
Chemical and Biological Defense Program

Final

Programmatic Environmental Impact Statement



Prepared by
U.S. Army Medical Research
and Materiel Command
Frederick, Maryland

May 2004

Chemical and Biological Defense Program

Final

**Programmatic Environmental
Impact Statement**

May 2004

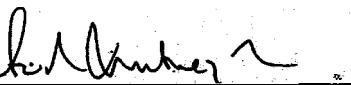
LEAD AGENCY: **DEPARTMENT OF THE ARMY, OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS AND ENVIRONMENT)**

TITLE OF PROPOSED ACTION: Chemical and Biological Defense Program

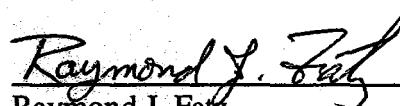
AFFECTED JURISDICTION: Nationwide

POINT OF CONTACT: **JoLane Souris**
USAMRMC, Command Environmental Coordinator
(301) 619-2004, jolane.souris@us.army.mil

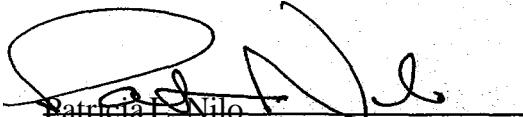
PREPARER AND PROPONENT:


MG Lester Martinez-Lopez
Commander
USAMRMC

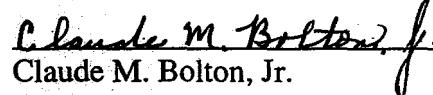
REVIEWED BY:


Raymond J. Fatz
Deputy Assistant Secretary of the Army
(Environment, Safety and
Occupational Health) OASA (I&E)

REVIEWED BY:


Patricia E. Nilo
Brigadier General, USA
Deputy for Chemical/Biological Defense Activity
Acting

APPROVED BY:


Claude M. Bolton, Jr.
Assistant Secretary of the Army
Acquisition, Logistics, and Technology

DOCUMENT DESIGNATION: Programmatic Environmental Impact Statement (PEIS)

ABSTRACT: The proposed action is the execution of an integrated program designed to protect our soldiers, sailors, marines, and airmen from the evolving chemical and biological threats they **may** encounter on the battlefield. The "No-Action" alternative is the continuation of current Chemical and Biological Defense **Program** (CBDP) operations as described in and covered by existing environmental analyses. Both were evaluated, and neither would reasonably result in the occurrence of significant adverse environmental impact. The PEIS was prepared for an ongoing program. It will facilitate future government decision making as the program grows to meet the evolving threats. It will have further benefits as an information source for other government agencies at all levels and **for** the public, **sharing** information on CBDP features that demonstrate DoD's commitment to protect the environment and to ensure public safety during execution of this operationally mandated program.

The analysis concludes that current and proposed CBDP research, development, and acquisition (RDA) activities have been and will likely continue to be performed without significant environmental impacts. The most severe potential effects associated with CBDP RDA activities are predicted to be minor; to date, all observed effects have been insignificant. Potential risks to CBDP laboratory workers, public health, and the environment are and will be mitigated by adherence to benchmark guidelines, regulations, and standard operating procedures.

Executive Summary

This programmatic environmental impact statement (PEIS) was prepared in accordance with guidance provided in Army Regulation 200-2 and 32 *Code of Federal Regulations* 651, *Environmental Effects of Army Actions*, dated 29 March 2002, implementing the National Environmental Policy Act (NEPA) (42 *United States Code* 4321-4347). This PEIS, the *Chemical and Biological Defense Program Programmatic Environmental Impact Statement (CBDP PEIS)*, was prepared by the U.S. Army with assistance from Science Applications International Corporation and its subcontractor, BSA Environmental Services, Inc., under Government Contract Number DAMD 17-98-D-022.

Current threats of chemical and biological warfare (CBW) and the continuing proliferation of CBW agents mandate the need to protect our soldiers, sailors, marines, and airmen who go in harm's way. If our military forces are not fully prepared to meet these threats, the consequences could be devastating. CBW threats also include chemical and/or biological terrorism, and the Department of Defense (DoD) mission has expanded to cover military capability to operate in the face of threats to homeland security. Chemical and biological defense capabilities cover products that detect, decontaminate, or provide protection from CBW agents. Some activities conducted under the CBDP necessarily involve use of hazardous chemicals or infectious disease agents for research, development, and acquisition (RDA) purposes. The controls on and the potential environmental consequences of such activities are a primary focus of this PEIS.

The Proposed Action (Preferred Alternative) and subject of this PEIS is the execution of an integrated CBDP designed to protect our soldiers, sailors, marines, and airmen from evolving chemical and biological threats they may encounter on the battlefield. The Department of the Army is the executive agent for the DoD CBDP. The Defense Advanced Research Projects Agency (DARPA) is the executive agent for DARPA's CBDP.

One alternative to the Proposed Action was considered—continuation of the current CBDP operations as described in and covered by existing environmental analyses (the No Action Alternative). No other alternatives were identified during the public scoping process. This PEIS characterizes the reasonably foreseeable environmental impacts, including impacts on human health, that might result from implementing either the Proposed Action or the No Action Alternative.

The CBDP is a dynamic program; each year, new short- and long-term RDA activities are initiated in both existing and new locations, while others are terminated. The analysis of potential environmental impacts considered that the sites for executing CBDP activities are located at numerous military installations and contractor facilities throughout the United States and in other countries. It was not necessary, however, to examine all CBDP activities at all of these sites in detail for this PEIS. The technical approach to gauge the environmental impacts of the CBDP was to demonstrate how the environmental compliance programs within the CBDP are actually working, via detailed analyses for selected example sites.

On that basis, the PEIS finds that the most severe potential effects associated with CBDP RDA activities are predicted to be minor; to date, all observed effects have been insignificant.

Potential risks to CBDP laboratory workers, public health, and the environment are and will be mitigated by adherence to the benchmark guidelines and regulations identified in this PEIS and by developing and following appropriate standard operating procedures similar to those identified for the selected example sites in this PEIS.

The principal conclusions of this PEIS are:

- (1) Execution of an integrated CBDP designed to protect our soldiers, sailors, marines, and airmen from evolving chemical and biological threats they may encounter on the battlefield (the Proposed Action) will not result in significant unmitigable adverse environmental impacts. As the program grows to meet evolving threats, this PEIS will be beneficial for the CBDP as a single reference source for up-to-date NEPA documentation, providing information on and analyses of both the biological and the chemical defense programs. It will provide a basis for tiering of future environmental analyses under the CBDP, which will facilitate future government decision making. It will have further benefits for the public, sharing information on features of the CBDP that demonstrate DoD's commitment to protect the environment and to ensure public safety during the execution of this operationally mandated program.
- (2) Continuation of current CBDP operations as described in and covered by existing environmental analyses (the No Action Alternative) cannot reasonably be expected to improve the efficiency of analyzing future CBDP activity environmental impacts and would not inform the public about government decision making as well as the Proposed Action.
- (3) Neither the Proposed Action nor the No Action Alternative is likely to cause significant adverse environmental impacts. However, the Proposed Action is preferred to achieve the benefits cited above for the integrated program, designed to protect against evolving threats.
- (4) The impacts of existing CBDP activities at the example sites on environmental attributes all were found to be negligible to minor, and mitigable. This suggests that the scale of the enumerated activities can be increased without causing significant, unmitigable environmental and health impacts. However, NEPA considerations will continue to be addressed as necessary for site-specific proposed actions, including both construction and operations that are part of the CBDP. Also, future activities not identified in this PEIS may require both site-specific and programmatic NEPA documentation.

On June 4, 2001, the U.S. Army announced its intention to prepare this PEIS. To identify concerns germane to this PEIS and to afford the affected public and government agencies opportunities for meaningful input, the Army conducted scoping activities, including disseminating information packages to the public and government activities, publishing notices in local newspapers, coordinating with public-interest groups, and establishing a public *CBDP PEIS* website (<http://chembioeis.detrick.army.mil>).

Subsequent to the scoping activities and data collection, the U.S. Army prepared the Draft PEIS (DPEIS) and announced its availability in the Federal Register on May 5, 2003. Concurrent with the Federal Register notice, the DPEIS was announced to example site representatives, to identified potential stakeholder organizations, and in newspapers of major circulation in and

Programmatic Environmental Impact Statement

around example sites. Further, the DPEIS was posted on the CDPD PEIS website, sent to local libraries, and submitted to federal and state agencies, potentially impacted Indian tribal groups, citizen advisory groups, and individuals upon request for review and comment. Written comments on the DPEIS were received from federal and state agencies through August 13, 2003. All comments were addressed and changes were made to the DPEIS in preparation of the Final PEIS.

Table of Contents

Executive Summary	i
1.0 Purpose, Background, and Scope	1-1
1.1 Purpose and Need	1-1
1.2 Background	1-2
1.2.1 Contents of Programmatic Environmental Impact Statement	1-2
1.2.2 Description of the Chemical and Biological Defense Program	1-2
1.2.2.1 Mission Objectives and Program Management	1-2
1.2.2.2 Commodity Areas	1-3
1.2.2.3 CBDP Research, Development, and Acquisition Activities	1-5
1.3 Scope of Environmental Review	1-6
1.3.1 Public Participation.....	1-6
1.3.2 Identification of Significant Issues	1-6
1.3.3 Technical Approach	1-7
1.3.3.1 Example Sites.....	1-8
1.3.3.2 Attribute Areas for Environmental Analysis	1-11
1.3.3.3 Mitigation Measures	1-14
2.0 Description of the Proposed Action.....	2-1
2.1 Background	2-1
2.2 Analytic Framework	2-1
2.2.1 CBDP Research, Development, and Acquisition Components	2-2
2.2.1.1 Research, Development, Test, and Evaluation	2-2
2.2.1.2 Operations, Maintenance, and Waste Management.....	2-3
2.2.1.3 Administration	2-3
2.2.2 Waste Management Impact Mitigation.....	2-4
2.2.3 Safety, Health, and Security Impact Mitigation.....	2-4
2.3 Benchmark Regulations and Guidelines for CBDP Activities	2-4
2.3.1 Animal Care and Use	2-5
2.3.2 Human Subjects	2-5
2.3.3 Chemical Surety Materiel	2-5
2.3.4 Waste Management Mitigation.....	2-7
2.3.4.1 Air Emissions.....	2-7
2.3.4.2 Solid Waste	2-8
2.3.4.3 Wastewater.....	2-8
2.3.4.4 Hazardous Waste	2-9
2.3.4.5 Medical and Infectious Waste.....	2-10
2.3.4.6 Radiological Waste	2-10
2.3.5 Safety, Health, and Security Mitigation.....	2-10
2.3.5.1 Biological Safety.....	2-11
2.3.5.2 Chemical Safety	2-13
2.3.5.3 Radiological Safety	2-15
2.3.5.4 Occupational Health.....	2-15
2.3.5.5 Security	2-16
2.3.6 Contract Administration.....	2-16

Table of Contents (cont.)

2.4	Existing CBDP Activities at the Example Sites	2-18
2.4.1	Edgewood Chemical Biological Center.....	2-18
2.4.1.1	Research, Development, Test, and Evaluation Activities.....	2-18
2.4.1.2	Operations, Maintenance, and Waste Management Activities	2-21
2.4.1.3	Safety, Health, and Security Mitigation.....	2-29
2.4.2	U.S. Army Medical Research Institute of Chemical Defense	2-35
2.4.2.1	Research, Development, Test, and Evaluation Activities.....	2-35
2.4.2.2	Operations, Maintenance, and Waste Management Activities	2-37
2.4.2.3	Safety, Health, and Security Mitigation.....	2-44
2.4.3	Naval Surface Warfare Center Dahlgren Laboratory	2-53
2.4.3.1	Research, Development, Test, and Evaluation Activities.....	2-53
2.4.3.2	Operations, Maintenance, and Waste Management Activities	2-54
2.4.3.3	Safety, Health, and Security Mitigation.....	2-57
2.4.4	U.S. Army Medical Research Institute of Infectious Diseases.....	2-61
2.4.4.1	Research, Development, Test, and Evaluation Activities.....	2-62
2.4.4.2	Operations, Maintenance, and Waste Management Activities	2-65
2.4.4.3	Safety, Health, and Security Mitigation.....	2-69
2.4.5	Dugway Proving Ground	2-78
2.4.5.1	Research, Development, Test, and Evaluation Activities.....	2-79
2.4.5.2	Operations, Maintenance, and Waste Management Activities	2-81
2.4.5.3	Safety, Health, and Security Mitigation.....	2-83
2.4.6	University of Texas Medical Branch	2-89
2.4.6.1	Research, Development, Test, and Evaluation Activities.....	2-89
2.4.6.2	Operations, Maintenance, and Waste Management Activities	2-90
2.4.6.3	Safety, Health, and Security Mitigation.....	2-94
2.4.7	Battelle Memorial Institute, West Jefferson	2-101
2.4.7.1	Research, Development, Test, and Evaluation Activities.....	2-101
2.4.7.2	Operations, Maintenance, and Waste Management Activities	2-103
2.4.7.3	Safety, Health, and Security Mitigation.....	2-106
2.4.8	Brooks Air Force Base.....	2-112
2.4.9	Marine Corps Systems Command	2-112
3.0	Alternatives.....	3-1
3.1	Introduction.....	3-1
3.2	Description of the Alternatives Considered.....	3-1
3.2.1	Proposed Action.....	3-1
3.2.2	No Action Alternative.....	3-1
3.2.3	Other Reasonable Alternatives	3-1
3.3	Impacts of Alternatives	3-1
3.4	Comparison of Alternatives and Selection of the Preferred Alternative	3-2
4.0	Description of Existing Environments	4-1
4.1	Environmental Attributes.....	4-1
4.1.1	Air Quality	4-1
4.1.2	Biological Resources	4-1

Table of Contents (cont.)

4.1.3	Cultural Resources	4-1
4.1.4	Earth Resources	4-2
4.1.5	Land Use	4-2
4.1.6	Noise	4-3
4.1.7	Socioeconomics and Environmental Justice	4-3
4.1.8	Transportation and Airspace	4-3
4.1.9	Utilities.....	4-3
4.1.10	Water Resources	4-3
4.2	Existing Environmental Attributes at the Edgewood Chemical Biological Center and U.S. Army Medical Research Institute of Chemical Defense (Aberdeen Proving Ground).....	4-4
4.2.1	Air Quality	4-4
4.2.2	Biological Resources	4-5
4.2.2.1	Terrestrial Resources	4-6
4.2.2.2	Aquatic Resources	4-7
4.2.2.3	Critical Habitats and Species of Special Concern.....	4-8
4.2.3	Cultural Resources	4-10
4.2.3.1	Historical Sites.....	4-10
4.2.3.2	Archaeological Sites	4-10
4.2.4	Earth Resources	4-11
4.2.4.1	Topography	4-11
4.2.4.2	Geology	4-12
4.2.4.3	Soils.....	4-12
4.2.4.4	Seismic Activity	4-14
4.2.5	Land Use	4-14
4.2.6	Noise	4-15
4.2.7	Socioeconomics and Environmental Justice	4-15
4.2.7.1	Economic Activity	4-15
4.2.7.2	Income.....	4-16
4.2.7.3	Population and Demographics	4-16
4.2.7.4	Housing	4-16
4.2.8	Transportation and Airspace	4-16
4.2.8.1	Highways and Roads.....	4-16
4.2.8.2	Railroads	4-17
4.2.8.3	Airports and Airspace	4-17
4.2.8.4	Marine Transportation	4-17
4.2.9	Utilities.....	4-17
4.2.9.1	Water Supply	4-18
4.2.9.2	Energy.....	4-18
4.2.10	Water Resources	4-18
4.2.10.1	Surface Water.....	4-18
4.2.10.2	Groundwater	4-21
4.2.10.3	Wetlands	4-24

Table of Contents (cont.)

4.3	Existing Environmental Attributes at the Naval Surface Warfare Center	
	Dahlgren Laboratory	4-25
4.3.1	Air Quality	4-25
4.3.2	Biological Resources	4-26
4.3.2.1	Terrestrial Resources	4-26
4.3.2.2	Aquatic Resources	4-26
4.3.2.3	Critical Habitats and Species of Special Concern.....	4-27
4.3.3	Cultural Resources	4-28
4.3.3.1	Historical Sites.....	4-28
4.3.3.2	Archaeological Sites	4-28
4.3.4	Earth Resources	4-28
4.3.4.1	Topography	4-28
4.3.4.2	Geology	4-29
4.3.4.3	Soils.....	4-29
4.3.4.4	Seismic Activity.....	4-29
4.3.5	Land Use	4-30
4.3.6	Noise	4-31
4.3.7	Socioeconomics and Environmental Justice	4-31
4.3.7.1	Economic Activity	4-31
4.3.7.2	Income.....	4-31
4.3.7.3	Population and Demographics	4-32
4.3.7.4	Housing	4-32
4.3.8	Transportation and Airspace	4-32
4.3.8.1	Highways and Roads.....	4-32
4.3.8.2	Railroads	4-32
4.3.8.3	Airports and Airspace	4-33
4.3.8.4	Marine Transportation	4-33
4.3.9	Utilities.....	4-33
4.3.9.1	Water Supply	4-33
4.3.9.2	Energy	4-33
4.3.10	Water Resources	4-33
4.3.10.1	Surface Water.....	4-33
4.3.10.2	Groundwater	4-34
4.3.10.3	Wetlands	4-35
4.4	Existing Environmental Attributes at the U.S. Army Medical Research Institute of Infectious Diseases	4-36
4.4.1	Air Quality	4-36
4.4.2	Biological Resources	4-37
4.4.2.1	Terrestrial Resources	4-38
4.4.2.2	Aquatic Resources	4-38
4.4.2.3	Critical Habitats and Species of Special Concern.....	4-38

Table of Contents (cont.)

4.4.3	Cultural Resources	4-38
4.4.3.1	Historical Sites	4-39
4.4.3.2	Archaeological Sites	4-39
4.4.4	Earth Resources	4-40
4.4.4.1	Topography	4-40
4.4.4.2	Geology	4-40
4.4.4.3	Soils.....	4-41
4.4.4.4	Seismic Activity.....	4-41
4.4.5	Land Use	4-41
4.4.6	Noise	4-42
4.4.7	Socioeconomics and Environmental Justice	4-42
4.4.7.1	Economic Activity	4-42
4.4.7.2	Income.....	4-43
4.4.7.3	Population and Demographics	4-43
4.4.7.4	Housing	4-43
4.4.8	Transportation and Airspace	4-43
4.4.8.1	Highways and Roads.....	4-43
4.4.8.2	Railroads	4-43
4.4.8.3	Airports and Airspace	4-44
4.4.8.4	Marine Transportation	4-44
4.4.9	Utilities.....	4-44
4.4.9.1	Water Supply	4-44
4.4.9.2	Energy	4-44
4.4.10	Water Resources	4-45
4.4.10.1	Surface Water.....	4-45
4.4.10.2	Groundwater	4-46
	4.4.10.3 Wetlands	4-47
4.5	Existing Environmental Attributes at Dugway Proving Ground	4-48
4.5.1	Air Quality	4-48
4.5.2	Biological Resources	4-49
4.5.2.1	Terrestrial Resources	4-49
4.5.2.2	Aquatic Resources	4-50
4.5.2.3	Critical Habitats and Species of Special Concern.....	4-50
4.5.3	Cultural Resources	4-51
4.5.3.1	Historical Sites	4-51
4.5.3.2	Archaeological Sites	4-51
4.5.4	Earth Resources	4-52
4.5.4.1	Topography	4-52
4.5.4.2	Geology.....	4-52
4.5.4.3	Soils.....	4-52
4.5.4.4	Seismic Activity.....	4-53
4.5.5	Land Use	4-53
4.5.6	Noise	4-54

Table of Contents (cont.)

4.5.7	Socioeconomics and Environmental Justice	4-54
4.5.7.1	Economic Activity	4-54
4.5.7.2	Income.....	4-55
4.5.7.3	Population and Demographics	4-55
4.5.7.4	Housing	4-55
4.5.8	Transportation and Airspace	4-55
4.5.8.1	Highways and Roads.....	4-55
4.5.8.2	Railroads	4-56
4.5.8.3	Airports and Airspace	4-56
4.5.8.4	Marine Transportation	4-56
4.5.9	Utilities.....	4-56
4.5.9.1	Water Supply	4-56
4.5.9.2	Energy.....	4-57
4.5.10	Water Resources	4-57
4.5.10.1	Surface Water.....	4-57
4.5.10.2	Groundwater	4-58
	4.5.10.3 Wetlands	4-58
4.6	Existing Environmental Attributes at the University of Texas Medical Branch	4-59
4.6.1	Air Quality	4-59
4.6.2	Biological Resources	4-60
4.6.2.1	Terrestrial Resources	4-60
4.6.2.2	Aquatic Resources	4-60
4.6.2.3	Critical Habitats and Species of Special Concern.....	4-61
4.6.3	Cultural Resources	4-61
4.6.3.1	Historical Sites	4-61
4.6.3.2	Archaeological Sites	4-62
4.6.4	Earth Resources	4-62
4.6.4.1	Topography	4-62
4.6.4.2	Geology	4-63
4.6.4.3	Soils.....	4-63
4.6.4.4	Seismic Activity.....	4-63
4.6.5	Land Use	4-63
4.6.6	Noise	4-63
4.6.7	Socioeconomics and Environmental Justice	4-64
4.6.7.1	Economic Activity	4-64
4.6.7.2	Income.....	4-64
4.6.7.3	Population and Demographics	4-64
4.6.7.4	Housing	4-64
4.6.8	Transportation and Airspace	4-64
4.6.8.1	Highways and Roads.....	4-64
4.6.8.2	Railroads	4-64
4.6.8.3	Airports and Airspace	4-65
	4.6.8.4 Marine Transportation	4-65

Table of Contents (cont.)

4.6.9	Utilities.....	4-65
4.6.9.1	Water Supply	4-65
4.6.9.2	Energy	4-65
4.6.10	Water Resources	4-66
4.6.10.1	Surface Water.....	4-66
4.6.10.2	Groundwater	4-66
4.6.10.3	Wetlands	4-66
4.7	Existing Environmental Attributes at the Battelle Memorial Institute, West Jefferson.....	4-68
4.7.1	Air Quality	4-68
4.7.2	Biological Resources	4-69
4.7.2.1	Terrestrial Resources	4-69
4.7.2.2	Aquatic Resources	4-69
4.7.2.3	Critical Habitats and Species of Special Concern.....	4-69
4.7.3	Cultural Resources	4-70
4.7.3.1	Historical Sites	4-70
4.7.3.2	Archaeological Sites	4-70
4.7.4	Earth Resources	4-70
4.7.4.1	Topography	4-70
4.7.4.2	Geology.....	4-70
4.7.4.3	Soils.....	4-71
4.7.4.4	Seismic Activity.....	4-72
4.7.5	Land Use	4-72
4.7.6	Noise	4-73
4.7.7	Socioeconomics and Environmental Justice.....	4-73
4.7.7.1	Economic Activity	4-73
4.7.7.2	Income.....	4-73
4.7.7.3	Population and Demographics	4-73
4.7.7.4	Housing	4-73
4.7.8	Transportation and Airspace	4-73
4.7.8.1	Highways and Roads.....	4-73
4.7.8.2	Railroads	4-74
4.7.8.3	Airports and Airspace	4-74
4.7.8.4	Marine Transportation	4-74
4.7.9	Utilities.....	4-74
4.7.9.1	Water Supply	4-74
4.7.9.2	Energy	4-74
4.7.10	Water Resources	4-75
4.7.10.1	Surface Water.....	4-75
4.7.10.2	Groundwater	4-75
4.7.10.3	Wetlands	4-76

Table of Contents (cont.)

5.0 Analysis of Environmental and Health Consequences of Chemical and Biological Defense Program Activities and Mitigation Measures	5-1
5.1 Analysis Methodology	5-1
5.2 Analysis of Air Quality Impacts of CBDP Activities at the Example Sites	5-2
5.2.1 Air Quality Impacts at the Edgewood Chemical Biological Center and the U.S. Army Medical Research Institute of Chemical Defense (Aberdeen Proving Ground)	5-2
5.2.2 Air Quality Impacts at the Naval Surface Warfare Center Dahlgren Laboratory	5-2
5.2.3 Air Quality Impacts at the U.S. Army Medical Research Institute of Infectious Diseases.....	5-3
5.2.4 Air Quality Impacts at Dugway Proving Ground	5-3
5.2.5 Air Quality Impacts at the University of Texas Medical Branch	5-3
5.2.6 Air Quality Impacts at the Battelle Memorial Institute, West Jefferson....	5-3
5.2.7 Air Quality Impact Summarization.....	5-4
5.3 Analysis of Biological Resource Impacts of CBDP Activities at the Example Sites.....	5-4
5.3.1 Biological Resource Impacts at ECBC and USAMRICD (Aberdeen Proving Ground)	5-4
5.3.2 Biological Resource Impacts at NSWCDL.....	5-5
5.3.3 Biological Resource Impacts at USAMRIID.....	5-5
5.3.4 Biological Resource Impacts at DPG	5-5
5.3.5 Biological Resource Impacts at UTMB	5-6
5.3.6 Biological Resource Impacts at BMI, West Jefferson	5-6
5.3.7 Biological Resource Impact Summarization	5-7
5.4 Analysis of Cultural Resource Impacts of CBDP Activities at the Example Sites ...	5-7
5.4.1 Cultural Resource Impacts at ECBC and USAMRICD (APG)	5-7
5.4.2 Cultural Resource Impacts at NSWCDL	5-8
5.4.3 Cultural Resource Impacts at USAMRIID	5-8
5.4.4 Cultural Resource Impacts at DPG	5-8
5.4.5 Cultural Resource Impacts at UTMB	5-9
5.4.6 Cultural Resource Impacts at BMI, West Jefferson.....	5-9
5.4.7 Cultural Resource Impact Summarization	5-9
5.5 Analysis of Earth Resource Impacts of CBDP Activities at the Example Sites.....	5-9
5.5.1 Earth Resource Impacts at ECBC and USAMRICD (APG)	5-9
5.5.2 Earth Resource Impacts at NSWCDL.....	5-10
5.5.3 Earth Resource Impacts at USAMRIID.....	5-10
5.5.4 Earth Resource Impacts at DPG	5-10
5.5.5 Earth Resource Impacts at UTMB	5-11
5.5.6 Earth Resource Impacts at BMI, West Jefferson	5-11
5.5.7 Earth Resource Impact Summarization	5-11

Table of Contents (cont.)

5.6	Analysis of Land Use Impacts of CBDP Activities at the Example Sites	5-11
5.6.1	Land Use Impacts at ECBC and USAMRICD (APG).....	5-11
5.6.2	Land Use Impacts at NSWCDL.....	5-11
5.6.3	Land Use Impacts at USAMRIID.....	5-12
5.6.4	Land Use Impacts at DPG.....	5-12
5.6.5	Land Use Impacts at UTMB	5-12
5.6.6	Land Use Impacts at BMI, West Jefferson	5-12
5.6.7	Land Use Impact Summarization.....	5-12
5.7	Analysis of Noise Impacts of CBDP Activities at the Example Sites	5-13
5.7.1	Noise Impacts at ECBC and USAMRICD (APG).....	5-13
5.7.2	Noise Impacts at NSWCDL.....	5-13
5.7.3	Noise Impacts at USAMRIID	5-13
5.7.4	Noise Impacts at DPG.....	5-13
5.7.5	Noise Impacts at UTMB	5-13
5.7.6	Noise Impacts at BMI, West Jefferson	5-13
5.7.7	Noise Impact Summarization.....	5-13
5.8	Analysis of Socioeconomic and Environmental Justice Impacts of CBDP Activities at the Example Sites	5-13
5.8.1	Socioeconomic and Environmental Justice Impacts at ECBC and USAMRICD (APG).....	5-14
5.8.2	Socioeconomic and Environmental Justice Impacts at NSWCDL.....	5-14
5.8.3	Socioeconomic and Environmental Justice Impacts at USAMRIID	5-14
5.8.4	Socioeconomic and Environmental Justice Impacts at DPG	5-14
5.8.5	Socioeconomic and Environmental Justice Impacts at UTMB	5-14
5.8.6	Socioeconomic and Environmental Justice Impacts at BMI, West Jefferson.....	5-15
5.8.7	Socioeconomic and Environmental Justice Impact Summarization.....	5-15
5.9	Analysis of Transportation and Airspace Impacts of CBDP Activities at the Example Sites.....	5-15
5.9.1	Transportation and Airspace Impacts at ECBC and USAMRICD	5-15
5.9.2	Transportation and Airspace Impacts at NSWCDL.....	5-16
5.9.3	Transportation and Airspace Impacts at USAMRIID	5-16
5.9.4	Transportation and Airspace Impacts at DPG	5-16
5.9.5	Transportation and Airspace Impacts at UTMB	5-17
5.9.6	Transportation and Airspace Impacts at BMI, West Jefferson	5-17
5.9.7	Transportation and Airspace Impact Summarization	5-17
5.10	Analysis of Utilities Impacts of CBDP Activities at the Example Sites.....	5-17
5.10.1	Utilities Impacts at ECBC and USAMRICD.....	5-17
5.10.2	Utilities Impacts at NSWCDL	5-18
5.10.3	Utilities Impacts at USAMRIID	5-18
5.10.4	Utilities Impacts at DPG	5-18
5.10.5	Utilities Impacts at UTMB.....	5-18

Table of Contents (cont.)

5.10.6	Utilities Impacts at BMI, West Jefferson.....	5-18
5.10.7	Utilities Impact Summarization	5-18
5.11	Analysis of Water Resource Impacts of CBDP Activities at the Example Sites.....	5-19
5.11.1	Water Resource Impacts at ECBC and USAMRICD (APG)	5-19
5.11.2	Water Resource Impacts at NSWCDL	5-19
5.11.3	Water Resource Impacts at USAMRIID.....	5-19
5.11.4	Water Resource Impacts at DPG	5-20
5.11.5	Water Resource Impacts at UTMB	5-20
5.11.6	Water Resource Impacts at BMI, West Jefferson.....	5-20
5.11.7	Water Resource Impact Summarization	5-20
5.12	Analysis of Safety, Health, and Security Impacts of CBDP Activities at the Example Sites.....	5-20
5.12.1	Safety, Health, and Security Impacts at ECBC and USAMRICD.....	5-21
5.12.2	Safety, Health, and Security Impacts at NSWCDL	5-22
5.12.3	Safety, Health, and Security Impacts at USAMRIID	5-22
5.12.4	Safety, Health, and Security Impacts at DPG	5-22
5.12.5	Safety, Health, and Security Impacts at UTMB	5-22
5.12.6	Safety, Health, and Security Impacts at BMI, West Jefferson.....	5-22
5.12.7	Safety, Health, and Security Impact Summarization	5-22
5.13	Programmatic Evaluation.....	5-23
5.13.1	Air Quality Impacts.....	5-23
5.13.2	Biological Resource Impacts	5-23
5.13.3	Cultural Resource Impacts	5-23
5.13.4	Earth Resource Impacts	5-23
5.13.5	Land Use Impacts	5-24
5.13.6	Noise Impacts.....	5-24
5.13.7	Socioeconomic and Environmental Justice Impacts.....	5-24
5.13.8	Transportation and Airspace Impacts	5-24
5.13.9	Utilities Impacts	5-24
5.13.10	Water Resource Impacts	5-24
5.13.11	Safety, Health, and Security Impacts	5-24
5.14	Cumulative Impacts	5-25
5.14.1	Cumulative Impacts over Time.....	5-26
5.14.2	Cumulative Impacts in Conjunction with Other Programs.....	5-26
5.14.3	Regionally Cumulative Impacts.....	5-27
5.15	Comparison of Alternatives	5-28
6.0	Conclusions.....	6-1
7.0	References.....	7-1
8.0	Persons and Agencies Contacted	8-1
9.0	Preparers	9-1
10.0	Acronym List/Metric Conversion Table.....	10-1

Table of Contents (cont.)

Appendix A – Stakeholder Interaction and Public Involvement Plan (Updated)	A-1
Appendix B – Draft PEIS Comments and Comment Resolution Matrix.....	B-1
Appendix C – Hazard Analyses.....	C-1

List of Figures

Figure 1-1. Map of the Example Site Locations.....	1-9
Figure 4-1. Location of the Edgewood Chemical Biological Center and the U.S. Army Medical Research Institute of Chemical Defense	4-4
Figure 4-2. Location of the Naval Surface Warfare Center Dahlgren Laboratory	4-25
Figure 4-3. Location of the U.S. Army Medical Research Institute of Infectious Diseases	4-36
Figure 4-4. Location of Dugway Proving Ground.....	4-48
Figure 4-5. Location of the University of Texas Medical Branch.....	4-59
Figure 4-6. Location of the Battelle Memorial Institute, West Jefferson.....	4-68
Figure A-1 Communication Activities	A-12
Figure B-1 Comment Resolution Matrix.....	B-1

List of Tables

Table 5-1. Summary of Environmental Impacts at the Example Sites by Attribute Area ..	5-25
Table 8-1. Persons and Agencies Contacted	8-1