds in Soil 4-288
4.19.1.3 Pesticides and PCBs in Soil 4-291
4.19.1.4 Other Organic Compounds in Soil 4-291
4.19.1.5 Inorganic Elements in Soil 4-292
4.19.2 Groundwater Sampling and Analysis 4-292
4.19.2.1 Volatile Organic Compounds in Groundwater 4-294
4.19.2.2 Semivolatile Organic Compounds in Groundwater . 4-297
4.19.2.3 Pesticides and PCBs in Groundwater 4-297
4.19.2.4 Other Organic Compounds in Groundwater 4-297
4.19.2.5 Inorganic Elements in Groundwater 4-297
4.19.3 Deviations from Final Zone H RFI Work Plan 4-298
4.20 AOC 666 4-299
4.20.1 Soil Sampling and Analysis 4-299
4.20.1.1 Volatile Organic Compounds in Soil 4-299
4.20.1.2 Semivolatile Organic Compounds in Soil 4-300
4.20.1.3 Pesticides and PCBs in Soil 4-300
4.20.1.4 Other Organic Compounds in Soil 4-303
4.20.1.5 Inorganic Elements in Soil 4-303
4.20.2 Groundwater Sampling and Analysis 4-304
4.20.2.1 Volatile Organic Compounds in Groundwater 4-304
4.20.2.2 Semivolatile Organic Compounds in Groundwater 4-304
4.20.2.3 Pesticides and PCBs in Groundwater 4-304
4.20.2.4 Other Compounds in Groundwater 4-305
4.20.2.5 Inorganic Elements in Groundwater 4-305
4.20.3 Deviations from Final Zone H RFI Work Plan 4-305
4.21 SWMU 159 4-311
4.21.1 Soil Sampling and Analysis 4-311
4.21.1.1 Volatile Organic Compounds in Soil 4-311
4.21.1.2 Semivolatile Organic Compounds in Soil 4-312
4.21.1.3 Pesticides and PCBs in Soil 4-312
4.21.1.4 Other Organic Compounds in Soil 4-312
4.21.1.5 Inorganic Elements in Soil 4-315

4.21.2 Sediment Sampling and Analysis 4-315
4.21.2.1 Volatile Organic Compounds in Sediment 4-315
4.21.2.2 Semivolatile Organic Compounds in Sediment 4-316
4.21.2.3 Pesticides and PCBs in Sediment 4-316
4.21.2.4 Other Organic Compounds in Sediment 4-316
4.21.2.5 Inorganic Elements in Sediment 4-317
4.21.3 Surface Water Sampling and Analysis 4-317
4.21.3.1 Volatile Organic Compounds in Surface Water . . . 4-318
4.21.3.2 Semivolatile Organic Compounds in Surface Water 4-318
4.21.3.3 Pesticides and PCBs in Surface Water 4-318
4.21.3.4 Other Organic Compounds in Surface Water 4-318
4.21.3.5 Inorganic Elements in Surface Water 4-318
4.21.4 Deviations from Final Zone H RFI Work Plan 4-318
4.22 Zone H Grid-Based Sampling 4-329
4.22.1 Soil Sampling and Analysis 4-329
4.22.1.1 Volatile Organic Compounds in Soil 4-329
4.22.1.2 Semivolatile Organic Compounds in Soil 4-329
4.22.1.3 Pesticides and PCBs in Soil 4-330
4.22.1.4 Other Organic Compounds in Soil 4-330
4.22.1.5 Inorganic Elements in Soil 4-330
4.22.2 Groundwater Sampling and Analysis 4-331
4.22.2.1 Volatile Organic Compounds in Groundwater 4-331
4.22.2.2 Semivolatile Organic Compounds in Groundwater 4-332
4.22.2.3 Pesticides and PCBs in Groundwater 4-333
4.22.2.4 Other Organic Compounds in Groundwater 4-333
4.22.2.5 Inorganic Chemicals in Groundwater 4-334
4.23 Other Impacted Areas 4-347

5.0 FATE AND TRANSPORT 5-1
5.1 Properties Affecting Fate and Transport 5-3
5.1.1 Chemical and Physical Properties Affecting Fate and Transport . 5-3
5.1.2 Media Properties Affecting Fate and Transport 5-7
5.2 Fate and Transport Approach for Zone H 5-17
5.2.1 Soil-to-Groundwater Cross-Media Transport 5-18
5.2.2 Soil-to-Air Cross-Media Transport 5-20
5.2.3 Groundwater-to-Surface Water Cross-Media Transport 5-21
5.2.4 Surface Soil-to-Sediment Cross-Media Transport 5-23
5.3 SWMU 9 (Includes SWMUs 19, 20, and 121, and AOCs 649, 650, 651, and 654) 5-27
5.3.1 SWMU 9 — Soil-to-Groundwater Cross-Media Transport 5-28
5.3.2 SWMU 9 – Groundwater-to-Surface Water Cross-Media Transport 5-31

5.3.3 SWMU 9 – Soil-to-Air Cross-Media Transport 5-34
5.3.4 SWMU 9 – Soil-to-Sediment Cross-Media Transport 5-36
5.3.5 SWMU 9 – Fate and Transport Summary 5-37
5.4 SWMU 13 5-47
5.4.1 SWMU 13 – Soil-to-Groundwater Cross-Media Transport 5-47
5.4.2 SWMU 13 – Groundwater-to-Surface Water Cross-Media Transport 5-48
5.4.3 SWMU 13 – Soil-to-Air Cross-Media Transport 5-49
5.5 SWMU 14 (Includes SWMU 15 and AOCs 670 and 684) 5-53
5.5.1 SWMU 14 – Soil-to-Groundwater Cross-Media Transport 5-54
5.5.2 SWMU 14 – Groundwater-to-Surface Water Cross-Media Transport 5-57
5.5.3 SWMU 14 – Soil-to-Air Cross-Media Transport 5-59
5.5.4 SWMU 14 – Soil-to-Sediment Cross-Media Transport 5-59
5.5.5 SWMU 14 – Fate and Transport Summary 5-60
5.6 SWMU 17 5-67
5.6.1 SWMU 17 – Soil-to-Groundwater Cross-Media Transport 5-67
5.6.2 SWMU 17 – Groundwater-to-Surface Water Cross-Media Transport 5-69
5.6.3 SWMU 17 – Soil-to-Air Cross-Media Transport 5-69
5.6.4 SWMU 17 – Fate and Transport Summary 5-69
5.7 SWMU 159 5-75
5.7.1 SWMU 159 – Soil-to-Groundwater Cross-Media Transport . . . 5-75
5.7.2 SWMU 159 – Surface Soil-to-Sediment/Surface Water 5-75
5.7.3 SWMU 159 – Soil-to-Air Cross-Media Transport 5-76
5.8 SWMU 178 5-79
5.8.1 SWMU 178 – Soil-to-Groundwater Cross-Media Transport . . . 5-79
5.8.2 SWMU 178 – Groundwater-to-Surface Water Cross-Media Transport 5-79
5.8.3 SWMU 178 – Soil-to-Air Cross-Media Transport 5-80
5.9 AOC 653 5-83
5.9.1 AOC 653 – Soil-to-Groundwater Cross-Media Transport 5-83
5.9.2 AOC 653 – Groundwater-to-Surface Water Cross-Media Transport 5-83
5.9.3 AOC 653 – Soil-to-Air Cross-Media Transport 5-84
5.10 AOC 655 5-87
5.10.1 AOC 655 — Soil to Groundwater Cross Media Transport 5-87
5.10.2 AOC 655 – Groundwater-to-Surface Water Cross-Media Transport 5-88
5.10.3 AOC 655 – Soil-to-Air Cross-Media Transport 5-88
5.11 AOC 656 5-91
5.11.1 AOC 656 – Soil-to-Groundwater Cross-Media Transport 5-91
5.11.2 AOC 656 – Groundwater-to-Surface Water Cross-Media Transport 5-91
5.11.3 AOC 656 – Soil-to-Air Cross-Media Transport 5-92

5.12 AOC 659 5-95
5.12.1 AOC 659 – Soil-to-Groundwater Cross-Media Transport 5-95
5.12.2 AOC 659 – Groundwater-to-Surface Water Cross-Media Transport 5-95
5.12.3 AOC 659 – Soil-to-Air Cross-Media Transport 5-95
5.13 AOC 660 5-99
5.13.1 AOC 660 – Soil-to-Groundwater Cross-Media Transport 5-99
5.13.2 AOC 660 – Groundwater to Surface Water Cross-Media Transport 5-99
5.13.3 AOC 660 – Soil-to-Air Cross-Media Transport 5-99
5.14 AOC 662 5-103
5.14.1 AOC 662 – Soil-to-Groundwater Cross-Media Transport 5-103
5.14.2 AOC 662 – Groundwater-to-Surface Water Cross-Media Transport 5-103
5.14.3 AOC 662 – Soil-to-Air Cross-Media Transport 5-103
5.15 AOC 663 (Includes SWMU 136) 5-107
5.15.1 AOC 663 – Soil-to-Groundwater Cross-Media Transport 5-107
5.15.2 AOC 663 – Groundwater-to-Surface Water Cross-Media Transport 5-107
5.15.3 AOC 663 – Soil-to-Air Cross-Media Transport 5-108
5.16 AOC 665 5-113
5.16.1 AOC 665 – Soil-to-Groundwater Cross-Media Transport 5-113
5.16.2 AOC 665 Groundwater-to-Surface Water Cross-Media Transport 5-113
5.16.3 AOC 665 – Soil-to-Air Cross-Media Transport 5-113
5.17 AOC 666 5-117
5.17.1 AOC 666 – Soil-to-Groundwater Cross-Media Transport 5-117
5.17.2 AOC 666 – Groundwater-to-Surface Water Cross-Media Transport 5-118
5.17.3 AOC 666 – Soil-to-Air Cross-Media Transport 5-118
5.18 AOC 667 (Includes SWMU 138) 5-121
5.18.1 AOC 667 – Soil-to-Groundwater Cross-Media Transport 5-121
5.18.2 AOC 667 – Groundwater-to-Surface Water Cross-Media Transport 5-121
5.18.3 AOC 667 – Soil-to-Air Cross-Media Transport 5-121
5.19 Other Impacted Areas 5-125
5.19.1 Other Impacted Areas – Soil-to-Groundwater Cross-Media Transport 5-125
5.19.2 Other Impacted Areas – Soil-to-Air Cross-Media Transport 5-125

6.0 BASELINE RISK ASSESSMENT APPROACH AND METHODOLOGY 6-1
6.1 Introduction 6-1
6.1.1 Objectives 6-2

6.1.2 Site Characterization 6-5
6.1.2.1 Data Sources 6-5
6.1.2.2 Data Validation 6-5
6.1.2.3 Management of Site-Related Data 6-6
6.1.2.4 Selection of Chemicals of Potential Concern 6-8
6.1.2.4.1 Comparison of Site-Related Data to Risk-Based Screening Concentrations . . 6-9
6.1.2.4.2 Comparison of Site-Related Data to Background Concentrations 6-11
6.1.2.4.3 Elimination of Essential Elements: Calcium, Iron, Magnesium, Potassium, ... 6-12
6.1.2.4.4 Summary of COPCs 6-13
6.1.2.5 Calculation of Risk and Hazard 6-14
6.1.3 Exposure Assessment 6-14
6.1.3.1 Exposure Setting and Land Use 6-15
6.1.3.2 Potentially Exposed Populations 6-15
6.1.3.3 Exposure Pathways 6-16
6.1.3.4 Exposure Point Concentrations 6-16
6.1.3.5 Quantification of Exposure 6-18
6.1.3.5.1 Surface Soil Pathway Exposure 6-19
6.1.3.5.2 Groundwater Pathway Exposure 6-20
6.1.4 Toxicity Assessment 6-21
6.1.4.1 Carcinogenicity and Noncancer Effects 6-21
6.1.4.2 Toxicity Profiles for COPCs 6-30
6.1.5 Risk Characterization 6-30
6.1.5.1 Surface Soil Pathways 6-34
6.1.5.2 Groundwater Pathways 6-34
6.1.5.3 Other Applicable Pathways 6-34
6.1.5.4 COCs Identified 6-34
6.1.5.5 Risk/Hazard Maps 6-35
6.1.6 Risk Uncertainty 6-36
6.1.6.1 General 6-36
6.1.6.2 Quality of Data 6-37
6.1.6.3 Identification of COPCs 6-38
6.1.6.4 Characterization of Exposure Setting and Identification of Exposure Pathways 6-41
6.1.6.5 Toxicity Assessment Information 6-47
6.1.6.6 Quantification of Risk/Hazard 6-48
6.1.6.7 Mapping Risk/Hazard 6-48
6.1.7 Risk Summary 6-51
6.1.8 Remedial Goal Options 6-51
6.2 Site-Specific HHRA 6-53
6.2.1 Baseline Risk Assessment for SWMU 9 6-55

6.2.1.1 Site Background and Investigative Approach 6-55
6.2.1.2 COPC Identification 6-56
6.2.1.3 Exposure Assessment 6-60
6.2.1.4 Toxicity Assessment 6-63
6.2.1.5 Risk Characterization 6-81
6.2.1.6 Risk Uncertainty 6-121
6.2.1.7 Risk Summary 6-126
6.2.1.8 Remedial Goal Options 6-127
6.2.2 Baseline Risk Assessment for SWMU 13 6-245
6.2.2.1 Site Background and Investigative Approach 6-245
6.2.2.2 COPC Identification 6-245
6.2.2.3 Exposure Assessment 6-246
6.2.2.4 Toxicity Assessment 6-247
6.2.2.5 Risk Characterization 6-251
6.2.2.6 Risk Uncertainty 6-255
6.2.2.7 Risk Summary 6-259
6.2.2.8 Remedial Goal Options Soil 6-259
6.2.3 Baseline Risk Assessment for Combined SWMU 14 (Including SWMU 15 and AOCs 669, 670 and 684) 6-285
6.2.3.1 Site Background and Investigative Approach 6-285
6.2.3.2 COPC Identification 6-286
6.2.3.3 Exposure Assessment 6-288
6.2.3.4 Toxicity Assessment 6-291
6.2.3.5 Risk Characterization 6-302
6.2.3.6 Risk Uncertainty 6-326
6.2.3.7 Risk Summary 6-332
6.2.3.8 Remedial Goal Options 6-333
6.2.4 Baseline Risk Assessment for SWMU 17 6-413
6.2.4.1 Site Background and Investigative Approach 6-413
6.2.4.2 COPC Identification 6-413
6.2.4.3 Exposure Assessment 6-414
6.2.4.4 Toxicity Assessment 6-416
6.2.4.5 Risk Characterization 6-422
6.2.4.6 Risk Uncertainty 6-431
6.2.4.7 Risk Summary 6-436
6.2.4.8 Remedial Goal Options 6-436
6.2.5 Baseline Risk Assessment for SWMU 159 6-463
6.2.5.1 Site Background and Investigative Approach 6-463
6.2.5.2 COPC Identification 6-463
6.2.5.3 Exposure Assessment 6-464
6.2.5.4 Toxicity Assessment 6-467
6.2.5.5 Risk Characterization 6-471
6.2.5.6 Risk Uncertainty 6-474
6.2.5.7 Risk Summary 6-477
6.2.5.8 Remedial Goal Options 6-478

6.2.6 Baseline Risk Assessment for SWMU 178 6-499
6.2.6.1 Site Background and Investigative Approach 6-499
6.2.6.2 COPC Identification 6-499
6.2.6.3 Exposure Assessment 6-500
6.2.6.4 Toxicity Assessment 6-501
6.2.6.5 Risk Characterization 6-503
6.2.6.6 Risk Uncertainty 6-505
6.2.6.7 Risk Summary 6-508
6.2.6.8 Remedial Goal Options 6-509
6.2.7 Baseline Risk Assessment for AOC 653 6-525
6.2.7.1 Site Background and Investigative Approach 6-525
6.2.7.2 COPC Identification 6-525
6.2.7.3 Exposure Assessment 6-526
6.2.7.4 Toxicity Assessment 6-527
6.2.7.5 Risk Characterization 6-531
6.2.7.6 Risk Uncertainty 6-535
6.2.7.7 Risk Summary 6-538
6.2.7.8 Remedial Goal Options 6-538
6.2.8 Baseline Risk Assessment for AOC 655 6-559
6.2.8.1 Site Background and Investigative Approach 6-559
6.2.8.2 COPC Identification 6-559
6.2.8.3 Exposure Assessment 6-560
6.2.8.4 Toxicity Assessment 6-562
6.2.8.5 Risk Characterization 6-566
6.2.8.6 Risk Uncertainty 6-570
6.2.8.7 Risk Summary 6-576
6.2.8.8 Remedial Goal Options 6-576
6.2.9 Baseline Risk Assessment for AOC 656 6-609
6.2.9.1 Site Background and Investigative Approach 6-609
6.2.9.2 COPC Identification 6-609
6.2.9.3 Exposure Assessment 6-610
6.2.9.4 Toxicity Assessment 6-612
6.2.9.5 Risk Characterization 6-615
6.2.9.7 Risk Summary 6-622
6.2.9.8 Remedial Goal Options 6-623
6.2.10 Baseline Risk Assessment for AOC 659 6-647
6.2.10.1 Site Background and Investigative Approach 6-647
6.2.10.2 COPC Identification 6-647
6.2.11 Baseline Risk Assessment for AOC 660 6-651
6.2.11.1 Site Background and Investigative Approach 6-651
6.2.11.2 COPC Identification 6-651
6.2.12 Baseline Risk Assessment for AOC 662 6-659
6.2.12.1 Site Background and Investigative Approach 6-659
6.2.12.2 COPC Identification 6-659

6.2.13 Baseline Risk Assessment for AOC 663 and SWMU 136 6-667
6.2.13.1 Site Background and Investigative Approach 6-667
6.2.13.2 COPC Identification 6-667
6.2.13.3 Exposure Assessment 6-668
6.2.13.4 Toxicity Assessment 6-670
6.2.13.5 Risk Characterization 6-676
6.2.13.6 Risk Uncertainty 6-680
6.2.13.7 Risk Summary 6-685
6.2.13.8 Remedial Goal Options 6-686
6.2.14 Baseline Risk Assessment for AOC 665 6-721
6.2.14.1 Site Background and Investigative Approach 6-721
6.2.14.2 COPC Identification 6-721
6.2.14.3 Exposure Assessment 6-721
6.2.14.4 Toxicity Assessment 6-722
6.2.14.5 Risk Characterization 6-724
6.2.14.6 Risk Uncertainty 6-726
6.2.14.7 Risk Summary 6-729
6.2.14.8 Remedial Goal Options 6-729
6.2.15 Baseline Risk Assessment for AOC 666 6-741
6.2.15.1 Site Background and Investigative Approach 6-741
6.2.15.2 COPC Identification 6-741
6.2.15.3 Exposure Assessment 6-742
6.2.15.4 Toxicity Assessment 6-743
6.2.15.5 Risk Characterization 6-748
6.2.15.6 Risk Uncertainty 6-752
6.2.15.7 Risk Summary 6-757
6.2.15.8 Remedial Goal Options 6-757
6.2.16 Baseline Risk Assessment for AOC 667 and SWMU 138 6-789
6.2.16.1 Site Background and Investigative Approach 6-789
6.2.16.2 COPC Identification 6-789
6.2.16.3 Exposure Assessment 6-790
6.2.16.4 Toxicity Assessment 6-791
6.2.16.5 Risk Characterization 6-793
6.2.16.6 Risk Uncertainty 6-795
6.2.16.7 Risk Summary 6-798
6.2.16.8 Remedial Goal Options 6-798
6.2.17 Baseline Risk Assessment for Other Impacted Areas 6-813
6.2.17.1 Site Background and Investigative Approach 6-813
6.2.17.2 COPC Identification 6-814
6.2.17.3 Exposure Assessment 6-814
6.2.17.4 Toxicity Assessment 6-816
6.2.17.5 Risk Characterization 6-819
6.2.17.6 Risk Uncertainty 6-823
6.2.17.7 Risk Summary 6-827
6.2.17.8 Remedial Goal Options 6-827

7.0 ECOLOGICAL RISK ASSESSMENT 7-1
7.1 Zone Rationale 7-1
7.2 Environmental Setting 7-7
7.2.1 Problem Formulation 7-7
7.2.2 Threatened and Endangered Species 7-8
7.3 Conceptual Model 7-11
7.4 Selection of Ecological Chemicals of Potential Concern 7-11
7.5 Contaminant Fate and Transport 7-32
7.6 Exposure Pathways and Assessment 7-36
7.7 Ecological Effects Assessment 7-39
7.8 Risk Characterization 7-40
7.8.1 Infaunal Invertebrates 7-41
7.8.2 Terrestrial Wildlife 7-49
7.8.3 Vegetation 7-98
7.8.4 Aquatic Wildlife 7-109
7.9 Uncertainty 7-111
7.10 Ecological Risk Assessment Conclusions 7-112

8.0 RECOMMENDATIONS FOR CORRECTIVE MEASURES 8-1
8.1 Introduction 8-2
8.2 Remedy Selection Approach 8-7
8.3 Proposed Remedy 8-7
8.4 Development of Target Media Cleanup Goals 8-7
8.4.1 Groundwater Cleanup Goals 8-8
8.4.2 Soil Cleanup Goals 8-8
8.4.3 Surface Water and Sediment Cleanup Goals 8-10
8.4.4 Air Cleanup Goals 8-11
8.5 Identification, Screening, and Development of Corrective Measure Technologies 8-12
8.5.1 Identification of Corrective Measure Technologies 8-12
8.5.2 Description of Prescreened Technologies 8-20
8.5.3 Screening Criteria 8-24
8.6 Identification of Corrective Measure Alternatives 8-25
8.7 Evaluation of Corrective Measure Alternatives 8-26
8.7.1 Protect Human Health and the Environment 8-27
8.7.2 Attain Media Cleanup Standards Set by the Implementing Agency 8-27
8.7.3 Control the Sources of Releases 8-27
8.7.4 Comply with Any Applicable Standards for Management of Wastes 8-28
8.7.5 Other Factors 8-28
8.8 Ranking the Corrective Measure Alternatives 8-31

9.0 CONCLUSIONS 9-1
9.1 SWMU 9 (Includes Groundwater for SWMUs 19, 20, and 121, and AOCs 649, 650, 651, and 654) 9-17
9.2 SWMU 13 9-23
9.3 Combined SWMU 14 (Includes SWMUs 14 and 15 and AOCs 670 and 684) 9-29
9.4 SWMU 17 9-47
9.5 SWMU 19 9-55
9.6 SWMU 20 9-67
9.7 SWMU 121 9-73
9.8 SWMU 178 9-85
9.9 AOCs 649, 650, and 651 9-89
9.10 AOC 656 9-97
9.11 AOC 653 9-103
9.12 AOC 654 9-109
9.13 AOC 655 9-111
9.14 AOC 659 9-119
9.15 AOC 660 9-125
9.16 AOC 662 9-127
9.17 AOC 663 and SWMU 136 9-129
9.18 AOC 665 9-139
9.19 AOC 667 and SWMU 138 9-143
9.20 AOC 666 9-147
9.21 SWMU 159 9-157
9.22 Other Impacted Areas 9-163
9.23 AOC 503 and AOC 661 9-173
9.24 Zone H RFI Summary of Recommendations 9-175

10.0 REFERENCES 10-1

11.0 SIGNATURE PAGE 11-1

List of Figures

Figure 1.1 NAVBASE 1-3
Figure 1.2 Vicinity Map 1-5
Figure 1.3 Locations of Land Holdings and Occupants 1-7
Figure 1.4 Investigative Zone Boundaries 1-13
Figure 1.5 Zone H — AOC and SWMU Location Map 1-17
Figure 3.1 Monitoring Well Location Map 3-3
Figure 3.2 Paleogeologic Contour Map for Top of Ashley Formation 3-11
Figure 3.3 NAVBASE Lithologic Cross Section A-A' 3-13
Figure 3.4 NAVBASE Lithologic Cross Section B-B' 3-15

Figure 3.5 NAVBASE Lithologic Cross Section C-C' 3-17
Figure 3.6 Potentiometric Map of Upper Zone/Shallow Aquifer 3-25
Figure 3.7 Potentiometric Map of Lower Zone/Shallow Aquifer 3-27
Figure 3.8 Vertical Hydraulic Gradients 3-31
Figure 3.9 Areal Distribution of Hydraulic Conductivity in the Surficial Aquifers 3-39
Figure 3.10 Wells Monitored During the Tidal Influence Study 3-45
Figure 3.11 Zone H Location Map with AECs 3-57
Figure 4.0 Zone H Soil, Groundwater, Sediment, and Surface Water Sample Location Map 4-3
Figure 4.1.1 SWMU 9 – Soil, Groundwater, Sediment, and Surface Water Sample and Trench Location Map 4-33
Figure 4.2.1 SWMU 13 – Soil and Groundwater Sample Location Map 4-79
Figure 4.3.1 AOCs 684 and 670, SWMUs 14 and 15 – Soil, Sediment, and Groundwater Sample Location Map 4-95
Figure 4.4.1 SWMU 17 – Soil and Groundwater Sample Location Map 4-127
Figure 4.5.1 SWMU 19 – Soil Sample and Trench Location Map 4-143
Figure 4.6.1 SWMU 20 – Soil Sample and Trench Location Map 4-155
Figure 4.7.1 SWMU 121 – Soil Sample Location Map 4-161
Figure 4.8.1 SWMU 178 – Soil and Groundwater Sample Location Map 4-171
Figure 4.9.1 AOCs 649, 650 and 651 – Soil Sample Location Map 4-183
Figure 4.10.1 AOC 656 – Soil and Groundwater Sample Location Map 4-193
Figure 4.11.1 AOC 653 – Soil and Groundwater Sample Location Map 4-205
Figure 4.12.1 AOC 654 – Soil Sample Location Map 4-217
Figure 4.13.1 AOC 655 – Soil and Groundwater Sample Location Map 4-225
Figure 4.14.1 AOC 659 – Soil Sample Location Map 4-239
Figure 4.15.1 AOC 660 – Soil and Groundwater Sample Location Map 4-247
Figure 4.16.1 AOC 662 – Soil and Groundwater Sample Location Map 4-257
Figure 4.17.1 AOC 663 and SWMU 136 – Soil and Groundwater Sample Location Map 4-267
Figure 4.18.1 AOC 665 – Soil Sample Location Map 4-281
Figure 4.19.1 AOC 667 and SWMU 138 – Soil and Groundwater Sample Location Map 4-289
Figure 4.19.2 AOC 667 and SWMU 138, Vicinity VOC Analytical Data For Groundwater 4-295
Figure 4.20.1 AOC 666 – Soil and Groundwater Sample Location Map 4-301
Figure 4.21.1 SWMU 159 – Soil Sample Location Map 4-313
Figure 4.23.1 Soil Sample Locations in the Vicinity of GDHSB007 and GDHSB038 4-349
Figure 4.23.2 Soil Sample Locations in the Vicinity of NBCHGDHO4D 4-351
Figure 6.1.1 Formulae for Calculating CDI for Soil 6-23
Figure 6.1.2 Formulae for Calculating CDI for Groundwater 6-27
Figure 6.1.3 Shallow Groundwater Chlorides Concentration 6-43

Figure 6.2.1.1 SWMU 19 Lead/Uptake/Biokinetic Model Output Child Blood Lead Level Probability Percentage 6-85
Figure 6.2.1.2 SWMU 121 Lead/Uptake/Biokinetic Model Output Child Blood Lead Level Probability Percentage 6-93
Figure 6.2.1.3 SWMU 9 Shallow Groundwater 1st Quarter Location Specific ILCR 6-99
Figure 6.2.1.4 SWMU 9 Shallow Groundwater 2nd Quarter Location Specific ILCR 6-101
Figure 6.2.1.5 SWMU 9 Deep Groundwater 1st Quarter Location Specific ILCR 6-103
Figure 6.2.1.6 SWMU 9 Deep Groundwater 2nd Quarter Location Specific ILCR 6-105
Figure 6.2.1.7 SWMU 9 Shallow Groundwater 1st Quarter Location Specific ILCR 6-107
Figure 6.2.1.8 SWMU 9 Shallow Groundwater 2nd Quarter Location Specific ILCR 6-109
Figure 6.2.1.9 SWMU 9 Deep Groundwater 1st Quarter Location Specific ILCR 6-111
Figure 6.2.1.10 SWMU 9 Deep Groundwater 2nd Quarter Location Specific ILCR 6-113
Figure 6.2.3.1 SWMU 14 Surface Soil Lead Concentrations 6-305
Figure 6.2.3.2 AOC 670 Lead Uptake/Bilinetic Model Output Child Blood Lead Level Probability Percentage 6-311
Figure 6.2.3.3 SWMU 14 Surface Soil Organic COC ILCR 6-317
Figure 6.2.3.4 SWMU 14 Surface Soil Organix COC ILCR — Industrial 6-321
Figure 6.2.4.1 SWMU 17 Surface Soil Residential Scenario ILCR 6-427
Figure 6.2.4.2 SWMU 17 Surface Soil Worker Scenario ILCR 6-429
Figure 7-1 Ecological Study Area Location Map 7-3
Figure 7-2 Ecological Subzones within Zone H 7-5
Figure 7-3 Contaminant Pathway Model for Ecological Receptors, Zone H . . 7-13
Figure 7-4 Mercury Soil Concentrations Exceeding Lethal Risk Level 7-51
Figure 7-5 Zinc Soil Concentrations Exceeding Lethal & Sublethal Risk Levels 7-53
Figure 7-6 Copper Soil Concentrations Exceeding Sublethal Risk Levels 7-57
Figure 7-7 Arsenic Soil Concentrations Exceeding Sublethal Risk Levels 7-59
Figure 7-8 Zinc Soil Concentrations Exceeding Sublethal Risk Levels 7-61
Figure 7-9 Copper Soil Concentrations Exceeding Sublethal Risk Levels 7-63
Figure 7-10 Mercury Soil Concentrations Exceeding Sublethal Risk Levels . . . 7-101
Figure 7-11 Lead Soil Concentrations Exceeding Lethal Risk Levels 7-103
Figure 7-12 Subzone H-3 Arsenic Soil Concentrations Exceeding Lethal Risk Levels 7-105
Figure 9.1 Zone H Surface Soil Residential Risk Scenario 9-5
Figure 9.2 Zone H Surface Soil Residential Hazard Scenario 9-7
Figure 9.3 Zone H Surface Soil Industrial Risk Scenario 9-9

Figure 9.4 Zone H Surface Soil Industrial Hazard Scenario 9-11
Figure 9.5 Zone H Surface Soil TPH Concentrations 9-13
Figure 9.6 Zone H Subsurface Soil TPH Concentrations 9-15
Figure 9.7 SWMU 13 Surface Soil TPH Concentrations 9-25
Figure 9.8 SWMU 13 Subsurface Soil TPH Concentrations 9-27
Figure 9.9 Combined SWMU 14 Surface Soil Risk Residential Scenario 9-41
Figure 9.10 Combined SWMU 14 Surface Soil Risk Industrial Scenario 9-43
Figure 9.11 Combined SWMU 14 Surface Soil Hazard Residential Scenario . . 9-45
Figure 9.12 SWMU 17 Surface Soil Risk Residential Scenario 9-51
Figure 9.13 SWMU 17 Surface Soil Risk Industrial Scenario 9-53
Figure 9.14 SWMU 19 Surface Soil Risk Residential Scenario 9-61
Figure 9.15 SWMU 19 Surface Soil Risk Industrial Scenario 9-63
Figure 9.16 SWMU 19 Surface Soil Hazard Residential Scenario 9-65
Figure 9.17 SWMU 20 Surface Soil Risk Residential Scenario 9-69
Figure 9.18 SWMU 20 Surface Soil Risk Industrial Scenario 9-71
Figure 9.19 SWMU 121 Surface Soil Risk Residential Scenario 9-79
Figure 9.20 SWMU 121 Surface Soil Risk Industrial Scenario 9-81
Figure 9.21 SWMU 121 Surface Soil Hazard Residential Scenario 9-83
Figure 9.22 SWMU 178 Surface Soil Risk Residential Scenario 9-87
Figure 9.23 AOCs 649, 650, and 651 Surface Soil Risk Residential Scenario . . 9-93
Figure 9.24 AOCs 649, 650, and 651 Surface Soil Risk Industrial Scenario . . . 9-95
Figure 9.25 AOC 656 Surface Soil Risk Residential Scenario 9-101
Figure 9.26 AOC 653 Surface Soil TPH Concentrations 9-105
Figure 9.27 AOC 653 Subsurface Soil TPH Concentrations 9-107
Figure 9.28 AOC 655 Surface Soil Risk Residential Scenario 9-115
Figure 9.29 AOC 655 Surface Soil Risk Industrial Scenario 9-117
Figure 9.30 AOC 659 Surface Soil TPH Concentrations 9-121
Figure 9.31 AOC 659 Subsurface Soil TPH Concentrations 9-123
Figure 9.32 AOC 663 and SWMU 136 Surface Soil Risk Residential Scenario 9-133
Figure 9.33 AOC 663 and SWMU 136 Surface Soil Risk Industrial Scenario . . 9-135
Figure 9.34 AOC 663 and SWMU 136 Surface Soil Hazard Residential Scenario 9-137
Figure 9.35 AOC 665 Surface Soil Risk Residential Scenario 9-141
Figure 9.36 AOC 667 and SWMU 138 Surface Soil TPH Concentrations 9-145
Figure 9.37 AOC 666 Surface Soil Risk Residential Scenario 9-151
Figure 9.38 AOC 666 Surface Soil Risk Industrial Scenario 9-153
Figure 9.39 AOC 666 Surface Soil Hazard Residential Scenario 9-155
Figure 9.40 SWMU 159 Surface Soil Risk Residential Scenario 9-161
Figure 9.41 OIA G07 and G38 Surface Soil Risk Residential Scenario 9-167
Figure 9.42 OIA G07 and G38 Surface Soil Risk Industrial Scenario 9-169
Figure 9.43 OIA G80 Surface Soil Risk Residential Scenario 9-171

List of Tables

Table 1.1	Zone H SWMUs and AOCs with Investigatory Designations	1-19
Table 1.2	Previous Investigations	1-20
Table 2.1	Zone H Groundwater Sample Equipment Blank Contaminant Comparison	2-18
Table 3.1	Zone H Monitoring Well Construction Data Summary	3-5
Table 3.2	Vertical Hydraulic Gradients	3-33
Table 3.3	Horizontal Hydraulic Gradient	3-35
Table 3.4	Zone H Shallow-Well Slug Test Hydraulic Conductivity Results in feet/day	3-36
Table 3.5	Zone H Deep-Well Slug Test Hydraulic Conductivity Results in feet/day	3-36
Table 3.6	Results of Groundwater Quality Analysis in milligrams per liter (mg/L), except for pH)	3-42
Table 3.7	Water Level Monitoring Summary of Wells Along Cross Section A-A'	3-49
Table 3.8	Water Level Monitoring Summary of Wells Along Cross Section B-B'	3-49
Table 3.9	Mean Temperature and Wind Data for Charleston Harbor between 1970 and 1985	3-54
Table 3.10	Monthly and Annual Mean Precipitation, Relative Humidity, and Cloud Cover for Charleston Harbor between 1960 and 1985	3-55
Table 4.0.1	Summary of Zone H AOC- and SWMU-Specific Soil and Groundwater Sampling	4-23
Table 4.0.2	Summary of Zone H SWMU- and AOC-Specific Sediment and Surface Water Sampling	4-25
Table 4.0.3	Zone H Quantities of Proposed and Actual Samples	4-25
Table 4.0.4	NAVBASE Analytical Program	4-28
Table 4.0.5	Zone H Diluted Sample Results	4-28
Table 4.1.1	Zone H Hydropunch and Temporary Monitoring Well Analytical Results (Results in μg/L) Collected from the SWMU 20 and SWMU 121 Areas of SWMU 9	4-52
Table 4.1.2	SWMU 9 Trench Soil Samples Organic Compounds in Soil (μg/kg)	4-54
Table 4.1.3	SWMU 9 Trench Soil Samples Inorganic Elements in Soil (mg/kg)	4-56
Table 4.1.4	SWMU 9 1993 Monitoring Well Soil Samples Organic Compounds in Soil (mg/kg)	4-57
Table 4.1.5	SWMU 9 1993 Monitoring Well Soil Samples Inorganic Compounds in Soil (mg/kg)	4-60
Table 4.1.6	SWMUs 9, 19, 20, and 121 and AOCs 649, 650, 651, and 654 Organic Compounds in Shallow Groundwater (μg/L)	4-62

Table 4.1.7 SWMUs 9, 19, 20, and 121 and AOCs 649, 650, 651, and 654 Organic Compounds in Deep Groundwater (μg/L) 4-67
Table 4.1.8 SWMUs 9, 19, 20, and 121 and AOCs 649, 650, 651, and 654 Inorganic Chemicals in Shallow Groundwater (μg/L) 4-68
Table 4.1.9 SWMUs 9, 19, 20, and 121 and AOCs 649, 650, 651, and 654 Inorganic Chemicals in Deep Groundwater (μg/L) 4-70
Table 4.1.10 SWMU 9 Organic Compounds Detected in Sediment (in μg/kg) . . 4-72
Table 4.1.11 SWMU 9 Inorganic Elements Detected in Sediment (in mg/kg) . . . 4-74
Table 4.1.12 SWMU 9 Organic Compounds Detected in Surface Water (in μg/L) 4-75
Table 4.1.13 SWMU 9 Inorganic Elements Detected in Surface Water (in μg/L) 4-76
Table 4.2.1 SWMU 13 Organic Compounds in Soil (in μg/kg) 4-86
Table 4.2.2 SWMU 13 Inorganic Elements in Soil (in mg/kg) 4-88
Table 4.2.3 SWMU 13 Organic Compounds in Groundwater (μg/L) 4-89
Table 4.2.4 SWMU 13 Inorganic Chemicals in Groundwater (μg/L) 4-90
Table 4.3.1 SWMUs 14 and 15, and AOC 670 and 684 Organic Compounds in Soil (μg/kg) 4-110
Table 4.3.2 SWMUs 14 and 15, AOCs 670 and 684 Inorganic Elements in Soil (mg/kg) 4-114
Table 4.3.3 SWMUs 14 and 15, and AOCs 670 and 684 Organic Compounds in Shallow Groundwater (μg/L) 4-115
Table 4.3.4 SWMUs 14, and 15, and AOCs 670 and 684 Organic Compounds in Deep Groundwater (μg/L) 4-116
Table 4.3.5 SWMUs 14 and 15, and AOCs 670 and 684 Inorganic Chemicals in Shallow Groundwater (μg/L) 4-117
Table 4.3.6 SWMUs 14 and 15, and AOCs 670 and 684 Inorganic Chemicals in Deep Groundwater (μg/L) 4-118
Table 4.3.7 SWMU 14 Organic Compounds Detected in Sediment (μg/kg) . . . 4-119
Table 4.3.8 SWMU 14 Inorganic Elements Detected in Sediment (mg/kg) 4-121
Table 4.3.9 SWMU 14 Organic Compounds Detected in Surface Water (μg/L) 4-122
Table 4.3.10 SWMU 14 Inorganic Elements Detected in Surface Water (μg/L) 4-123
Table 4.4.1 SWMU 17 Organic Compounds in Soil (μg/kg) 4-134
Table 4.4.2 SWMU 17 Inorganic Elements in Soil (mg/kg) 4-136
Table 4.4.3 SWMU 17 Organic Compounds in Groundwater (μg/L) 4-137
Table 4.4.4 SWMU 17 Inorganic Chemicals in Groundwater (μg/L) 4-139
Table 4.5.1 SWMU 19 Organic Compounds in Soil (in μg/kg) 4-147
Table 4.5.2 SWMU 19 Inorganic Elements in Soil (mg/kg) 4-150
Table 4.6.1 SWMU 20 Organic Compounds in Soil (μg/kg) 4-158
Table 4.7.1 SWMU 121 Organic Compounds in Soil (μg/kg) 4-165
Table 4.7.2 SWMU 121 Inorganic Elements in Soil (mg/kg) 4-167
Table 4.8.1 SWMU 178 Organic Compounds in Soil (μg/kg) 4-175

Table 4.8.2 SWMU 178 Inorganic Elements in Soil (mg/kg) 4-176
Table 4.8.3 SWMU 178 Organic Compounds in Groundwater (μg/L) 4-178
Table 4.8.4 SWMU 178 Inorganic Chemicals in Groundwater (μg/L)[a] 4-179
Table 4.9.1 AOCs 649, 650, and 651 Organic Compounds in Soil (μg/kg) . . . 4-187
Table 4.9.2 AOC 649, 650, and 651 Inorganic Elements in Soil (mg/kg) 4-189
Table 4.10.1 AOC 656 Organic Compounds in Soil (in μg/kg) 4-198
Table 4.10.2 AOC 656 Inorganic Elements in Soil (mg/kg) 4-200
Table 4.10.3 AOC 656 Organic Elements in Groundwater (μg/L) 4-201
Table 4.10.4 AOC 656 Inorganic Chemicals in Groundwater (μg/L) 4-202
Table 4.11.1 AOC 653 Organic Compounds in Soil (μg/kg) 4-210
Table 4.11.2 AOC 653 Inorganic Elements in Soil (in mg/kg) 4-212
Table 4.11.3 AOC 653 Organic Compounds in Groundwater (μg/L) 4-213
Table 4.11.4 AOC 653 Inorganic Elements in Groundwater (μg/L) 4-214
Table 4.12.1 AOC 654 Organic Compounds in Soil (μg/kg) 4-220
Table 4.12.2 AOC 654 Inorganic Elements in Soil (mg/kg) 4-221
Table 4.13.1 AOC 655 Organic Compounds in Soil (μg/kg) 4-231
Table 4.13.2 AOC 655 Inorganic Elements in Soil (mg/kg) 4-233
Table 4.13.3 AOC 655 Organic Compounds in Groundwater (μg/L) 4-234
Table 4.13.4 AOC 655 Inorganic Chemicals in Groundwater (μg/L) 4-235
Table 4.14.1 AOC 659 Organic Compounds in Soil (μg/kg) 4-242
Table 4.14.2 AOC 659 Inorganic Elements in Soil (mg/kg) 4-244
Table 4.15.1 AOC 660 Organic Compounds in Soil (in μg/kg) 4-251
Table 4.15.2 AOC 660 Inorganic Elements in Soil (in mg/kg) 4-252
Table 4.15.3 AOC 660 Organic Compounds in Groundwater (μg/L) 4-253
Table 4.15.4 AOC 660 Inorganic Chemicals in Groundwater (μg/L)[a] 4-254
Table 4.16.1 AOC 662 Organic Compounds in Soil (μg/kg) 4-261
Table 4.16.2 AOC 662 Inorganic Elements in Soil (mg/kg) 4-262
Table 4.16.3 AOC 662 Organic Compounds in Groundwater (μg/L) 4-263
Table 4.16.4 AOC 662 Inorganic Elements in Groundwater (μg/L) 4-264
Table 4.17.1 AOC 663 and SWMU 136 Organic Compounds in Soil 4-274
Table 4.17.2 AOC 663 and SWMU 136 Inorganic Elements in Soil (mg/kg) . . . 4-276
Table 4.17.3 AOC 663 and SWMU 136 Organic Compounds in Groundwater (μg/L) 4-277
Table 4.17.4 AOC 663 and SWMU 136 Inorganic Chemicals in Groundwater (μg/L) 4-277
Table 4.18.1 AOC 665 Organic Compounds in Soil (in μg/kg) 4-284
Table 4.18.2 AOC 665 Inorganic Elements in Soil (in mg/kg) 4-286
Table 4.19.1 AOC 667 and SWMU 138 Organic Compounds in Soil (mg/kg) . . 4-298
Table 4.19.2 AOC 667 and SWMU 138 Inorganic Elements in Soil (mg/kg) 4-298(b)
Table 4.19.3 AOC 667 and SWMU 138 Organic Compounds in Groundwater (μg/L) . . . . . 4-298(c)
Table 4.19.4 NBCIGDI011 Volatile Organic Compounds in Groundwater (μg/L) . . . . . 4-298(d)

Table 4.19.5 AOC 667 and SWMU 138 Groundwater Screening Samples Volatile Organic Compounds in Groundwater (μg/L) . . . . . 4-298(e)
Table 4.19.6 AOC 667 and SWMU 138 Inorganic Elements in Groundwater (μg/L) . . . . . 4-298(e)
Table 4.20.1 AOC 666 Organic Compounds in Soil (in μg/kg) 4-306
Table 4.20.2 AOC 666 Inorganic Elements in Soil (in mg/kg) 4-308
Table 4.20.3 AOC 666 Organic Compounds in Groundwater (μg/L) 4-309
Table 4.20.4 AOC 666 Inorganic Chemicals in Groundwater (μg/L) 4-310
Table 4.21.1 SWMU 159 Organic Compounds in Soil (μg/kg) 4-319
Table 4.21.2 SWMU 159 Inorganic Elements in Soil (mg/kg) 4-321
Table 4.21.3 SWMU 159 Organic Compounds Detected in Sediment 4-323
Table 4.21.4 SWMU 159 Inorganic Elements Detected in Sediment 4-325
Table 4.21.5 SWMU 159 Organic Compounds Detected in Surface Water 4-326
Table 4.21.6 SWMU 159 Inorganic Compounds Detected in Surface Water . . . 4-327
Table 4.22.1 Zone H Grid-Based Soil Samples 4-335
Table 4.22.2 Zone H Grid-Based Soil Samples Inorganic Elements in Soil (in mg/kg) 4-338
Table 4.22.3 Grid (GDH) Locations Organic Compounds in Shallow Groundwater (μg/L) 4-339
Table 4.22.4 Grid (GDH) Locations Organic Compounds in Deep Groundwater (μg/L) 4-340
Table 4.22.5 Grid (GDH) Locations Inorganic Chemicals in Shallow Groundwater (μg/L) 4-342
Table 4.22.6 Grid (GDH) Locations Inorganic Chemicals in Deep Groundwater (μg/L) 4-344
Table 4.23.1 Area of GDHSB007 and GDHSB038 Soil Sample Locations PCBs in Soil (in μg/kg)([a]) 4-353
Table 4.23.2 Area of NBCHGDH04D SVOCs in Soil (μg/kg) and Groundwater (μg/L) 4-353
Table 5.1.1 Chemical and Physical Properties 5-10
Table 5.1.2 Zone H Summary of Physical Parameter Data for Soil 5-11
Table 5.1.3 Zone H Physical Parameter Data from Shelby Tube Samples 5-12
Table 5.1.4 Groundwater Travel Times from Zone H AOCs/SWMUs to Surface Water Body[a] NAVBASE 5-13
Table 5.2.1 Fate and Transport Properties and Screening Levels for Constituents Detected in Soil and Groundwater 5-24
Table 5.3.1 Chemicals Detected in Soil Comparison to Groundwater Protection SSL or Background UTL 5-38
Table 5.3.2 Chemicals Detected in Groundwater and Surface Water Comparison of Groundwater to Tap Water Risk-Based Concentrations for SWMU 9 5-40
Table 5.3.3 Soil-to-Air Volatilization Screening Analysis for SWMUs 19, 20, 121, and AOCs 649 and 654 5-42

Table 5.3.4	Chemicals Detected in Soil and Sediment for SWMUs 9, 19, 20, 121 and AOC 654	5-43
Table 5.3.5	Significant Migration Pathways for SWMUs 9, 19, 20, 121 and AOCs 649, 650 and 654	5-45
Table 5.4.1	Chemical Detected in Soil and Shallow Groundwater: Comparison of Groundwater Protection Risk-Based Screening Criteria for SWMU 13	5-50
Table 5.4.2	Soil-to-Air Volatilization Screening Analysis for SWMU 13	5-52
Table 5.5.1	Chemicals Detected in Soil for SWMUs 14, 15, and AOCs 670 and 684; Soil to Groundwater Screening Analysis	5-61
Table 5.5.2	Contaminants Detected in Groundwater and Surface Water; Groundwater Comparison to Tap Water Risk-Based Concentrations or Grid-based Background UTLs	5-63
Table 5.5.3	Soil-to-Air Volatilization Screening Analysis for SWMU 14, 15, and AOCs 670 and 684	5-64
Table 5.5.4	Chemicals Detected in Surface Soil and Sediment for SWMU 14 (includes SWMU 15, AOCs 670 and 684)	5-65
Table 5.5.5	Significant Migration Pathways for SWMUs 14, 15, and AOCs 670, 684	5-66
Table 5.6.1	Chemicals Detected in Soil and Groundwater: Comparison to Groundwater Protection SSLs, Tap Water RBCs, and Grid-Based Background UTLs for SWMU 17	5-70
Table 5.6.2	Soil-to-Air Volatilization Screening Analysis for SWMU 17	5-72
Table 5.6.3	Significant Migration Pathways for SWMU 17	5-73
Table 5.7.1	Chemicals Detected in Soil, Sediment and Surface Water; Soil Comparison to Groundwater Protection SSLs and Grid-Based Background UTLs for SWMU 159	5-77
Table 5.7.2	Soil-to-Air Volatilization Screening Analysis for AOC 159	5-78
Table 5.8.1	Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for SWMU 178	5-81
Table 5.8.2	Soil-to-Air Volatilization Screening Analysis for AOC 178	5-82
Table 5.9.1	Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 653	5-85
Table 5.9.2	Soil-to-Air Volatilization Screening Analysis for AOC 653	5-86
Table 5.10.1	Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 655	5-89
Table 5.10.2	Soil-to-Air Volatilization Screening Analysis for AOC 655	5-90
Table 5.11.1	Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 656	5-93

Table 5.12.1 Chemicals Detected in Soil Comparison to Groundwater Protection SSLs for AOC 659 5-97
Table 5.12.2 Soil-to-Air Volatilization Screening Analysis for AOC 659 5-98
Table 5.13.1 Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 660 5-100
Table 5.13.2 Soil-to-Air Volatilization Screening Analysis for AOC 660 5-101
Table 5.14.1 Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 662 5-104
Table 5.14.2 Soil-to-Air Volatilization Screening Analysis for AOC 662 5-105
Table 5.15.1 Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 663 and SWMU 136 5-109
Table 5.15.2 Soil-to-Air Volatilization Screening Analysis for AOC 663 and SWMU 136 5-111
Table 5.16.1 Chemicals Detected in Soil Comparison to Groundwater Protection SSLs for AOC 665 5-114
Table 5.16.2 Soil-to-Air Volatilization Screening Analysis for AOC 665 5-115
Table 5.17.1 Chemicals Detected in Soil and Groundwater Comparison to Groundwater Protection SSLs, Tap Water, RBCs and Grid-Based Background UTLs for AOC 666 5-119
Table 5.17.2 Soil-to-Air Volatilization Screening Analysis for AOC 666 5-120
Table 5.18.1 Chemicals Detected in Soil and Groundwater; Comparison to Groundwater Protection SSLs, Tap Water RBCs and Background UTLs for AOC 667 and SWMU 138 5-122
Table 5.18.2 Soil-to-Air Volatilization Screening Analysis for AOCs 667 and 138 5-123
Table 5.19.1 Chemicals Detected in Soil Above Groundwater Protection SSL for Other Impacted Areas 5-126
Table 5.19.2 Soil-to-Air Volatilization Screening Analysis for AOC G80 5-127
Table 6.1.1 Parameters Used to Estimate CDI at RME 6-52
Table 6.2.1.1 Methods Run at SWMU 19 Surface Soil 6-129
Table 6.2.1.2 Methods Run at SWMU 20 Surface Soil 6-131
Table 6.2.1.3 Methods Run at SWMU 121 Surface Soil 6-132
Table 6.2.1.4 Methods Run at AOC 649 Surface Soil 6-134
Table 6.2.1.5 Methods Run at AOC 650 Surface Soil 6-135
Table 6.2.1.6 Methods Run at AOC 654 Surface Soil 6-136
Table 6.2.1.7 Methods Run at SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Shallow Groundwater, Sampling Round 01 6-137
Table 6.2.1.8 Methods Run at SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Shallow Groundwater, Sampling Round 02 6-139

Table 6.2.1.9 Methods Run at SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Deep Groundwater, Sampling Round 01 6-141
Table 6.2.1.10 Methods Run at SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Deep Groundwater, Sampling Round 02 6-142
Table 6.2.1.11 SWMU 19 Surface Soil 6-143
Table 6.2.1.12 SWMU 20 Surface Soil 6-146
Table 6.2.1.13 SWMU 121 Surface Soil 6-147
Table 6.2.1.14 AOC 649 Surface Soil 6-149
Table 6.2.1.15 AOC 650 Surface Soil 6-151
Table 6.2.1.16 AOC 654 Surface Soil 6-153
Table 6.2.1.17 SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Shallow Groundwater, Sampling Round 01 6-155
Table 6.2.1.18 SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Shallow Groundwater, Sampling Round 02 6-158
Table 6.2.1.19 SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Deep Groundwater, Sampling Round 01 6-160
Table 6.2.1.20 SWMU 9 (Includes SWMUs 19, 20, 121 and AOCs 649, 650, 651 and 654) Deep Groundwater, Sampling Round 02 6-161
Table 6.2.1.21 Exposure Pathways Summary — Combined SWMU 9 NAVBASE Charleston 6-162
Table 6.2.1.22 Statistical Analysis of COPCs Surface Soil at SWMU 19 6-164
Table 6.2.1.23 Statistical Analysis of COPCs Surface Soil at SWMU 20 6-165
Table 6.2.1.24 Statistical Analysis of COPCs Surface Soil at SWMU 121 6-166
Table 6.2.1.25 Statistical Analysis of COPCs Surface Soil at AOC 649 6-167
Table 6.2.1.26 Statistical Analysis of COPCs SWMU 9 Shallow Groundwater — First Quarter 6-168
Table 6.2.1.27 Statistical Analysis of COPCs SWMU 9 Shallow Groundwater — Second Quarter 6-169
Table 6.2.1.28 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 19 6-170
Table 6.2.1.29 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 19 6-171
Table 6.2.1.30 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 20 6-172
Table 6.2.1.31 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 20 6-173
Table 6.2.1.32 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 121 6-174
Table 6.2.1.33 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 121 6-175
Table 6.2.1.34 Chronic Daily Intakes Incidental Ingestion with Surface Soil (0-1') for AOC 649 6-176

Table 6.2.1.35 Chronic Daily Intakes Dermal Contact with Surface Soil (0 - 1') for AOC 649 6-177
Table 6.2.1.36 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0 - 1') for AOC 649 6-178
Table 6.2.1.37 Chronic Daily Intakes Dermal Contact with Surface Soil (0 - 1') for AOC 650 6-179
Table 6.2.1.38 Chronic Daily Intakes Ingestion/Inhalation of COPCs in Shallow Groundwater 6-180
Table 6.2.1.39 Chronic Daily Intakes Ingestion/Inhalation of COPCs in Deep Groundwater for SWMU 9 — First Quarter 6-181
Table 6.2.1.40 Chronic Daily Intakes Ingestion/Inhalation of COPCs in Shallow Groundwater for SWMU 9 — Second Quarter 6-182
Table 6.2.1.41 Chronic Daily Intakes Ingestion/Inhalation of COPCs in Deep Groundwater for SWMU 9 — Second Quarter 6-183
Table 6.2.1.42 Toxicological Database Information for Chemicals of Potential Concern for SWMU 9 6-184
Table 6.2.1.43 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 19 6-188
Table 6.2.1.44 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 19 6-189
Table 6.2.1.45 NAVBASE — Charleston Zone H SWMU 19 USEPA LEAD MODEL Version 0.99d Output 6-190
Table 6.2.1.46 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 20 6-191
Table 6.2.1.47 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 20 6-192
Table 6.2.1.48 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 121 6-193
Table 6.2.1.49 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 121 6-194
Table 6.2.1.50 NAVBASE — Charleston Zone H SWMU 121 USEPA LEAD MODEL Version 0.99d Output 6-195
Table 6.2.1.51 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for AOC 649 6-196
Table 6.2.1.52 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for AOC 649 6-197
Table 6.2.1.53 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for AOC 650 6-198
Table 6.2.1.54 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for AOC 650 6-199
Table 6.2.1.55 Hazard Quotients and Incremental Lifetime Cancer Risks Shallow Groundwater Ingestion for SWMU 9 — First Quarter 6-200

Table 6.2.1.56 Hazard Quotients and Incremental Lifetime Cancer Risks Inhalation of Contaminants Volatilized from Shallow Groundwater for SWMU 9 — First Quarter 6-201
Table 6.2.1.57 Hazard Quotients and Incremental Lifetime Cancer Risks Shallow Groundwater Ingestion for SWMU 9 — Second Quarter 6-202
Table 6.2.1.58 Hazard Quotients and Incremental Lifetime Cancer Risks Inhalation of Contaminants Volatilized from Shallow Groundwater for SWMU 9 — Second Quarter 6-203
Table 6.2.1.59 Hazard Quotients and Incremental Lifetime Cancer Risks Deep Groundwater Ingestion for SWMU 9 — First Quarter 6-204
Table 6.2.1.60 Hazard Quotients and Incremental Lifetime Cancer Risks Inhalation of Contaminants Volatilized from Deep Groundwater for SWMU 9 — First Quarter 6-205
Table 6.2.1.61 Hazard Quotients and Incremental Lifetime Cancer Risks Deep Groundwater Ingestion for SWMU 9 — Second Quarter 6-206
Table 6.2.1.62 Location-Specific Analysis of COPCs Detected in SWMU 9 Groundwater with Corresponding Hazard Quotient and Risk Estimates 6-207
Table 6.2.1.63 Summary of Risk and Hazard-based COCs for combined SWMU 9 6-221
Table 6.2.1.64 Summary of Risk and Hazard for Combined SWMU 9 6-226
Table 6.2.1.65 Residential Based Remedial Goal Options for SWMU 19 Surface Soil 6-227
Table 6.2.1.66 Worker-Based Remedial Goal Options for SWMU 19 Surface Soil 6-228
Table 6.2.1.67 Residential Based Remedial Goal Options for SWMU 20 Surface Soil 6-229
Table 6.2.1.68 Worker-Based Remedial Goal Options for SWMU 20 Surface Soil 6-230
Table 6.2.1.69 Residential Based Remedial Goal Options for SWMU 121 Surface Soil 6-231
Table 6.2.1.70 Site Worker-Based Remedial Goal Options for SWMU 121 Surface Soil 6-232
Table 6.2.1.71 Residential-Based Remedial Goal Options for AOC 649 Surface Soil 6-233
Table 6.2.1.72 Worker-Based Remedial Goal Options for AOC 649 Surface Soil 6-234
Table 6.2.1.73 Residential-Based Remedial Goal Options for AOC 650 Surface Soil 6-235
Table 6.2.1.74 Worker-Based Remedial Goal Options for AOC 650 Surface Soil 6-236

Table 6.2.1.75 Residential-Based Remedial Goal Options for SWMU 9 Shallow Groundwater — First Quarter 6-237
Table 6.2.1.76 Worker-Based Remedial Goal Options for SWMU 9 Shallow Groundwater — First Quarter 6-238
Table 6.2.1.77 Residential-Based Remedial Goal Options for SWMU 9 Shallow Groundwater — Second Quarter 6-239
Table 6.2.1.78 Worker-Based Remedial Goal Options for SWMU 9 Shallow Groundwater — Second Quarter 6-240
Table 6.2.1.79 Residential-Based Remedial Goal Options for SWMU 9 Deep Groundwater — First Quarter 6-241
Table 6.2.1.80 Worker-Based Remedial Goal Options for SWMU 9 Deep Groundwater — First Quarter 6-242
Table 6.2.1.81 Residential-Based Remedial Goal Options for SWMU 9 Deep Groundwater — Second Quarter 6-243
Table 6.2.1.82 Worker-Based Remedial Goal Options for SWMU 9 Deep Groundwater — Second Quarter 6-244
Table 6.2.2.1 Methods Run at SWMU 13 Surface Soil 6-260
Table 6.2.2.2 Methods Run at SWMU 13 Shallow Groundwater, Sampling Round 01 6-262
Table 6.2.2.3 Methods Run at SWMU 13 Shallow Groundwater, Sampling Round 02 6-263
Table 6.2.2.4 SWMU 13 Surface Soil 6-264
Table 6.2.2.5 SWMU 13 Shallow Groundwater, Sampling Round 01 6-266
Table 6.2.2.6 SWMU 13 Shallow Groundwater, Sampling Round 02 6-267
Table 6.2.2.7 Exposure Pathways Summary — SWMU 13 6-268
Table 6.2.2.8 Statistical Analysis of COPCs Surface Soil at SWMU 13 6-270
Table 6.2.2.9 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 13 6-271
Table 6.2.2.10 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 13 6-272
Table 6.2.2.11 Chronic Daily Intakes Ingestion of Shallow Groundwater for SWMU 13 6-273
Table 6.2.2.12 Toxicological Database Information for Chemicals of Potential Concern for SWMU 13 6-274
Table 6.2.2.13 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 13 6-276
Table 6.2.2.14 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 13 6-277
Table 6.2.2.15 Hazard Quotients and Incremental Lifetime Cancer Risks Shallow Groundwater Ingestion for SWMU 13 6-278
Table 6.2.2.16 Central Tendency Chronic Daily Intakes Ingestion of Shallow Groundwater for SWMU 13 6-279
Table 6.2.2.17 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks Shallow Groundwater Ingestion for SWMU 13 6-280

Table 6.2.2.18 Summary of Risk and Hazard for SWMU 13 6-281
Table 6.2.2.19 Residential-Based Remedial Goal Options for SWMU 13 Shallow Groundwater 6-282
Table 6.2.2.20 Worker-Based Remedial Goal Options for SWMU 13 Shallow Groundwater 6-283
Table 6.2.3.1 Methods Run at SWMU 14 Surface Soil 6-334
Table 6.2.3.2 Methods Run at SWMU 15 Surface Soil 6-335
Table 6.2.3.3 Methods Run at AOC 670 Surface Soil 6-336
Table 6.2.3.4 Methods Run at AOC 684 Surface Soil 6-338
Table 6.2.3.5 Methods Run at SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Shallow Groundwater, Sampling Round 01 6-340
Table 6.2.3.6 Methods Run at SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Shallow Groundwater, Sampling Round 02 6-341
Table 6.2.3.7 Methods Run at SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Deep Groundwater, Sampling Round 01 6-342
Table 6.2.3.8 Methods Run at SWMU 14 (Includes SWMU 15, AOC 670, and AOC 684) Deep Groundwater, Sampling Round 02 6-343
Table 6.2.3.9 SWMU 14 Surface Soil 6-344
Table 6.2.3.10 SWMU 15 Surface Soil 6-346
Table 6.2.3.11 AOC 670 Surface Soil 6-348
Table 6.2.3.12 AOC 684 Surface Soil 6-350
Table 6.2.3.13 SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Shallow Groundwater, Sampling Round 01) 6-353
Table 6.2.3.14 SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Shallow Groundwater, Sampling Round 02) 6-354
Table 6.2.3.15 SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Deep Groundwater, Sampling Round 01) 6-355
Table 6.2.3.16 SWMU 14 (Includes SWMU 15, AOC 670 and AOC 684) Deep Groundwater, Sampling Round 02) 6-356
Table 6.2.3.17 Exposure Pathways Summary — SWMU 14 6-357
Table 6.2.3.18 Statistical Analysis of COPCs Surface Soil at SWMU 14 6-359
Table 6.2.3.19 Statistical Analysis of COPCs Surface Soil at Combined AOC 670 6-360
Table 6.2.3.20 Statistical Analysis of COPCs Surface Soil at AOC 684 6-361
Table 6.2.3.21 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 14 6-362
Table 6.2.3.22 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 14 6-363
Table 6.2.3.23 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 15 6-364
Table 6.2.3.24 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 15 6-365
Table 6.2.3.25 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for AOC 670 6-366

Table 6.2.3.26 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for AOC 670 6-367
Table 6.2.3.27 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for AOC 684 6-368
Table 6.2.3.28 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for AOC 684 6-369
Table 6.2.3.29 Chronic Daily Intakes Ingestion of Shallow Groundwater for Combined SWMU 14 6-370
Table 6.2.3.30 Chronic Daily Intakes Ingestion of Deep Groundwater for Combined SWMU 14 6-371
Table 6.2.3.31 SWMU 14 Toxicological Database Information for Chemicals of Potential Concern 6-372
Table 6.2.3.32 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 14 6-374
Table 6.2.3.33 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 14 6-375
Table 6.2.3.34 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 15 6-376
Table 6.2.3.35 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 15 6-377
Table 6.2.3.36 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for AOC 670 6-378
Table 6.2.3.37 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for AOC 670 6-379
Table 6.2.3.38 NAVBASE — Charleston Zone HAPC 670 USEPA LEAD MODEL Version 0.99d Output 6-380
Table 6.2.3.39 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for AOC 684 6-381
Table 6.2.3.40 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for AOC 684 6-382
Table 6.2.3.41 Hazard Quotients and Incremental Lifetime Cancer Risks Shallow Groundwater Ingestion for Combined SWMU 14 6-383
Table 6.2.3.42 Hazard Quotients and Incremental Lifetime Cancer Risks Deep Groundwater Ingestion for Combined SWMU 14 6-384
Table 6.2.3.43 Hazard Quotients and Incremental Lifetime Cancer Risks Inhalation of Contaminants Volatilized from Deep Groundwater for Combined SWMU 14 6-385
Table 6.2.3.44 Summary of Risk and Hazard-based COCs for combined SWMU 14 6-386
Table 6.2.3.45 COPCs Detected in SWMU 14 Surface Soil with Corresponding Hazard Quotient and Risk Estimates 6-387
Table 6.2.3.46 Summary of Risk and Hazard for Combined SWMU 14 6-399
Table 6.2.3.47 Residential-Based Remedial Goal Options for SWMU 14 Surface Soil 6-400

Table 6.2.3.48 Worker-Based Remedial Goal Options for SWMU 14 Surface Soil 6-401
Table 6.2.3.49 Residential-Based Remedial Goal Options for SWMU 15 Surface Soil 6-402
Table 6.2.3.50 Worker-Based Remedial Goal Options for SWMU 15 Surface Soil 6-403
Table 6.2.3.51 Residential-Based Remedial Goal Option for AOC 670 Surface Soil 6-404
Table 6.2.3.52 Worker-Based Remedial Goal Options for AOC 670 Surface Soil 6-405
Table 6.2.3.53 Residential-Based Remedial Goal Option for AOC 684 Surface Soil 6-406
Table 6.2.3.54 Worker-Based Remedial Goal Options for AOC 684 Surface Soil 6-407
Table 6.2.3.55 Residential-Based Remedial Goal Option for Combined SWMU 14 Shallow Groundwater 6-408
Table 6.2.3.56 Worker-Based Remedial Goal Options for Combined SWMU 14 Shallow Groundwater 6-409
Table 6.2.3.57 Residential-Based Remedial Goal Options for Combined SWMU 14 Deep Groundwater 6-410
Table 6.2.3.58 Worker-Based Remedial Goal Options for Combined SWMU 14 Deep Groundwater 6-411
Table 6.2.4.1 Methods Run at SWMU 17 Surface Soil 6-437
Table 6.2.4.2 Methods Run at SWMU 17 Shallow Groundwater, Sampling Round 01 6-439
Table 6.2.4.3 Methods Run at SWMU 17 Shallow Groundwater, Sampling Round 02 6-440
Table 6.2.4.4 SWMU 17 Surface Soil 6-441
Table 6.2.4.5 SWMU 17 Shallow Groundwater, Sampling Round 01 6-443
Table 6.2.4.6 SWMU 17 Shallow Groundwater, Sampling Round 02 6-444
Table 6.2.4.7 Exposure Pathways Summary — SWMU 17 6-445
Table 6.2.4.8 Statistical Analysis of COPCs Surface Soil at SWMU 17 6-447
Table 6.2.4.9 Chronic Daily Intakes Incidental Ingestion of Surface Soil (0-1') for SWMU 17 6-448
Table 6.2.4.10 Chronic Daily Intakes Dermal Contact with Surface Soil (0-1') for SWMU 17 6-449
Table 6.2.4.11 Chronic Daily Intakes Ingestion/Inhalation of COPCs in Shallow Groundwater for SWMU 17 6-450
Table 6.2.4.12 Toxicological Database Information for Chemicals of Potential Concern 6-451
Table 6.2.4.13 Hazard Quotients and Incremental Lifetime Cancer Risks Incidental Surface Soil Ingestion for SWMU 17 6-453
Table 6.2.4.14 Hazard Quotients and Incremental Lifetime Cancer Risks Dermal Contact with Surface Soil for SWMU 17 6-454

Table 6.2.4.15 Hazard Quotients and Incremental Lifetime Cancer Risks Shallow Groundwater Ingestion for SWMU 17 6-455
Table 6.2.4.16 Hazard Quotients and Incremental Lifetime Cancer Risks Inhalation of Contaminants Volatilized from Shallow Groundwater for SWMU 17 6-456
Table 6.2.4.17 Summary of Risk and Hazard-based COCs form SWMU 17 6-457
Table 6.2.4.18 Summary of Risk and Hazard for SWMU 17 6-458
Table 6.2.4.19 Residential-Based Remedial Goal Options for SWMU 17 Surface Soil 6-459
Table 6.2.4.20 Worker-Based Remedial Goal Options for SWMU 17 Surface Soil 6-460
Table 6.2.4.21 Residential-Based Remedial Goal Options for SWMU 17 Shallow Groundwater 6-461
Table 6.2.4.22 Worker-Based Remedial Goal Options for SWMU 17 Shallow Groundwater 6-462
Table 6.2.5.1 Methods Run at SWMU 159 — Surface Soil 6-479
Table 6.2.5.2 SWMU 159 — Surface Soil 6-481
Table 6.2.5.3 SWMU — Sediment 6-483
Table 6.2.5.4 Exposure Pathways Summary — SWMU 159 6-485
Table 6.2.5.5 Chronic Daily Intakes — Incidental Ingestion of Surface Soil 6-487
Table 6.2.5.6 Chronic Daily Intakes — Dermal Contact with Surface Soil 6-488
Table 6.2.5.7 Chronic Daily Intakes — Incidental Ingestion of Sediment 6-489
Table 6.2.5.8 Dermal Contact with Sediment 6-490
Table 6.2.5.9 Toxicology Database Information for Chemicals of Potential Concern 6-491
Table 6.2.5.10 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion 6-493
Table 6.2.5.11 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil 6-494
Table 6.2.5.12 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Sediment Ingestion 6-495
Table 6.2.5.13 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Sediment 6-496
Table 6.2.5.14 Summary of Risk and Hazard for SWMU 159 6-497
Table 6.2.5.15 Residential-Based Remedial Goal Options 6-498
Table 6.2.6.1 Methods Run at SWMU 178 — Surface Soil 6-510
Table 6.2.6.2 Methods Run at SWMU 178 — Shallow Groundwater, Sampling Round 01 6-511
Table 6.2.6.3 Methods Run at SWMU 178 — Shallow Groundwater, Sampling Round 02 6-512
Table 6.2.6.4 SWMU 178 — Surface Soil 6-513
Table 6.2.6.5 SWMU 178 — Shallow Groundwater, Sampling Round 01 6-515
Table 6.2.6.6 SWMU 178 — Shallow Groundwater, Sampling Round 02 6-516
Table 6.2.6.7 Exposure Pathways Summary — SWMU 178 6-517

Table 6.2.6.8 Chronic Daily Intakes — Incidental Ingestion of Surface Soil . . . 6-519
Table 6.2.6.9 Chronic Daily Intakes — Dermal Contract with Surface Soil 6-520
Table 6.2.6.10 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion 6-521
Table 6.2.6.11 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil 6-522
Table 6.2.6.12 Summary of Risk and Hazard for SWMU 178 6-523
Table 6.2.6.13 Residential-Based Remedial Goal Options 6-524
Table 6.2.7.1 Methods Run at AOC 653 — Surface Soil 6-539
Table 6.2.7.2 Methods Run at AOC 653 — Shallow Groundwater, Sampling Round 01 6-540
Table 6.2.7.3 Methods Run at AOC 653 — Shallow Groundwater, Sampling Round 02 6-541
Table 6.2.7.4 Methods Run at AOC 653 — Surface Soil 6-542
Table 6.2.7.5 AOC 653 — Shallow Groundwater, Sampling Round 01 6-544
Table 6.2.7.6 AOC 653 — Shallow Groundwater, Sampling Round 02 6-545
Table 6.2.7.7 Exposure Pathways Summary — AOC 653 6-546
Table 6.2.7.8 Chronic Daily Intakes — Incidental Ingestion of Surface Soil . . . 6-548
Table 6.2.7.9 Chronic Daily Intakes — Dermal Contact with Surface Soil 6-549
Table 6.2.7.10 Chronic Daily Intakes — Ingestion of Shallow Groundwater 6-550
Table 6.2.7.11 Toxicological Database Information for Chemicals of Potential Concern 6-551
Table 6.2.7.12 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion 6-553
Table 6.2.7.13 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil 6-554
Table 6.2.7.14 Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion 6-555
Table 6.2.7.15 Summary of Risk and Hazard for AOC 653 6-556
Table 6.2.7.16 Residential-Based Remedial Goal Options 6-557
Table 6.2.7.17 Worker-Based Remedial Goal Options 6-558
Table 6.2.8.1 Methods Run at AOC 655 — Surface Soil 6-578
Table 6.2.8.2 Methods Run at AOC 655 — Shallow Groundwater, Sampling Round 01 6-580
Table 6.2.8.3 Methods Run at AOC 655 — Shallow Groundwater, Sampling Round 02 6-581
Table 6.2.8.4 AOC 655 — Surface Soil 6-582
Table 6.2.8.5 AOC 655 — Shallow Groundwater, Sampling Round 01 6-584
Table 6.2.8.6 AOC 655 — Shallow Groundwater, Sampling Round 02 6-585
Table 6.2.8.7 Exposure Pathways Summary 6-586
Table 6.2.8.8 Statistical Analysis of COPCs — Surface Soil at AOC 655 6-588
Table 6.2.8.9 Chronic Daily Intakes — Incidental Ingestion of Surface Soil . . . 6-589
Table 6.2.8.10 Chronic Daily Intakes — Dermal Contact with Surface Soil 6-590
Table 6.2.8.11 Chronic Daily Intakes — Ingestion of Shallow Groundwater 6-591

Table 6.2.8.12 Toxicological Database Information for Chemicals of Potential Concern 6-592
Table 6.2.8.13 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental 6-594
Table 6.2.8.14 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil 6-595
Table 6.2.8.15 Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion 6-596
Table 6.2.8.16 Summary of Risk and Hazard-based COCs for AOC 655 6-597
Table 6.2.8.17 Central Tendency Chronic Daily Intakes — Incidental Ingestion of Surface Soil 6-598
Table 6.2.8.18 Central Tendency Chronic Daily Intakes — Dermal Contact with Surface Soil 6-599
Table 6.2.8.19 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion 6-600
Table 6.2.8.20 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil 6-601
Table 6.2.8.21 Central Tendency Chronic Daily Intakes — Ingestion of Shallow Groundwater 6-602
Table 6.2.8.22 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion 6-603
Table 6.2.8.23 Summary of Risk and Hazard for AOC 655 6-604
Table 6.2.8.24 Residential-Based Remedial Goal Options — Surface Soil 6-605
Table 6.2.8.25 Worker-Based Remedial Goal Options — Surface Soil 6-606
Table 6.2.8.26 Residential-Based Remedial Goal Options — Shallow Groundwater 6-607
Table 6.2.8.27 Worker-Based Remedial Goal Options — Shallow Groundwater 6-608
Table 6.2.9.1 Methods Run at AOC 656 — Surface Soil 6-624
Table 6.2.9.2 Methods Run at AOC 656 — Shallow Groundwater, Sampling Round 01 6-625
Table 6.2.9.3 Methods Run at AOC 656 — Shallow Groundwater, Sampling Round 02 6-626
Table 6.2.9.4 AOC 656 — Surface Soil 6-627
Table 6.2.9.5 AOC 656 — Shallow Groundwater, Sampling Round 01 6-629
Table 6.2.9.6 AOC 656 — Shallow Groundwater, Sampling Round 02 6-630
Table 6.2.9.7 Exposure Pathways Summary 6-631
Table 6.2.9.8 Statistical Analysis of COPCs Surface Soil at AOC 656 6-633
Table 6.2.9.9 Chronic Daily Intakes — Incidental Ingestion of Surface Soil . . . 6-634
Table 6.2.9.10 Chronic Daily Intakes — Dermal Contact with Surface Soil 6-635
Table 6.2.9.11 Chronic Daily Intakes — Ingestion of Shallow Groundwater 6-636
Table 6.2.9.12 Toxicological Database Information for Chemicals of Potential Concern 6-637

Table 6.2.9.13 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion 6-639
Table 6.2.9.14 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil 6-640
Table 6.2.9.15 Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion 6-641
Table 6.2.9.16 Summary of Risk and Hazard-based COCs for AOC 656 6-642
Table 6.2.9.17 Summary of Risk and Hazard for AOC 656 6-643
Table 6.2.9.18 Residential-Based Remedial Goal Options — Surface Soil 6-644
Table 6.2.10.1 Methods Run at AOC 659 — Surface Soil 6-648
Table 6.2.10.2 AOC 659 — Surface Soil 6-649
Table 6.2.11.1 Methods Run at AOC 660 — Surface Soil 6-652
Table 6.2.11.2 Methods Run at AOC 660 — Shallow Groundwater, Sampling Round 01 6-653
Table 6.2.11.3 Methods Run at AOC 660 — Shallow Groundwater, Sampling Round 02 6-654
Table 6.2.11.4 Surface Soil 6-655
Table 6.2.11.5 Shallow Groundwater, Sampling Round 01 6-656
Table 6.2.11.6 Shallow Groundwater, Sampling Round 02 6-657
Table 6.2.12.1 Methods Run at AOC 662 6-660
Table 6.2.12.2 Methods Run at AOC 662 — Shallow Groundwater, Sampling Round 01 6-661
Table 6.2.12.3 Methods Run at AOC 662 — Shallow Groundwater, Sampling Round 02 6-662
Table 6.2.12.4 Surface Soil 6-663
Table 6.2.12.5 Shallow Groundwater, Sampling Round 01 6-664
Table 6.2.12.6 Shallow Groundwater, Sampling Round 02 6-665
Table 6.2.13.1 Methods Run at AOC 663 (Includes SWMU 136) — Surface Soil 6-687
Table 6.2.13.2 Methods Run at AOC 663 (Includes SWMU 136) — Shallow Groundwater, Sampling Round 01 6-688
Table 6.2.13.3 Methods Run at AOC 663 (Includes SWMU 136) — Shallow Groundwater, Sampling Round 02 6-689
Table 6.2.13.4 AOC 663 (Includes SWMU 136) — Surface Soil 6-690
Table 6.2.13.5 AOC 663 (Includes SWMU 136) — Shallow Groundwater, Sampling Round 01 6-692
Table 6.2.13.6 AOC 663 (Includes SWMU 136) — Shallow Groundwater, Sampling Round 02 6-693
Table 6.2.13.7 Exposure Pathways Summary 6-694
Table 6.2.13.8 Chronic Daily Intakes — Incidental Ingestion of Surface Soil AOC 663/SWMU 136 6-696
Table 6.2.13.9 Chronic Daily Intakes — Dermal Contact with Surface Soil AOC 663/SWMU 136 6-697

Table 6.2.13.10 Chronic Daily Intakes — Ingestion of Shallow Groundwater AOC 666 6-698
Table 6.2.13.11 Chronic Daily Intakes — Inhalation of Shallow Groundwater — AOC 663/SWMU 136 6-700
Table 6.2.13.12 Toxicological Database Information for Chemicals of Potential Concern 6-701
Table 6.2.13.13 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface soil Ingestion — AOC 663/SWMU 136 6-703
Table 6.2.13.14 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC 663/SWMU 136 6-704
Table 6.2.13.15 Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion — AOC 663/SWMU 136 6-705
Table 6.2.13.16 Hazard Quotients and Incremental Lifetime Cancer Risks — Inhalation of Contaminants Volatilized from Shallow Groundwater — AOC 663/SWMU 136 6-706
Table 6.2.13.17 Summary of Carcinogenic Risk and Non-carcinogenic and Identification of Chemicals of Concern — AOC 663/ SWMU 136 6-707
Table 6.2.13.18 Central Tendency Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC 663/SWMU 136 6-709
Table 6.2.13.19 Central Tendency Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC 663/SWMU 136 6-710
Table 6.2.13.20 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOC 663/SWMU 136 6-711
Table 6.2.13.21 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC 663/SWMU 136 6-712
Table 6.2.13.22 Central Tendency Chronic Daily Intakes — Ingestion of Shallow Groundwater — AOC 663/SWMU 136 6-713
Table 6.2.13.23 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion — AOC 663/SWMU 136 6-714
Table 6.2.13.24 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Inhalation of Contaminants Volatilized from Shallow Groundwater — AOC 663/SWMU 136 6-715
Table 6.2.13.25 Exposure Pathway Summary of Carcinogenic Risk and Non-carcinogenic Hazard — AOC 663/SWMU 136 6-716
Table 6.2.13.26 Residential-Based Remedial Goal Options — Surface Soil — AOC 663/SWMU 136 6-717
Table 6.2.13.27 Worker-Based Remedial Goal Options — Surface Soil — AOC 663 6-718
Table 6.2.13.28 Residential-Based Remedial Gaol Options — Shallow Groundwater — AOC 663/SWMU 136 6-719

Table 6.2.13.29 Worker-Based Remedial Goal Options — Shallow Groundwater — AOC 663/SWMU 136 6-720
Table 6.2.14.1 Methods Run at AOC 665 6-730
Table 6.2.14.2 Surface Soil 6-731
Table 6.2.14.3 Exposure Pathways Summary — AOC 665 6-733
Table 6.2.14.4 Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC 665 6-735
Table 6.2.14.5 Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC 665 6-736
Table 6.2.14.6 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Ingestion of Surface Soil — AOC 665 6-737
Table 6.2.14.8 Summary of Risk and Hazard for AOC 665 6-739
Table 6.2.14.9 Residential-Based Remedial Goal Options — Surface Soil — AOC 665 6-740
Table 6.2.15.1 Methods Run at AOC 666 — Surface Soil 6-758
Table 6.2.15.2 Methods Run at AOC 666 — Shallow Groundwater, Sampling Round 01 6-759
Table 6.2.15.3 Methods Run at AOC 666 — Shallow Groundwater, Sampling Round 02 6-760
Table 6.2.15.4 Surface Soil 6-761
Table 6.2.15.5 Shallow Groundwater, Sampling Round 01 6-763
Table 6.2.15.6 Shallow Groundwater, Sampling Round 02 6-764
Table 6.2.15.7 Exposure Pathways Summary — AOC 666 6-765
Table 6.2.15.8 Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC 666 6-767
Table 6.2.15.9 Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC 666 6-768
Table 6.2.15.10 Chronic Daily Intakes — Ingestion/Inhalation of Chemicals Reported in Shallow Groundwater — AOC 666 6-769
Table 6.2.15.11 Toxicological Database Information for Chemicals of Potential Concern 6-770
Table 6.2.15.12 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOC 666 6-772
Table 6.2.15.13 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC 666 6-773
Table 6.2.15.14 Hazard Quotients and Incremental Lifetime Cancer Risk — Ingestion of Shallow Groundwater — AOC 666 6-774
Table 6.2.15.15 Hazard Quotients and Incremental Lifetime Cancer Risk — Inhalation of Shallow Groundwater — AOC 666 6-775
Table 6.2.15.16 Summary of Risk and Hazard-Based COCs for AOC 666 6-776
Table 6.2.15.17 Central Tendency Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC 666 6-777
Table 6.2.15.18 Central Tendency Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC 666 6-778

Table 6.2.15.19 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOC 666 6-779
Table 6.2.15.20 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC 666 6-780
Table 6.2.15.21 Central Tendency Chronic Daily Intakes — Ingestion of Shallow Groundwater — AOC 666 6-781
Table 6.2.15.22 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Shallow Groundwater Ingestion — AOC 666 6-782
Table 6.2.15.23 Central Tendency Hazard Quotients and Incremental Lifetime Cancer Risks — Inhalation of Contaminants Volatilized from Shallow Groundwater — AOC 666 6-783
Table 6.2.15.24 Summary of Risks and Hazard for AOC 666 6-784
Table 6.2.15.25 Residential-Based Remedial Goal Options — Surface Soil — AOC 666 6-785
Table 6.2.15.26 Worker-Based Remedial Goal Options — Surface Soil — AOC 666 6-786
Table 6.2.15.27 Residential-Based Remedial Goal Options — Shallow Groundwater — AOC 666 6-787
Table 6.2.15.28 Worker-Based Remedial Goal Options — Shallow Groundwater — AOC 666 6-788
Table 6.2.16.1 Methods Run at SWMU 667 (Includes SWMU 138) — Surface Soil 6-799
Table 6.2.16.2 Methods Run at SWMU 667 (Includes SWMU 138) — Shallow Groundwater, Sampling Round 01 6-800
Table 6.2.16.3 Methods Run at SWMU 667 (Includes SWMU 138) — Shallow Groundwater, Sampling Round 02 6-801
Table 6.2.16.4 SWMU 667 (Includes SWMU 138) — Surface Soil 6-802
Table 6.2.16.5 SWMU 667 (Includes SWMU 138) — Shallow Groundwater, Sampling Round 01 6-804
Table 6.2.16.6 SWMU 667 (Includes SWMU 138) — Shallow Groundwater, Sampling Round 02 6-805
Table 6.2.16.7 Exposure Pathways Summary — AOC 667 6-806
Table 6.2.16.8 Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOCs 667/138 6-808
Table 6.2.16.9 Chronic Daily Intakes — Dermal Contact with Surface Soil — AOCs 667/138 6-809
Table 6.2.16.10 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOCs 667/138 6-810
Table 6.2.16.11 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOCs 667/138 6-811
Table 6.2.16.12 Summary of Risk and Hazard for SWMU 138/AOC 667 6-812

Table 6.2.17.1 Methods Run at Other Impacted Area, G07 — Surface Soil 6-828
Table 6.2.17.2 Methods Run at Other Impacted Area, G38 — Surface Soil 6-829
Table 6.2.17.3 Methods Run at Other Impacted Area, G80 — Surface Soil 6-830
Table 6.2.17.4 Other Impacted Area, G07 — Surface Soil 6-831
Table 6.2.17.5 Other Impacted Area, G38 — Surface Soil 6-832
Table 6.2.17.6 Other Impacted Area, G80 — Surface Soil 6-833
Table 6.2.17.7 Exposure Pathways Summary — Other Impacted Areas 6-834
Table 6.2.17.8 Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC G07 6-836
Table 6.2.17.9 Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC G07 6-837
Table 6.2.17.10 Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC G38 6-838
Table 6.2.17.11 Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC G38 6-839
Table 6.2.17.12 Chronic Daily Intakes — Incidental Ingestion of Surface Soil — AOC G80 6-840
Table 6.2.17.13 Chronic Daily Intakes — Dermal Contact with Surface Soil — AOC G80 6-841
Table 6.2.17.14 Other Impacted Areas — Toxicological Database Information for Chemicals of Potential Concern 6-842
Table 6.2.17.15 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOC G07 6-844
Table 6.2.17.16 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC G07 6-845
Table 6.2.17.17 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOC G38 6-846
Table 6.2.17.18 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC G38 6-847
Table 6.2.17.19 Hazard Quotients and Incremental Lifetime Cancer Risks — Incidental Surface Soil Ingestion — AOC G80 6-848
Table 6.2.17.20 Hazard Quotients and Incremental Lifetime Cancer Risks — Dermal Contact with Surface Soil — AOC G80 6-849
Table 6.2.17.21 Summary of Risk and Hazard for Other Impacted Areas 6-850
Table 6.2.17.22 Residential-Based Remedial Goal Options — Impacted Grid Sampling Location Surface Soil 6-851
Table 6.2.17.23 Worker-Based Remedial Goal Options — Impacted Grid Sampling Location Surface Soil 6-852
Table 7-1 AOCs/SWMUs within Zone H Subzones 7-2
Table 7-2 Federal and State Listed Threatened, Endangered and Candidate Species That Occur or Potentially Occur on NAVBASE 7-9
Table 7-3a Subzone H-1 Inorganic Constituents in Surface Soil 7-15
Table 7-3b Subzone H-1 Organic Constituents in Surface Soil 7-16
Table 7-4a Subzone H-2 Inorganic Constituents in Surface Soil 7-18

Table 7-4b	Subzone H-2 Organic Constituents in Surface Soil	7-19
Table 7-4c	Subzone H-2 Sediment Concentrations	7-22
Table 7-5a	Subzone H-3 Inorganic Constituents in Surface Soil	7-23
Table 7-5b	Subzone H-3 Organic Constituents in Surface Soil	7-23
Table 7-6a	Surface Water Concentrations (Shipyard Creek)	7-27
Table 7-6b	Sediment Concentrations (Shipyard Creek)	7-28
Table 7-6c	Subzone H-4 Sediments Concentrations	7-30
Table 7-7	Wildlife Contaminant Exposure Model for Surface Soil Zone H	7-38
Table 7-8	Summary of Chemical Effects Studies on Terrestrial Infaunal Invertebrates	7-42
Table 7-9	Bioaccumulation Data[1] Baseline Risk Assessment Zone H	7-65
Table 7-10	Exposure Parameters and Assumptions for Representative Wildlife Species at Subzone H-1	7-71
Table 7-11	Exposure Parameters and Assumptions for Representative Wildlife Species at Subzone H-2	7-72
Table 7-12	Exposure Parameters and Assumptions for Representative Wildlife Species at Subzone H-3	7-73
Table 7-13	Significant Risk Levels[a] for Terrestrial Wildlife within Zone H Subzones	7-74
Table 7-14a	Hazard Quotients for Potential Lethal Effects for Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Soil at Subzone H-1	7-75
Table 7-14b	Hazard Quotients for Potential Sublethal Effects for Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Soil at Subzone H-1	7-78
Table 7-14c	Hazard Quotients for Potential Lethal Effects for Wildlife Species Associated with Mean Exposure Concentrations of Selected ECPCs in Soil at Subzone H-1	7-81
Table 7-14d	Hazard Quotients for Potential Sublethal Effects for Wildlife Species Associated with Mean Exposure Concentrations of Selected ECPCs in Soil at Subzone H-1	7-82
Table 7-15a	Hazard Quotients for Potential Lethal Effects for Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Soil at Subzone H-2	7-83
Table 7-15b	Hazard Quotients for Potential Sublethal Effects for Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Soil at Subzone H-2	7-86
Table 7-15c	Hazard Quotients for Potential Lethal Effects for Selected Wildlife Species Associated with Mean Exposure Concentrations of Selected ECPCs in Soil at Subzone H-2	7-88
Table 7-15d	Hazard Quotients for Potential Sublethal Effects for Wildlife Species Associated with Mean Exposure Concentrations of Selected ECPCs in Soil at Subzone H-2	7-88

Table 7-16a	Hazard Quotients for Potential Lethal Effects for Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Soil at Subzone H-3	7-89
Table 7-16b	Hazard Quotients for Potential Sublethal Effects for Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Soil at Subzone H-3	7-92
Table 7-16c	Hazard Quotients for Potential Lethal Effects for Selected Wildlife Species Associated with Mean Exposure Concentrations of Selected ECPCs in Soil at Subzone H-3	7-96
Table 7-16d	Hazard Quotients for Potential Sublethal Effects for Selected Wildlife Species Associated with Mean Exposure Concentrations of Selected ECPCs in Soil at Subzone H-3	7-96
Table 7-17	Comparison of Phytotoxic Responses to Maximum Soil Concentrations of ECPCs at Subzones H-1, H-2, and H-3	7-99
Table 8.1	Sites Containing COCs, Types of COCs, and Possible Remedial Technologies	8-14
Table 8.2	Removal/Containment/Disposal Options	8-18
Table 8.3	Treatment Technology Options	8-19
Table 8.4	Comparison and Ranking of Alternatives	8-32
Table 9.1	Zone H Conclusion Summary SWMU 9	9-22
Table 9.2	Zone H Conclusion Summary SWMU 13	9-24
Table 9.3	Zone H Conclusion Summary Combined SWMU 14 (Includes SWMUs 14 and 15 and AOCs 670 and 684)	9-39
Table 9.4	Zone H Conclusion Summary SWMU 17	9-50
Table 9.5	Zone H Conclusion Summary SWMU 19	9-59
Table 9.6	Zone H Conclusion Summary SWMU 20	9-68
Table 9.7	Zone H Conclusion Summary SWMU 121	9-78
Table 9.8	Zone H Conclusion Summary SWMU 178	9-86
Table 9.9	Zone H Conclusion Summary AOC 649, 650, and 651	9-91
Table 9.10	Zone H Conclusion Summary AOC 656	9-99
Table 9.11	Zone H Conclusion Summary AOC 653	9-104
Table 9.12	Zone H Conclusion Summary AOC 654	9-110
Table 9.13	Zone H Conclusion Summary AOC 655	9-114
Table 9.14	Zone H Conclusion Summary AOC 659	9-120
Table 9.15	Zone H Conclusion Summary AOC 660	9-126
Table 9.16	Zone H Conclusion Summary AOC 662	9-128
Table 9.17	Zone H Conclusion Summary AOC 663 and SWMU 136	9-132
Table 9.18	Zone H Conclusion Summary AOC 665	9-140
Table 9.19	Zone H Conclusion Summary AOC 667 and SWMU 138	9-144
Table 9.20	Zone H Conclusion Summary AOC 666	9-150
Table 9.21	Zone H Conclusion Summary SWMU 159	9-159
Table 9.22	Zone H RFI Summary of Recommendations	9-177

List of Appendices

Appendix A	Chain of Custody
Appendix B	Zone H and Zone I Lithologic Boring Logs and Monitoring Well Construction Diagrams
Appendix C	Groundwater Sampling Forms
Appendix D	Aquifer Characterization Graphs
Appendix E	Final Technical Memorandum, Preliminary RFI Field Activity Soil-Gas and Geophysical Surveys, SWMUs 9 and 14, Naval Base Charleston, Charleston, South Carolina
Appendix F	Soil Consultants Geotechnical Report
Appendix G	Groundwater Quality Parameters Data
Appendix H	Tidal Data for Cooper River and Groundwater Level Graphs
Appendix I	Zone H Site Specific Analytical Data
Appendix J	Background Document
Appendix K	Data Validation Reports
Appendix L	Comprehensive Long-Term Environmental Action Navy — Naval Base Charleston Final Focused Field Investigation Report
Appendix M	Grid-Based Analytical Data for Zone H NAVBASE Charleston
Appendix N	Analytical Data for Soil Samples Collected in Other Impacted Areas
Appendix O	Terrestrial Species List
Appendix P	Wildlife Toxicity Data
Appendix Q	Risk/Hazard Data

4.19 AOC 667 and SWMU 138

AOC 667 and SWMU 138, because of their proximity, have been investigated together. AOC 667, the vehicle maintenance area, was a two-story brick structure (Building 1776) with an oil-water separator. The site was used for the routine maintenance of automobiles and heavy equipment, including oil changes and repairing hydraulic parts from the equipment. A 550-gallon portable storage tank held waste oil. Numerous oil stains have been noted around the building. SWMU 138, the SAA related to Building 1776, accumulated hazardous waste in 55-gallon drums which were immediately transferred to a permitted hazardous waste storage facility when they became full.

Soil and groundwater were sampled at AOC 667 and SWMU 138 to determine if contamination resulted from petroleum product storage and dispensing at the storage tank or other releases at the sites.

Recent assessment of Naval maps/drawings identified the oil/water separator, mentioned above, to be a stormwater sewer inlet that has been modified to receive stormwater runoff from the immediate area and prevent entry of oil and grease from vehicle washing and repair into the sewer system. The structure had a PVC tube, approximately 4 inches in diameter that penetrated the side and then inverted to direct water only to the stormwater sewer during periods of high rainfall. The PVC pipe from the tank joined a line that served as a vent and connection to the stormwater sewer system. The system was not physically connected to the adjacent buildings nor is there evidence that it ever was. The piping would have allowed small amounts of light nonaqueous phase liquids (LNAPL) to be discharged to the stormsewer system when water levels fell below the inlet of the pipe.

4.19.1 Soil Sampling and Analysis

Soil was sampled in a single phase at AOC 667 and SWMU 138 from locations shown on Figure 4.19.1 in accordance with the procedures outlined in Section 2.2. Tables 4.19.1 and 4.19.2 summarize organic and inorganic results, respectively, for soil. Appendix I of the RFI report presents a complete analytical report for the samples collected at AOC 667 and SWMU 138. Concentrations of compounds, as they contribute to risk and hazard for each surface soil sample at AOC 667/SWMU 138, are presented in Appendix Q to the RFI document.

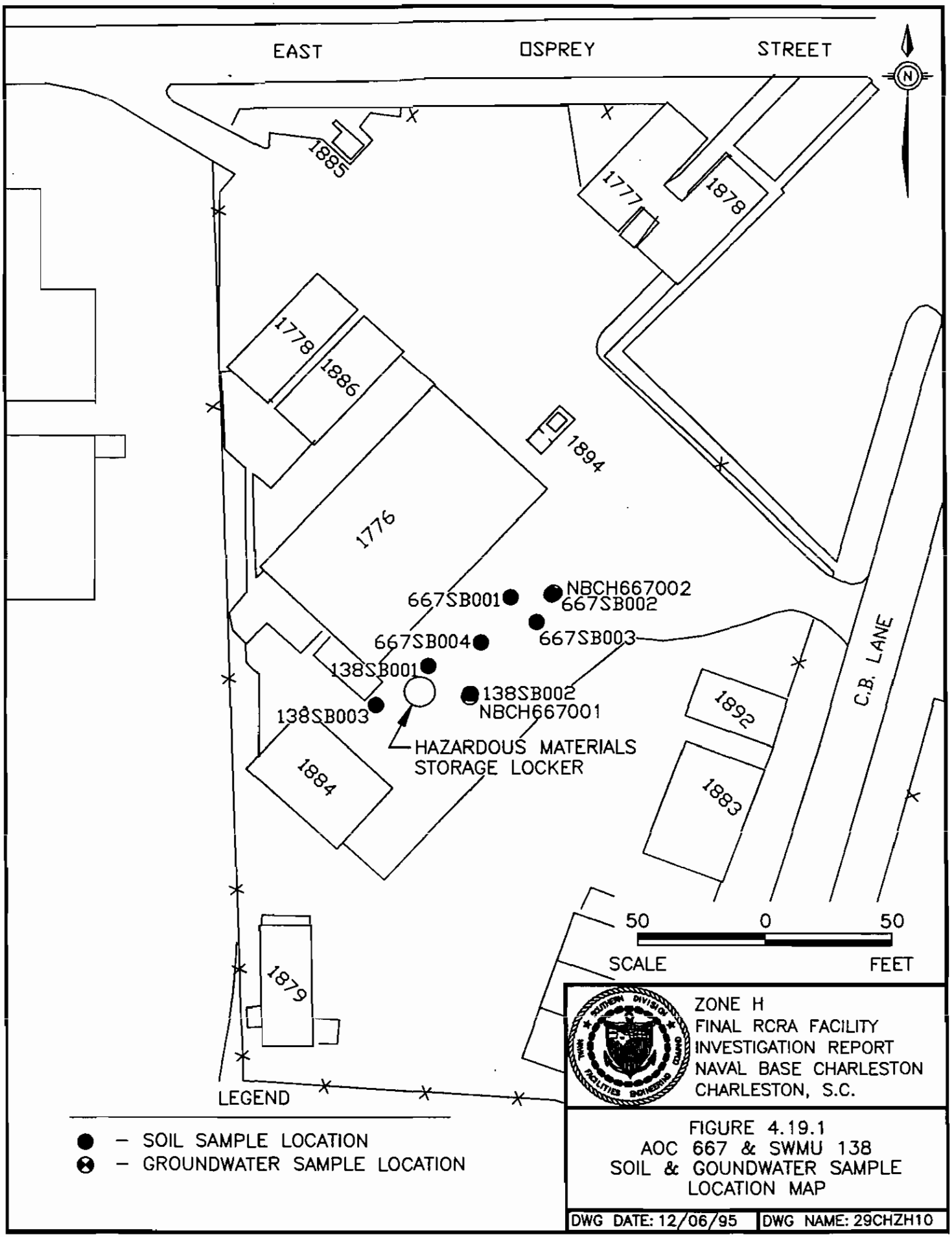
Fourteen soil samples were collected from seven locations. Of the 14 soil samples collected, seven were collected from the 0- to 1-foot interval and seven samples were from the 3- to 5-foot interval. Sampling locations were selected relative to the storage tank and the SAA in areas most likely to have been impacted if a release occurred. Samples were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, cyanide, and TPH. Two samples selected as duplicates were analyzed for herbicides, hexavalent chromium, organophosphate pesticides, and dioxins, in addition to the standard suite of analyses.

4.19.1.1 Volatile Organic Compounds in Soil

VOCs were detected at seven different sampling locations, and in all 14 samples analyzed. Of the 14 detections, seven were collected from the 0- to 1-foot interval and seven were from the 3- to 5-foot interval. Seven VOCs were detected and concentrations ranged from two to eight orders of magnitude below their respective RBSLs.

4.19.1.2 Semivolatile Organic Compounds in Soil

SVOCs were detected at six of the seven sampling locations, and seven of the 14 total samples analyzed. Of the seven detections, five samples were from the 0- to 1-foot interval and two were from the 3- to 5-foot interval. Benzo(a)pyrene was the only one exceeding its RBSL. This compound was detected at 153 μg/kg (RBSL=88 μg/kg) in the first interval sample collected at


EAST
OSPREY
STREET
N
1885
1777
1878
1778
1886
1894
1776
667SB001
NBCH667002
667SB002
667SB003
667SB004
138SB001
138SB002
NBCH667001
138SB003
HAZARDOUS MATERIALS
STORAGE LOCKER
1884
1892
1883
C.B. LANE
1879
50
0
50
SCALE
FEET
LEGEND
● – SOIL SAMPLE LOCATION
⊗ – GROUNDWATER SAMPLE LOCATION
ZONE H
FINAL RCRA FACILITY
INVESTIGATION REPORT
NAVAL BASE CHARLESTON
CHARLESTON, S.C.
FIGURE 4.19.1
AOC 667 & SWMU 138
SOIL & GOUNDWATER SAMPLE
LOCATION MAP
DWG DATE: 12/06/95
DWG NAME: 29CHZH10

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sample location 138SB003. The remaining 10 SVOCs were at least four orders of magnitude below their respective RBSLs.

4.19.1.3 Pesticides and PCBs in Soil

Five pesticides were detected in five of the seven soil sample locations and in six of the 14 samples analyzed. Of the six detections, five samples were from the 0- to 1-foot depth interval and one from the 3- to 5-foot depth interval. All were from one to three orders of magnitude below their respective RBSLs, except 4,4'-DDT, which had a detection of 1,140 μg/kg and an RBSL of 1,900 μg/kg.

No PCBs were detected in the soil samples collected at AOC 667 and SWMU 138.

4.19.1.4 Other Organic Compounds in Soil

TPH analysis identified petroleum hydrocarbons in the duplicate sample locations (138CB002 and 667CB002). The petroleum hydrocarbons were detected in the 0- to 1-foot depth interval at concentrations ranging from 200,000 to 1,800,000 μg/kg.

Herbicides were detected in both duplicate samples (138CB002 and 667CB002) from the 0- to 1-foot interval. Silvex (RBSL=63,000 μg/kg) was detected in one sample (138CB002) at a concentration of 7.9 μg/kg. 2,4,5-T (RBSL=78,000 μg/kg) was detected in one sample (667CB002) at a concentration of 8.5 μg/kg.

No organophosphate pesticides were detected in soil samples duplicated at AOC 667 and SWMU 138.

Dioxins were detected in both of the samples submitted for duplicate analysis (138CB00201 and 667CB00202). The TEQs were 1.038 and 6.689 pg/g, respectively (US EPA-derived preliminary remediation goal - 1,000 pg/g).

4.19.1.5 Inorganic Elements in Soil

Table 4.19.2 summarizes the inorganic element analytical results from the soil samples collected at AOC 667 and SWMU 138. Beryllium was the only element detected at a concentration exceeding its RBSL and interval-specific UTL.

Cyanide was detected at one of the seven sampling locations, and in one of the 14 samples analyzed. The detection was two orders of magnitude below the RBSL.

Hexavalent chromium was not detected in the duplicate soil samples collected at AOC 667 and SWMU 138.

4.19.2 Groundwater Sampling and Analysis

As part of the initial RFI sampling effort, two monitoring wells were installed to sample groundwater at AOC 667 and SWMU 138 (Figure 4.19.1). One of these wells was installed in the vicinity of the oil/water separator and the other in the area of the SAA. These wells were installed in accordance with the procedures outlined in Section 2.4 of this report. First-round samples from these wells were analyzed for VOCs, SVOCs, pesticides/PCBs, metals, and cyanide. Based on the analytical results of the first round, samples for the following rounds were analyzed for VOCs and metals. One second-round sample was duplicated and analyzed for the same parameters as the primary samples. Tables 4.19.3 and 4.19.4 summarize organic and inorganic results, respectively, for groundwater samples collected from these wells. Appendix I contains a complete report of the analytical data for groundwater samples collected from AOC 667 and SWMU 138.

Based on analytical results for groundwater samples collected from the wells installed during the initial AOC 667/SWMU 138 RFI and analytical results for groundwater samples collected from a Zone I shallow grid well installed downgradient from AOC 667/SWMU 138, additional groundwater sampling was considered necessary. The additional sampling was conducted during June 1997, at the same time groundwater screening samples were being collected in the SWMU 138/AOC 667 area for the Zone L RFI (sanitary sewer system). Data from the AOC 667/SWMU 138 groundwater screening samples and the Zone L groundwater screening samples are presented in the following section. Three Zone L groundwater screening samples were collected in the vicinity of AOC 667/SWMU 138 along the sanitary sewer pipe draining the building. Figure 4.19.2 illustrates the groundwater sampling locations and associated VOC detections.

The original AOC 667/SWMU 138 RFI, submitted in July 1996, has been updated to include results from more recent sampling efforts. This document (revised and submitted in June 1998) represents "Revision 1" of the original July 1996 RFI.

No changes to extent of contamination definition were identified through the additional groundwater screening sample collection and analysis; therefore, no changes to the July 1996, version of the AOC 667/SWMU 138 RFI Report Fate and Transport, Human Health Risk Assessment, and Conclusions sections or the Zone H Ecological Risk Assessment section were made.

Groundwater screening numbers presented in data tables have been updated to reflect more recent published data.

4.19.2.1 Volatile Organic Compounds in Groundwater

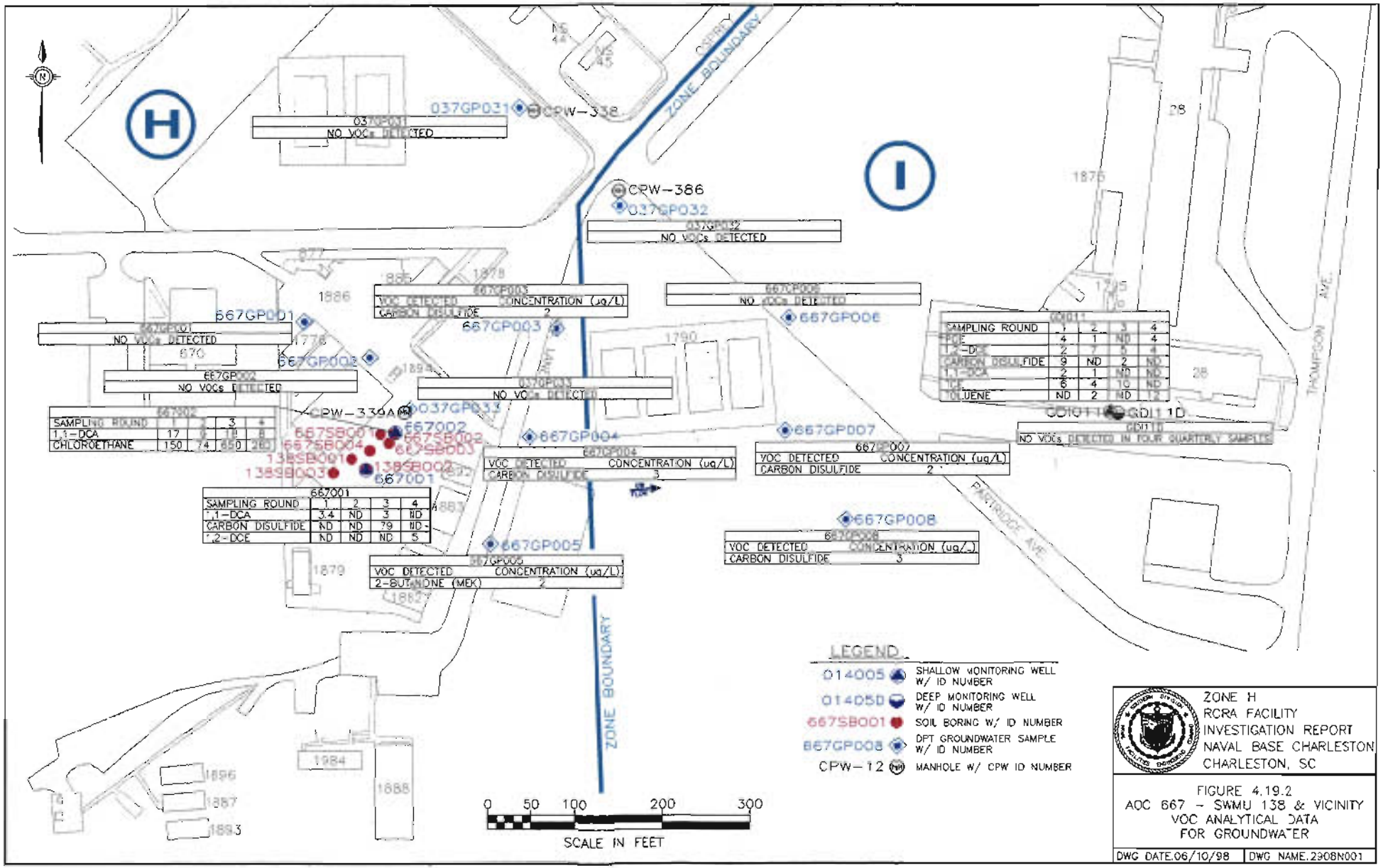
Groundwater samples from NBCH667001 contained 1,1-dichloroethane, carbon disulfide, and 1,2-dichloroethene. 1,1-Dichloroethane was detected in the first and third round samples. Carbon disulfide was only detected in the third round sample. 1,2-Dichloroethene was only detected in the fourth round sample. Groundwater samples from NBCH667002 contained 1,1-dichloroethane and its breakdown product, chloroethane, for all quarters of sampling (see Table 4.19.3). All detections of chloroethane exceeded the compound's RBSL.

Groundwater in NBCIGDI011, which is approximately 850 feet downgradient of NBCH667002, contained the following VOCs: tetrachloroethene, 1,2-dichloroethene, carbon disulfide, 1,1-dichloroethane, trichloroethene, and toluene (Table 4.19.4). Carbon disulfide was only detected in the first and third sampling rounds. 1,1-Dichloroethane was only detected in the first and second sampling rounds. Tetrachloroethene was detected in all but the third sampling round. Toluene was detected in only the second sampling round. Concentrations for tetrachloroethene and trichloroethene exceeded their respective RBSLs.

The only detected compound common to AOC 667/SWMU 138 and NBCIGDI011 was 1,1-dichloroethane.

In order to determine the extent of contamination in the vicinity of NBCH667002, eight groundwater screening samples were collected through the use of direct push technology (DPT) (Figure 4.19.1). These samples were collected from approximately 15 feet below ground surface at each sample location. Analytical data for these samples along are summarized in Table 4.19.5.

No VOCs were detected in the three groundwater screening samples collected in the vicinity of AOC 667/SWMU 138 during the Zone L RFI.



ZONE H
RCRA FACILITY
INVESTIGATION REPORT
NAVAL BASE CHARLESTON
CHARLESTON, SC

FIGURE 4.19.2
AOC 667 - SWMU 138 & VICINITY
VOC ANALYTICAL DATA
FOR GROUNDWATER

DWG DATE.06/10/98 | DWG NAME.2908N001

Carbon disulfide and 2-butanone were the only VOCs detected in the groundwater screening samples. Carbon disulfide was detected at four of the eight locations. All of the detections were estimated and below 4μg/L. 2-Butanone was only detected at one location and its concentration was also an estimated value (2μg/L). Neither of the compounds were detected at concentrations exceeding their respective RBSL.

Based on the groundwater screening sample results, VOC contamination in groundwater in the vicinity of AOC 667/SWMU 138 appears to be isolated, and groundwater contamination in the vicinity of NBCIGDI011 does not appear to be related to that at AOC 667/SWMU 138. The distribution of VOC contamination in groundwater in the vicinity of NBCKGDI011 will be discussed in the Zone I RFI report which is currently being revised.

4.19.2.2 Semivolatile Organic Compounds in Groundwater

No SVOCs were detected in the groundwater sample results for wells at AOC 667 and SWMU 138.

4.19.2.3 Pesticides and PCBs in Groundwater

No pesticides or PCBs were detected in groundwater sample results for wells at AOC 667 and SWMU 138.

4.19.2.4 Other Organic Compounds in Groundwater

No petroleum hydrocarbons were detected in the groundwater sample results for wells at AOC 667 and SWMU 138.

4.19.2.5 Inorganic Elements in Groundwater

Table 4.19.6 summarizes the analytical results for inorganics in the groundwater samples collected at AOC 667 and SWMU 138. Manganese (RBSL - 18 μg/L) and beryllium were the only

inorganic elements exceeding their respective RBSLs. No manganese detection exceeded its UTL. No UTL was calculated for beryllium since there were few background detections.

No cyanide was detected in the groundwater samples collected at AOC 667 and SWMU 138.

4.19.3 Deviations from Final Zone H RFI Work Plan

Eight groundwater screening samples were collected to aid in extent of contamination definition. These samples were not proposed in the Final Zone H RFI Work Plan.

Table 4.19.1
AOC 667 and SWMU 138
Organic Compounds in Soil (mg/kg)

Compound Name	No. of Detections (1st Interval/2nd Interval)	Range of Concentrations for Detections (upper interval/lower interval)	Risk-Based Screening Levels
Volatile Organic Compounds ***(14 Samples Collected – 7 Upper Interval Samples, 7 Lower Interval Samples, 2 Samples Duplicated)***			
Acetone	6/7	34-120/21.1-780	780,000
Carbon disulfide	1/0	4.6/0	780,000
1,1-Dichloroethane	½	10/19-74	780,000
Methylene chloride	½	12.9/5-12.4	85,000
2-Butanone (MEK)	2/1	6.9-9/6.83	4,700,000
Toluene	5/3	2.3-13.13/5-6	1,600,000
Xylene (total)	1/0	2.4/0	16,000,000
Semivolatile Organic Compounds ***(14 Samples Collected – 7 Upper Interval Samples, 7 Lower Interval Samples, 2 Samples Duplicated)***			
Fluorene	0/1	0/720	310,000
Phenanthrene	2/1	50.8-55.8/1,000	310,000
Di-n-butylphthalate	1/0	64/0	780,000
Fluoranthene	1/0	117/0	310,000
Pyrene	1/0	89.1/0	230,000
Naphthalene	0/1	0/670	310,000
4-Chloro-3-methylphenol	1/0	72/0	Not Listed
2-Methylnapthalene	0/1	0/2,600	310,000

Table 4.19.1
AOC 667 and SWMU 138
Organic Compounds in Soil (mg/kg)

Compound Name	No. of Detections (1st Interval/2nd Interval)	Range of Concentrations for Detections (upper interval/lower interval)	Risk-Based Screening Levels
BEHP	2/1	310-480/111	46,000
Benzo(b)fluoranthene	1/0	214/0	880
Benzo(a)pyrene	1/0	153/0	88
Pesticides ***(14 Samples Collected – 7 Upper Interval Samples, 7 Lower Interval Samples, 2 Samples Duplicated)***			
4,4'-DDD	3/1	4-11.4/18.1	2,700
4,4'-DDE	4/0	2-632/0	1,900
Pesticides ***(14 Samples Collected – 7 Upper Interval Samples, 7 Lower Interval Samples, 2 Samples Duplicated)***			
4,4'-DDT	2/1	25.7-1,140/8.99	1,900
alpha-Chlordane	1/0	3/0	470 alpha + gamma
gamma-Chlordane	2/0	2-4.8/0	
Polychlorinated Biphenyls ***(14 Samples Collected – 7 Upper Interval Samples, 7 Lower Interval Samples, 2 Samples Duplicated)***			
No PCBs detected.			
Total Petroleum Hydrocarbons ***(2 Duplicate Analyses – 2 Upper Interval Samples)***			
Total Petroleum Hydrocarbons	2/0	200,000-1,800,000/0	not listed
Herbicides ***(2 Duplicate Analyses – 2 Upper Interval Samples)***			
2,4,5-TP (Silvex)	2/0	7.9-7.9/0	63,000
2,4,5-T	1/0	8.5/0	78,000
Organophosphate Pesticides ***(2 Duplicate Analyses – 2 Upper Interval Samples***			
No organophosphates detected.			
Dioxins ***(2 Duplicate Analyses – 2 Upper Interval Samples)***			
Total TEQ	2/0	1.038-6.689/0 pg/g	1000 pg/g

Table 4.19.2
AOC 667 and SWMU 138
Inorganic Elements in Soil (mg/kg)

Inorganic Elements	Number of Analyses (upper interval/lower interval)	Number of Detections (upper interval/lower interval)	Range of Concentrations for Detections (upper interval/lower interval)	Risk-Based Screening Level	Upper Tolerance Limit of Background[c]
Aluminum[a]	7/7	7/7	1,820-3,350/3,640-6,870	7,900	25,310/ 46,180
Iron[a]	7/7	7/7	1,850-7,460/4,580-7,710	Not Listed	30,910/46,180
Lead	7/7	7/1	2.8-56.7/14.4	400	118/68.69
Nickel	7/7	5/7	1.7-9.3/6.6-25.5	160	33.38/29.9
Potassium[a]	7/7	0/0	0/0	Not Listed	Nutrient[e]
Silver	7/7	0/0	0/0	39	Not Valid[d]
Sodium[a]	7/7	7/7	17.1-331/567-2,120	Not Listed	Nutrient[e]
Thallium	7/7	0/0	0/0	0.63	0.63/1.3
Antimony	7/7	2/1	1.1-1.4/10.4	3.1	Not Valid[d]
Arsenic	7/7	7/7	0.92-8.5/6.6-10.0	0.37	14.81/35.52
Barium	7/7	6/3	6.4-175/1-8.7	550	40.33/43.80
Beryllium	7/7	7/7	0.03-1.5/0.31-1.21	0.15	1.466/1.62
Cadmium	7/7	2/5	0.35-0.36/0.31-0.46	3.9	1.05/1.10
Cobalt	7/7	7/6	0.28-3.4/0.9-2.5	470	5.863/14.8
Copper	7/7	7/5	1.6-34.85/4.3-8.1	290	27.6/31.62
Vanadium	7/7	7/7	6.0-15.5/11.4-42.9	55	77.38/131.6
Zinc	7/7	7/7	3.9-212.75/15.2-54.4	2,300	214.3/129.6
Selenium	7/7	0/3	0/1 1-2.3	39	2.0/2.7
Mercury	7/7	6/0	0.02-0.03/0	2.3	0.485/0.74
Magnesium[a]	7/7	6/7	83.5-3,150/2,450-9,700	Not Listed	9,592/9,179
Manganese[a]	7/7	7/7	7.9-152/51-123	39	636.4/1,412
Calcium	7/7	7/7	1,300-202,000/118,000-205,000	Not Listed	Nutrient[e]
Chromium	7/7	7/7	3.1-56.7/15.4-59.9	39	85.65/83.86
Tin[a]	2/0	0/0	0/0	4,700	Not Valid[d]
Hexavalent Chromium[b]	2/0	0/0	0/0	39	Not Valid[d]
Cyanide	7/7	1/0/0	3.8/0	160	Not Valid[d]

Notes:
[a] = Elements that are not included in both SW-846 and Appendix IX methods.
[b] = Included in duplicate sample analyses only.
[c] = See Appendix J for UTL determination.
[d] = Number of nondetections prevented determination of UTL.
[e] = Elements considered to be nutrients; therefore, UTL was not determined.

Table 4.19.3
AOC 667 and SWMU 138
Organic Compounds in Groundwater (μg/L)

Round 1: 2 Samples Collected, 0 Samples Duplicated
Round 2: 2 Samples Collected, 1 Sample Duplicated
Round 3: 2 Samples Collected, 1 Sample Duplicated
Round 4: 2 Samples Collected, 1 Sample Duplicated

Compound Name	Sampling Round	Number of Detections	Range of Concentrations for Detections	Risk-Based Screening Level	Max. Contam. Level
Volatile Organic Compounds (Four Sampling Rounds)					
Carbon Disulfide	1	ND	NA	100	Not Listed
	2	ND	NA		
	3	1	79		
	4	ND	NA		
Chloroethane	1	1	150	3.6	Not Listed
	2	1	74		
	3	1	650		
	4	1	260		
1,1-Dichloroethane	1	2	3.4-17	81	Not Listed
	2	1	9		
	3	2	3-18		
	4	1	8		
1,2-Dichloroethene (total)	1	ND	NA	5.5	70*
	2	ND	NA		
	3	ND	NA		
	4	1	5		
Semivolatile Organic Compounds (Collected in Round 1 Only)					
No SVOCs detected.					
Pesticides (Collected in Round 1 Only)					
No pesticides detected.					
Polychlorinated Biphenyls (Collected in Round 1 Only)					
No PCBs detected.					
Total Petroleum Hydrocarbons (Collected in Round 1 Only)					
No TPH detected.					

Notes:
* — MCL for cis-1,2-dichloroethene

Table 4.19.4
NBCIGDI011
Volatile Organic Compounds in Groundwater (μg/L)

Round 1: 1 Sample Collected, 0 Samples Duplicated
Round 2: 1 Sample Collected, 0 Samples Duplicated
Round 3: 1 Sample Collected, 0 Samples Duplicated
Round 4: 1 Sample Collected, 0 Sample Duplicated

Compound Name	Sampling Round	Number of Detections	Range of Concentrations for Detections	Risk-Based Screening Level	Max. Contam. Level
Volatile Organic Compounds (Four Sampling Rounds)					
Carbon Disulfide	1	1	9	100	Not Listed
	2	ND	NA		
	3	1	2		
	4	ND	NA		
1,1-Dichloroethane	1	1	2	81	Not Listed
	2	1	1		
	3	ND	NA		
	4	ND	NA		
1,2-Dichloroethene	1	1	2	5.5	70*
	2	1	7		
	3	1	5		
	4	1	4		
Tetrachloroethene	1	1	4	1.1	5
	2	1	1		
	3	ND	NA		
	4	1	4		
Toluene	1	ND	NA	75	1000
	2	1	2		
	3	ND	NA		
	4	ND	NA		
Trichloroethene	1	1	6	1.6	5
	2	1	4		
	3	1	10		
	4	1	12		

Table 4.19.5
AOC 667 and SWMU 138 Groundwater Screening Samples
Volatile Organic Compounds in Groundwater (μg/L)

Compound Name	Number of Detections	Range of Concentrations for Detections	Risk-Based Screening Level	Max. Contam. Level
Volatile Organic Compounds				
Carbon Disulfide	4/8	2.0 - 3.0	100	Not Listed
2-Butanone	1/8	2.0	190	Not Listed

Table 4.19.6
AOC 667 and SWMU 138
Inorganic Elements in Groundwater (μg/L)

Round 1: 2 Samples Collected, 0 Samples Duplicated
Round 2: 2 Samples Collected, 1 Sample Duplicated
Round 3: 2 Samples Collected, 1 Sample Duplicated
Round 4: 2 Samples Collected, 1 Sample Duplicated

Compound Name[a]	Sampling Round	Number of Detections	Range of Concentrations for Detections	Risk-Based Screening Level	Upper Tolerance Limit of Background[b]	Max. Contam. Level
Barium	1	2	12.9-61.4	260	323	2,000
	2	2	18.2-47.9			
	3	ND	NA			
	4	ND	NA			
Beryllium	1	ND	NA	0.016	Not Valid	4
	2	ND	NA			
	3	ND	NA			
	4	2	0.35-0.38			
Calcium[c]	1	2	113,000-154,000	Not Listed	Nutrient	Not Listed
	2	2	81,900-114,000			
	3	2	85,200-130,000			
	4	2	82,450-127,000			
Iron	1	2	86.2-361	1100	Nutrient	Not Listed
	2	2	38.6-853			
	3	2	89.9-943			
	4	2	34.4-177			

Table 4.19.6
AOC 667 and SWMU 138
Inorganic Elements in Groundwater (μg/L)

Round 1: 2 Samples Collected, 0 Samples Duplicated
Round 2: 2 Samples Collected, 1 Sample Duplicated
Round 3: 2 Samples Collected, 1 Sample Duplicated
Round 4: 2 Samples Collected, 1 Sample Duplicated

Compound Name[a]	Sampling Round	Number of Detections	Range of Concentrations for Detections	Risk-Based Screening Level	Upper Tolerance Limit of Background[b]	Max. Contam. Level
Magnesium	1	2	90,600-144,000	Not Listed	Nutrient	Not Listed
	2	2	121,000-232,000			
	3	2	50,650-108,000			
	4	2	90,650-185,000			
Manganese	1	2	36.7-58.2	84	2,440	Not Listed
	2	2	68.9-155			
	3	2	17.4-73.4			
	4	2	43.8-69.6			
Potassium[c]	1	2	41,600-66,100	Not Listed	Nutrient	Not Listed
	2	2	50,600-91,800			
	3	2	25,850-56,700			
	4	2	43,550-99,900			
Sodium[c]	1	2	584,000-1,500,000	Not Listed	Nutrient	Not Listed
	2	2	1,220,000-2,580,000			
	3	2	234,500-1,180,000			
	4	2	747,000-2,150,000			
Vanadium[d]	1	0	—	26	Not Valid	Not Listed
	2	2	3.4-5.3			
	3	0	—			
	4	2	1.3-2.4			
Cyanide[d]	1	—	Not Detected	73	Not Valid	200
	2	—	No Analysis			
	3	—	No Analysis			
	4	—	No Analysis			

Notes:
[a] = Only elements with detections are listed. Cyanide was a separate analysis.
[b] = See Appendix J for UTL determinations.
[c] = Element considered to be a nutrient; therefore UTL was not determined.
[d] = High percentage of nondetects in background samples prevented UTL determination.