DOE/EIS-0423-S1
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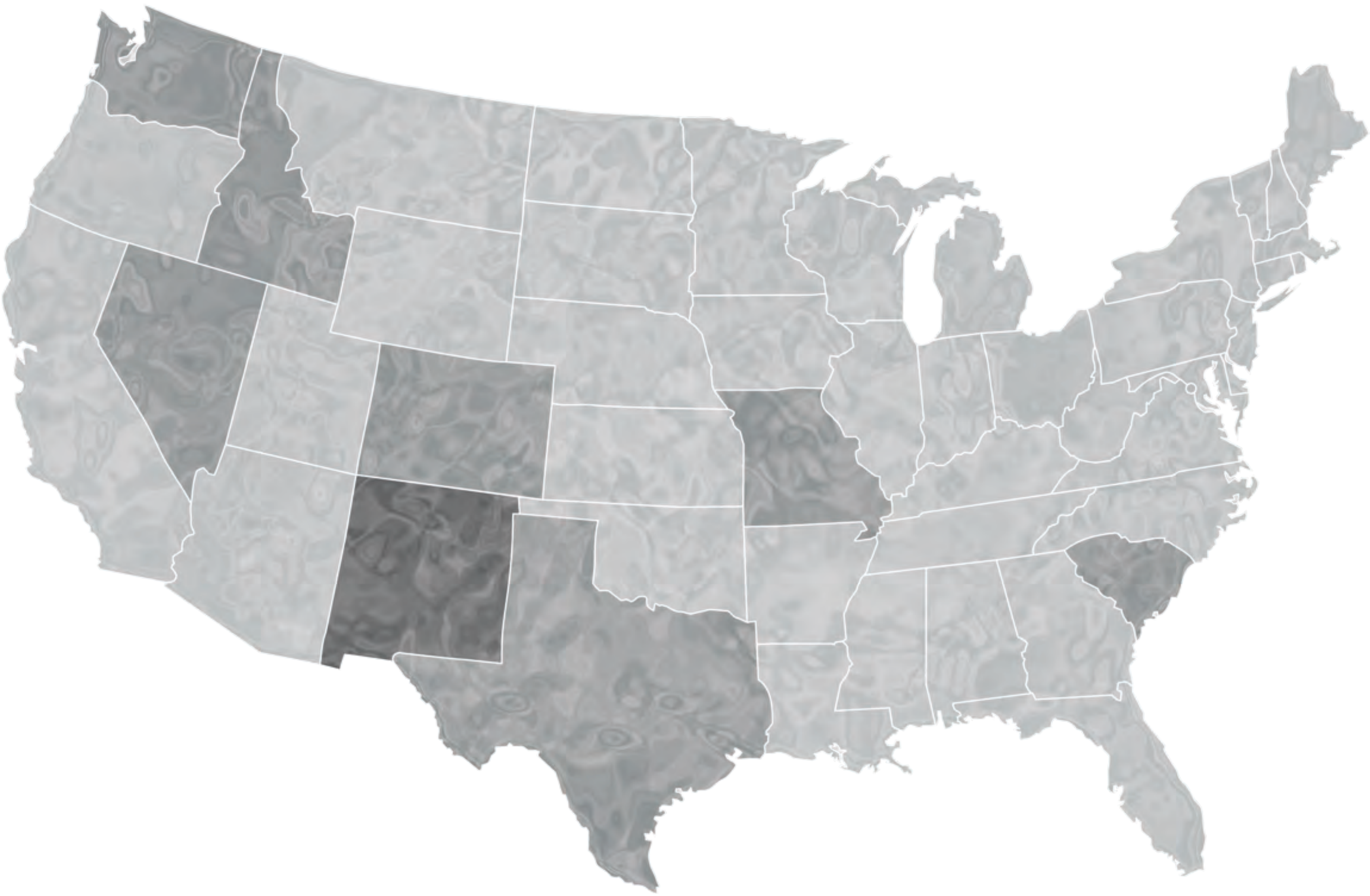
Final

Long-Term Management and Storage of Elemental Mercury

Supplemental Environmental Impact Statement



Chapters 1–9 • Appendices A–I
Comment Response Document

U.S. Department of Energy
Office of Environmental Management
Washington, DC

Availability of this
Final Long-Term Management and
Storage of Elemental Mercury
Supplemental Environmental Impact Statement

For additional information on this
Mercury Storage SEIS, contact:

David Levenstein, Document Manager
Office of Environmental Compliance (EM–11)
U.S. Department of Energy
Post Office Box 2612
Germantown, MD 20874
Website: http://www.mercurystorageeis.com

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FINAL
LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

Cover Sheet

Lead Agency: U.S. Department of Energy (DOE)

Cooperating Agencies: U.S. Environmental Protection Agency (EPA)
U.S. Bureau of Land Management (BLM)

Title: *Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)* (DOE/EIS-0423-S1)

Candidate Locations for Storage Facility(ies): Colorado, Idaho, Missouri, Nevada, New Mexico, South Carolina, Texas, Washington

Contacts: For copies of this supplemental environmental impact statement (SEIS), visit DOE's National Environmental Policy Act (NEPA) website at http://energy.gov/nepa or contact David Levenstein at the address below.

For additional information on this *Mercury Storage SEIS*, contact:

David Levenstein, Document Manager
Office of Environmental Compliance (EM–11)
U.S. Department of Energy
Post Office Box 2612
Germantown, MD 20874
Website: http://www.mercurystorageeis.com

For general information on the DOE NEPA process, contact:

Carol M. Borgstrom, Director
Office of NEPA Policy and Compliance (GC–54)
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585
Website: http://energy.gov/nepa
Telephone: 202-586-4600, or leave a message at 800-472-2756

Abstract: Pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414), DOE was directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. Therefore, DOE has analyzed the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury in a facility(ies) constructed and operated in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) (74 FR 31723). DOE issued the *Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* (DOE/EIS-0423) in January 2011. The January 2011 *Mercury Storage EIS* analyzed the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at seven candidate locations: Grand Junction Disposal Site near Grand Junction, Colorado; Hanford Site near Richland, Washington; Hawthorne Army Depot near Hawthorne, Nevada; Idaho National Laboratory near Idaho Falls, Idaho; Kansas City Plant in Kansas City, Missouri; Savannah River Site near Aiken, South Carolina; and Waste Control Specialists, LLC, site near Andrews, Texas. As required by Council on Environmental Quality (CEQ) NEPA regulations, the No Action Alternative was also analyzed as a basis for comparison. DOE has subsequently reconsidered the range of reasonable alternatives evaluated in the January 2011 *Mercury Storage EIS*. Accordingly, DOE has prepared this *Mercury Storage SEIS* to evaluate three additional locations for a long-term elemental mercury storage facility(ies), all three of which are in the vicinity of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. Both the January 2011 *Mercury Storage EIS* and this *Mercury Storage SEIS* were prepared in accordance with NEPA (42 U.S.C. 4321 et seq.), the CEQ implementing regulations (40 CFR 1500–1508), and DOE's NEPA implementing

procedures (10 CFR 1021). DOE intends to decide (1) where to locate the elemental mercury storage facility(ies), and (2) whether to use existing buildings, new buildings, or a combination of existing and new buildings. In the January 2011 *Mercury Storage EIS*, DOE identified the Waste Control Specialists, LLC, site near Andrews, Texas, as the Preferred Alternative for the long-term management and storage of elemental mercury. Based on analysis in this SEIS and public comment, DOE has not changed its Preferred Alternative, the Waste Control Specialists, LLC, site near Andrews, Texas. DOE will issue a Record of Decision no sooner than 30 days after publication of the EPA Notice of Availability for the *Final Mercury Storage SEIS* in the *Federal Register*. The selection of a site will be based on the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors and will be announced in a Record of Decision in the *Federal Register*.

On January 1, 2013, the prohibition on the export of elemental mercury went into effect pursuant to the Mercury Export Ban Act of 2008. As of August 31, 2013, seven waste management companies have notified DOE of their intent to store elemental mercury at RCRA-permitted facilities in accordance with Section 5(g)(2)(B) of the Act. All of these companies have certified that they will ship the elemental mercury to a DOE-designated facility(ies), when such a facility(ies) is operational and ready to accept the mercury. Until such time that DOE has designated a facility(ies) and is ready to accept elemental mercury for long-term management and storage, similar notifications may be received by DOE from other waste management companies.

Public Comments: In preparing this final SEIS, DOE considered comments received during the scoping period (June 5, 2012, through July 5, 2012) and public comment period on the draft SEIS (April 19, 2013, through June 3, 2013). Comments on the draft SEIS were accepted during the 45-day period following publication of EPA's Notice of Availability in the *Federal Register*. All comments were considered during preparation of this final SEIS, including late comments received by August 31, 2013. Part II: Comment Response Document, contains the comments received on the draft SEIS and DOE's responses to these comments.

This final SEIS contains revisions and new information based in part on comments received on the draft SEIS. Vertical change bars in the margins indicate the locations of these revisions and new information. Editorial corrections are not indicated by change bars. The *Summary and Guide for Stakeholders* is now under separate cover. Part II: Comment Response Document, is entirely a new part of this final SEIS and therefore does not contain change bars.

DOE will consider the environmental impact information presented in the January 2011 *Mercury Storage EIS* and this SEIS, as well as other factors (e.g., cost, schedule, strategic objectives, and public comments), when making long-term elemental mercury management and storage decisions. As required by CEQ NEPA regulations (40 CFR 1506.10), DOE will make a decision on the proposed action no sooner than 30 days after publication of EPA's Notice of Availability of this *Final Mercury Storage SEIS* in the *Federal Register*. DOE will announce its decision in a Record of Decision published in the *Federal Register*.

PART I
CHAPTERS 1 THROUGH 9
APPENDICES A THROUGH I

Table of Contents

List of Figures vii
List of Tables ix
List of Abbreviations and Acronyms xi
Measurement Units xiv
Conversions xv

Chapter 1 Introduction and Purpose and Need for Agency Action 1–1
1.1 Introduction 1–1
1.2 Purpose and Need for Agency Action 1–2
1.3 Proposed Action 1–3
1.3.1 Estimated Mercury Inventory 1–3
1.4 Decisions to Be Made 1–5
1.5 Scope of This SEIS 1–5
1.5.1 Candidate Site Identification 1–6
1.5.2 Construction 1–6
1.5.3 Operations 1–6
1.5.4 Transportation 1–6
1.5.5 Closure of Mercury Storage Facility(ies) 1–7
1.6 Public Involvement 1–7
1.6.1 Summary of Major Public Scoping Comments and DOE's Responses 1–8
1.6.2 Summary of Major Public Comments on the *Draft Mercury Storage SEIS* and DOE's Responses 1–9
1.7 Other Relevant National Environmental Policy Act Reviews 1–10
1.7.1 *Final Environmental Impact Statement for the Waste Isolation Pilot Plant* and Two Associated SEISs 1–10
1.7.2 *Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste* 1–11
1.7.3 *Final Site-Wide Environmental Impact Statement for the Y–12 National Security Complex* 1–11
1.8 Organization of This *Mercury Storage SEIS* 1–12
1.9 References 1–13

Chapter 2 Facility Description, Alternatives, and Comparison of Environmental Consequences 2–1
2.1 Introduction 2–1
2.2 Mercury Storage Facility(ies) 2–3
2.2.1 New Facility(ies) Description 2–4
2.2.2 Construction Requirements 2–6
2.2.3 Operations Requirements 2–7
2.3 Alternative Sites Evaluated 2–9
2.3.1 January 2011 *Mercury Storage EIS* Candidate Sites 2–10
2.3.2 WIPP Facility and Vicinity 2–12
2.3.2.1 WIPP Vicinity Section 10 2–15
2.3.2.2 WIPP Vicinity Section 20 2–15
2.3.2.3 WIPP Vicinity Section 35 2–15
2.4 Preferred Alternative 2–15
2.5 Alternatives Considered but Eliminated from Detailed Analysis 2–16
2.6 Comparison of Alternatives 2–16
2.6.1 Summary of Environmental Consequences 2–21
2.6.1.1 Land Use and Visual Resources 2–22

2.6.1.2 Geology, Soils, and Geologic Hazards 2–22
2.6.1.3 Water Resources 2–23
2.6.1.4 Meteorology, Air Quality, and Noise 2–23
2.6.1.5 Ecological Resources 2–24
2.6.1.6 Cultural and Paleontological Resources 2–25
2.6.1.7 Site Infrastructure 2–25
2.6.1.8 Waste Management 2–25
2.6.1.9 Occupational and Public Health and Safety 2–26
2.6.1.10 Ecological Impacts 2–28
2.6.1.11 Socioeconomics 2–29
2.6.1.12 Environmental Justice 2–30
2.6.2 Summary of Cumulative Impacts 2–30
2.7 References 2–32

Chapter 3 Affected Environment 3–1
3.1 Approach to Defining the Affected Environment 3–1
3.2 Waste Isolation Pilot Plant Site and Vicinity 3–2
3.2.1 Land Use and Visual Resources 3–2
3.2.1.1 Land Use 3–2
3.2.1.2 Visual Resources 3–5
3.2.2 Geology, Soils, and Geologic Hazards 3–6
3.2.2.1 Geology 3–6
3.2.2.2 Soils 3–11
3.2.2.3 Geologic Hazards 3–12
3.2.3 Water Resources 3–13
3.2.3.1 Surface Water 3–13
3.2.3.2 Groundwater 3–14
3.2.4 Meteorology, Air Quality, and Noise 3–17
3.2.4.1 Meteorology and Air Quality 3–17
3.2.4.2 Noise 3–20
3.2.5 Ecological Resources 3–21
3.2.5.1 Terrestrial Resources 3–21
3.2.5.2 Wetlands 3–21
3.2.5.3 Aquatic Resources 3–21
3.2.5.4 Threatened and Endangered Species 3–21
3.2.6 Cultural and Paleontological Resources 3–22
3.2.6.1 Prehistoric Resources 3–22
3.2.6.2 Historic Resources 3–23
3.2.6.3 American Indian Resources 3–23
3.2.6.4 Paleontological Resources 3–24
3.2.7 Site Infrastructure 3–24
3.2.7.1 Ground Transportation 3–24
3.2.7.2 Electricity 3–24
3.2.7.3 Fuel 3–24
3.2.7.4 Water 3–24
3.2.8 Waste Management 3–25
3.2.8.1 Waste Minimization 3–25
3.2.9 Occupational and Public Health and Safety 3–26
3.2.9.1 Normal Operations 3–26
3.2.9.2 Facility Accidents 3–27
3.2.9.3 Transportation 3–27

3.2.10 Socioeconomics ... 3–28
3.2.10.1 Regional Economic Characteristics ... 3–28
3.2.10.2 Demographic and Housing Characteristics ... 3–28
3.2.10.3 Local Transportation ... 3–28
3.2.11 Environmental Justice ... 3–28
3.2.11.1 WIPP Vicinity Section 10 ... 3–30
3.2.11.2 WIPP Vicinity Section 20 ... 3–31
3.2.11.3 WIPP Vicinity Section 35 ... 3–32
3.3 References ... 3–33
3.3.1 References in Addition to Those from the *Draft GTCC EIS* ... 3–33
3.3.2 References Incorporated from the *Draft GTCC EIS* ... 3–35

Chapter 4 Environmental Consequences ... 4–1
4.1 Introduction ... 4–1
4.2 Waste Isolation Pilot Plant Site ... 4–2
4.2.1 Land Use and Visual Resources ... 4–3
4.2.1.1 WIPP Vicinity Section 10 ... 4–3
4.2.1.2 WIPP Vicinity Section 20 ... 4–3
4.2.1.3 WIPP Vicinity Section 35 ... 4–3
4.2.2 Geology, Soils, and Geologic Hazards ... 4–4
4.2.2.1 WIPP Vicinity Section 10 ... 4–4
4.2.2.2 WIPP Vicinity Section 20 ... 4–5
4.2.2.3 WIPP Vicinity Section 35 ... 4–5
4.2.3 Water Resources ... 4–5
4.2.3.1 WIPP Vicinity Section 10 ... 4–5
4.2.3.2 WIPP Vicinity Section 20 ... 4–6
4.2.3.3 WIPP Vicinity Section 35 ... 4–7
4.2.4 Meteorology, Air Quality, and Noise ... 4–7
4.2.4.1 WIPP Vicinity Section 10 ... 4–7
4.2.4.2 WIPP Vicinity Section 20 ... 4–9
4.2.4.3 WIPP Vicinity Section 35 ... 4–9
4.2.5 Ecological Resources ... 4–10
4.2.5.1 WIPP Vicinity Section 10 ... 4–10
4.2.5.2 WIPP Vicinity Section 20 ... 4–10
4.2.5.3 WIPP Vicinity Section 35 ... 4–10
4.2.6 Cultural and Paleontological Resources ... 4–11
4.2.6.1 WIPP Vicinity Section 10 ... 4–11
4.2.6.2 WIPP Vicinity Section 20 ... 4–11
4.2.6.3 WIPP Vicinity Section 35 ... 4–12
4.2.7 Site Infrastructure ... 4–12
4.2.7.1 WIPP Vicinity Section 10 ... 4–12
4.2.7.2 WIPP Vicinity Section 20 ... 4–13
4.2.7.3 WIPP Vicinity Section 35 ... 4–13
4.2.8 Waste Management ... 4–14
4.2.8.1 WIPP Vicinity Section 10 ... 4–14
4.2.8.2 WIPP Vicinity Section 20 ... 4–14
4.2.8.3 WIPP Vicinity Section 35 ... 4–15
4.2.9 Occupational and Public Health and Safety ... 4–15
4.2.9.1 WIPP Vicinity Section 10 ... 4–15
4.2.9.2 WIPP Vicinity Section 20 ... 4–31
4.2.9.3 WIPP Vicinity Section 35 ... 4–31

4.2.10 Ecological Risk 4–31
4.2.10.1 WIPP Vicinity Section 10 4–31
4.2.10.2 WIPP Vicinity Section 20 4–39
4.2.10.3 WIPP Vicinity Section 35 4–39
4.2.11 Socioeconomics 4–39
4.2.11.1 WIPP Vicinity Section 10 4–39
4.2.11.2 WIPP Vicinity Section 20 4–40
4.2.11.3 WIPP Vicinity Section 35 4–40
4.2.12 Environmental Justice 4–40
4.2.12.1 WIPP Vicinity Section 10 4–40
4.2.12.2 WIPP Vicinity Section 20 4–40
4.2.12.3 WIPP Vicinity Section 35 4–41
4.3 Closure 4–41
4.4 Cumulative Impacts 4–42
4.4.1 Methodology and Analytical Baseline 4–42
4.4.2 Potential Cumulative Actions 4–43
4.4.2.1 Waste Isolation Pilot Plant Vicinity Reference Locations 4–43
4.5 Mitigation Measures 4–46
4.6 Resources 4–48
4.6.1 Unavoidable Adverse Environmental Impacts 4–48
4.6.2 Irreversible and Irretrievable Commitment of Resources 4–49
4.6.2.1 Land Use 4–49
4.6.2.2 Energy and Water 4–49
4.6.2.3 Materials and Geologic Resources 4–50
4.6.2.4 Waste 4–50
4.6.3 Relationship Between Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity 4–50
4.7 References 4–51

Chapter 5 Environmental Laws, Regulations, Permits, and Other Potentially Applicable Requirements 5–1
5.1 Introduction 5–1
5.2 Laws, Regulations, and Other Potentially Applicable Requirements 5–1
5.3 Permits and Notifications 5–3
5.4 Consultations 5–5
5.4.1 Consultations Regarding Ecological Resources 5–6
5.4.2 Consultations Regarding Cultural Resources 5–6
5.4.3 Consultations Regarding American Indian Resources 5–6
5.5 References 5–6

Chapter 6 Glossary 6–1

Chapter 7 List of Preparers 7–1

Chapter 8 Distribution List 8–1

Chapter 9 Index 9–1

Appendix A The Mercury Export Ban Act of 2008 and *Federal Register* Notices.......................... A–1
A.1 Public Law 110-414: Mercury Export Ban Act—October 14, 2008 .... A–2
A.2 Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury A–10
A.3 Notice of Availability for the Draft SEIS for the Long-Term Management and Storage of Elemental Mercury A–12

Appendix B Impact Assessment Methodology...B–1
B.1 Introduction..B–1
B.2 Updates to Occupational and Public Health and Safety Methodology B–3
B.3 Updates to Socioeconomics and Environmental Justice Methodology..............................B–4
B.4 References..B–6

Appendix C Storage Facility Construction and Operations Data.. C–1
C.1 Transportation Requirements..C–1
C.2 Mercury Storage Facility..C–5
C.2.1 Introduction..C–5
C.2.2 Physical Description C–7
C.2.3 Construction Data C–9
C.2.4 Operations Data C–11
C.3 References..C–12

Appendix D Human Health and Ecological Risk Assessment Analysis... D–1
D.1 Introduction.. D–1
D.2 Overview of Input Data and Assumptions D–1
D.2.1 Quantity of Mercury to Be Shipped.. D–1
D.2.2 Assumptions About Transportation Analysis D–3
D.2.3 Assumptions About the Mercury Storage Facility.. D–6
D.2.4 Assumptions About Mercury Containers.. D–8
D.3 Overview of Mercury Toxicity and Risk D–11
D.3.1 Toxic Effects of Mercury.. D–12
D.3.2 Factors Strongly Influencing the Risks Associated with the Proposed Action.. D–20
D.4 References... D–21

Appendix E Updates to the January 2011 *Mercury Storage EIS*...E–1
E.1 Introduction...E–1
E.2 Updates to Occupational and Public Health and Safety Analysis.....................................E–1
E.3 Updates to Socioeconomics and Environmental Justice Analysis E–7
E.3.1 Summary Comparison of Candidate Site Updates...E–8
E.3.2 Y–12 National Security Complex E–11
E.3.2.1 Affected Environment E–11
E.3.2.2 Environmental Consequences...E–13
E.3.3 Grand Junction Disposal Site..E–15
E.3.3.1 Affected Environment E–15
E.3.3.2 Environmental Consequences...E–18
E.3.4 Hanford Site..E–19
E.3.4.1 Affected Environment E–19
E.3.4.2 Environmental Consequences...E–21
E.3.5 Hawthorne Army Depot..E–25
E.3.5.1 Affected Environment E–25
E.3.5.2 Environmental Consequences...E–28

E.3.6 Idaho National Laboratory E–30
E.3.6.1 Affected Environment E–30
E.3.6.2 Environmental Consequences E–33
E.3.7 Kansas City Plant E–35
E.3.7.1 Affected Environment E–35
E.3.7.2 Environmental Consequences E–38
E.3.8 Savannah River Site E–40
E.3.8.1 Affected Environment E–40
E.3.8.2 Environmental Consequences E–43
E.3.9 Waste Control Specialists, LLC, Site E–45
E.3.9.1 Affected Environment E–45
E.3.9.2 Environmental Consequences E–47
E.4 Environmental Documentation Review E–50
E.5 References E–52

Appendix F Common and Scientific Names of Plant and Animal Species F–1

Appendix G Cooperating Agency Agreements G–1
G.1 Correspondence with the U.S. Department of the Interior G–2
G.1.1 U.S. Department of Energy's Correspondence to the U.S. Department of the Interior G–2
G.1.2 Response from the U.S. Department of the Interior G–4
G.2 Correspondence with the U.S. Environmental Protection Agency G–5
G.2.1 U.S. Department of Energy's Correspondence to the U.S. Environmental Protection Agency G–5
G.2.2 Response from the U.S. Environmental Protection Agency G–7
G.3 Correspondence with the New Mexico Environment Department G–8
G.3.1 U.S. Department of Energy's Correspondence to the New Mexico Environment Department G–8

Appendix H Contractor National Environmental Policy Act Disclosure Statement H–1

Appendix I Responses to Consultation Requests I–1
I.1 Correspondence with the New Mexico Ecological Services Office I–2
I.1.1 U.S. Department of Energy's Correspondence to the New Mexico Ecological Services Office I–2
I.1.2 Response from the New Mexico Ecological Services Office I–9
I.2 Correspondence with the New Mexico Department of Game and Fish I–13
I.2.1 U.S. Department of Energy's Correspondence to the New Mexico Department of Game and Fish I–13
I.2.2 Response from the New Mexico Department of Game and Fish I–16
I.3 Correspondence with the New Mexico Energy, Minerals and Natural Resources Department I–22
I.3.1 U.S. Department of Energy's Correspondence to the New Mexico Energy, Minerals and Natural Resources Department I–22
I.3.2 Response from the New Mexico Energy, Minerals and Natural Resources Department I–25
I.4 Correspondence with the New Mexico Historic Preservation Division I–27
I.4.1 U.S. Department of Energy's Correspondence to the New Mexico Historic Preservation Division I–27
I.4.2 Response from the New Mexico Historic Preservation Division I–30

List of Figures

Figure 1–1. The Mercury Cycle 1–2

Figure 2–1. Potential Sources of Mercury in the United States 2–2
Figure 2–2. Typical Elemental Mercury Storage Containers 2–4
Figure 2–3. Conceptual Exterior Representation of a New Mercury Storage Facility 2–5
Figure 2–4. Conceptual Layout of a New Mercury Storage Facility 2–5
Figure 2–5. Alternative Sites for Long-Term Storage of Mercury 2–9
Figure 2–6. WIPP Facility in State of New Mexico 2–13
Figure 2–7. WIPP Vicinity Reference Locations 2–14

Figure 3–1. Location of the Waste Isolation Pilot Plant Site in Eddy County, New Mexico 3–3
Figure 3–2. Four Property Areas Within the Waste Isolation Pilot Plant Boundary 3–4
Figure 3–3. Location of the Waste Isolation Pilot Plant Site Within the Great Plains Province in Southeastern New Mexico 3–7
Figure 3–4. Stratigraphic Column for the Waste Isolation Pilot Plant Site and Surrounding Area 3–8
Figure 3–5. Stratigraphy of Aquifer Units at the Waste Isolation Pilot Plant Site 3–15
Figure 3–6. Populations Residing in the Two-County Area Surrounding the Waste Isolation Pilot Plant in 2000 and 2010 3–29
Figure 3–7. Populations Residing Within 16 Kilometers (10 miles) of the Storage Location at Waste Isolation Pilot Plant Vicinity Section 10 3–30
Figure 3–8. Populations Residing Within 16 Kilometers (10 miles) of the Storage Location at Waste Isolation Pilot Plant Vicinity Section 20 3–31
Figure 3–9. Populations Residing Within 16 Kilometers (10 miles) of the Storage Location at Waste Isolation Pilot Plant Vicinity Section 35 3–32

Figure 4–1. Candidate Mercury Storage and Greater-Than-Class C Waste Disposal Facility Locations 4–44

Figure C–1. Dimensions of a Typical 3-Liter Flask C–1
Figure C–2. Dimensions of a Typical 1-Metric-Ton Container C–2
Figure C–3. Example Box Pallet for Shipping 3-Liter Flasks in a 7-Flask by 7-Flask Configuration C–3
Figure C–4. Conceptual Layout for a New Mercury Storage Facility C–7
Figure C–5. Conceptual Schematic for Receiving and Shipping Area and Handling Area of a New Mercury Storage Facility C–8

Figure D–1. 7- by 7-Array of 3-Liter Flasks D–9
Figure D–2. 3-Liter Flasks in Box Pallets on a Seismically Rated Rack D–10
Figure D–3. 1-Metric-Ton Container D–10
Figure D–4. 1-Metric-Ton Containers in a Spill Tray D–11
Figure D–5. Risk (Frequency and Consequence) Ranking Matrix D–13

Figure E–1. Populations Residing Within the Five-County Area Surrounding Y–12 National Security Complex E–12
Figure E–2. Block Groups Containing Minority and Low-Income Populations Surrounding Y–12 National Security Complex E–14
Figure E–3. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Y–12 National Security Complex E–15
Figure E–4. Populations Residing Within the Two-County Area Surrounding the Grand Junction Disposal Site E–17

Figure E–5. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Grand Junction Disposal Site E–18
Figure E–6. Populations Residing Within the Two-County Area Surrounding the 200-West Area at the Hanford Site E–20
Figure E–7. Block Groups Containing Minority and Low-Income Populations Surrounding the 200-West Area at the Hanford Site E–22
Figure E–8. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the 200-West Area at the Hanford Site E–23
Figure E–9. Populations Residing Within Mineral County, Nevada, Surrounding the Hawthorne Army Depot E–26
Figure E–10. Block Group Containing Minority and Low-Income Populations Surrounding the Hawthorne Army Depot E–27
Figure E–11. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Hawthorne Army Depot E–28
Figure E–12. Populations Residing Within the Two-County Area Surrounding Idaho National Laboratory E–31
Figure E–13. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Radioactive Waste Management Complex E–32
Figure E–14. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Idaho Nuclear Technology and Engineering Center E–33
Figure E–15. Populations Residing Within the Four-County Area Surrounding the Kansas City Plant E–36
Figure E–16. Block Groups Containing Minority and Low-Income Populations Surrounding the Kansas City Plant E–37
Figure E–17. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Kansas City Plant E–38
Figure E–18. Populations Residing Within the Four-County Area Surrounding the Savannah River Site E–41
Figure E–19. Block Groups Containing Minority and Low-Income Populations Surrounding the Savannah River Site E–42
Figure E–20. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Savannah River Site E–43
Figure E–21. Populations Residing Within the Three-County Area Surrounding the Waste Control Specialists Site E–46
Figure E–22. Block Groups Containing Minority and Low-Income Populations Surrounding the Waste Control Specialists Site E–48
Figure E–23. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Waste Control Specialists Site E–49

List of Tables

Table 1–1. Anticipated Mercury Inventory ... 1–4

Table 2–1. Comparison of Action Alternatives – Physical Setting and Location Factors ... 2–17
Table 2–2. Comparison of Action Alternatives – Environmental Consequences ... 2–18
Table 2–3. Summary of Consequences and Risks from All Onsite Mercury Spill Scenarios ... 2–27
Table 2–4. Transportation Kilometers and Frequency Analysis for Transport Accidents ... 2–27
Table 2–5. Summary of Transportation Consequences and Risks to Human Receptors ... 2–28
Table 2–6. Summary of Consequences and Risk to Ecological Receptors – Transportation Accident with Pallet Fire ... 2–29
Table 2–7. Summary of Cumulative Impacts Assessment ... 2–31

Table 3–1. General Regions of Influence for the Affected Environment ... 3–2
Table 3–2. Annual Emissions of Criteria Pollutants and Volatile Organic Compounds from Selected Major Facilities and Total Point and Area Source Emissions in Eddy County Encompassing the Waste Isolation Pilot Plant Site ... 3–18
Table 3–3. National Ambient Air Quality Standards or New Mexico State Ambient Air Quality Standards and Highest Background Levels Representative of the Waste Isolation Pilot Plant Area, 2003–2007 ... 3–19
Table 3–4. Federally and State-Listed Species Potentially Occurring at the Waste Isolation Pilot Plant Site ... 3–22

Table 4–1. Air Pollutant Emissions from Transportation of Elemental Mercury by Truck to All WIPP Vicinity Reference Locations ... 4–8
Table 4–2. Air Pollutant Emissions from Transportation of Elemental Mercury by Rail to All WIPP Vicinity Reference Locations ... 4–8
Table 4–3. Summary of Candidate Onsite Accident Scenarios and Their Likelihood of Occurrence ... 4–19
Table 4–4. Summary of Types of Accidents Considered in Onsite Spill Analysis ... 4–20
Table 4–5. Summary of Risks of All Onsite Elemental Mercury Spill Scenarios – All WIPP Vicinity Reference Locations ... 4–22
Table 4–6. Frequency Analysis of Truck and Railcar Accidents – All WIPP Vicinity Reference Locations ... 4–23
Table 4–7. Summary of Transportation Risks to Human Receptors, Spills of Elemental Mercury onto the Ground or into Water – All WIPP Vicinity Reference Locations ... 4–25
Table 4–8. Predicted Range of Distances Downwind Within Which Acute Airborne Severity Levels Are Exceeded – Crashes with Fires ... 4–26
Table 4–9. Summary of Acute-Inhalation Risks to Human Receptors, Accidents with Fires, Transportation Routes to All WIPP Vicinity Reference Locations ... 4–27
Table 4–10. Predicted Range of Distances Downwind to Which Lakes Could Potentially Be Contaminated Above Levels Safe for Consumption of Fish – Accidental Truck and Railcar Crashes with Fires ... 4–27
Table 4–11. Summary of Transportation Risks to Human Receptors – All WIPP Vicinity Reference Locations ... 4–28
Table 4–12. Predicted Range of Distances Downwind to Which Acute Airborne Severity Levels Are Exceeded – IDA Fires ... 4–30
Table 4–13. Predicted Range of Distances Downwind to Which Lakes Could Potentially Be Contaminated Above Levels Safe for Consumption of Fish – Intentional Destructive Acts ... 4–31
Table 4–14. Screening Values and Equivalent Deposited Screening Values ... 4–32

Table 4–15. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Truck Spill with Wooden Pallet Fire and No Rain 4–34
Table 4–16. Frequencies, Consequences, and Risks to Ecological Receptors from Truck Crashes with Wooden Pallet Fires and No Rain, All Sites 4–35
Table 4–17. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Truck Spill with Wooden Pallet Fire and Rain 4–36
Table 4–18. Frequencies, Consequences, and Risks to Ecological Receptors from Truck Crashes with Wooden Pallet Fires and Rain, All Sites 4–36
Table 4–19. Frequencies, Consequences, and Risks to Ecological Receptors from Railcar Crashes with Wooden Pallet Fires and No Rain, All Sites 4–37
Table 4–20. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Intentionally Initiated Railcar Spill with Fire, No Rain 4–38
Table 4–21. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Intentionally Initiated Railcar Spill with Fire and Rain 4–39
Table 4–22. Actions That May Contribute to Cumulative Impacts 4–43

Table 5–1. Environmental Permit Summary 5–4
Table 5–2. Summary of Consultations 5–6

Table B–1. General Regions of Influence B–3
Table B–2. Site-Specific Thresholds for Identification of Minority and Low-Income Communities Within the 16-Kilometer (10-Mile) Region of Influence B–5
Table B–3. Site-Specific Thresholds for Identification of Minority and Low-Income Communities Within the 3.2-Kilometer (2-Mile) Region of Influence B–5
Table B–4. Environmental Justice Impact Assessment Protocol B–6

Table C–1. Data for a Mercury Storage Facility – New Construction C–9
Table C–2. Resource Commitments for Construction of a New Mercury Storage Facility C–10
Table C–3. Air Emissions During Construction of a New Mercury Storage Facility C–10
Table C–4. Resource Commitments for Operation of a New Mercury Storage Facility C–11

Table D–1. Dispatching Sites, Years, and Quantities of Elemental Mercury D–2
Table D–2. Estimate of Amounts of Mercury to be Transported D–5
Table D–3. Basic Probabilities Used in the Transportation Risk Analysis D–6
Table D–4. Physical Data for a Mercury Storage Facility – New Construction D–8
Table D–5. Definition of Consequence Severity Bands for Acute Inhalation of Elemental Mercury and Inorganic Mercury – Public Receptors D–14
Table D–6. Proposed EPA Values for Mercury Vapor AEGLs D–15
Table D–7. Summary of Definitions of Consequence Severity Levels D–19

Table E–1. Definition of Consequence Severity Bands for Acute Inhalation of Elemental Mercury, Public Receptors E–2
Table E–2. Distances to the Closest Site Boundary or Public Receptor Compared with Calculated Distances – Outdoor Earthquake Scenario E–3
Table E–3. Predicted Range of Distances Downwind to Which Acute Airborne Severity Levels Are Exceeded – Crashes with Fires E–5
Table E–4. Predicted Range of Distances Downwind to Which Acute Airborne Severity Levels Are Exceeded – IDA Fires E–6
Table E–5. Section Updates for Socioeconomics and Environmental Justice Analyses E–8
Table E–6. Summary Comparison of Changes to Environmental Justice Data E–9

Table F–1. List of Common and Scientific Names of Plant and Animal Species F–1

List of Abbreviations and Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
1-MT	1-metric-ton
3-L	3-liter
ACGIH	American Conference of Governmental Industrial Hygienists
ACS	*American Community Survey*
AEGL	Acute Exposure Guideline Level
bgs	below ground surface
BLM	U.S. Bureau of Land Management
BNSF	Burlington Northern Santa Fe
C&D	construction and demolition
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CH	contact-handled
CO	carbon monoxide
CWC	Central Waste Complex
dBA	decibels A-weighted
DLA	Defense Logistics Agency
DNSC	Defense National Stockpile Center
DOE	U.S. Department of Energy
Draft GTCC EIS	*Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste*
Draft Mercury Storage SEIS	*Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERPG	Emergency Response Planning Guideline
Final Mercury Storage SEIS	*Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*
FL	frequency level
FLPMA	Federal Land Policy and Management Act
GJDS	Grand Junction Disposal Site
GTCC	greater-than-Class C

GTCC EIS	*Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste*
Hanford	Hanford Site
IDA	intentional destructive act
IDLH	immediately dangerous to life or health
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
Interim Guidance	*U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury*
KCP	Kansas City Plant
LCF	latent cancer fatality
L_{dn}	day–night average sound level
LLW	low-level radioactive waste
LMP	Land Management Plan
LWA	Land Withdrawal Act
LWB	land withdrawal boundary
MB	marker bed
Mercury Storage EIS	*Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement*
Mercury Storage SEIS	*Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*
MM EIS	*Final Mercury Management Environmental Impact Statement*
MSL	mean sea level
NEPA	National Environmental Policy Act
NMAC	*New Mexico Administrative Code*
NMSA	*New Mexico Statutes Annotated*
NNSA	National Nuclear Security Administration
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOI	Notice of Intent
NRC	U.S. Nuclear Regulatory Commission
O_3	ozone
PAC	Protective Action Criterion
PCB	polychlorinated biphenyl
PGA	peak ground acceleration

PM_n	particulate matter with an aerodynamic diameter less than or equal to *n* micrometers
PPE	personal protective equipment
ppm	part(s) per million
PSD	Prevention of Significant Deterioration
R&R	reclamation and recycling
RCRA	Resource Conservation and Recovery Act
RfC	reference concentration
RH	remote-handled
ROD	Record of Decision
ROI	region of influence
RWMC	Radioactive Waste Management Complex
SEIS	supplemental environmental impact statement
SHPO	State Historic Preservation Officer
SL	severity level
SO_2	sulfur dioxide
SRS	Savannah River Site
SWDA	Solid Waste Disposal Act
TEEL	Temporary Emergency Exposure Limit
the Act	Mercury Export Ban Act of 2008
TLV	threshold limit value
TRAGIS	Transportation Routing Analysis Geographic Information System
TRU	transuranic
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TWA	time-weighted average
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRM	Visual Resource Management
WCS	Waste Control Specialists, LLC, site
WIPP	Waste Isolation Pilot Plant
WIPP SEIS II	*Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement*
Y−12	Y−12 National Security Complex

Measurement Units

The principal measurement units used in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)* are SI units (the abbreviation for the Système International d'Unites). The SI system is an expanded version of the metric system that was accepted in 1966 in Elsinore, Denmark, as the legal standard by the International Organization for Standardization. In this system, most units are made up of combinations of seven basic units, of which length in meters, mass in kilograms, and volume in liters are of most importance in this *Mercury Storage SEIS*. Exceptions are radiological units that use the English system (e.g., rem, millirem).

SCIENTIFIC (EXPONENTIAL) NOTATION

Numbers that are very small or very large are often expressed in scientific, or exponential, notation as a matter of convenience. For example, the number 0.000034 may be expressed as 3.4×10^{-5} or 3.4E-05, and 65,000 may be expressed as 6.5×10^{4} or 6.5E+04. In this *Mercury Storage SEIS*, numerical values that are less than 0.001 or greater than 9,999 are generally expressed in scientific notation, i.e., 1.0×10^{-3} and 9.9×10^{3}, respectively.

Multiples or submultiples of the basic units are also used. A partial list of prefixes that denote multiples and submultiples follows, with the equivalent multiplier values expressed in scientific notation.

Prefix	Symbol	Multiplier	
atto	a	0.000 000 000 000 000 001	1×10^{-18}
femto	f	0.000 000 000 000 001	1×10^{-15}
pico	p	0.000 000 000 001	1×10^{-12}
nano	n	0.000 000 001	1×10^{-9}
micro	μ	0.000 001	1×10^{-6}
milli	m	0.001	1×10^{-3}
centi	c	0.01	1×10^{-2}
deci	d	0.1	1×10^{-1}
deka	da	10	1×10^{1}
hecto	h	100	1×10^{2}
kilo	k	1,000	1×10^{3}
mega	M	1,000,000	1×10^{6}
giga	G	1,000,000,000	1×10^{9}
tera	T	1,000,000,000,000	1×10^{12}
peta	P	1,000,000,000,000,000	1×10^{15}
exa	E	1,000,000,000,000,000,000	1×10^{18}

The following symbols are occasionally used in conjunction with numerical expressions:

$<$ less than
$\leq$ less than or equal to
$>$ greater than
$\geq$ greater than or equal to

Conversions

English to Metric			Metric to English		
Multiply	**by**	**To get**	**Multiply**	**by**	**To get**
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092903	square meters	square meters	10.7639	square feet
square yards	0.8361	square meters	square meters	1.196	square yards
acres	0.40469	hectares	hectares	2.471	acres
square miles	2.58999	square kilometers	square kilometers	0.3861	square miles
Length			**Length**		
inches	2.54	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	kilometers	kilometers	0.6214	miles
Temperature			**Temperature**		
degrees Fahrenheit	Subtract 32, then multiply by 0.55556	degrees Celsius	degrees Celsius	Multiply by 1.8, then add 32	degrees Fahrenheit
Volume			**Volume**		
fluid ounces	29.574	milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight			**Weight**		
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.45360	kilograms	kilograms	2.2046	pounds
short tons	0.90718	metric tons	metric tons	1.1023	short tons

CHAPTER 1
INTRODUCTION AND
PURPOSE AND NEED FOR AGENCY ACTION

CHAPTER 1
INTRODUCTION AND PURPOSE AND NEED FOR AGENCY ACTION

The U.S. Department of Energy (DOE) is required to develop a capability for the safe and secure long-term management and storage of elemental mercury pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414). Accordingly, DOE will identify or construct an appropriate facility(ies) to host this capability. DOE's proposed action is to select a suitable location for the long-term management and storage of elemental mercury generated within the United States. DOE has prepared this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)* (DOE/EIS-0423-S1) in accordance with implementing regulations under the National Environmental Policy Act (40 CFR 1500–1508; 10 CFR 1021). To date, DOE has not issued a Record of Decision pursuant to the *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* issued in January 2011. Prior to making a final decision, DOE is considering three additional locations that are reasonable to site a storage facility(ies) for elemental mercury. Relevant information and data from the January 2011 *Mercury Storage EIS* that remain unchanged have been reproduced and presented in this supplemental environmental impact statement for the convenience of the reader. The U.S. Environmental Protection Agency and the U.S. Bureau of Land Management are cooperating agencies in the preparation of this *Mercury Storage SEIS*.

1.1 INTRODUCTION

Mercury is a naturally occurring element. Mercury enters the environment through natural processes such as volcanoes and wildfires. Human activities that release mercury to the environment include fuel burning, incineration, metal smelting, use of mercury in industrial processes, mining, waste disposal, and production of commercial products containing mercury. Sometimes called "quicksilver," liquid mercury has been used in manufacturing processes because it conducts electricity, reacts to temperature changes, and alloys with many other metals. Examples of products that historically contained or currently contain mercury include batteries, paint, thermometers, thermostats, blood pressure monitors, switches for automobile lighting, fluorescent lights, and dental fillings.

The mercury emitted from human activities is primarily in its elemental or inorganic forms. This inorganic form of mercury, when bound to airborne particles (Hg_p) or in its gaseous divalent form (Hg^{+2}), is readily removed from the atmosphere by dry deposition (settling) onto land surfaces and wet deposition (precipitation), including deposition in water bodies. Most of the mercury in water, soil, sediment, plants, and animals is in the form of inorganic mercury salts (e.g., mercuric chloride) and organic

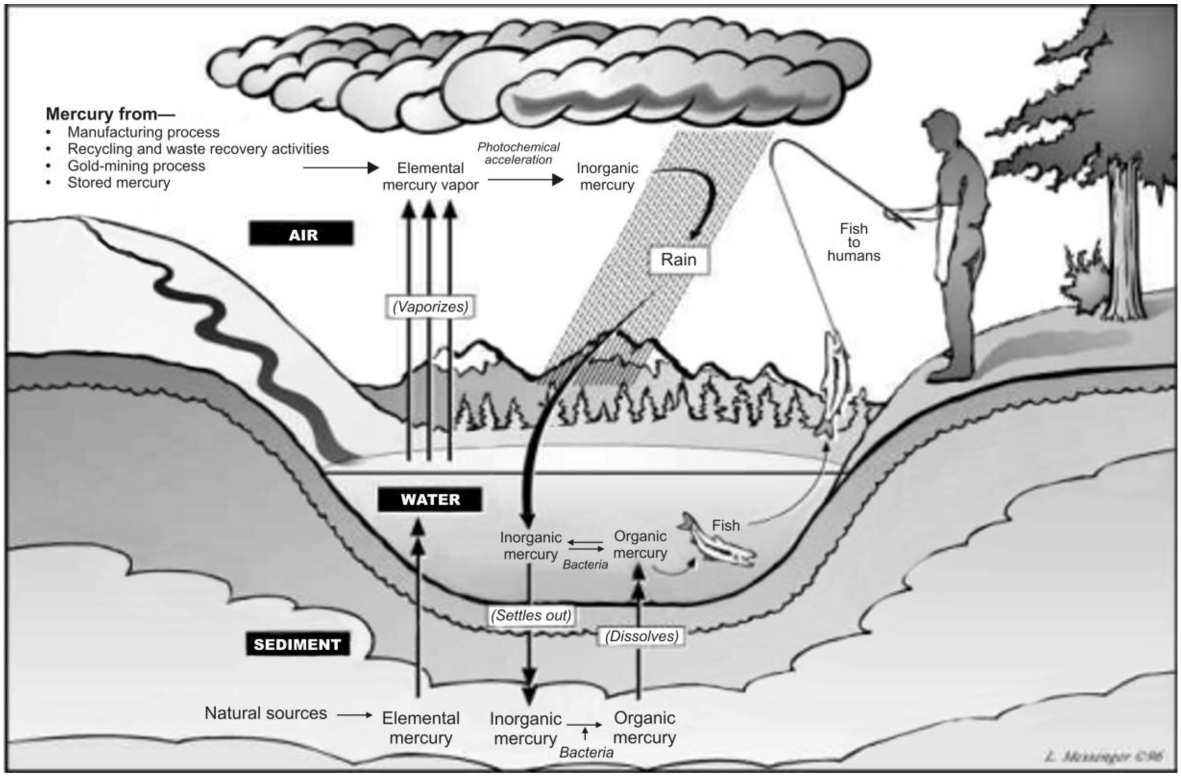
What is Elemental Mercury?
Why is it of Concern?

Elemental mercury is a dense, naturally occurring metal that is liquid at room temperature. Mercury is a globally deposited pollutant, affecting water bodies near industrial sources (e.g., the Great Lakes) and remote areas (e.g., the Arctic Circle). Mercury is found in the environment as elemental mercury (e.g., elemental mercury vapor [Hg^0]), inorganic mercury compounds (e.g., mercuric chloride [$HgCl_2$] and mercuric sulfide [HgS]); and organic mercury compounds (e.g., methylmercury [CH_3Hg]).

Mercury and its compounds are persistent, bioaccumulative, and toxic. The toxic effects of mercury depend on its chemical form and the route of exposure. Methylmercury, a mercury compound that is generally not used commercially or stored, is the most toxic form. It can affect the immune system; alter genetic systems; and damage the nervous system, including coordination and the senses of touch, taste, and sight. Methylmercury can be particularly damaging to developing embryos. Exposure to methylmercury is usually by ingestion; it is absorbed more readily than other forms of mercury. Less toxic than methylmercury, elemental mercury (Hg^0) vapors can cause tremors, gingivitis, and excitability when inhaled over a long period of time. If elemental mercury is ingested, it is absorbed relatively slowly and can pass through the digestive system without causing damage (USGS 2000).

It is estimated that since the 19th century, the total amount of mercury available in the environment has increased by a factor of two to five above pre-industrial levels. As the quantity of available mercury in the environment has increased, so have the risks of neurological and reproductive problems for humans and wildlife. These increases in risk make mercury a pollutant of environmental concern in the United States and throughout the world (EPA 2000:1).

mercury (e.g., methylmercury). As it cycles through the environment, mercury undergoes a series of chemical and physical transformations (EPA 1997:2-2, 2000:1). Figure 1–1 provides a simplified diagram of how mercury moves through the environment.



Note: Figure modified to include potential sources of mercury other than emissions from manufacturing processes.
Source: Utah 2009.

Figure 1–1. The Mercury Cycle

1.2 PURPOSE AND NEED FOR AGENCY ACTION

The Mercury Export Ban Act of 2008 (P.L. 110-414), hereafter referred to as "the Act," prohibits, as of October 14, 2008, any Federal agency from conveying, selling, or distributing to any other Federal agency, any state or local government agency, or any private individual or entity any elemental mercury[1] under the control or jurisdiction of the Federal agency (with certain limited exceptions, as described in the Act). A copy of the Act is included in Appendix A. The Act also prohibits the export of mercury from the United States effective January 1, 2013 (subject to certain essential-use exemptions). The United States is a net exporter of mercury, exporting over 600 metric tons (660 tons) of mercury between 2004 and 2007 (USGS 2009). Therefore, banning the export of mercury from the United States is expected to result in surplus inventories of mercury.

Section 5 of the Act, "Long-Term Storage," directs the U.S. Department of Energy (DOE) to designate a DOE facility(ies) for the long-term management and storage of mercury generated within the United States.[2] DOE needs to provide such a facility(ies) capable of managing a mercury inventory estimated to

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

[2] DOE has interpreted Section 5 of the Act to authorize DOE to designate an existing and/or new storage facility(ies) at property owned or leased by DOE. Accordingly, if DOE decides to designate a facility that currently is owned by a commercial entity or by another Federal agency, DOE would acquire an appropriate ownership or leasehold interest in that facility to comply with Section 5 of the Act. DOE would ensure that any such facility currently owned by a commercial entity or by another Federal agency would afford DOE the same level of responsibility and control over stored mercury as a facility owned by DOE.

range up to 10,000 metric tons (11,000 tons) based on a 40-year period of analysis, as described in the next section. The Act specifies that the new DOE mercury storage facility(ies) shall not include the Y–12 National Security Complex (Y–12) or any other portion or facility of the Oak Ridge Reservation in Oak Ridge, Tennessee.

Section 5 of the Act authorizes DOE to assess and collect a fee at the time of delivery of mercury to the DOE storage facility(ies) to cover certain costs of long-term management and storage. These costs include operations and maintenance, security, monitoring, reporting, personnel, administration, inspections, training, fire suppression, closure, and other costs required for compliance with applicable laws; such costs shall not include costs associated with land acquisition or permitting. A fee structure has not been determined; however, it is expected that it would be competitive with the costs of other mercury storage options. In addition, the generators of the mercury will be responsible for the costs of shipping mercury to the DOE storage facility(ies). Therefore, much of the costs of mercury storage will be borne by the generators of mercury. The incentive for generators to send their mercury to the DOE facility(ies) is that DOE would take ownership of the mercury and indemnify the generator from future liability, in accordance with Section 5(e) of the Act.

1.3 PROPOSED ACTION

As stated in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*, DOE proposes to construct one or more new facilities and/or select one or more existing facilities (including modification as needed) for the long-term management and storage of mercury, as mandated by Section 5 of the Act. Any such facility(ies) must comply with applicable requirements of Section 5 of the Act, "Management Standards for a Facility," including the requirements of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.), and other permitting requirements.

1.3.1 Estimated Mercury Inventory

Chapter 1, Section 1.3.1, of the January 2011 *Mercury Storage EIS* provides information on the inventory developed for analysis and is hereby incorporated into this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*. The same inventory is used in this supplemental environmental impact statement (SEIS) and is shown in Table 1–1.

The Act does not specify how long the DOE mercury storage facility(ies) would need to be operated. For purposes of analysis in the January 2011 *Mercury Storage EIS* and this SEIS, DOE assumed the mercury storage facility(ies) would operate over a 40-year timeframe. For purposes of analysis, the January 2011 *Mercury Storage EIS* assumes a 40-year operational period with the first year starting in 2013 and the fortieth year, in 2052. An operational start date is not known at this time; however, the period of analysis remains 40 years. For example, if the mercury storage facility(ies) were to start operations in 2014, the last year of operations would likewise shift to 2053, and so forth. This corresponds to the 40-year planning projection for receipt into storage of up to 10,000 metric tons (11,000 tons) of mercury. A 40-year period of analysis is consistent with the timeframe used in previous analyses by the Defense Logistics Agency (DLA 2004) and the U.S. Environmental Protection Agency (EPA) (EPA 2007). These are estimates with a degree of uncertainty; therefore, it is possible that more or less than 10,000 metric tons of mercury could eventually require storage for a period longer or shorter than 40 years. Additional National Environmental Policy Act (NEPA) review would be required to expand the facility(ies) to accept more than 10,000 metric tons of mercury or extend its operations beyond the 40-year period of analysis.

Table 1–1. Anticipated Mercury Inventory

Source	Years Sent to Storage[a]	Quantity (metric tons)[b]
DOE Y–12 National Security Complex in Oak Ridge, Tennessee[c]	1st – 2nd	1,200
Closure of chlor-alkali plants or conversion to non-mercury-cell technology	1st – 7th	1,100
Waste reclamation and recycling facilities	1st – 40th	2,500
Byproduct of gold mining	1st – 40th	3,700–4,900
Total		**8,500–9,700**

[a] For purposes of analysis, the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* and this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* assume a 40-year operational period. It was assumed that the mercury from the Y–12 National Security Complex would be shipped to the DOE-designated storage facility(ies) in the first 2 years of operation; chlor-alkali plant mercury would be shipped in the first 7 years of operation; and waste reclamation and recycling facility and gold-mining byproduct mercury would be shipped over the entire 40-year period of analysis.

[b] Rounded to two significant figures.

[c] Depending on ongoing DOE mission needs, the entire inventory of Y–12 National Security Complex mercury or a portion of this inventory could be retained in storage at Y–12 National Security Complex. It is also possible that other governmental sources of elemental mercury could be transferred to the storage facility(ies).

Note: To convert metric tons to tons, multiply by 1.1023.

Key: DOE=U.S. Department of Energy.

There is considerable uncertainty regarding the 10,000-metric-ton (11,000-ton) estimate of mercury that could be sent to DOE for storage. Estimates of mercury generated from gold mining are dependent on the amount of gold mining conducted. Mercury from gold mining could decrease as existing gold deposits are depleted or could increase if additional deposits are discovered. The amount of gold mined is also dependent on the price of gold. The quantity of mercury from waste reclamation and recycling facilities is dependent on the volume of waste and recyclable materials processed and is likely to decrease as programs to collect mercury-containing thermometers, thermostats, switches, and natural gas metering devices are completed. In addition, chlor-alkali plants may close or convert their mercury-cell processes before 2013.

The Act prohibits the export of elemental mercury from the United States beginning in 2013. The Act does not ban the export of mercury compounds. Recognizing the potential for exported mercury compounds to be processed into elemental mercury, Congress directed EPA to publish, no later than 1 year after the date of enactment of the Act, a report on “mercuric chloride, mercurous chloride or calomel, mercuric oxide, and other mercury compounds, if any, that may currently be used in significant quantities in products or processes.” EPA submitted a report entitled *Potential Export of Mercury Compounds from the United States for Conversion to Elemental Mercury* to Congress in October 2009. The report provides information on sources, amounts, and uses of mercury compounds; assesses the potential for these compounds to be processed into elemental mercury after export; and provides information for Congress to consider in determining whether to extend the Act’s mercury export prohibition to include one or more of these mercury compounds. The report concludes that one mercury compound—mercury(I) chloride (also known as mercurous chloride or calomel)—is likely to be exported and processed into elemental mercury after export. Mercury(I) chloride is currently produced in significant quantities from pollution-control equipment at U.S. gold mines. The report also finds that three other mercury compounds—mercury(II) oxide, mercury(II) sulfate, and mercury(II) nitrate—could possibly be exported and processed into elemental mercury after export (EPA 2009). If certain mercury compounds are eventually added to the mercury export ban, additional environmental review may be necessary. Mercury must meet the acceptance criteria for the DOE storage facility(ies) and must be at least 99.5 percent pure elemental mercury (DOE 2009a).

1.4 DECISIONS TO BE MADE

DOE intends to decide (1) where to locate the mercury storage facility(ies), and (2) whether to use existing buildings, new buildings, or a combination of existing and new buildings.

DOE's objectives for the long-term management and storage of mercury are important to DOE, EPA, and the public. They are, in part, as follows:

- Protect human health and the environment and ensure safety of the public and facility workers.
- Meet the requirements of the Mercury Export Ban Act of 2008.
- Comply with applicable Federal, state, and local statutes and regulations.

DOE will make a decision on the proposed action no sooner than 30 days after publication of EPA's Notice of Availability of the *Final Mercury Storage SEIS* in the *Federal Register*. DOE will announce its decision in a Record of Decision published in the *Federal Register*.

1.5 SCOPE OF THIS SEIS

In the January 2011 *Mercury Storage EIS*, DOE analyzed the following alternative locations for hosting the mercury storage facility(ies).

- Grand Junction Disposal Site near Grand Junction, Colorado
- Hanford Site's 200-West Area near Richland, Washington
- Hawthorne Army Depot's Central Magazine Area near Hawthorne, Nevada
- Idaho National Laboratory's Idaho Nuclear Technology and Engineering Center or Radioactive Waste Management Complex near Idaho Falls, Idaho
- Bannister Federal Complex's Kansas City Plant in Kansas City, Missouri
- Savannah River Site's E Area near Aiken, South Carolina
- Waste Control Specialists, LLC, site near Andrews, Texas

The analyses presented in the January 2011 *Mercury Storage EIS* remain valid and are incorporated into this SEIS with two exceptions: (1) the occupational and public health and safety analysis; and (2) the socioeconomics and environmental justice analysis. This SEIS includes updates to the occupational and public health and safety analysis resulting from changes to the definition of severity levels (i.e., magnitude of impacts) for acute-inhalation exposures to the public under certain accident scenarios. This SEIS also includes updates to the socioeconomics and environmental justice analyses to incorporate 2010 decennial census information that was not available at the time the January 2011 *Mercury Storage EIS* was published. The updates to the analyses are presented in Appendix B and Appendix E of this SEIS. Relevant information and data from the January 2011 *Mercury Storage EIS* that remain unchanged have been reproduced and presented in this SEIS for the convenience of the reader.

In this SEIS, DOE analyzes three additional locations in the vicinity of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico. WIPP is a deep geologic repository for the disposal of radioactive transuranic (TRU) waste generated through defense-related activities. Chapter 3, "Affected Environment," provides a description of this area.

One of the locations addressed in this SEIS lies within the boundary stipulated for WIPP under the WIPP Land Withdrawal Act, while the other two locations are outside this boundary but near WIPP to take advantage of existing infrastructure used for WIPP such as roads and electricity. Chapter 2, Figure 2–6, shows the section, township, and range of these parcels of land.

1.5.1 Candidate Site Identification

Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS* provides information on the screening approach used to identify the sites included in the environmental impact statement (EIS). The candidate sites were included in the EIS analyses if they met most of the criteria listed below. The same approach applies to the identification of the locations analyzed in this SEIS.

- The facility(ies) will not create significant conflict with any existing DOE site mission and will not interfere with future mission compatibility.
- The candidate host location has an existing facility(ies) suitable for mercury storage with the capability and flexibility for operational expansion, if necessary.
- The facility(ies) is, or will be, capable of complying with RCRA permitting requirements (see Chapter 5, Sections 5.2.4 and 5.3, of the January 2011 *Mercury Storage EIS*).
- The facility(ies) has supporting infrastructure and a capability or potential capability for flooring that would support mercury loadings.
- Storage of mercury at the facility(ies) is compatible with local and regional land use plans, and new construction would be feasible, as may be required.
- The facility(ies) is accessible to major transportation routes.
- The candidate location has sufficient information on hand to adequately characterize the site.

Recognizing that existing buildings are not available at the three WIPP locations addressed in this SEIS, DOE evaluated construction and operation of a new facility(ies) that would meet RCRA requirements. Because the mercury would of necessity be transported to the designated facility(ies), DOE included transportation analyses in the scope of this SEIS. These three aspects of this SEIS follow the same approach as that used in the January 2011 *Mercury Storage EIS* and are introduced in the sections below.

1.5.2 Construction

Construction impacts are those related to land disturbance, water and air resources, employment, and resource use. Chapter 2, Section 2.2.2, and Appendix C, Section C.2.3, describe construction activities. Chapter 4, Sections 4.2.1, 4.2.3, 4.2.4, 4.2.11, and 4.6, describe the environmental impacts of the construction activities.

1.5.3 Operations

Operational impacts include those related to water and air resources, human health effects, including accidents, and resource use. Chapter 2, Section 2.2.3, and Appendix C, Section C.2.4, describe operational activities. Chapter 4, Sections 4.2.3, 4.2.4, 4.2.9, and 4.6 describe the environmental impacts of the operational activities.

1.5.4 Transportation

Transportation impacts include those related to air emissions, human health, and ecological risk. DOE analyzed the transport of mercury from potential source locations to the designated DOE mercury storage facility(ies), including potential transport of DOE mercury from existing storage at Y–12 in Oak Ridge, Tennessee. DOE evaluated impacts for the transportation of mercury by truck and rail, including transportation accidents, in Chapter 4, Section 4.2.9.1.3.

1.5.5 Closure of Mercury Storage Facility(ies)

For a complete life-cycle analysis, DOE considered the possibility that the facility(ies) could be no longer needed. If the mercury storage facility(ies) is no longer needed at some point in the future, DOE would close it, as described in Chapter 4, Section 4.3. More detailed analysis of closure activity impacts is not possible at this time because DOE has not yet developed plans for future use or closure of this building(s). Reuse or closure plans would be subject to additional environmental analysis, as appropriate.

1.6 PUBLIC INVOLVEMENT

As a preliminary step in the development of an EIS (or SEIS), regulations established by the Council on Environmental Quality (40 CFR 1501.7) and DOE require "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a Proposed Action." The purpose of this scoping process is (1) to inform the public about a proposed action and the alternatives being considered and (2) to identify and clarify issues relevant to the EIS by soliciting public comments.

On June 5, 2012, DOE published the "Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury" in the *Federal Register* (77 FR 33204) (see Appendix A). Publication of the Notice of Intent initiated a 30-day public scoping period. During this time, DOE solicited comments from Federal, state, and local agencies; stakeholders; American Indian tribal nations; and the general public to assist in defining the scope of this SEIS. DOE hosted two meetings to obtain public comments on the proposed scope of this SEIS. The public scoping meetings were held on June 26, 2012, in Carlsbad, New Mexico, and June 28, 2012, in Albuquerque, New Mexico.

A total of approximately 65 people attended the scoping meetings. Each meeting began with a short DOE presentation on the NEPA process and the proposed scope of this SEIS. Following the presentation, attendees were invited to provide comments. Oral comments were recorded by a court reporter; written comments were also accepted. In addition, the public was provided with the opportunity to discuss issues directly with DOE management and technical specialists who staffed an exhibit area. DOE received 92 comment documents during the scoping period. A total of 19 oral comments were recorded in the meeting transcripts. DOE considered all public comments equally in refining the scope of this SEIS; the comments and DOE's responses are summarized in Section 1.6.1.

On April 19, 2013, DOE published the "Notice of Availability for the *Draft Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury*" in the *Federal Register* (78 FR 23548) (see Appendix A). Publication of the draft SEIS initiated a 45-day public comment period. During this time, DOE solicited comments from Federal, state, and local agencies; stakeholders; American Indian tribal nations; and the general public on the content of the *Draft Mercury Storage SEIS*. DOE hosted two public hearings to obtain public comments on the draft SEIS. The public hearings were held on May 7, 2013, in Carlsbad, New Mexico, and May 9, 2013, in Albuquerque, New Mexico.

A total of approximately 30 people attended these hearings. Each hearing began with a short DOE presentation on the NEPA process and a summary of findings in the draft SEIS. Following the presentation, attendees were invited to provide comments. Oral comments were recorded by a court reporter; written comments were also accepted. In addition, the public was provided with the opportunity to discuss issues directly with DOE representatives who staffed an exhibit area.

DOE received 22 comment documents. A total of 6 oral comments were recorded in the hearing transcripts. DOE considered all public comments in preparing this *Final Mercury Storage SEIS*, including late comments received by August 31, 2013; the comments and DOE's responses are summarized in Section 1.6.2, and all comment documents and DOE's responses are presented in Part II: Comment Response Document, of this SEIS.

For those individuals who could not attend one of the public scoping meetings, or one of the public hearings on the draft SEIS, DOE provided other methods to submit comments: (1) the mercury storage project website (http://www.mercurystorageeis.com), (2) email to David.Levenstein@em.doe.gov, and (3) U.S. mail to Mr. David Levenstein, Document Manager, Office of Environmental Compliance (EM–11), U.S. Department of Energy, Post Office Box 2612, Germantown, Maryland 20874.

1.6.1 Summary of Major Public Scoping Comments and DOE's Responses

Candidate Sites in the WIPP Vicinity

Comments: Commentors expressed concern about New Mexico becoming a "dumping ground," and opposition to expansion of the WIPP mission. Several commentors stated that mercury storage would do nothing to clean up existing mercury contamination in the region and would not reduce mercury levels in New Mexico. Other commentors pointed out that there are legal restrictions under the WIPP Land Withdrawal Act limiting WIPP to the disposal of TRU waste from defense activities. Opposition to locating a disposal facility for greater-than-Class C (GTCC) and DOE GTCC-like waste in the WIPP vicinity was included in a number of comments about the scope of the SEIS.

Other commentors expressed support for including the locations in the WIPP vicinity among the candidate sites for long-term management and storage of mercury. Some commentors noted that the Act created a real need for the long-term storage facility. Other commentors stated that the mercury storage facility would not interfere with the mission of WIPP. A few commentors noted that there is an existing potash mining lease associated with one of the proposed locations (i.e., WIPP Vicinity Section 10), which could potentially interfere with siting a mercury storage facility at this location.

Response: This SEIS is being prepared in response to a specific requirement that DOE identify, construct, and operate a facility(ies) for mercury storage as opposed to disposal. Mercury cleanup is addressed under other statutes and regulations. The Act considers the Nation's best interests in removing excess mercury in the United States from global commerce by placing it in a safe and secure facility(ies). DOE acknowledges that new legislation may be required for DOE to construct and operate a facility for long-term management and storage of mercury at any of the WIPP Vicinity reference locations. In the Notice of Intent published on June 5, 2012, DOE identified two candidate locations that would be evaluated in an SEIS for the long-term management and storage of elemental mercury. After consideration of scoping comments received, DOE decided to evaluate a third candidate location. The third location is WIPP Vicinity Section 35, located adjacent to and outside of the WIPP land withdrawal boundary approximately 5.6 kilometers (3.5 miles) southeast of the WIPP facility.

Environmental Considerations

Comments: Commentors expressed concern regarding safety aspects of transporting the mercury to the storage facility, the potential for spills, and potential mercury toxicity to downstream surface-water locations. Commentors recognized that DOE has established an excellent safety record regarding transportation to and disposal of TRU waste at WIPP, and that job creation in the Carlsbad area would benefit the community. DOE was encouraged to include information on habitat areas and threatened and endangered species in Eddy County. Commentors expressed concern about potential environmental justice issues and requested that an adequate region of influence be included in the SEIS. One commentor asked that the SEIS define what "long-term" management means and include consideration of disposal in salt.

Response: As discussed in Chapter 4, Section 4.2.9.1.3, DOE evaluates potential health and safety impacts of transportation in this SEIS, including accidents and routine operations. DOE agrees that WIPP has established an excellent transportation and onsite safety record. The scope of analysis for this SEIS includes land use and visual resources; geology, soils, and geologic hazards; water resources; meteorology, air quality, and noise; ecological resources; cultural and paleontological resources; site infrastructure; waste management; occupational and public health and safety; ecological risk; socioeconomics; and environmental justice. The region of influence for environmental justice analysis was defined taking into consideration the distance from the candidate sites where significant impacts would occur. The SEIS scope does not include analysis related to final disposal of mercury; long-term management and storage of mercury has been defined as 40 years for purposes of analysis, but may be indefinite until a final disposal pathway can be identified that complies with all disposal regulations.

1.6.2 Summary of Major Public Comments on the *Draft Mercury Storage SEIS* and DOE's Responses

Why is DOE preparing a supplemental environmental impact statement and why are candidate sites near WIPP being considered?

During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. This prompted DOE to reconsider several DOE sites using the same selection criteria found in Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS*. Certain exclusionary selection criteria, e.g., site security, caused DOE to again rule out several DOE sites. This reevaluation of DOE sites led to a determination that several sites at and in the vicinity of WIPP would fit within the range of reasonable alternatives and should be evaluated. Similar to the Waste Control Specialists, LLC, site (the Preferred Alternative), the WIPP vicinity is in a remote and arid location. In addition, it offers required infrastructure and is accessible to transportation routes. The WIPP site has personnel with an outstanding transportation management record and experience in implementing RCRA and other pertinent environmental requirements, records management, safety and security. The WIPP Vicinity reference locations have physical attributes that make such a site a favorable location for a DOE mercury storage facility. Input from within DOE, including Carlsbad Field Office site management, was sought prior to moving forward on this option.

What are the consequences of missing the January 2013 deadline for having a DOE facility operational? Will DOE ever build the storage facility?

Since the mercury export ban took effect on January 1, 2013, storage of elemental mercury at private facilities is the only option until a DOE facility becomes operational. As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act. All of these companies have certified that they will ship the elemental mercury to a DOE-designated facility, when such a facility is operational and ready to accept the mercury. Whether elemental mercury would be stored in a RCRA-permitted DOE facility or a RCRA-permitted commercial waste management facility, the storage procedures for this mercury would be similar. DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury.

Why aren't the commercial sites that have notified DOE of their intent to store mercury being considered reasonable alternatives?

All seven of the waste management companies that have notified DOE of their intent to store mercury have certified that they will ship the mercury to a DOE facility when it is ready to accept the mercury for long-term management and storage. None of these waste management companies have indicated a desire to serve as DOE's facility for up to 40 years under an appropriate leasehold or ownership arrangement with DOE.

Would constructing and operating a mercury storage facility in the vicinity of WIPP interfere with WIPP operations, oil and gas exploration, or potash mining interests in the area?

DOE acknowledges in Chapter 4, Section 4.2.1, of this SEIS, that an existing potash mining lease exists in Section 10; however, a lease does not currently exist in Section 20 or 35. One oil well exists in Section 35; however, none exist in Section 10 or 20. Potash mining and well drilling are prohibited within the land withdrawal boundary, where Section 20 is located. As discussed in Chapter 4, Section 4.4.2, the proposed mercury storage facility and GTCC disposal facility could co-exist in the vicinity of WIPP without interference of operations with each other or with the current WIPP transuranic disposal operations. The proposed mercury storage facility would only occupy a maximum of 3.1 hectares (7.6 acres). Allowing for a subsidence buffer zone of approximately one-quarter mile surrounding the facility, the siting of a mercury storage facility would affect a portion, but not all, of the potash mining interests in a particular section. The proposed mercury storage facility is not a permanent disposal facility. The storage of mercury will only be necessary until EPA approves a treatment and disposal standard for elemental mercury. However, DOE does acknowledge that although the period of analysis for the long-term management and storage of mercury is 40 years, the need for storage could be longer. In the event that more than 10,000 metric tons (11,000 tons) of mercury need to be stored or storage beyond the 40-year period of analysis becomes necessary, additional NEPA review may be required. Once the mercury storage facility is no longer needed, additional potash reserves would then be available for mining in Sections 10 and 35.

Would construction and operation of a mercury storage facility violate the WIPP Land Withdrawal Act or the Federal Land Policy and Management Act?

DOE acknowledges in Chapter 5, Section 5.3, of this SEIS, that selection of a WIPP Vicinity reference location may involve a legislative process to amend the Land Withdrawal Act (for Section 20) or a land withdrawal in accordance with the Federal Land Policy and Management Act (for Sections 10 and 35).

1.7 OTHER RELEVANT NATIONAL ENVIRONMENTAL POLICY ACT REVIEWS

The January 2011 *Mercury Storage EIS* contains descriptions of relevant NEPA documents, including NEPA documents pertaining to the candidate sites analyzed in that EIS. Those descriptions are incorporated in this SEIS, and the reader is referred to Chapter 1, Section 1.9, of the January 2011 *Mercury Storage EIS*. The following additional documents are relevant to this SEIS.

1.7.1 *Final Environmental Impact Statement for the Waste Isolation Pilot Plant* and Two Associated SEISs

In the *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (DOE/EIS-0026) (DOE 1980) and two SEISs (DOE/EIS-0026-FS and DOE/EIS-0026-S-2) issued in 1990 and 1997 (DOE 1990, 1997), DOE analyzed the development, operation, and transportation activities associated with WIPP, a mined repository for TRU waste near Carlsbad, New Mexico. In the 1997 *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (WIPP SEIS II)*, DOE analyzed the impacts from management and operation of WIPP to support disposal of TRU waste. DOE determined that the operation of WIPP during the period when it would be accepting waste shipments from around the DOE complex could be accomplished safely and that WIPP would not be expected to result in any long-term (over 10,000 years) impacts on human health as long as the repository was not disturbed after decommissioning (DOE 1997). In the Record of Decision associated with the 1997 *WIPP SEIS II* (63 FR 3624), DOE announced its decision that WIPP would be developed and begin accepting TRU waste for disposal. Since then, DOE published eight supplement analyses of the 1997 *WIPP SEIS II*. The supplement analyses indicated that the identified and projected impacts for all resource areas, including cumulative impacts, were not substantially changed from those previously evaluated, nor did they represent significant new circumstances or information relative to environmental concerns (DOE 2009b).

1.7.2 *Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste*

DOE prepared the *Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste (Draft GTCC EIS)* (DOE/EIS-0375) (DOE 2011) to evaluate the potential environmental impacts associated with the proposed development, operation, and long-term management of a disposal facility or facilities for GTCC low-level radioactive waste (LLW) and DOE GTCC-like waste. GTCC LLW has radionuclide concentrations exceeding the limits for Class C LLW established by the U.S. Nuclear Regulatory Commission (NRC). GTCC LLW is generated by activities licensed by the NRC or Agreement States and cannot be disposed of in currently licensed commercial LLW disposal facilities. DOE prepared this EIS in response to its obligations set forth in Section 631 of the Energy Policy Act of 2005.

The NRC LLW classification system does not apply to radioactive wastes generated or owned by DOE and disposed of in DOE facilities. However, DOE owns or generates LLW and non-defense-generated TRU radioactive waste, which have characteristics similar to those of GTCC LLW and for which there may be no path for disposal. DOE included these wastes for evaluation in the *Draft GTCC EIS* because similar approaches may be used to dispose of both types of radioactive waste. For the purposes of the *Draft GTCC EIS*, DOE referred to this waste as "GTCC-like waste." The total volume of GTCC LLW and DOE GTCC-like waste addressed in the *Draft GTCC EIS* is about 12,000 cubic meters (420,000 cubic feet), and it contains about 160 million curies of radioactivity. About three-fourths of this volume is GTCC LLW, with DOE GTCC-like waste making up the remaining one-fourth of the volume. DOE evaluated potential disposal locations at the Hanford Site in Washington; Idaho National Laboratory; Los Alamos National Laboratory in New Mexico; the Nevada National Security Site; the Savannah River Site in South Carolina; WIPP, including a location within and a location outside the land withdrawal boundary (Sections 27 and 35) in New Mexico; and generic commercial sites assumed to be located throughout the United States in the four NRC regions. DOE evaluated WIPP deep geologic repository disposal and disposal in intermediate-depth boreholes, near-surface trenches, and aboveground vaults, as appropriate to each site.

1.7.3 *Final Site-Wide Environmental Impact Statement for the Y–12 National Security Complex*

As one of the National Nuclear Security Administration's major production facilities, Y–12 is the primary site for enriched uranium processing and storage, and one of the primary manufacturing facilities for maintaining the U.S. nuclear weapons stockpile. Y–12 supplies nuclear weapons components, dismantles weapons components, safely and securely stores and manages special nuclear material, supplies special nuclear material for use in naval and research reactors, and dispositions surplus materials. The *Final Site-Wide Environmental Impact Statement for the Y–12 National Security Complex* (DOE/EIS-0387) (NNSA 2011) analyzes the potential environmental impacts of reasonable alternatives for ongoing and foreseeable future operations, facilities, and activities at Y–12. This EIS is relevant because it includes management of the 1,200 metric tons (1,300 tons) of mercury currently stored at Y–12.

1.8 ORGANIZATION OF THIS *MERCURY STORAGE SEIS*

Part I of this *Final Mercury Storage SEIS* consists of the following chapters and appendices. (The *Summary and Guide for Stakeholders* is a separately bound volume.)

- Chapter 1, "Introduction and Purpose and Need for Agency Action," introduces the health and environmental concern about mercury, provides background information on the Mercury Export Ban Act of 2008, describes the purpose and need for action and the proposed action, and summarizes the mercury inventory used in this SEIS, as well as the January 2011 *Mercury Storage EIS*. It also describes the scope of this SEIS and other relevant NEPA documents.
- Chapter 2, "Facility Description, Alternatives, and Comparison of Environmental Consequences," describes the new mercury storage candidate sites analyzed in this SEIS, the activities that would take place, and a comparison of impacts associated with the candidate sites analyzed in this SEIS and in the January 2011 *Mercury Storage EIS*.
- Chapter 3, "Affected Environment," describes the potentially affected environments in the WIPP vicinity. The level of detail presented for each resource (e.g., air quality, water resources) depends on the likelihood that the resource would be affected by mercury management and storage activities.
- Chapter 4, "Environmental Consequences," describes the potential impacts on the affected environment of the proposed mercury storage facility alternatives, including cumulative impacts and unavoidable adverse impacts. It also discusses potential future closure activities, irreversible and irretrievable commitments of resources, the relationship between short-term uses of the environment and long-term productivity, and mitigation.
- Chapter 5, "Environmental Laws, Regulations, Permits, and Other Potentially Applicable Requirements," describes the environmental and health and safety compliance requirements governing implementation of the alternatives, a summary of permit requirements, and the status of consultations with Federal and state agencies and American Indian tribal governments.
- Chapters 6, 7, 8, and 9 are the "Glossary," "List of Preparers," "Distribution List," and "Index," respectively.

The following appendices include descriptions of methods used to estimate environmental impacts of the alternatives and detailed information to support the impact analyses.

- Appendix A – "The Mercury Export Ban Act of 2008 and *Federal Register* Notices"
- Appendix B – "Impact Assessment Methodology"
- Appendix C – "Storage Facility Construction and Operations Data"
- Appendix D – "Human Health and Ecological Risk Assessment Analysis"
- Appendix E – "Updates to the January 2011 *Mercury Storage EIS*"
- Appendix F – "Common and Scientific Names of Plant and Animal Species"
- Appendix G – "Cooperating Agency Agreements"
- Appendix H – "Contractor National Environmental Policy Act Disclosure Statement"
- Appendix I – "Responses to Consultation Requests"

Part II of this *Final Mercury Storage SEIS* consists of the Comment Response Document. The Comment Response Document is composed of three sections, as follows:

- Section 1, "Overview of the Public Comment Process," describes the public comment process for the *Draft Mercury Storage SEIS*, as well as the procedure used to respond to these comments.
- Section 2, "Responses to Comments Received on the *Draft Mercury Storage SEIS*," includes copies of all comments received and DOE's responses to these comments. Comments and responses are presented in a side-by-side format for easy viewing.
- Section 3, "References," lists the references cited in the Comment Response Document.

1.9 REFERENCES

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Code of Federal Regulations

10 CFR 1021, U.S. Department of Energy, "National Environmental Policy Act Implementing Procedures."

40 CFR 1500–1508, Council on Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act.

40 CFR 1501.7, Council on Environmental Quality, "NEPA and Agency Planning: Scoping."

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63 FR 3624, U.S. Department of Energy, 1998, "Record of Decision for the Department of Energy's Waste Isolation Pilot Plant Disposal Phase," January 23.

77 FR 33204, U.S. Department of Energy, 2012, "Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury," June 5.

78 FR 23548, U.S. Department of Energy, 2013, "Notice of Availability for the *Draft Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury*," April 19.

United States Code

42 U.S.C. 6901 et seq., Resource Conservation and Recovery Act of 1976, as amended.

U.S. Public Laws

P.L. 110-414, Mercury Export Ban Act of 2008.

CHAPTER 2
FACILITY DESCRIPTION, ALTERNATIVES, AND COMPARISON OF ENVIRONMENTAL CONSEQUENCES

CHAPTER 2
FACILITY DESCRIPTION, ALTERNATIVES, AND COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Chapter 2 provides descriptions of basic design requirements for a new facility(ies) that may be used for the long-term management and storage of elemental mercury and the alternative locations that are being considered in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*. Seven candidate sites were previously evaluated as alternatives for long-term mercury storage in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* (DOE 2011) and are still under consideration. A summary description of these alternative locations is provided in this chapter; however, detailed descriptions can be found in Chapter 2 of the January 2011 *Mercury Storage EIS*. This chapter concludes with a summary of impacts and a comparison of impacts analyzed in this *Mercury Storage SEIS* with those analyzed in the January 2011 *Mercury Storage EIS*.

2.1 INTRODUCTION

As previously discussed in Chapter 1, Section 1.2, "Purpose and Need for Agency Action," the U.S. Department of Energy (DOE) estimates that up to approximately 10,000 metric tons (11,000 tons) of excess elemental mercury may be eligible for long-term management and storage in a DOE-designated facility(ies) based on a 40-year period of analysis.[1, 2] DOE's selection of a mercury storage facility(ies) would comply with the requirements of Section 5(a) of the Mercury Export Ban Act of 2008 (referred to hereafter as "the Act"), entitled "Designation of a Facility." Specifically, Section 5(d) of the Act, entitled "Management Standards for a Facility," requires DOE to construct and operate the facility(ies) in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.). The mercury to be stored at the DOE facility(ies) must be elemental with a purity of 99.5 percent or greater by volume (DOE 2009).[3]

Potential sources of excess mercury in the United States that may require long-term storage in a DOE facility(ies) are illustrated in Figure 2–1 and include (1) that resulting from closure of chlor-akali plants or conversion to non-mercury-cell technology; (2) that generated as a byproduct of the gold-mining process; (3) that reclaimed from recycling and waste recovery activities; (4) DOE mercury at the Y–12 National Security Complex (Y–12); and (5) other relatively minor sources. Only four chlor-alkali plants are expected to still be using mercury-cell technology beyond 2010: Ashta Chemical in Ohio,

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1 Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

2 The Mercury Export Ban Act of 2008 does not require that mercury be stored in a DOE mercury storage facility(ies), nor does the Act specify how long such a facility(ies) would need to be operated. The U.S. Environmental Protection Agency projected in the report *Mercury Storage Cost Estimates* (EPA 2007), that, in addition to governmental stockpiles of mercury, 7,500 to 10,000 metric tons (8,300 to 11,000 tons) of mercury may become excess over the next 40 years. In preparing this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*, DOE has reexamined these estimates. For purposes of analysis, DOE assumes the operation of a mercury storage facility(ies) with a capacity of 10,000 metric tons over a 40-year period of analysis. These are estimates with a degree of uncertainty; therefore, it is possible that more or less than 10,000 metric tons of mercury could eventually require storage for a period longer or shorter than 40 years. Additional National Environmental Policy Act analysis may be required to expand the facility(ies) to accept more than 10,000 metric tons of mercury or extend its operations beyond the 40-year period of analysis.

3 The treatment standard for wastes containing high concentrations of mercury (greater than 260 parts per million) is recovery through roasting or retorting, which is performed at various commercial waste recovery facilities. This process yields high purity (e.g., elemental mercury that is at least 99.5 percent pure by volume) that is generally acceptable for reintroduction back into commerce and is analogous to the materials proposed to be stored in a DOE facility(ies). Therefore, only mercury with greater than 99.5 percent purity by volume would be accepted for long-term storage in a DOE facility(ies).

PPG Industries in West Virginia, and Olin Corporation in Tennessee and Georgia (Chlorine Institute 2008).[4] Mining in the state of Nevada accounts for more than 80 percent of gold production and produces almost all of the byproduct mercury in the United States, although South Dakota reportedly generates small amounts (less than 1 metric ton [1.1 tons] per year) of byproduct mercury (Miller and Jones 2005; Townsend 2009). Comparatively, the latest available data for Nevada report the generation of approximately 97 metric tons (107 tons) of byproduct mercury in 2002 (Miller and Jones 2005). Alaska, California, Colorado, and Utah are active gold-mining states; however, the mines located in these states reportedly do not generate byproduct mercury (Clinkenbeard 2009; Krahulec 2009; Mannon 2009; Szumigala 2009). As reported by the U.S. Geological Survey in 2009, the six reclamation and recycling companies shown on the map in Figure 2–1 account for the majority of secondary mercury reclamation and recycling efforts (USGS 2009). However, virtually all commodity-grade (e.g., elemental) mercury used in the United States is ultimately supplied by Bethlehem Apparatus Company in Pennsylvania or DFG Mercury Corporation in Illinois. These two companies have the high-level purification equipment necessary for producing commercial-grade mercury (EPA 2005).

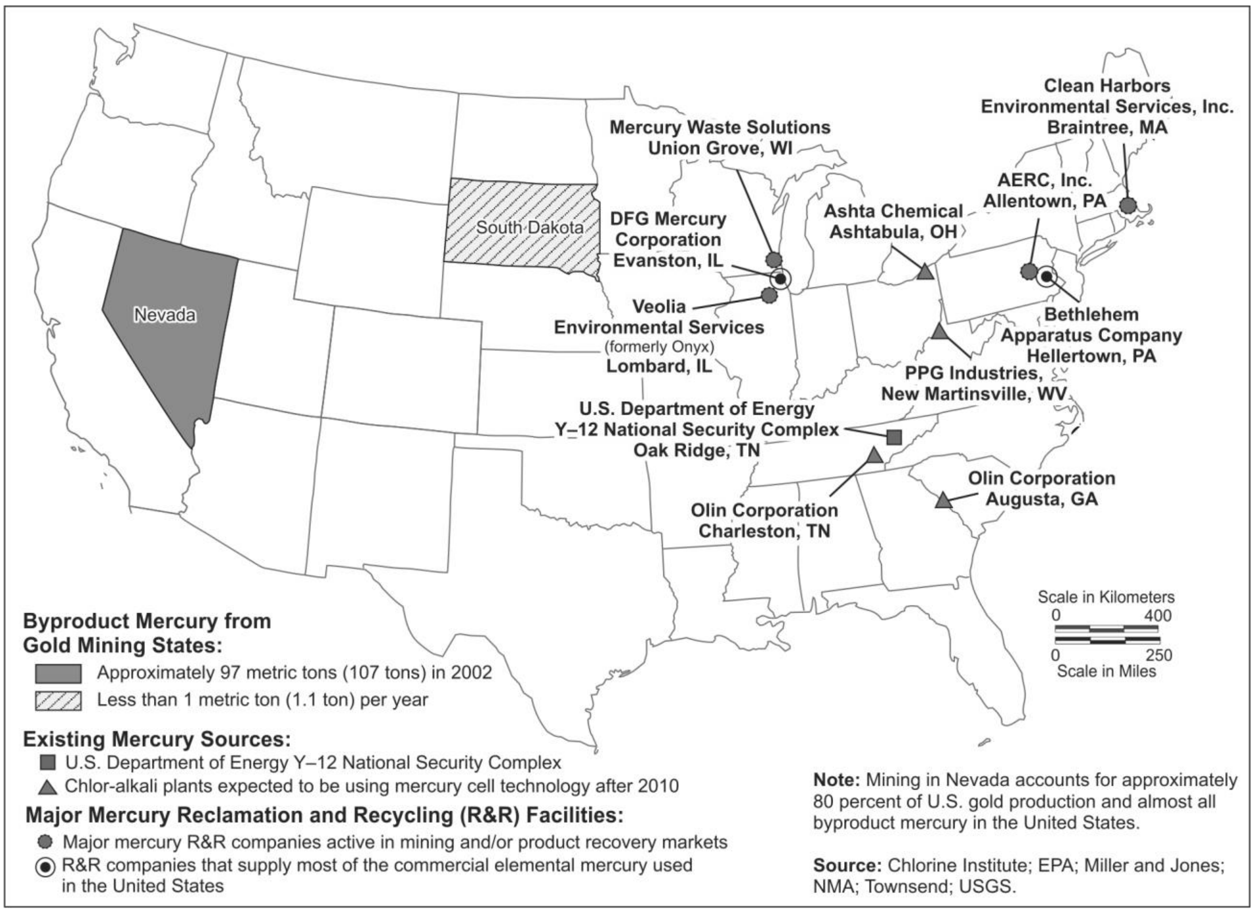

Figure 2–1. Potential Sources of Mercury in the United States

[4] Olin Corporation has announced that its chlor-alkali plants in Tennessee and Georgia will be consolidated and converted to mercury-free technology in 2012 (Pavey 2012). The fate of this mercury is uncertain and may still be eventually shipped to a DOE facility(ies) for long-term management and storage; therefore, the quantities of mercury analyzed in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* remain unchanged.

In March 2004, the Defense Logistics Agency (DLA) Defense National Stockpile Center (DNSC) issued the *Final Mercury Management Environmental Impact Statement (MM EIS)* (DLA 2004), which analyzed alternatives for managing the U.S. Department of Defense stockpile of mercury. The *MM EIS* analyzed consolidated long-term storage at several candidate DNSC and non-DNSC sites. In the Record of Decision (ROD), DLA amended its selection of consolidated storage at one location (69 FR 23733) and DLA selected the Hawthorne Army Depot in Nevada, a non-DNSC candidate site analyzed in the *MM EIS*, for storage of approximately 4,400 metric tons (4,900 tons) of mercury. All 4,400 metric tons (4,900 tons) of defense-related mercury has been successfully transferred to the Hawthorne Army Depot for long-term management and storage (DLA 2012). This quantity of defense-related mercury is not included in the estimates of excess mercury that may require long-term storage in a DOE-designated facility(ies), although the Hawthorne Army Depot site was evaluated in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* for storage of the additional mercury for which DOE would be responsible.

2.2 MERCURY STORAGE FACILITY(IES)

As required by Section 5 of the Act, DOE has developed guidance, entitled *U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury (Interim Guidance)* (DOE 2009), establishing basic standards and procedures for the receipt, management, and long-term storage of mercury at a DOE facility(ies). The guidance is based on laws, regulations, DOE Orders, and best management practices. The *Interim Guidance* discusses DOE's anticipated waste acceptance criteria for discarded mercury to be stored at the facility(ies). All mercury to be stored at the facility(ies) must meet these requirements. Further, it describes the procedures DOE would use to receive, store, and monitor the mercury. In addition, spill and emergency response procedures are described.

Major characteristics of DOE's mercury storage facility(ies) would include, but would not necessarily be limited to, the following (74 FR 31723; DOE 2009):

- RCRA-regulated/permitted with proper spill containment features and emergency response procedures
- Security and access control
- Fire suppression systems
- Ventilated storage and handling area(s)
- Fully enclosed weather protected building
- Reinforced-concrete floors able to withstand structural loads of mercury storage

Additionally, as described in Appendix C, Section C.2.1, the mercury storage facility(ies) would have the following functional areas: Receiving and Shipping Area, Handling Area, Storage Area, and an Office Administration Area. The Office Administration Area is likely to be in a separate building, where all the management, operations, training, and other administrative functions would be conducted. If necessary, transfer of mercury from failed containers into new containers would occur in the Handling Area.

A typical mercury storage facility would be dominated by the Storage Area, which would constitute approximately 90 percent of the floor space. The Storage Area would generally be a large open space similar to a warehouse, where storage, inspection, and monitoring could be effectively performed. The other functional areas would occupy the remaining 10 percent of the facility(ies).

The mercury storage facility(ies) would accept two types of mercury containers: 3-liter (3-L) (34.6-kilogram [76-pound]) flasks and 1-metric-ton (1-MT) (1.1-ton) containers. Other types of containers would be considered on a case-by-case basis.

Figure 2–2 shows the typical 3-L flask and 1-MT container that are used to store and transport mercury. These containers are typically made of carbon steel or stainless steel and also satisfy the U.S. Department of Transportation hazardous materials regulations for mercury transport (49 CFR 172.101). A DOE storage facility with a capacity to store 10,000 metric tons (11,000 tons) of mercury could store up to approximately 116,000 of the 3-L flasks and 6,000 of the 1-MT containers. The numbers of containers are based on an assumed 40:60 percent split between the amount of mercury that is expected to be stored in 3-L flasks (4,000 metric tons [4,400 tons]) and the amount that is expected to be stored in 1-MT containers (6,000 metric tons [6,600 tons]). The 40:60 split is based on a rough estimate of known inventories (DOE 2009). All mercury currently stored at Y–12 is in 3-L flasks. It is anticipated that most of the mercury shipped from the chlor-alkali and mining facilities would be in 1-MT containers, whereas most of the mercury shipped from reclamation and recycling facilities would be in 3-L flasks.

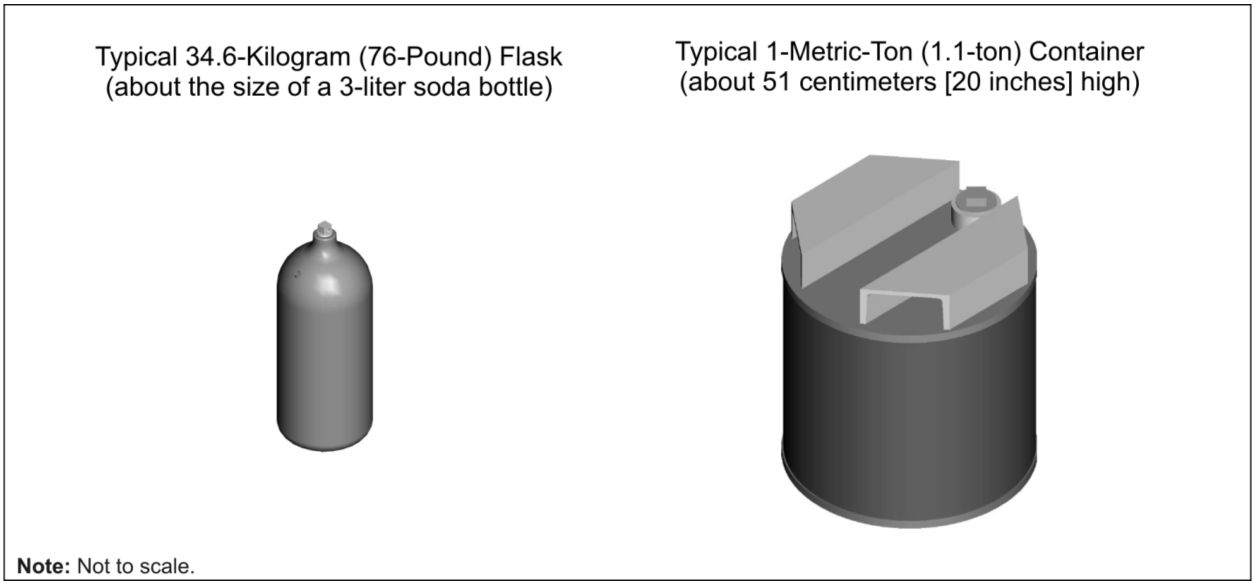

Figure 2–2. Typical Elemental Mercury Storage Containers

2.2.1 New Facility(ies) Description

If constructed, a new mercury storage facility(ies) would be designed and built for the specific purpose of providing the safe and secure long-term storage of mercury. Figure 2–3 provides a conceptual illustration of what the exterior of a new mercury storage facility might look like, and Figure 2–4 provides a conceptual layout of the interior of a full-size facility (i.e., with a storage capacity of 10,000 metric tons [11,000 tons]) and how the mercury containers might be stored. Appendix C provides additional details and data related to requirements for construction and operation of a new facility(ies).

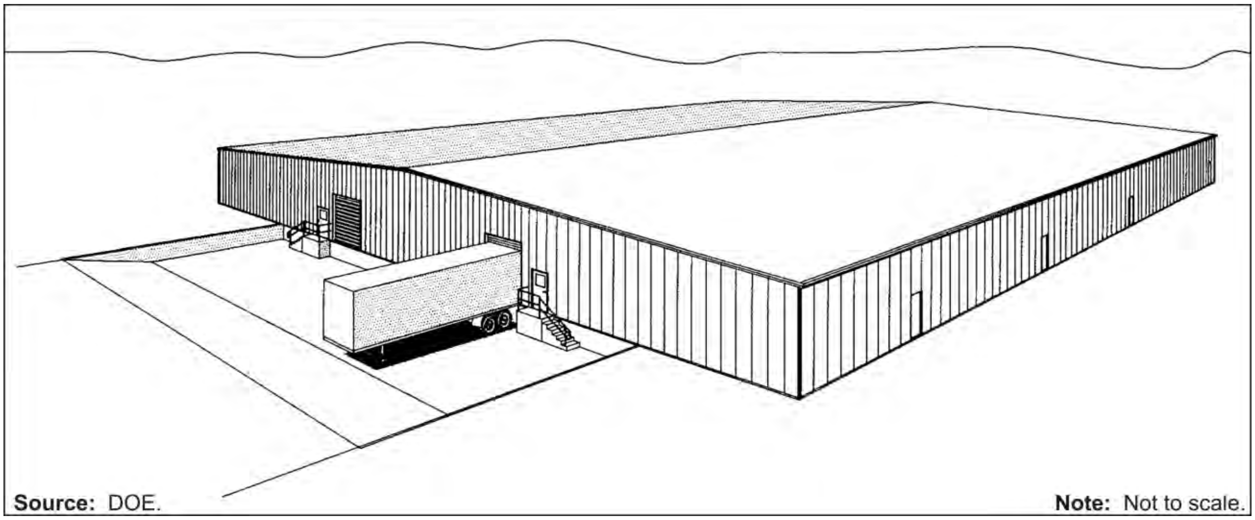

Figure 2–3. Conceptual Exterior Representation of a New Mercury Storage Facility

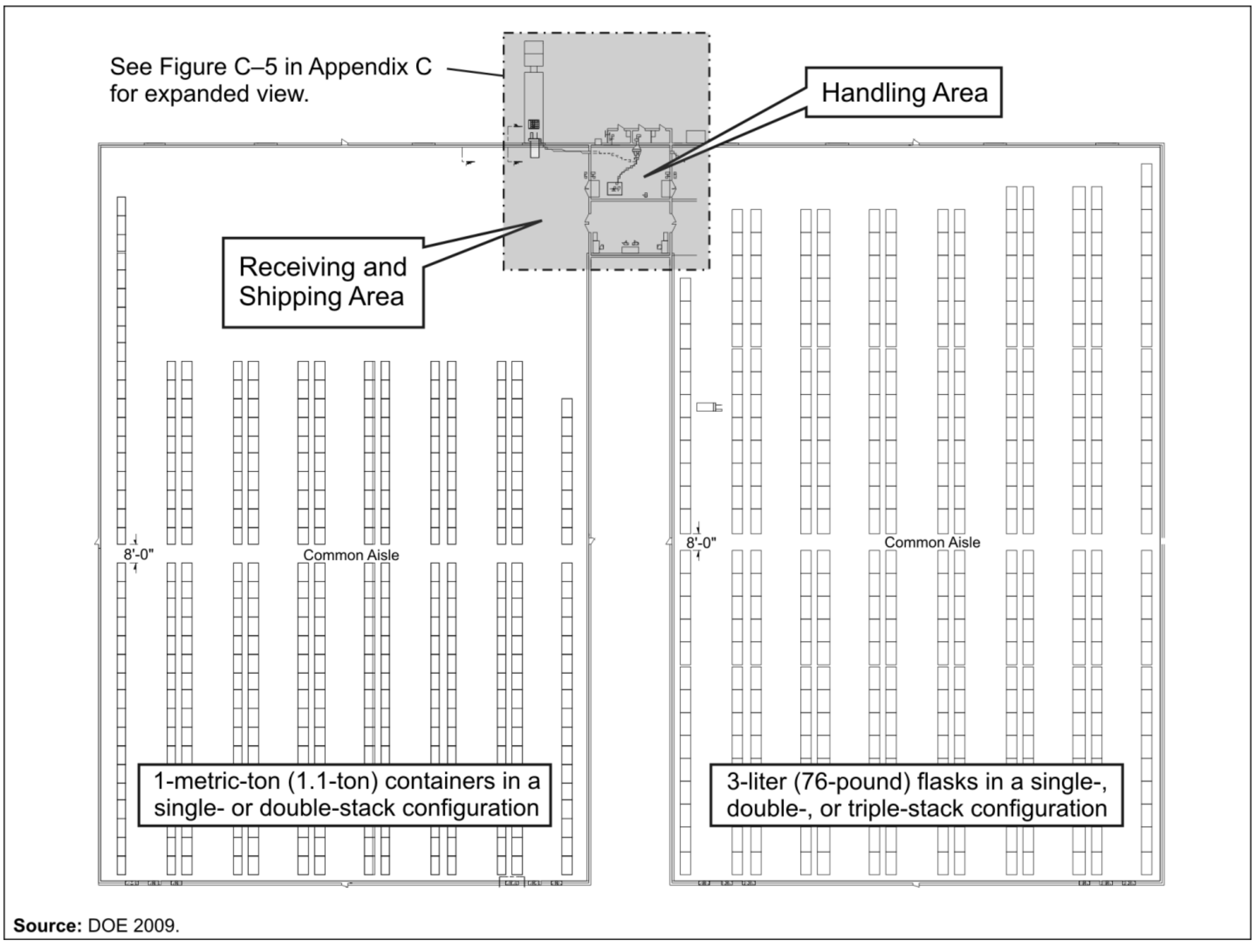

Figure 2–4. Conceptual Layout of a New Mercury Storage Facility

If built, a new mercury storage facility(ies) with a 10,000-metric-ton (11,000-ton) capacity would require approximately 13,610 square meters (146,500 square feet) of storage space. The 1-MT containers may be single- or double-stacked and the 3-L flasks may be single-, double-, or triple-stacked, depending on seismic and safety considerations, as well as the requirements of a RCRA permit. If constructed, the height of the building would be approximately 6.1 meters (20 feet) to accommodate the potential triple stacking of 3-L flasks. The new facility(ies) would have a reinforced-concrete floor, strong enough to withstand the heavy loads from mercury storage. The floors would also be treated with an epoxy sealant to add strength and make them impervious to mercury leaks and spills and water from fire suppression systems. Mercury containers would be stored in spill trays designed to contain at least 10 percent of the volume of mercury stored in each spill tray in the unlikely event one of the containers were to leak. The exterior of the storage facility(ies) would likely be sheet metal panels fastened to structural steel supports and connected together to form a weather-protected structure. The Receiving and Shipping Area would have a loading dock with large rollup doors. Lighting, ventilation, fire suppression, and security monitoring systems would be incorporated into the facility(ies) design. Monitoring systems could include security alarms and surveillance cameras. A new full-size, standalone facility boundary would encompass approximately 3.1 hectares (7.6 acres) and would include a paved area for delivery truck access and vehicle parking. The facility(ies) would also need to be RCRA regulated and permitted, and thus would require, among other things, secondary containment (e.g., curbing), regular inspection of stored materials, strict record-keeping, and periodic reporting.

2.2.2 Construction Requirements

Construction of a new mercury storage facility(ies) with a 10,000-metric-ton (11,000-ton) capacity would require the disturbance of approximately 3.1 hectares (7.6 acres) of land for building construction and equipment laydown areas. When completed, the building footprint would be approximately 1.6 hectares (3.9 acres). Construction of a full-size storage facility would require approximately 6 months; however, due to the uncertainty regarding the timing of the availability of mercury that would require long-term storage, a new facility(ies) could be constructed in a modular fashion to accommodate storage of mercury on an as-needed basis. The ability to build the storage facility(ies) in a modular fashion would also ensure that the facility(ies) is sized correctly for the amount of mercury that would eventually require storage. For example, the Storage Areas of the facility(ies) could be built in two sections, one section at a time, with each section capable of storing 5,000 metric tons (5,500 tons) of mercury.

Construction would entail leveling and grading an area large enough to accommodate the storage building or an area large enough to accommodate each module, which would be built as necessary to meet anticipated storage needs. The foundation would consist of heavily compacted aggregate stone overlain with a reinforced-concrete slab approximately 30 centimeters (12 inches) thick. With the exception of small trenches for connecting to utilities or installing concrete footers, excavation for preparing the site and laying the foundation is not expected to exceed a depth of 0.6 meters (2 feet). Electricity during construction would be provided by portable generators. Complete construction of a full-size facility would require an average of 18 full-time construction workers during a 6-month construction period. Resource requirements for construction of a new mercury storage facility with a 10,000-metric-ton (11,000-ton) capacity are discussed in Chapter 4, Section 4.6.2, and Appendix C, Section C.2.3.

Modifications to existing facilities that may be used for the long-term storage of mercury would likely not require any new disturbance of land. However, minor modifications to candidate existing facilities might include the reconfiguration of space. Examples of possible modifications include installing security monitoring systems, fire suppression systems, and equipment in the Handling Area; upgrading ventilation systems; and implementing spill prevention and containment measures.

2.2.3 Operations Requirements

Worker activity levels at the storage facility(ies) would increase or decrease with the receipt of mercury shipments. Operations personnel would include management and administrative staff, facility technicians, facility maintenance staff, subject matter experts, and security staff. Administrative staff would be responsible for permit maintenance, fee collection, record-keeping, and reporting. The Office Administration Area would require heating, ventilating, and air conditioning for occupants. The Handling Area would be ventilated through the use of a high-negative draw system for removing vapors from mercury "sources" (e.g., container residues, open containers, small spills). The exhaust air would pass through a sulfur filter to remove mercury vapors and be discharged to the outside. An air conditioning unit would be available for maintaining interior temperatures below 21 degrees Celsius (70 degrees Fahrenheit) during times when mercury is being handled to keep its volatility low. The Storage Area would be ventilated using low-vacuum, high-volume, industrial-sized roof- or wall-mounted fans sized to provide multiple air exchanges over a short period of time and to evacuate low-concentration vapors that may accumulate in the storage spaces over time. These fans would operate on an as-needed basis prior to and during occupancy. Facility technicians would be responsible for inspections and leak and small-spill response. Facility maintenance staff would be responsible for maintaining the operability of the building. Subject matter experts would prepare health and safety plans and quality assurance plans and perform industrial hygiene duties. Security provided for the facility(ies) would reduce the threat of inadvertent or deliberate unauthorized access to the facility(ies) and the Storage Area(s). Security measures might include fences, barriers, gates, locks, television monitoring, or surveillance with guards. During the first 7 years of operations, when the facility(ies) is receiving the highest frequency of shipments, approximately eight full-time workers would be required. During the later years of operations, when the frequency of shipments is expected to be much lower, approximately five full-time workers would be required.

If DOE elects to transfer any excess mercury stored at Y–12, it is assumed that this mercury would be shipped to the designated storage facility(ies) within the first 2 years of operation. Closure of the four chlor-alkali plants that use mercury-cell technology, or conversion to mercury-free processes, is expected to be completed by 2020. However, the timing of these closures and/or conversions is difficult to predict; therefore, the frequency of these mercury shipments to the storage facility(ies) is uncertain. Projected shipments to the new storage facility(ies), based on estimated mercury inventories that may become available for long-term storage, are discussed in Appendix D, Section D.2.2. The amount of mercury in each shipment could vary, ranging from a single container up to the maximum load allowable by transportation regulations.

Appendix C, Section C.1, discusses in more detail the projected timing of shipments to the DOE facility(ies).[5] In summary, it is anticipated that the mercury from Y–12 would be transferred in the first 2 years of operation, the mercury from chlor-alkali facilities would be shipped in the first 7 years of operation, and any mercury from mining and reclamation and recycling facilities would be shipped at a steady rate over the 40-year period of analysis. This corresponds to an estimated 66 to 79 truck deliveries (or 23 railcar deliveries) per year in the first two years of operation, 26 to 39 truck deliveries (or 8 railcar deliveries) per year between the third and seventh years of operation, and then 14 to 27 truck deliveries (or 5 railcar deliveries) per year thereafter.

Resource requirements for the operation of a mercury storage facility with a 10,000-metric-ton (11,000-ton) capacity are discussed in Chapter 4, Section 4.6.2, and Appendix C, Section C.2.4.

[5] For purposes of analysis, the January 2011 *Mercury Storage EIS* assumes a 40-year operational period with the first year starting in 2013 and the fortieth year, in 2052. An operational start date is not known at this time; however, the period of analysis remains 40 years. For example, if the mercury storage facility(ies) were to start operations in 2014, the last year of operations would likewise shift to 2053, and so forth.

Operations would include tasks such as facility security, shipping and receiving, inspections, monitoring and long-term storage of mercury, record-keeping, and emergency and small-spill response, as described below (DOE 2009).

- **Security.** The mercury storage facility(ies) would be within a fenced and secure area with controlled access to the premises. Only authorized vehicles and personnel would be allowed access within the facility(ies) boundary. It is conservatively assumed for labor estimates that security personnel would guard the facility(ies) 24 hours per day, 7 days per week, although this level of security may not be required at all times. Security alarms and surveillance cameras may also be used.
- **Shipping and Receiving.** Mercury containers (3-L flasks and 1-MT containers) would be inspected and prepared for "ready storage" at the originating facility(ies) prior to shipment to the mercury storage facility(ies). All containers shall have sufficient integrity to be transported and placed into long-term storage. Shipments of mercury would most likely be conducted by third-party transportation companies in accordance with regulations governing the transportation of hazardous waste. See Appendix C, Section C.1, for a detailed discussion of shipping containers and methods. After arriving at the facility(ies), if visible mercury contamination or leaking containers are observed, the mercury may be immediately moved to the Handling Area for emergency overpacking or reflasking and may subsequently be returned to the generator, at the generator's expense.
- **Inspections.** Upon arrival at the mercury storage facility(ies), concentrations of mercury vapor would be measured and verified to be below any actionable levels. As discussed in Section 5.3 of the *Interim Guidance*, the actionable level for mercury vapor is the American Conference of Governmental Industrial Hygienists' threshold limit value of 0.025 milligrams per cubic meter as a time-weighted average. A visual inspection would follow to detect any obvious problems that may have occurred while on the truck or railcar. If the initial inspections and manifest documentation are acceptable, then the mercury would be moved to the Shipping and Receiving Area, where additional visual inspections would be performed to check for leaks, structural integrity of pallets and containers, approved container types, corrosion, etc. The mercury would then be moved to the Handling Area for any additional verification that it meets waste acceptance criteria (e.g., 99.5 percent purity). The containers and pallets that pass the acceptance/verification process would be placed into long-term storage and location data would be recorded.
- **Monitoring and Long-Term Storage.** Regular inspections of the mercury containers would be performed in accordance with RCRA regulations within the Storage Area to ensure that no containers are corroding or leaking. Prior to and during occupancy, the Storage Area would be ventilated using low-vacuum, high-volume industrial-sized roof- or wall-mounted vent fans. Monitoring would include testing the airspace for elevated concentrations of mercury vapors.
- **Record-Keeping.** Manifests, inspection records, training logs, and required reports would need to be completed and maintained in accordance with RCRA regulations. These documents would be stored in the Office Administration Area.
- **Emergency and Small-Spill Response.** Spill response would be handled in accordance with the facility's RCRA contingency plan. The Handling Area would be used for transferring mercury from corroding or leaking containers or from containers that have failed inspection upon arrival at the facility(ies) to new containers. The likelihood of these types of occurrences is considered small. When technicians are working with open containers in the Handling Area, the area would be negatively ventilated using a hooded duct system equipped with a sulfur filter designed to remove mercury vapors from the air. Filtered air would be vented to the outside via a small exhaust stack. Personal protective equipment, rags, and spent filters would be placed in 55-gallon (208-liter) drums, characterized, and disposed of off site at an appropriate facility.

2.3 ALTERNATIVE SITES EVALUATED

Chapter 2, Section 2.4, of the January 2011 *Mercury Storage EIS* describes seven candidate sites for the long-term management and storage of elemental mercury. This *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)* evaluates three additional candidate sites for the long-term management and storage of elemental mercury: Waste Isolation Pilot Plant (WIPP) Vicinity Section 10, WIPP Vicinity Section 20, and WIPP Vicinity Section 35. The names and locations of the candidate sites analyzed in the January 2011 *Mercury Storage EIS* and in this supplemental environmental impact statement (SEIS) are listed below and presented in Figure 2–5.

- New construction at the Grand Junction Disposal Site
- New construction at the Hanford Site (Hanford) in the 200-West Area
- Existing storage buildings at the Hawthorne Army Depot in the Central Magazine Area
- New construction at Idaho National Laboratory's (INL's) Idaho Nuclear Technology and Engineering Center (INTEC)
- Existing storage buildings at INL's Radioactive Waste Management Complex (RWMC)
- Existing building at the Bannister Federal Complex's Kansas City Plant (KCP)
- New construction at the Savannah River Site (SRS) E Area
- New construction at the Waste Control Specialists, LLC, site (WCS)
- New construction at WIPP Vicinity Section 10
- New construction at WIPP Vicinity Section 20
- New construction at WIPP Vicinity Section 35

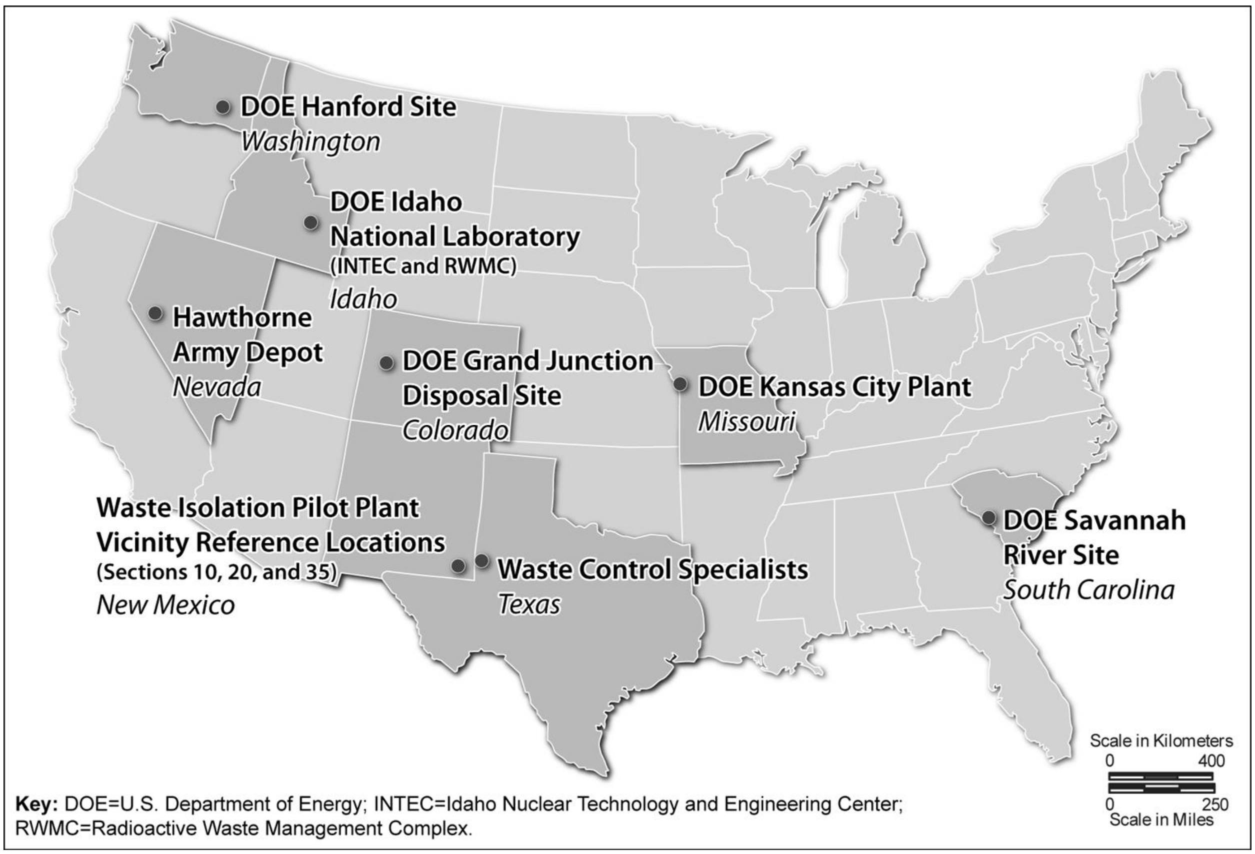

Figure 2–5. Alternative Sites for Long-Term Storage of Mercury

The January 2011 *Mercury Storage EIS* also analyzed the potential impacts associated with the No Action Alternative. The No Action Alternative is discussed in Chapter 2, Section 2.4.1, of the January 2011 *Mercury Storage EIS* (DOE 2011). Under the No Action Alternative, DOE would not designate a facility(ies) for the long-term management and storage of mercury. The No Action Alternative would affect all sources of mercury. Excess mercury that could not be sold would be stored as a commodity to the extent allowed by law. Some mercury would likely be considered waste and would be stored in accordance with law. Such storage would not necessarily occur at the sites identified as potential sources of excess mercury. This storage service might be provided by a commercial waste management company(ies). As discussed further in Chapter 2, Section 2.6.1, several waste management companies have notified DOE of their intent to accumulate and store mercury at RCRA-permitted facilities in accordance with Section 5(g)(2)(B) of the Mercury Export Ban Act of 2008. Approximately 1,200 metric tons (1,300 tons) of DOE mercury would continue to be stored at Y–12. This DOE mercury is currently stored in approximately 35,000 of the 3-L flasks at Y–12.

2.3.1 January 2011 *Mercury Storage EIS* Candidate Sites

The candidate sites analyzed in the January 2011 *Mercury Storage EIS*[6] are summarized as follows:

Grand Junction Disposal Site: The Grand Junction Disposal Site is located approximately 29 kilometers (18 miles) southeast of Grand Junction, Colorado. The new facility would be constructed in the northwestern corner of the 146-hectare (360-acre) site, which is owned by DOE and managed by DOE's Office of Legacy Management. Currently, the site has a 38-hectare (94-acre) area used to dispose of uranium mill tailings.

Hanford Site's 200-West Area: Hanford occupies 151,775 hectares (375,040 acres) along the Columbia River in the southeastern portion of the state of Washington. Hanford is owned by the Federal Government and is managed by DOE. The new facility would be located in the 200-West Area of Hanford at the Central Waste Complex (CWC). Located in the 200-West Area, the CWC receives, stores, and distributes solid radioactive and nonradioactive waste.

Hawthorne Army Depot's Central Magazine Area: The Hawthorne Army Depot is located approximately 16 kilometers (10 miles) from Hawthorne, Nevada. The 59,500-hectare (147,000-acre) site is owned and managed by the U.S. Department of Defense. DOE would designate a maximum of 29 buildings existing in the Central Magazine Area, which would provide up to approximately 27,000 square meters (290,000 square feet) of storage space for DOE storage of mercury. NOTE: Currently, DLA Strategic Materials (formerly DNSC) is storing approximately 4,400 metric tons (4,900 tons) of elemental mercury at the Hawthorne Army Depot (DLA 2012).

Idaho National Laboratory's Idaho Nuclear Technology and Engineering Center or Radioactive Waste Management Complex: The INL site is a 230,323-hectare (569,135-acre) area located in southeastern Idaho. INL is owned by the Federal Government and managed by DOE. INL consists of several facility areas situated on an expanse of otherwise undeveloped, cool desert terrain. A new facility would be located at INTEC. Current operations at INTEC include management of sodium-bearing waste, special nuclear material disposition, spent nuclear fuel storage, nuclear material disposition, environmental remediation, and demolition of excess facilities. RWMC has a

[6] DOE has interpreted Section 5 of the Act to authorize DOE to designate existing and/or new storage facilities at property owned or leased by DOE. Accordingly, if DOE decides to designate a facility that currently is owned by a commercial entity or by another Federal agency, DOE would acquire an appropriate ownership or leasehold interest in that facility to comply with Section 5 of the Act. DOE would ensure that any such facility currently owned by a commercial entity or by another Federal agency would afford DOE the same level of responsibility and control over stored mercury as a facility owned by DOE. This interpretation would apply to the Hawthorne Army Depot, owned and managed by the U.S. Department of Defense, and WCS, a commercial entity.

number of buildings in the Transuranic Storage Area currently dedicated to storage, staging, characterization, and shipping of transuranic waste. Seven Type II storage modules could be used for the storage of mercury; each building would provide approximately 2,700 square meters (29,000 square feet) of storage.

Bannister Federal Complex's Kansas City Plant: KCP is part of the 125-hectare (310-acre) Bannister Federal Complex located 13 kilometers (8 miles) south of downtown Kansas City, Missouri. KCP occupies 55 hectares (136 acres) of the complex and is under the custody and control of DOE's National Nuclear Security Administration (NNSA). Approximately 14,000 square meters (150,000 square feet) of existing storage space within KCP could be available for the long-term storage of mercury.

On October 11, 2011, NNSA published a Notice of Availability (NOA) in *Federal Business Opportunities* soliciting proposals from entities that might be interested in the KCP property (NNSA 2011). Through the NOA process, NNSA determined that only land uses consistent with mixed use (industrial, warehouse, and office) are feasible. Subsequent to the NOA, NNSA prepared an environmental assessment to evaluate the proposed action of transferring the KCP property to one or more entities for a use that is different than its current use (NNSA 2013a). A Finding of No Significant Impact was published along with the environmental assessment in May 2013 (NNSA 2013b). If NNSA were to finalize the conveyance of the KCP property for another use prior to DOE's issuing a ROD for the long-term management and storage of elemental mercury, then the Bannister Federal Complex's KCP would no longer be considered a reasonable alternative in this SEIS.

Savannah River Site's E Area: SRS is located in south-central South Carolina and occupies approximately 80,290 hectares (198,400 acres) in Aiken, Barnwell, and Allendale Counties. SRS is owned by the Federal Government and managed by DOE. E Area is located in the central part of SRS. The current land use designation for E Area is Site Industrial Use. E Area, which includes the Old Burial Ground, Mixed Waste Management Facility, transuranic waste pads, and E Area Vaults, receives low-level radioactive, transuranic, and mixed low-level radioactive waste from all site areas. The new facility would be located in E Area of SRS.

Waste Control Specialists, LLC, Site: Waste Control Specialists, LLC, a commercial entity, owns and operates a 541-hectare (1,338-acre) site for the treatment, storage, and landfill disposal of various hazardous and radioactive wastes. The WCS site is located approximately 50 kilometers (31 miles) west of Andrews, Texas, and 10 kilometers (6 miles) east of Eunice, New Mexico. The new mercury storage facility would be located either north or south of the existing WCS complex of buildings. The Container Storage Building, an existing building located within WCS, is presently configured to store hazardous waste and, with minor modifications, could provide storage of up to approximately 2,000 metric tons (2,200 tons) of elemental mercury.

WCS is licensed by the U.S. Nuclear Regulatory Commission to dispose of low-level radioactive waste. A portion of the WCS site, a 36.4-hectare (90-acre) burial site known as the Federal Waste Facility, has been designated for disposal of DOE low-level radioactive waste. The first shipment of low-level radioactive waste was received in June 2013. The Federal Waste Facility will be the responsibility of the Federal Government after it closes (Blaney 2013; WCS 2013).

2.3.2 WIPP Facility and Vicinity

WIPP is the Nation's only underground repository for the permanent disposal of defense-generated transuranic waste. The WIPP site is located in Eddy County in the Chihuahuan Desert of southeastern New Mexico (see Figure 2–6). The site is about 42 kilometers (26 miles) east of Carlsbad in a region known as Los Medaños, a relatively flat, sparsely inhabited plateau with little surface water. The WIPP site encompasses approximately 41 square kilometers (16 square miles) under the jurisdiction of DOE pursuant to the Waste Isolation Pilot Plant Land Withdrawal Act (WIPP LWA) (P.L. 102-579). The WIPP site covers 16 sections (each section is 2.6 square kilometers [1 square mile]) of Federal land in Township 22 South, Range 31 East, and is divided into four areas under DOE control (see Figures 2–6 and 2–7). A chain-link fence surrounds the innermost Property Protection Area, which includes all of the surface facilities. Surrounding this inner area is the Exclusive Use Area, which is surrounded by a barbed-wire fence. Enclosing these two areas is the Off-Limits Area, which is unfenced to allow livestock grazing but, like the other two areas, is patrolled and posted against trespassing or other land uses. Beyond the Off-Limits Area, the land is managed under the traditional public land use concept of multiple uses, but mining and drilling are restricted. The WIPP site includes all of the necessary surface and subsurface facilities to manage waste handling and disposal operations. In the Notice of Intent published on June 5, 2012, DOE identified two candidate locations that would be evaluated in an SEIS for the long-term management and storage of elemental mercury. After consideration of scoping comments received that identified potash mining interests in the area, DOE decided to evaluate a third candidate location. A total of three options for long-term storage of mercury in the vicinity of WIPP have been identified: (1) new construction in Section 10 outside the land withdrawal boundary (LWB); (2) new construction in Section 20 inside the LWB;[7] and (3) new construction in Section 35 outside the LWB. These locations will be referred to individually as "WIPP Vicinity Section 10"; "WIPP Vicinity Section 20"; and "WIPP Vicinity Section 35" or together as the "WIPP Vicinity reference locations." Figures 2–6 and 2–7 show the WIPP facility relative to the WIPP Vicinity reference locations.

[7] The WIPP LWA (P.L. 102-579) was signed into law on October 20, 1992, and was later amended by the WIPP LWA Amendments of 1996 (P.L. 104-201). The WIPP LWA withdrew approximately 41 square kilometers (16 square miles) of land from the public domain for the purpose of creating and operating WIPP, the geologic repository in New Mexico designated as the national disposal site for transuranic waste generated by atomic energy defense activities.

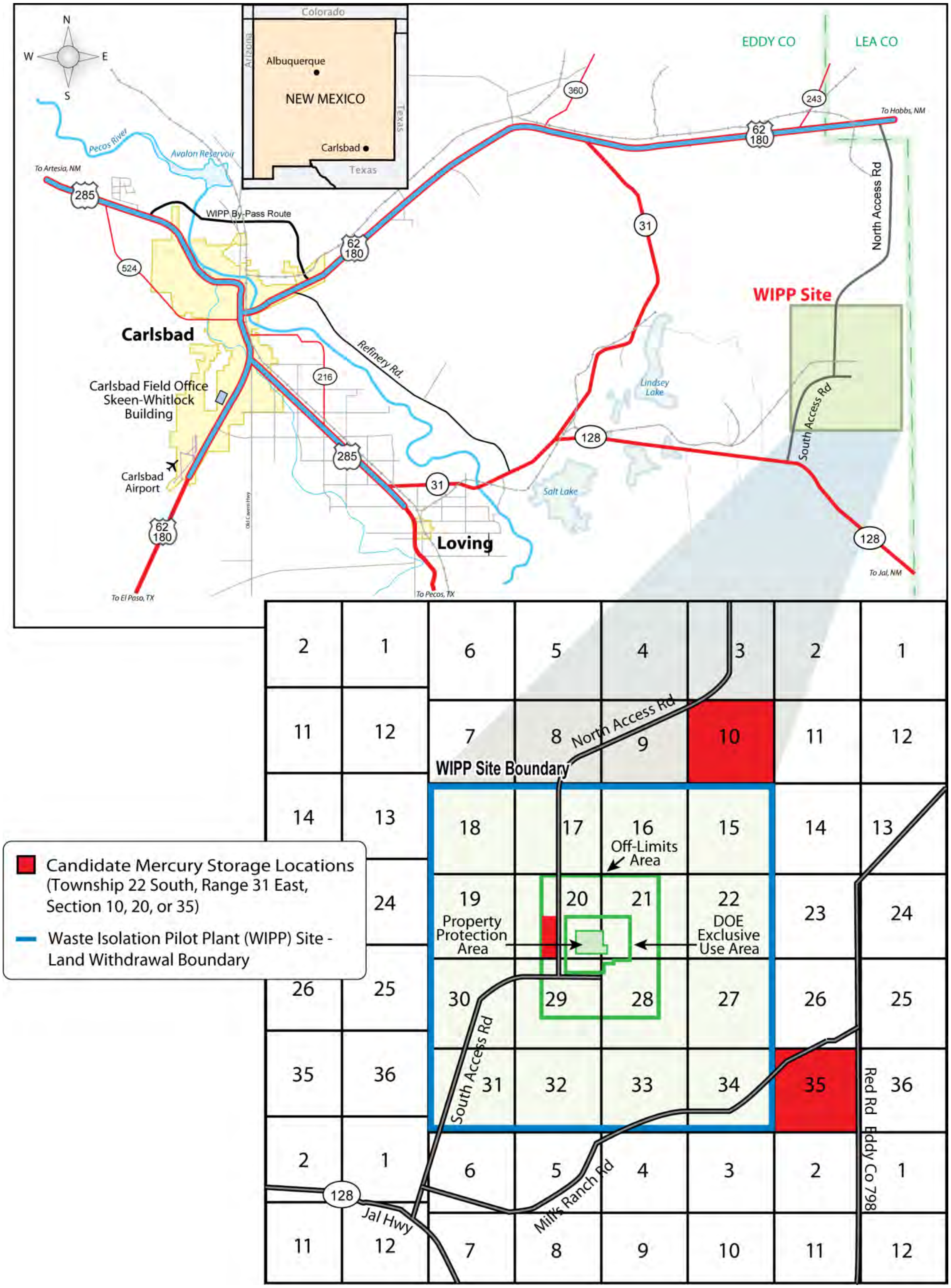

Figure 2–6. WIPP Facility in State of New Mexico

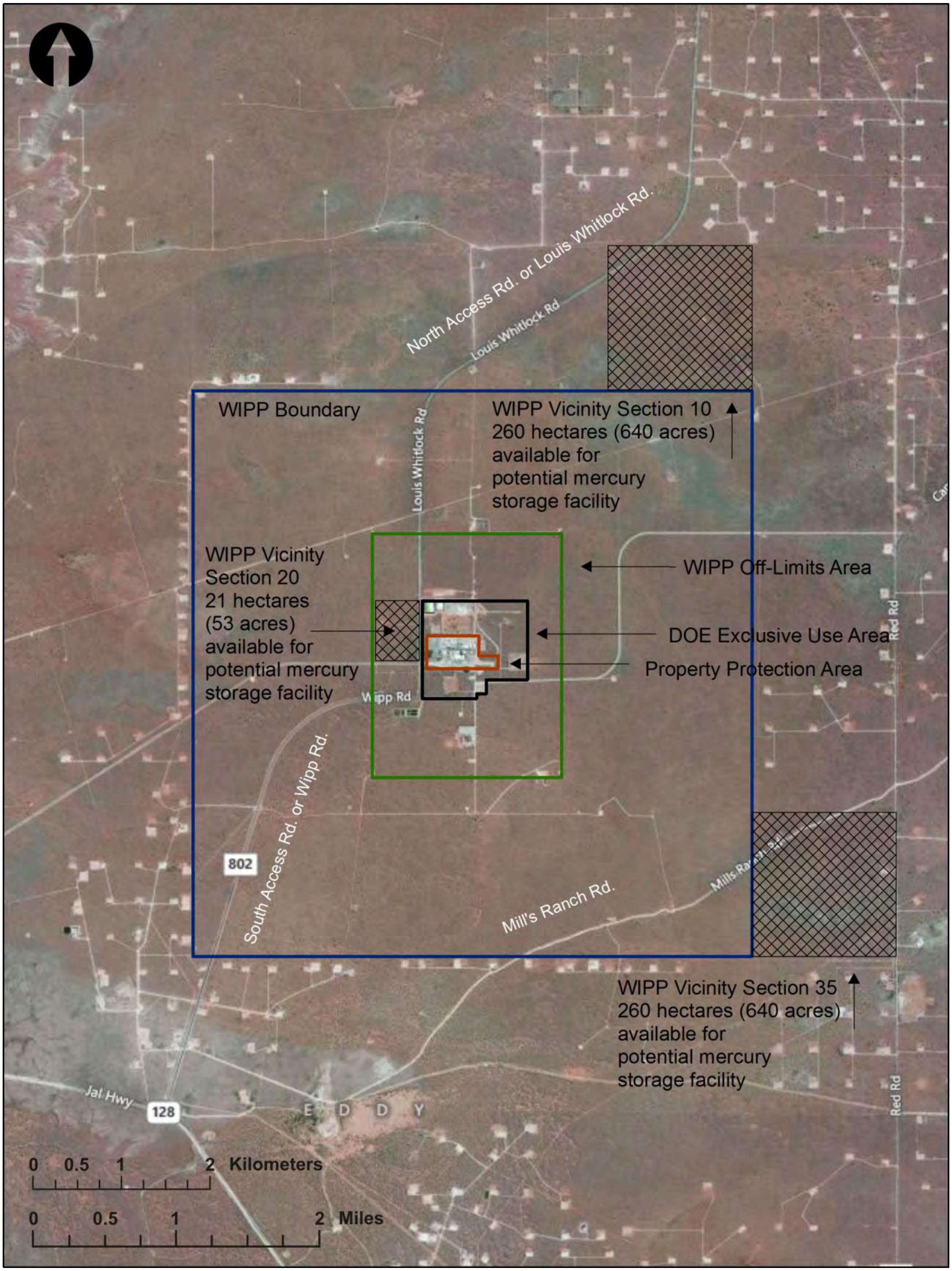

Figure 2–7. WIPP Vicinity Reference Locations

2.3.2.1 WIPP Vicinity Section 10

This alternative involves construction of a new facility, as described in Appendix C, Section C.2. The new facility would be located in Section 10, Township 22 South, Range 31 East, approximately 5.6 kilometers (3.5 miles) north of the WIPP facility, as illustrated in Figures 2–6 and 2–7. A full-size mercury storage facility with up to a 10,000-metric-ton (11,000-ton) capacity would occupy 3.1 hectares (7.6 acres) of the available (approximately 260-hectare [640-acre]) area proposed for locating the facility, as shown in Figure 2–7. The available area for siting a mercury storage facility is not confined to any particular part of Section 10; therefore, the entire 260-hectare (640-acre) Section 10 is defined as the available area. However, it may be more advantageous to site the facility near the North Access Road for truck access and connection to existing utility infrastructure. Truck and rail access are available at the WIPP site.

2.3.2.2 WIPP Vicinity Section 20

This alternative involves construction of a new facility, as described in Appendix C, Section C.2. The new facility would be located in Section 20, Township 22 South, Range 31 East, across the WIPP access road to the west of the WIPP facility within the DOE Exclusive Use Area, as illustrated in Figures 2–6 and 2–7. As shown in Figure 2–7, a full-size mercury storage facility with up to a 10,000-metric-ton (11,000-ton) capacity would occupy 3.1 hectares (7.6 acres) of the available (approximately 21-hectare [53-acre]) area proposed for locating the facility. The available area is defined to the south by a rail line, the east by North Access Road, the west by the boundary of the Off-Limits Area, and the north by the lateral extension of the Exclusive Use Area boundary. Truck and rail access are available at the WIPP site.

2.3.2.3 WIPP Vicinity Section 35

This alternative involves construction of a new facility, as described in Appendix C, Section C.2. The new facility would be located in Section 35, Township 22 South, Range 31 East, approximately 5.6 kilometers (3.5 miles) southeast of the WIPP facility, as illustrated in Figures 2–6 and 2–7. A full-size mercury storage facility with up to a 10,000-metric-ton (11,000-ton) capacity would occupy 3.1 hectares (7.6 acres) of the available (approximately 260-hectare [640-acre]) area proposed for locating the facility, as shown in Figure 2–7. The available area for siting a mercury storage facility is not confined to any particular part of Section 35; therefore, the entire 260-hectare (640-acre) Section 35 is defined as the available area. However, it may be more advantageous to site the facility near Mill's Ranch Road or Red Road for truck access and connection to existing utility infrastructure. Truck and rail access are available at the WIPP site.

2.4 PREFERRED ALTERNATIVE

In the January 2011 *Mercury Storage EIS*, DOE identified WCS near Andrews, Texas, as the Preferred Alternative for the long-term management and storage of elemental mercury. Based on analysis in this SEIS and public comment, DOE has not changed its Preferred Alternative. DOE will make a decision no sooner than 30 days after publication of the U.S. Environmental Protection Agency NOA for the *Final Mercury Storage SEIS* in the *Federal Register*. The selection of a site will be based on the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors and will be announced in a ROD in the *Federal Register*.

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

A number of alternatives were considered but were not evaluated in detail. As required by Council on Environmental Quality regulations (40 CFR 1502.14(a)), the reasons for elimination of these alternatives from detailed study are presented in Chapter 2, Section 2.6, of the January 2011 *Mercury Storage EIS* (DOE 2011). Alternatives may be eliminated from further consideration because of technical immaturity, regulatory unacceptability, or because they do not support the purpose and need for the proposed action.

2.6 COMPARISON OF ALTERNATIVES

This section presents a comparison of alternatives analyzed in this SEIS and the January 2011 *Mercury Storage EIS*, including the No Action Alternative. The analyses presented in the January 2011 *Mercury Storage EIS* remain valid and are incorporated into this SEIS with two exceptions: (1) the occupational and public health and safety analysis; and (2) the socioeconomics and environmental justice analysis. This SEIS includes updates to the occupational and public health and safety analysis resulting from changes to the definition of severity levels (i.e., magnitude of impacts) for acute-inhalation exposures to the public under certain accident scenarios. This SEIS also includes updates to the socioeconomics and environmental justice analyses to incorporate 2010 decennial census information that was not available at the time the January 2011 *Mercury Storage EIS* was published. The updates to the analyses are presented in Appendix B and Appendix E of this SEIS and are also included as appropriate in the comparison of alternatives presented in this section. Relevant information and data from the January 2011 *Mercury Storage EIS* that remain unchanged have been reproduced and presented in this SEIS for the convenience of the reader. Table 2–1 presents a comparison of key physical setting and location factors, i.e., those factors that provide some means of discerning the differences among action alternative sites regarding their surroundings, operational experience, or land use compatibility.

Depending on the resource area, environmental consequences would be negligible, similar with no discernible differences between alternatives, or vary from one alternative to another. Table 2–2 presents a summary comparison of environmental consequences across action alternatives for some resource areas. Those resource area environmental consequences that are projected to be negligible or very low under all action alternatives are not presented in Table 2–2 and include water resources, noise, ecological resources, cultural and paleontological resources, waste management, and socioeconomics.

Because of the various sites and circumstances in which mercury would be stored under the No Action Alternative, environmental consequences would be highly speculative and are not readily quantifiable or comparable to the individual storage sites analyzed under the action alternatives. Mercury storage locations under the No Action Alternative are largely undefined; thus, the potential environmental consequences of storage could be greater or smaller than those presented for the action alternatives. Environmental consequences to land use and visual resources, geology and soils, ecological resources, and cultural and paleontological resources are dependent on the affected environment disturbed and amount of land disturbance that might occur. Because the No Action Alternative could involve expansion and/or modification of storage capacities at multiple locations, it is possible that more or less land, or land with more- or less-sensitive resources than those analyzed under the action alternatives, could be affected. Potential environmental consequences to water resources would depend on the specific location and proximity to surface-water bodies and groundwater aquifers and the current use of these water resources. Therefore, the environmental consequences of the No Action Alternative on water resources could be more or less than under the action alternatives.

Table 2–1. Comparison of Action Alternatives – Physical Setting and Location Factors

	Alternatives That Use Existing Buildings			Alternatives That Require New Construction							
									WIPP Vicinity		
Site/Resource Factor	**INL RWMC**	**Hawthorne Army Depot**	**KCP**	**GJDS**	**Hanford 200-West Area**	**SRS E Area**	**WCS**	**INL INTEC**	**Section 10**	**Section 20**	**Section 35**
Site size in hectares (acres)	INL: 230,323 (569,135) RWMC: 76 (187)	59,500 (147,000)	55 (136)	146 (360)	Hanford: 151,775 (375,040) 200 Areas: 5,064 (12,513)	SRS: 80,290 (198,400) E Area: 134 (330)	Entire site: 5,460 (13,500) Facilities: 541 (1,338)	INL: 230,323 (569,135) INTEC: 107 (264)	WIPP: 4,144 (10,260) Section 10: 260 (640)	WIPP: 4,144 (10,260) Section 20: 21 (53)	WIPP: 4,144 (10,260) Section 35: 260 (640)
Compatible with land use plans?	Yes	Yes; facility use agreement between DoD and DOE may be required.	Yes	1996 MOU possible restriction on land use and current zoning – under evaluation.	Yes	Yes	Yes	Yes	BLM-administered land outside the WIPP LWB used for a mercury storage facility would be withdrawn from all forms of entry, appropriation, and disposal under the public land laws and reserved for the purposes of operating a mercury storage facility. Existing potash mining lease may impact siting a facility.	Land inside the WIPP LWB used for a mercury storage facility would be subject to the provisions of the WIPP LWA and may require Federal legislation.	BLM-administered land outside the WIPP LWB used for a mercury storage facility would be withdrawn from all forms of entry, appropriation, and disposal under the public land laws and reserved for the purposes of operating a mercury storage facility.
Facility or site operates under existing RCRA storage permits.[a]	Yes	Yes	No	No	Yes	Yes	Yes	Yes	WIPP operates under a RCRA storage and disposal permit.		
Seismic risk[b]	0.12 *g*	0.57 *g*	0.05 *g*	0.14 *g*	0.18 *g*	0.17 *g*	0.12 *g*	0.12 *g*	0.08 *g*		
Nearest surface-water feature	Big Lost River Channel 1.6 km (1 mile) northwest. Diversion spread areas (intermittent and seasonal) 1.6 km (1 mile) west.	Walker Lake 5.0 km (3.1 miles) northwest.	Blue River borders site to the east and Indian Creek borders site to the south.	Cheney Reservoir 0.6 km (1 mile) southeast.	Columbia River 10 km (6.2 miles) north. Cold Creek (ephemeral) 4.8 km (3 miles) south.	Upper Three Runs Creek 500 m (1,640 feet) north.	No perennial features within 16 km (10 miles). Ranch house drainage area (intermittent and seasonal) 0.4 km (0.25 miles) southeast.	Big Lost River channel 900 m (2,950 feet) northwest.	Laguna Grande de la Sal, a salt lake, approximately 13 kilometers (8 miles) to the west-southwest.		
Site in 100-year floodplain?	No	No	Yes; flood protection system designed for 500-year flood event.	No	No	No	No	Yes; diversion dam designed for 300-year flood event.	No		
Residential population within 16-km (10-mile) radius[c]	175 (9.8% minority) (18% low-income)	2,583 (23% minority) (15% low-income)	705,513 (36% minority) (13% low-income)	2,823 (14% minority) (11% low-income)	147 (38% minority) (18% low-income)	6,691 (38% minority) (20% low-income)	3,322 (47% minority) (12% low-income)	205 (11% minority) (15% low-income)	550 (44% minority) (6% low-income)	575 (45% minority) (5% low-income)	430 (44% minority) (6% low-income)
Residential population within 3.2-km (2-mile) radius[c]	0	169 (23% minority) (20% low-income)	26,192 (52% minority) (20% low-income)	194 (12% minority) (10% low-income)	0	0	27 (35% minority) (7.8% low-income)	0	36 (45% minority) (5% low-income)	21 (46% minority) (5% low-income)	13 (47% minority) (5% low-income)
Environmental justice considerations within 16-km (10-mile) radius[c]	No minority or low-income census block groups.	1 that is both a minority and low-income census block group (out of 4 blocks).	157 minority only, 5 low-income only, and 88 that are both minority and low-income census block groups (out of 659 blocks).	No minority or low-income census block groups.	2 minority only census block groups and 1 that is both a minority and low-income census block group (out of 4 blocks).	4 minority census block groups and 1 low-income census block group (out of 15 blocks).	2 minority and no low-income census block groups (out of 8 blocks).	No minority or low-income census block groups.	No minority or low-income census block groups.		
Site employment	8,485 (INL)	500–650	2,400	7	9,759 (Hanford)	8,400 (SRS)	150	8,485 (INL)	1,100 (WIPP)		

[a] This factor does not imply that a permit already exists for the storage of DOE mercury; rather, this factor is intended to establish a candidate site's experience operating under other RCRA storage permits. The conditions of any RCRA permit would have to be modified, or in some cases a new application would have to be submitted for approval.

[b] Seismic risk is based on predicted peak acceleration for an earthquake event expected to occur once in 2,500 years. Earthquake-produced ground motion is expressed in units of percent *g* (i.e., force of acceleration relative to that of Earth's gravity). Meteorological risks associated with tornadoes, hurricanes, or floods are bounded by earthquake scenario risks.

[c] Population data have been updated per 2010 census data. The January 2011 *Mercury Storage EIS* was based on 2000 census data. See Appendix E of this SEIS.

Note: Various mercury storage locations, many of which are undetermined, would be involved under the No Action Alternative; therefore, these locations are not presented in the above table. Section 2.6 presents a discussion comparing the potential environmental consequences of the No Action Alternative against those of the action alternatives.

Key: BLM=U.S. Bureau of Land Management; DoD=U.S. Department of Defense; GJDS=Grand Junction Disposal Site; Hanford=Hanford Site; INL=Idaho National Laboratory; INTEC=Idaho Nuclear Technology and Engineering Center; KCP=Kansas City Plant; km=kilometers; LWA=Land Withdrawal Act; LWB=land withdrawal boundary; m=meters; MOU=Memorandum of Understanding; RCRA=Resource Conservation and Recovery Act; RWMC=Radioactive Waste Management Complex; SRS=Savannah River Site; WCS=Waste Control Specialists, LLC, site; WIPP=Waste Isolation Pilot Plant.

Table 2–2. Comparison of Action Alternatives – Environmental Consequences

Resource/Site	Alternatives That Use Existing Buildings			Alternatives That Require New Construction							
	INL RWMC	Hawthorne Army Depot	KCP	GJDS	Hanford 200-West Area	SRS E Area	WCS	INL INTEC	WIPP Vicinity Section 10	WIPP Vicinity Section 20	WIPP Vicinity Section 35
Land use and visual resources	New land would not be disturbed nor would any of the proposed existing buildings have to be expanded to accommodate the long-term storage of mercury. Therefore, there would be no impacts on land use or visual resources.			Construction of a new mercury storage facility(ies) would disturb approximately 3.1 hectares (7.6 acres) of land. Because of the low profile of a new storage building, there would be minimal impacts on visual resources.							
Geology and soils	None	May require minor trenching for utility connections.	None	Potentially would disturb and expose up to 3.1 hectares (7.6 acres) of land (i.e., soil) to a depth of approximately 60 centimeters (24 inches) for 6 months. Geologic resource commitments for construction of a new facility(ies) would include approximately 4,755 cubic meters (6,220 cubic yards) of concrete and 3,875 cubic meters (5,070 cubic yards) of crushed stone.							
Air quality	Negligible air emissions would occur for modification of existing buildings. Operation of a long-term mercury storage facility(ies) would not involve the treatment or processing of mercury; therefore, air emissions would be negligible and limited to employee vehicles, trucks, semiannual testing of emergency generators, and venting of residual mercury vapors. Truck and/or rail transport of mercury would result in negligible emissions of criteria and toxic air pollutants.			Minor short-term air quality impacts would occur during construction of a new storage facility(ies), primarily due to dust generation and emissions from heavy equipment. Operation of a long-term mercury storage facility(ies) would not involve the treatment or processing of mercury; therefore, air emissions would be negligible and limited to onsite employee vehicles, trucks, semiannual testing of emergency generators, and venting of residual mercury vapors. Truck and/or rail transport of mercury would result in negligible emissions of criteria and toxic air pollutants.							
	Carbon dioxide would be generated from fuel-burning equipment used in construction of a new facility(ies), if applicable, and from transportation of mercury to the storage facility(ies); however, emissions (maximum of 3,699 metric tons [4,077 tons]) would be negligible compared with the annual worldwide generation of carbon dioxide (estimated at 26.4 billion metric tons [29.1 billion tons]) and would have a negligible effect on the global climate.										
Infrastructure	Negligible; capacity would meet increased demands.	Negligible; capacity would meet increased demands.	Negligible; capacity would meet increased demands.	Moderate; electrical capacity would have to be increased. No public water supply. No rail access.	Negligible; capacity would meet increased demands.	Negligible; capacity would meet increased demands.	Negligible; capacity would meet increased demands.	Negligible; capacity would meet increased demands.	Minor upgrades would be required to provide water and sanitary service to site. Moderate impacts on electrical infrastructure. Negligible impacts on available infrastructure capacities.	Minor upgrades would be required to connect water and sanitary service to existing WIPP infrastructure. Moderate impacts on electrical infrastructure. Negligible impacts on available infrastructure capacities.	Minor upgrades would be required to provide water and sanitary service to site. Moderate impacts on electrical infrastructure. Negligible impacts on available infrastructure capacities.
Occupational and public health and safety[a]											
Normal operations[b]	SL-I consequences and negligible risk to involved workers, noninvolved workers, and members of the public at all sites.										
Facility accidents[b]	Consequences range from SL-I to SL-II with an associated negligible-to-low risk to involved workers and noninvolved workers from both inside and outside spills. Consequences of SL-I with an associated negligible risk to public receptors from inside and outside spills.										
Transportation[a, c]											
Truck kilometers (miles)	2,662,210 (1,654,225)	3,127,892 (1,943,587)	2,230,117 (1,385,734)	2,509,474 (1,559,319)	3,399,774 (2,112,527)	2,707,719 (1,682,503)	2,907,276 (1,806,502)	2,662,210 (1,654,225)	3,007,088 (1,868,523)		
Annual truck accident fatalities[d]	9.2×10^{-4}	1.1×10^{-3}	7.8×10^{-4}	8.7×10^{-4}	1.2×10^{-3}	9.4×10^{-4}	1.0×10^{-3}	9.2×10^{-4}	1.0×10^{-3}		
Truck accident – human health[b]	For spills onto the ground with subsequent evaporation of mercury, the frequency component of the human health risk would be negligible. The risk would also be negligible. Consequences could be in the SL-I, SL-II, SL-III, or SL-IV range. However, SL-III and SL-IV would only be encountered at short distances (< 100 meters [330 feet]). For direct spills of mercury into water, the consequences could be SL-I or SL-II with a negligible-to-low risk (but with a large degree of uncertainty). For truck accidents with fires, acute-inhalation exposures could be in the SL-I, SL-II, or SL-III range, all with corresponding low risks. For deposition directly onto the ground, consequences would be SL-I with negligible risks. For deposition onto the surface of a water body with subsequent human consumption of fish, the frequency side of the risk estimate is always negligible for fish consumption above the SL-I/SL-II threshold at the national average consumption rate and for subsistence fishermen at the average and 95th percentile consumption rates, with negligible risks. However, in severe cases, there is the potential for contaminating water bodies above the SL-I/SL-II threshold (but still with negligible risk) for the 95th percentile subsistence fisherman up 7,000 meters (23,000 feet) downwind.										

Table 2–2. Comparison of Action Alternatives – Environmental Consequences *(continued)*

	Alternatives That Use Existing Buildings			Alternatives That Require New Construction							
									WIPP Vicinity		
Resource/Site	**INL RWMC**	**Hawthorne Army Depot**	**KCP**	**GJDS**	**Hanford 200-West Area**	**SRS E Area**	**WCS**	**INL INTEC**	**Section 10**	**Section 20**	**Section 35**
Transportation[a, c] *(continued)*											
Rail kilometers (miles)	600,162 (372,924)	635,564 (394,922)	403,890 (250,966)	510,579 (317,260)	729,541 (453,317)	461,068 (286,495)	634,260 (394,112)	600,162 (372,924)	685,920 (426,212)		
Annual rail accident fatalities[d]	1.5×10^{-4}	1.6×10^{-4}	1.0×10^{-4}	1.3×10^{-4}	1.9×10^{-4}	1.2×10^{-4}	1.6×10^{-4}	1.5×10^{-4}	1.7×10^{-4}		
Rail accident – human health[b, e]	For spills of mercury onto the ground with subsequent evaporation of mercury, the frequency component of the human health risk would be negligible. The risk would also be negligible. Consequences could be in the SL-I, SL-II, SL-III, or SL-IV range. However, SL-III and SL-IV would only be encountered at short distances (< 100 meters [330 feet]). For direct spills of mercury into water, the consequences could be SL-I or SL-II with a negligible-to-low risk (but with a large degree of uncertainty). For railcar accidents with fires, acute-inhalation exposures could be in the SL-I, SL-II, or SL-III range with low risks. For deposition directly onto the ground, consequences would be SL-I with negligible risks. For deposition onto the surface of a water body with subsequent human consumption of fish, the frequency side of the risk estimate is always negligible for fish consumption at the national average consumption rate and for subsistence fishermen at the average and 95th percentile consumption rates, with negligible risks, with the exception of the dry deposition case, in which there is a low predicted frequency that the 95th percentile subsistence fisherman could be exposed above the SL-I/SL-II threshold. In severe cases, there is the potential for contaminating water bodies above the SL-I/SL-II threshold for the 95th percentile subsistence fisherman up to 10 kilometers (6.2 miles) downwind.										
Ecological impacts[a, b, c]	In the Truck Scenarios with dry deposition, three receptors could potentially be exposed at the SL-II level with a corresponding low risk: sediment-dwelling biota, soil invertebrates, and plants. All other ecological receptors would be exposed at the SL-I level with negligible risk. In the Truck Scenario with rain, only one ecological receptor could potentially be exposed at the SL-IV level: sediment-dwelling biota. The corresponding risk would be moderate. In the same accident scenario, soil invertebrates could be exposed at the SL-III level, with a corresponding low risk. Plants, the American robin, and the river otter could be exposed at the SL-II level, with corresponding low risk. All other ecological receptors would be exposed at the SL-I level with negligible risk. For Railcar Scenarios with dry deposition, sediment-dwelling biota could be exposed at the SL-III level with corresponding low risk; soil invertebrates, plants, and the American robin at the SL-II level with corresponding low risk; and all other ecological receptors at the SL-I level with corresponding negligible risk. For Railcar Scenarios with rain, the frequency of exposure of any ecological receptor is negligible and all risks would be negligible. Exposures within this negligible risk range could be SL-IV (sediment-dwelling biota and soil invertebrates), SL-III (plants), and SL-II (American robin, aquatic biota, and short-tailed shrew). Note that, in all transportation scenarios, aquatic biota, the short-tailed shrew, the great blue heron, and the red-tailed hawk have negligible predicted ecological risk.										
Environmental justice[f]	None	No disproportionately high and adverse impacts. Potential transportation routes are adjacent to identified minority and/or low-income populations; transportation accidents are predicted to pose a negligible-to-low risk to human health.	No disproportionately high and adverse impacts. Potential transportation routes are adjacent to identified minority and/or low-income populations; transportation accidents are predicted to pose a negligible-to-low risk to human health.	None	No disproportionately high and adverse impacts. Potential transportation routes are adjacent to identified minority and/or low-income populations; transportation accidents are predicted to pose a negligible-to-low risk to human health.	No disproportionately high and adverse impacts. Potential transportation routes are adjacent to identified minority populations; transportation accidents are predicted to pose a negligible-to-low risk to human health.	No disproportionately high and adverse impacts. Potential transportation routes are near identified minority populations; transportation accidents are predicted to pose a negligible-to-low risk to human health.	None	None	None	None

[a] Risk is an assessment that is a function of the frequency of an event and the magnitude of its potential impact. See Appendix D, Section D.3.1, of this SEIS, for detailed discussion on the qualitative (i.e., negligible, low, moderate, and high) risk assessment.
[b] Consequences are presented by SLs (Severity Levels), with SL-I representing negligible-to-very-low consequences and SL-IV representing the most severe consequences. SLs are defined in Appendix D, Section D.3.1, of this SEIS.
[c] The greatest transportation impact under either Truck Scenario 1 or 2 is presented in this table; see Chapter 4 and Appendix D of this SEIS for more details. Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2, of this SEIS.
[d] Annual fatalities for truck or rail transportation are due to mechanical impacts only and represent the predicted annual average occurrence of an accident involving a fatality over the 40-year analysis period.
[e] Potential transportation impacts by rail to GJDS or WIPP Vicinity Section 10 or 35 would involve intermodal transportation: rail transport to Grand Junction/WIPP, transfer from rail to truck, and truck transport to GJDS/WIPP Vicinity Section 10 or 35.
[f] Population data have been updated per 2010 census data. The January 2011 *Mercury Storage EIS* was based on 2000 census data. See Appendix E of this SEIS.

Note: Various mercury storage locations, many of which are undetermined, would be involved under the No Action Alternative; therefore, these locations are not presented in the above table. Section 2.6 presents a discussion comparing the potential environmental consequences of the No Action Alternative against those of the action alternatives.

Key: <=less than; GJDS=Grand Junction Disposal Site; Hanford=Hanford Site; INL=Idaho National Laboratory; INTEC=Idaho Nuclear Technology and Engineering Center; KCP=Kansas City Plant; RWMC=Radioactive Waste Management Complex; SL=Severity Level; SRS=Savannah River Site; WCS=Waste Control Specialists, LLC, site; WIPP=Waste Isolation Pilot Plant.

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Impacts on infrastructure and waste management would depend on the specific infrastructure and waste management capabilities available to support the mercury storage facility(ies). Impacts on socioeconomics and environmental justice would be related to the changes in employment due to mercury storage and the minority and low-income composition of the communities near the mercury storage facility(ies). Because impacts on infrastructure, waste management, socioeconomics, and environmental justice are indeterminate for the No Action Alternative, impacts could be more or less than under the action alternatives.

Under the No Action Alternative, the management and storage of mercury may or may not be conducted in accordance with RCRA regulations. As such, it would be reasonable to conclude that there could be a heightened risk associated with facility accidents and the inconsistent management and storage of mercury containers. This could lead to greater environmental consequences associated with air quality, occupational and public health and safety, and ecological resources. In contrast, because some of the mercury might remain at the generating facilities and would not be transferred to a DOE long-term storage facility(ies), it is possible that environmental consequences associated with transportation would be somewhat less than those predicted to occur under the action alternatives.

Under the No Action Alternative, environmental consequences associated with the construction and operation of a mercury storage facility would not occur at any of the candidate sites. Conversely, under any of the action alternatives, there would be beneficial environmental consequences at the various locations where excess mercury is currently stored because the mercury would be transferred to a DOE facility(ies) for long-term storage.

Action alternatives that involve using existing buildings would result in construction-related impacts that would be very small when compared to action alternatives that involve construction of a new mercury storage facility(ies). In other words, action alternatives in which new construction occurs would likely show somewhat larger impacts than those in which an existing facility(ies) is modified with respect to certain resource areas, e.g., land use, visual resources, air quality, short-term impacts, and commitment of resources.

2.6.1 Summary of Environmental Consequences

This section summarizes the potential impacts on resources under the SEIS alternatives. Detailed descriptions and in-depth discussions of impacts on resources are provided in Chapter 4 of this SEIS. This SEIS evaluates the impacts on resource areas of the transportation, receipt, and long-term storage of mercury at a designated facility, including construction of the facility. Impacts for the action alternatives other than the WIPP Vicinity reference locations are summarized in the January 2011 *Mercury Storage EIS* Chapter 2, and a detailed discussion is presented in Chapter 4.

As described in Section 2.2.2, a new mercury storage facility(ies) could be built in a modular fashion by constructing sections of the Storage Area on an as-needed basis. The analysis in this EIS assumes that the entire facility (10,000-metric-ton [11,000-ton] capacity) would be constructed at the same time, thereby evaluating the maximum or peak impacts that could reasonably be expected. If the facility(ies) were to be constructed in a modular fashion, impacts would be spread over a longer period and would occur at different times; however, the peak of these impacts would be less.

The No Action Alternative would affect all sources of mercury. Excess mercury that could not be sold would be stored as a commodity to the extent allowed by law. Some mercury would likely be considered waste and would be stored in accordance with law. Such storage would not necessarily occur at the sites identified as potential sources of excess mercury. This storage service might be provided by a commercial waste management company or companies. In brief, such facilities could vary in location, size, natural and human environments, and in the nature of their operations. Therefore, the potential impacts of such storage are speculative. The approximately 1,200 metric tons (1,300 tons) of DOE mercury currently stored in 35,000 of the 3-L flasks at Y–12 would continue to be managed and stored in this location. No new construction would be required at Y–12, nor would any incremental increase in impacts on resource areas occur because storage operations at Y–12 would not change. A discussion on environmental consequences under the No Action Alternative is provided in Chapter 4 of the January 2011 *Mercury Storage EIS*.

On January 1, 2013, the prohibition on the export of mercury went into effect pursuant to the Mercury Export Ban Act of 2008. As of August 31, 2013, seven waste management companies have notified DOE of their intent to store mercury at RCRA-permitted facilities in accordance with Section 5(g)(2)(B) of the Act. The companies and storage locations that have submitted notifications are (1) Chemical Waste Management, Inc., at its facility in Emelle, Alabama; (2) Clean Harbors Environmental Services, Inc., at its facility in Phoenix, Arizona; (3) Clean Harbors Environmental Services, Inc., at its facility in Wichita, Kansas; (4) EQ Detroit, Inc., at its facility in Detroit, Michigan; (5) Lamp Environmental Industries, Inc., at its facility in Hammond, Louisiana; (6) Veolia ES Technical Solutions, L.L.C., at its facility in Port Washington, Wisconsin; and (7) Waste Management Mercury Waste, Inc., at its facility in Union Grove, Wisconsin.[8] All of these companies have certified that they will ship the elemental mercury to a DOE-designated facility(ies), when such a facility(ies) is operational and ready to accept the mercury (Clean Harbors 2012, 2013; EQ Detroit 2013; LEI 2013; Veolia 2013; WM and Chemical 2012).

2.6.1.1 Land Use and Visual Resources

For the WIPP Vicinity reference locations, the required land disturbance for the construction of a mercury storage facility would be approximately 3.1 hectares (7.6 acres). Additionally, the low profile of a long-term mercury storage building, if it were to be constructed, would have minimal impacts on visual resources and would not change the U.S. Bureau of Land Management visual resource management classifications.

As discussed in Chapter 4, Section 4.2.1, and Chapter 5, Section 5.2, land administered by the U.S. Bureau of Land Management at WIPP Vicinity Section 10 or WIPP Vicinity Section 35, both located outside the WIPP LWB, used for construction and operations of a long-term management and storage facility for elemental mercury would be withdrawn from all forms of entry, appropriation, and disposal under the public land laws and reserved for the purposes of operating a mercury storage facility pursuant to the Federal Land Policy and Management Act of 1976. Potash mining in the region surrounding WIPP, including an existing lease for future underground mining operations in Section 10, may influence the ability to site a mercury storage facility due to the potential for increased risk of land subsidence.

Land at WIPP Vicinity Section 20 inside the WIPP LWB used for construction and operations of a long-term management and storage facility for elemental mercury would be subject to the provisions of the WIPP LWA (P.L. 102-579) and may require Federal legislation.

2.6.1.2 Geology, Soils, and Geologic Hazards

Construction of a new storage facility would expose surficial soils for a duration of up to 6 months. These activities would disturb up to 3.1 hectares (7.6 acres) at a depth less than 60 centimeters (24 inches) for the installation of a reinforced-concrete slab and asphalt-covered lots on a compacted gravel base. Some trenching may be required below 60 centimeters (24 inches) for the installation of utilities or concrete footers. Adherence to best management practices for erosion and sediment control would be

[8] The listing of companies by name is for informational purposes only and does not imply or suggest an endorsement by DOE. Until such time that DOE has designated a facility(ies) and is ready to accept mercury for long-term management and storage, similar notifications may be received by DOE from other waste management companies.

implemented during periods of construction to mitigate impacts due to soil erosion and loss. Geologic resources would include approximately 4,755 cubic meters (6,220 cubic yards) of concrete and 3,875 cubic meters (5,070 cubic yards) of crushed stone. These resources are commonly available, and the quantities are relatively small for a construction project and would not impact regional supplies. However, small trenches may need to be excavated to connect utilities to the proposed buildings, particularly for the WIPP Vicinity Section 10 and WIPP Vicinity Section 35 candidate sites.

Geologic hazards from earthquakes would potentially have an adverse effect on a mercury storage facility and the surrounding area. The predicted peak ground acceleration from a seismic event with an annual probability of occurrence of once in 2,500 years for the WIPP Vicinity reference locations is 0.08 *g*. A qualitative description of predicted damage for such an event is slight damage to ordinary structures and no damage to properly designed and constructed buildings. The final design for construction of a new facility or modification to existing buildings would take seismic risk into consideration to protect the public, workers, and the environment from potential adverse effects of a significant seismic event. Therefore, facilities built in an area of higher seismic risk could involve additional design and construction considerations than facilities built in an area of lower seismic risk.

2.6.1.3 Water Resources

Ground-disturbing activities performed involving the construction of a new mercury storage facility would be conducted with best management practices in place. Appropriate permits would be obtained and a stormwater pollution prevention plan and soil erosion and sediment controls would be implemented to minimize potential water quality impacts. Construction of a new mercury storage facility would require approximately 1,270,000 liters (336,000 gallons) of water over the 6-month construction period for dust suppression and for potable and sanitary needs.

During operation of a mercury storage facility, best management practices for storage of mercury would be employed to prevent spills and releases of mercury into the environment, including the use of spill trays under mercury containers, spill containment features, and regular inspections in accordance with RCRA regulations. Operation of a mercury storage facility under all action alternatives would require 88,500 liters (23,375 gallons) of water per year for potable and sanitary needs.

2.6.1.4 Meteorology, Air Quality, and Noise

As discussed in Chapter 4, meteorological risks associated with tornadoes, hurricanes, or floods are bounded by earthquake scenario risks. Seismic risks have been previously discussed in Section 2.6.1.2.

Minor short-term air quality impacts would occur under those alternatives involving construction of a new storage facility. These impacts would include a small increase in criteria and toxic air pollutant emissions from construction equipment and earth-disturbing activities in the immediate vicinity of the construction site that would occur only during working hours. Emissions would occur over a 6-month construction period and would not exceed any ambient air quality standard. Air emissions during modification of existing buildings for mercury storage would be negligible.

Operation of a long-term mercury storage facility would not involve the treatment or processing of mercury; therefore, air emissions are projected to be negligible and limited to employee vehicles, trucks, semiannual testing of emergency generators, and the occasional exhausting of air from the Storage Areas. Occasionally, mercury containers would need to be emptied and repackaged in the Handling Area. Repackaging of mercury in new containers would generate some mercury vapors. The Handling Area would be outfitted with a vacuum air exhaust and mercury vapor filter, which would maintain air emissions exhausted to the outside at negligible concentrations during repackaging operations.

Truck and/or rail transport of mercury from various facilities to the DOE long-term mercury storage facility would generate air emissions along routes of transport. The peak year of emissions from transport of mercury is expected to occur in 2013, the first year of facility operation. The frequency of truck and/or rail shipments is expected to decrease over time. Maximum air emissions from transporting the mercury would occur under the Hanford 200-West Area alternative, as evaluated in the January 2011 *Mercury Storage EIS* (DOE 2011); expected emissions are directly proportional to the number of miles required to transport the mercury to the facility. Truck transport to Hanford is predicted to yield the highest concentrations of carbon monoxide, nitrogen dioxide, volatile organic compounds, particulate matter, and carbon dioxide, and rail transport to Hanford is predicted to yield the highest concentrations of sulfur dioxide. As discussed in the January 2011 *Mercury Storage EIS*, transport of mercury would require up to approximately 170,000 truck miles or 56,000 rail miles in its first year of operation under the Hanford 200-West Area alternative.

Carbon dioxide is a compound associated with global climate change. Peak annual carbon dioxide emissions generated from construction of a new facility at one of the WIPP Vicinity reference locations would be approximately 259 metric tons (286 tons). The second highest year of carbon dioxide emissions would be during the first year the mercury is transported by truck to the site, when emissions would be approximately 258 metric tons (285 tons) per year. Transportation by rail would result in less air emissions than for truck transportation. Comparing these values with the 26.4 billion metric tons (29.1 billion tons) of global carbon dioxide emissions estimated to have occurred worldwide from fossil fuel use annually from 2000 through 2005 and U.S. carbon dioxide annual emissions of 5.98 billion metric tons (6.59 billion tons) in 2006 (IPCC 2007), it can be concluded that the addition of carbon dioxide from implementation of the action at any of the WIPP Vicinity reference locations would have a negligible effect on the global climate.

Short-term noise impacts at the WIPP Vicinity reference locations could result from construction of a new mercury storage facility. These impacts would include some increase in traffic to the site and an increase in noise resulting from construction employee vehicles, equipment delivery, and heavy equipment operation. These impacts would occur during the 6-month construction period. Since construction noise would occur during normal working hours and only for a short period of time, the impacts are expected to be negligible. Operational activities associated with the long-term storage of mercury would not result in a measureable increase in noise above background levels. The receipt of mercury shipments by truck or rail during normal working hours would also not result in a significant increase in noise above current vehicular or rail activity.

2.6.1.5 Ecological Resources

Construction of a new facility may impact some areas that have not previously been disturbed, although none of these areas contain critical habitat or protected plant or animal species. Terrestrial habitats present within the WIPP Vicinity reference locations include desert grassland and short-grass prairie ecosystems. None of the alternatives proposed are expected to adversely impact wetlands or aquatic species. No threatened or endangered species are known or expected to occur within areas proposed under any of the alternatives. However, DOE would consult immediately with the U.S. Fish and Wildlife Service, as well as the New Mexico Department of Game and Fish, in the event that a listed species is identified within the proposed mercury storage area. Therefore, construction of a mercury storage facility at any of the WIPP Vicinity reference locations is not expected to adversely affect any ecological resources.

2.6.1.6 Cultural and Paleontological Resources

The land in the vicinity of WIPP has been determined to represent a potentially significant contributor of cultural resources. The majority of the WIPP Vicinity reference locations have not been examined for the presence of cultural resources; however, some surveys have been conducted. There are no known cultural or paleontological resources existing on WIPP Vicinity Section 10 or WIPP Vicinity Section 20. Of the seven cultural resource sites found on WIPP Vicinity Section 35, one is currently recommended as being potentially eligible for listing on the National Register of Historic Places. Also, construction of a new storage facility at any of the WIPP Vicinity reference locations is not expected to have an impact on American Indian resources. If potential historic features are identified during construction, appropriate consultations with the New Mexico State Historic Preservation Officer would be initiated to properly manage the discovery site.

2.6.1.7 Site Infrastructure

Infrastructure impacts could occur if installation of new infrastructure is required where service does not currently exist, if project demands exceed or approach available capacity, or if implementation of the alternative would otherwise disrupt service. Infrastructure resources include roads and railways, electricity, fuel, and water supplies. The frequency of mercury shipments is projected to be very small compared with baseline truck and rail traffic; therefore, existing road and rail systems would be adequate for supporting the transfer of mercury. However, direct rail shipments to WIPP Vicinity Section 10 and WIPP Vicinity Section 35 would not be possible; this mode of transportation would require rail transport to the WIPP facility, transfer of mercury to trucks, and a short truck transport of mercury to the DOE facility in Section 10 or 35.

Construction of a new facility is projected to require 193,000 liters (51,000 gallons) of diesel fuel and 1,270,000 liters (336,000 gallons) of water over a 6-month construction period. Electricity would be supplied by a diesel-fired generator. Water and fuel would be delivered by tanker truck as needed. Therefore, construction of a new facility would have negligible impacts at any of the sites because the existing infrastructure would not be used to supply any of the necessary utility resources.

Annual operation of a mercury storage facility is projected to require 253 megawatt-hours of electricity, 606 liters (160 gallons) of diesel fuel, and 88,500 liters (23,400 gallons) of water. Diesel fuel would be delivered to the site as needed to meet demand and would not impact existing infrastructure. For WIPP Vicinity Section 10 and WIPP Vicinity Section 35, minor infrastructure upgrades would be necessary to provide water and sanitary service. For WIPP Vicinity Section 20, minor infrastructure upgrades would be required to connect water and sanitary systems to existing WIPP infrastructure. In each location, moderate upgrades would be required to provide connections to electrical service. Operation of a mercury storage facility would have negligible impacts on the capacities of available infrastructure.

2.6.1.8 Waste Management

Construction of a new facility is projected to generate approximately 270 cubic meters (355 yards) of nonhazardous solid waste construction debris and 9,850 liters (2,600 gallons) of sanitary liquid waste. These volumes are comparable to a typical construction site and are expected to have negligible impacts on regional facilities.

The operation of a mercury storage facility is expected to generate a total of 910 drums (208 liters [55 gallons] each) of hazardous waste and 2,360,000 liters (623,000 gallons) of sanitary liquid waste over the 40-year period of analysis. On an annual basis, this yields approximately 23 drums of hazardous waste and 58,960 liters (15,575 gallons) of sanitary liquid waste. The hazardous waste, consisting of cleaning rags, personal protective equipment, spill response materials, and mercury vapor filters, would be shipped for offsite treatment and/or disposal in a licensed facility. Since the mercury storage facility would not involve any treatment or processing of mercury, the rate of hazardous waste generation would remain very low. Existing sanitary systems at all of the alternative sites can meet the projected sanitary liquid waste volume.

Therefore, waste management impacts for construction and operation of a mercury storage facility at any WIPP Vicinity reference location would be negligible.

2.6.1.9 Occupational and Public Health and Safety

This section provides a summary of human health consequences and associated risks to workers and members of the public. The impacts are similar for any of the WIPP Vicinity reference locations. The analysis considers various scenarios. Scenarios were developed for the following activities: (1) normal operations, (2) facility accidents, (3) transportation, and (4) intentional destructive acts (IDAs). The respective sections of Chapter 4 discuss human health consequences and associated risk analysis in detail under each of the WIPP Vicinity reference locations. This summary presents the most conservative (i.e., maximum) consequence, and thus risk, to a human receptor that could be expected to occur under certain scenarios. Consequences are presented in terms of severity levels (SLs), with SL-I representing negligible-to-very-low consequences and SL-IV representing the most severe consequences. SLs are defined for various receptor scenarios in Appendix D, Section D.3.1. Overall risk is a function of the frequency at which an event might occur and the probable severity of the event.

Normal Operations

Normal operations for the long-term storage of mercury would not involve any processing or treatment of mercury. Normal operations would involve the receipt and storage of mercury for extended periods of time. Exposures could arise during normal operating conditions from small amounts of mercury vapor accumulating in the Storage Areas. This scenario can best be described as a chronic, slow release of mercury vapor within the storage building resulting from an undetected leaking container or external contamination of a container. Under all alternatives, the consequences to involved workers, noninvolved workers, or members of the public are predicted to be negligible (i.e., SL-I), with negligible associated risks.

Facility Accidents

Facility accidents are exposure scenarios initiated by failure of engineered systems or caused by human error. Accidents could include mercury spills inside or outside the storage building. Of the various scenarios considered, those with the highest probability of occurring would likely be (1) a container or pallet drop during transfer from the transport vehicle to permanent storage (e.g., by forklift), (2) a collapse of storage racks, (3) an earthquake event, or (4) a flood event. The consequences and risks of the flood event are bounded by the earthquake analysis.

The consequences and associated risks to human health receptors would be identical under all action alternatives evaluated and are summarized in Table 2–3.

Table 2–3. Summary of Consequences and Risks from All Onsite Mercury Spill Scenarios

Scenario	Consequence (Risk)
Spills Inside Building	
Involved worker	SL-I to SL-II (Negligible to low)
Noninvolved worker[a]	SL-I (Negligible)
Member of the public	SL-I (Negligible)
Spills Outside Building	
Involved worker	SL-I to SL-II (Negligible to low)
Noninvolved worker[a]	SL-I to SL-II (Negligible to low)
Member of the public	SL-I (Negligible)

[a] A noninvolved worker is nearby (outside the building) but still on site.
Key: SL=severity level.

Transportation

Transportation consequences under all alternatives are a function of the methods of transportation (i.e., truck or rail), the number of miles traveled, and the nature of the accident. The distance between the WIPP Vicinity reference locations (approximately 5.6 kilometers [3.5 miles]) is considered a negligible difference in transportation risk calculations. Table 2–4 presents the number of kilometers that would be traveled and the annual frequency of fatal accidents that are projected to occur.

In addition to fatal accidents due to mechanical impact, exposure to mercury from spills that could result from transportation accidents could impact human health. Table 2–5 summarizes the consequences and associated risk to human health receptors under certain scenarios.

Table 2–4. Transportation Kilometers and Frequency Analysis for Transport Accidents

Mode of Transport	WIPP Vicinity Reference Locations (Sections 10, 20, and 35)	
	Kilometers (miles)	Annual Frequency of Fatal Accidents[a]
Truck[b]	3,007,088 (1,868,523)	1.0×10^{-3}
Rail[c]	685,920 (426,212)	1.7×10^{-4}

[a] Fatality caused by mechanical impact, not exposure to mercury.
[b] The greatest transportation impact under either Truck Scenario 1 or 2 is presented in this table. Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.
[c] WIPP Vicinity Sections 10 and 35 do not have direct rail access. Potential transportation impacts by rail would involve intermodal transportation: rail transport to WIPP, transfer from rail to truck, and truck transport to WIPP Vicinity Section 10 or 35.
Key: WIPP=Waste Isolation Pilot Plant.

Table 2–5. Summary of Transportation Consequences and Risks to Human Receptors

Scenario	Truck[a]	Railcar
	Consequence (Risk)	
Spill onto ground	SL-I to SL-IV (Negligible)	SL-I to SL-IV (Negligible)
Spill into water[b]	SL-I to SL-II (Negligible to low)	SL-I to SL-II (Negligible to low)
Spill with fire – inhalation	SL-III (Negligible) or SL-II (Low)	SL-III (Negligible) or SL-II (Low)
Spill with fire – dry deposition onto soil	SL-I (Negligible)	SL-I (Negligible)
Spill with fire – wet deposition onto soil	SL-I (Negligible)	SL-I (Negligible)
Consumption of methylmercury in fish – dry deposition onto water	Potentially above SL-I/SL-II (Negligible)	Potentially above SL-I/SL-II (Negligible to low)
Consumption of methylmercury in fish – wet deposition onto water	Potentially above SL-I/SL-II (Negligible)	Potentially above SL-I/SL-II (Negligible)

a The greatest transportation impact under either Truck Scenario 1 or 2 is presented in this table. Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.
b Due to a large range of uncertainty, estimating the consequences of this scenario is difficult.
Key: SL=severity level.

Intentional Destructive Acts

The most plausible scenario for an IDA in the context of mercury would be the deliberate crash of a gasoline tanker into a truck or railcar carrying mercury with a subsequent fire. Other scenarios involving an attack on a storage facility other than during unloading of a truck or railcar are judged to be less likely because of the distribution of mercury within the facility, security measures, and facility design features that would mitigate the impacts of mercury releases into the environment. Therefore, the IDA analysis summarized below applies to all the action alternatives similarly.

Human exposure pathways from an IDA include atmospheric inhalation and dry or wet deposition. The most severe case for atmospheric exposure pathways would be at the SL-III level and could occur between approximately 100 meters (330 feet) and 5.6 kilometers (3.5 miles) downwind of the release point. The deposition benchmark of 180 milligrams per kilogram in soil would not be exceeded anywhere. However, sufficient mercury could be deposited on lakes such that, in the event of rain, methylmercury might accumulate to potentially hazardous levels in fish up to 10 kilometers (6.2 miles) downwind for national average consumption rates, 20 kilometers (12.4 miles) for the average subsistence fisherman, and 40 kilometers (24.8 miles) for the 95th percentile subsistence fisherman.

2.6.1.10 Ecological Impacts

Consequences and, hence, risks to ecological receptors would be negligible except if there is a fire. The frequency of onsite fires sufficient to cause a release of mercury at any of the storage sites is predicted to be negligible; consequently, the ecological risk would also be negligible. Ecological risk would be evident only in the event of a transportation accident with fire; thus, the ecological risk would be similar under all action alternatives. Table 2–6 presents the ecological risk to various sensitive receptors.

Table 2–6. Summary of Consequences and Risk to Ecological Receptors – Transportation Accident with Pallet Fire

Receptor	Truck[a]		Railcar	
	Deposition Pathway			
	Dry	Wet	Dry	Wet
	Consequence (Risk)			
Sediment-dwelling biota	SL-II (Low)	SL-IV (Moderate)	SL-III (Low)	b (Negligible)
Soil invertebrates	SL-II (Low)	SL-III (Low)	SL-II (Low)	b (Negligible)
Plants	SL-II (Low)	SL-II (Low)	SL-II (Low)	b (Negligible)
American robin	SL-I (Negligible)	SL-II (Low)	SL-II (Low)	b (Negligible)
River otter	SL-I (Negligible)	SL-II (Low)	SL-I (Negligible)	b (Negligible)
Aquatic biota	SL-I (Negligible)	SL-I (Negligible)	SL-I (Negligible)	b (Negligible)
Short-tailed shrew	SL-I (Negligible)	SL-I (Negligible)	SL-I (Negligible)	b (Negligible)
Great blue heron	SL-I (Negligible)	SL-I (Negligible)	SL-I (Negligible)	b (Negligible)
Red-tailed hawk	SL-I (Negligible)	SL-I (Negligible)	SL-I (Negligible)	b (Negligible)

a The greatest transportation impact under either Truck Scenario 1 or 2 is presented in this table. Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.

b The predicted frequency of railcar crashes with pallet fires in the presence of rain is negligible; therefore, the associated risks would be negligible and consequences are not presented in the table.

Key: SL=severity level.

2.6.1.11 Socioeconomics

Construction of a new facility is projected to require the employment of approximately 18 people for approximately 6 months. Operation of the mercury storage facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and then approximately 5 to 6 individuals for the remainder of the analysis period. The projected employment for construction and operations and associated indirect employment would have a negligible impact on socioeconomic conditions (i.e., overall employment and population trends) for the WIPP vicinity region.

During construction of a new storage facility, it is estimated that construction-related transportation would average 45 vehicle trips per day. During operations, the greatest impact would be during the first 2 years, when it is estimated that approximately 11 vehicles a day would be associated with facility employment. At the peak of operations, it is estimated that up to 79 shipments of mercury would be made in a year. The minimal increase in the number of vehicle trips projected during construction or operations of a mercury facility over baseline vehicular traffic would be negligible for any of the WIPP Vicinity reference locations.

2.6.1.12 Environmental Justice

Analysis of census population block groups within a region of influence (ROI), defined as a 16-kilometer (10-mile) radius surrounding a site, did not identify minority or low-income communities near the WIPP Vicinity reference locations. Therefore, no disproportionately high and adverse impacts or risks are expected to occur for any population group, including the minority and low-income population groups near these candidate sites.

Five census blocks are located within 16 kilometers (10 miles) of WIPP Vicinity Section 10. Three census blocks are located within 16 kilometers of WIPP Vicinity Section 20. Three census blocks are located within 16 kilometers of WIPP Vicinity Section 35. None of the census blocks within the ROI for the WIPP Vicinity reference locations contain a high minority or low-income population. Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

2.6.2 Summary of Cumulative Impacts

The Council on Environmental Quality regulations implementing the National Environmental Policy Act define cumulative effects as "impacts on the environment which result from the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). Actions that may contribute to cumulative impacts include on- and offsite projects conducted by government agencies, businesses, or individuals that are within the ROIs of the actions considered in this SEIS. The ROIs used in the cumulative impacts analysis were generally assumed to be within a 16-kilometer (10-mile) radius of the WIPP Vicinity reference locations.

Projected impacts on the various resource areas of constructing and operating a mercury storage facility range from none, to negligible, to minor. Those resource areas that were predicted to be impacted in a minor way were evaluated for their potential to contribute to cumulative impacts within the ROI. Where impacts were predicted not to occur or were negligible, cumulative impacts were not analyzed since there would be either no or only a very small incremental increase in impacts on the resources within the ROI. Regardless of the projected level of impact, land disturbance associated with new construction and air quality impacts resulting from mercury emissions were evaluated for their potential to contribute to cumulative impacts within the ROI. Based on the criteria noted above, the analysis included an evaluation of land use, air quality, infrastructure, and ecological resources. It was determined that the potential contribution to cumulative impacts on those resource areas evaluated would be negligible. Table 2–7 summarizes the potential contributions to cumulative impacts for these resource areas. Chapter 4, Section 4.4, provides a detailed discussion of the cumulative impacts assessment and potential contributing actions that were considered. A discussion of global commons impacts is also provided in Section 4.2.4.

Table 2–7. Summary of Cumulative Impacts Assessment

Alternative	Resource Area	Cumulative Impacts	Contribution of Proposed Action to Cumulative Impacts
WIPP Vicinity Reference Locations (Sections 10, 20, and 35)	Land Use	Rural area; limited development expected within the ROI. GTCC waste disposal facility could require up to 44 hectares (110 acres) if WIPP vicinity is selected; one of the locations being considered is WIPP Vicinity Section 35. A mercury storage facility and GTCC waste disposal facility could be located within the 260-hectare (640-acre) area that comprises Section 35 without interference with operations or compromising the safety and security of these facilities. Also present within the ROI are a number of oil wells and underground potash mines located in the vicinity of WIPP, including an existing potash mine lease on WIPP Vicinity Section 10 and one oil well in WIPP Vicinity Section 35. No substantial cumulative impacts on land use.	Negligible
	Air Quality	No exceedance of air quality standards.	Negligible
	Infrastructure	No substantial cumulative impacts on regional power consumption or impact on existing capacities. A maximum of 79 shipments would be made to the proposed mercury storage facility during the peak year of operations and is not expected to appreciably increase demands on transportation systems near the WIPP Vicinity reference locations.	Negligible
	Ecological Resources	No substantial cumulative impacts on terrestrial resources or loss of habitat due to disturbance of land (see Land Use above).	Negligible

Key: GTCC=greater-than-Class C; ROI=region of influence; WIPP=Waste Isolation Pilot Plant.

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CHAPTER 3
AFFECTED ENVIRONMENT

CHAPTER 3
AFFECTED ENVIRONMENT

Chapter 3 presents a description of the affected environment for the Waste Isolation Pilot Plant (WIPP) Vicinity reference locations considered in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*, which provides the context for understanding the environmental consequences of the action alternatives described in Chapter 4. Chapter 3 of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* (DOE 2011a) presents a description of the affected environment for the other seven candidate sites being considered for the long-term management and storage of elemental mercury. As discussed in Appendix E, Section E.4, environmental documentation that has become available since publication of the January 2011 *Mercury Storage EIS* has been reviewed, and with the exception of the socioeconomics and environmental justice resource areas, no significant changes to the affected environment as presented in Chapter 3 of the January 2011 *Mercury Storage EIS* were found to be necessary. This *Mercury Storage SEIS* includes updates to the socioeconomics and environmental justice resource areas to incorporate 2010 decennial census information that was not available at the time the January 2011 *Mercury Storage EIS* was published. The updates to the affected environment descriptions for the socioeconomics and environmental justice resource areas are presented in Appendix B and Appendix E of this *Mercury Storage SEIS.* A significant portion of this chapter is based on the affected environment descriptions for the WIPP vicinity as presented in Chapter 4, Section 4.2, and Chapter 11, Section 11.1, of the *Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste* (*Draft GTCC EIS*) (DOE 2011b). Text adopted and incorporated into this supplemental environmental impact statement (SEIS), in part or in whole, from the *Draft GTCC EIS* has been reviewed, updated, or amended as necessary for the specific candidate sites analyzed in this SEIS (i.e., Sections 10, 20, and 35) and to support the impacts analysis for these sites presented in Chapter 4.

3.1 APPROACH TO DEFINING THE AFFECTED ENVIRONMENT

This chapter describes the environment at the Waste Isolation Pilot Plant (WIPP) Vicinity reference locations that could be affected through implementing the alternatives evaluated in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*. As described in Chapter 2, the WIPP Vicinity reference locations consist of three candidate sites: Section 10 outside the WIPP land withdrawal boundary (LWB); Section 20 inside the WIPP LWB; and Section 35 outside the WIPP LWB (see Figures 3–1 and 3–2). For the WIPP Vicinity reference locations, the affected environment is described for the following resource areas: land use and visual resources; geology, soils, and geologic hazards; water resources; meteorology, air quality, and noise; ecological resources; cultural and paleontological resources; infrastructure; waste management; occupational and public health and safety; socioeconomics; and environmental justice. This supplemental environmental impact statement (SEIS) provides a description of the existing environment of the WIPP site as a whole, as well as that of the WIPP Vicinity reference locations within which the proposed action would take place.

The U.S. Department of Energy (DOE) evaluated the environmental impacts of managing and storing elemental mercury[1] within defined regions of influence (ROIs). These ROIs are specific to the resource area evaluated; encompass geographic areas within which any meaningful impact is expected to occur; and can include the areas within which the proposed action would take place, the sites as a whole, or nearby or distant offsite areas. For example, impacts on historic resources were evaluated at specific facility locations within each site, whereas human health risks to the general public were assessed for an area within a 16-kilometer (10-mile) radius of the facility location. Brief descriptions of the ROIs for each resource area are given in Table 3–1; more specific information on methodology and the definition of ROIs is presented in Appendix B of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*. Appendix F, Table F–1, lists the scientific names of plants and animals used in this chapter, grouped by common name in alphabetical order.

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this SEIS.

Table 3–1. General Regions of Influence for the Affected Environment

Environmental Resource Area	Region of Influence
Land use and visual resources	The project location, the site, and nearby offsite areas
Geology, soils, and geologic hazards	The project location, the site, and nearby offsite areas
Water resources	The project location, the site, and adjacent surface-water bodies and groundwater
Meteorology, air quality, and noise	For meteorology and air quality, the site and nearby offsite areas potentially affected by air pollutant emissions; for noise, the project location, the site, and surrounding areas, including transportation corridors where proposed activities might increase noise levels
Ecological resources	The project location, the site, and nearby offsite areas
Cultural and paleontological resources	The project location and adjacent areas
Infrastructure	The project location, the site, and local areas supporting the site
Waste management	The waste management facilities located on the site
Occupational and public health and safety	The site, offsite areas, and the transportation corridors
Socioeconomics	The counties where approximately 90 percent of site employees reside
Environmental justice	The area within 16 kilometers of the site and the area within 3.2 kilometers of the site as a subset of the 16-kilometer area

Note: To convert kilometers to miles, multiply by 0.6214.

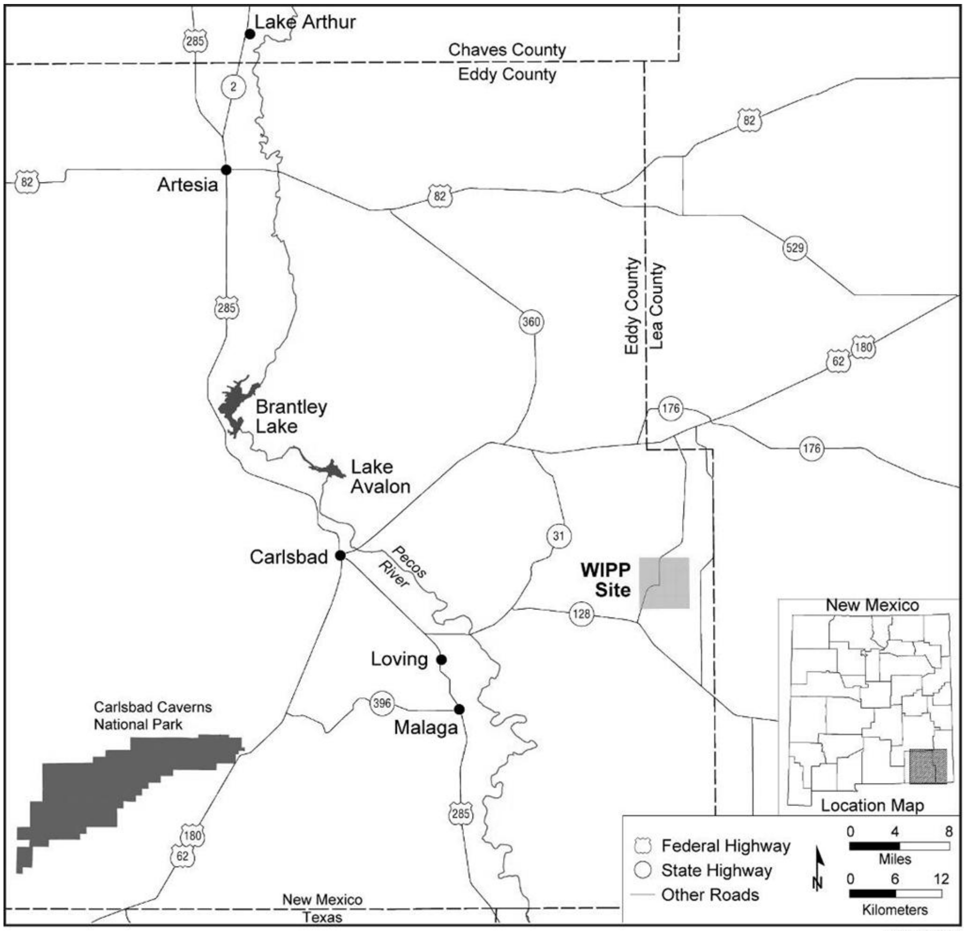
The existing environmental conditions for each resource area were determined from information provided in previous environmental impact statements and environmental studies, other government reports and databases, and relevant laws and regulations.

3.2 WASTE ISOLATION PILOT PLANT SITE AND VICINITY

3.2.1 Land Use and Visual Resources

3.2.1.1 Land Use

WIPP is the Nation's only underground repository for the permanent disposal of defense-generated transuranic (TRU) waste. The WIPP site is located in Eddy County in the Chihuahuan Desert of southeastern New Mexico (see Figure 3–1). The site is about 42 kilometers (26 miles) east of Carlsbad in a region known as Los Medaños, a relatively flat, sparsely inhabited plateau with little surface water. The WIPP site encompasses approximately 41 square kilometers (16 square miles) under the jurisdiction of DOE pursuant to the Waste Isolation Pilot Plant Land Withdrawal Act (WIPP LWA) (P.L. 102-579). The WIPP LWA transferred responsibility of the WIPP withdrawal area from the Secretary of the Interior to the Secretary of Energy. The land is permanently withdrawn from all forms of entry, appropriation, and disposal under the public land laws and is reserved for uses associated with the purposes of WIPP.



Source: DOE 2006a.

MPA100826

Figure 3–1. Location of the Waste Isolation Pilot Plant Site in Eddy County, New Mexico

The WIPP site covers 16 sections (each section is 2.6 square kilometers [1 square mile or 640 acres]) of Federal land in Township 22 South, Range 31 East, and is divided into four areas under DOE control (see Figure 3–2). A chain-link fence surrounds the innermost Property Protection Area, which includes all of the surface facilities. Surrounding this inner area is the Exclusive Use Area, which is surrounded by a barbed-wire fence. Enclosing these two areas is the Off-Limits Area, which is unfenced to allow livestock grazing but, like the other two areas, is patrolled and posted against trespassing or other land uses. Beyond the Off-Limits Area, the land is managed under the traditional public land use concept of multiple uses, but mining and drilling are restricted. The boundary of WIPP was set to extend at least 1.6 kilometers (1 mile) beyond any underground development (Sandia 2008). WIPP includes all of the necessary surface and subsurface facilities to manage waste handling and disposal operations.

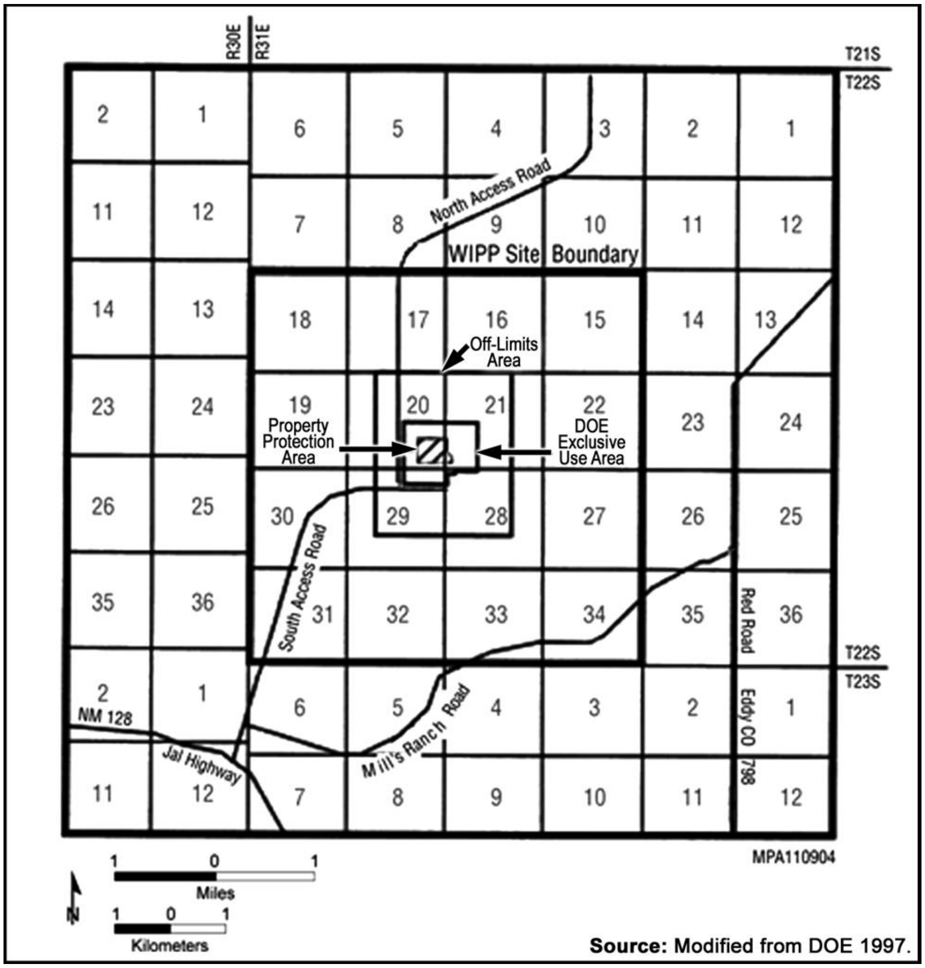


Figure 3–2. Four Property Areas Within the Waste Isolation Pilot Plant Boundary

There are four property areas adopted within the 4,146-hectare (10,240-acre) WIPP site (see Figure 3–2):

- *Property Protection Area*. This is the 14-hectare (35-acre) interior core of the site that is surrounded by a chain-link fence. It is under tight, 24-hour security.

- *Exclusive Use Area*. This 112-hectare (277-acre) area is surrounded by a barbed-wire fence and is restricted for the exclusive use of DOE and its contractors and subcontractors in support of the project. The area is marked with "no trespassing" signs and is patrolled by WIPP security personnel.

- *Off-Limits Area*. This is a 588-hectare (1,454-acre) area where unauthorized entry and introduction of weapons and/or dangerous materials are prohibited. Prohibition signs are posted at consistent intervals along its perimeter. Unless they pose a threat to security, safety, or the environmental quality of the WIPP site, grazing and public thoroughfares can occur in this area. This area is patrolled by WIPP security personnel to prevent unauthorized activities or use.

- *WIPP Site (Land Withdrawal) Boundary*. This 4,146-hectare (10,240-acre) area delineates the perimeter of the WIPP site. The LWB was established to extend at least 1.6 kilometers (1.0 mile) beyond any WIPP underground development.

Except for the facilities within the boundaries of the posted 112-hectare (277-acre) Exclusive Use Area, surface land use remains largely unchanged from its pre-1992 multiple land use designation. Those who wish to conduct activities that might affect lands that are under the jurisdiction of WIPP but outside the Property Protection Area are required by the WIPP Land Management Plan (LMP) to prepare a land use request (DOE 2007). Mining and drilling for reasons other than to support WIPP activities are prohibited within the WIPP site except at two 129-hectare (320-acre) tracts of land within the WIPP LWB that are leased for oil and gas development. These adjoining lease tracts occupy Section 31 in the far southwest corner of the WIPP site (DOE 1993).

Extensive potash mining occurs in the vicinity of WIPP outside of the LWB, particularly to the north, west, and southwest of the WIPP site. Potash leases in the vicinity of WIPP are held by two commercial mining companies: Mosaic Potash Carlsbad, Inc. and Intrepid Potash NW, LLC. In 2010, several potash leases were reassigned to Western Ag-Minerals, Inc. (a wholly owned subsidiary of Mosaic Potash Carlsbad, Inc.) from Yates Petroleum Corporation, which include Township 22 South, Range 31 East, Section 10 for future exploration (Rutley 2012).

Portions of two grazing allotments administered by the U.S. Bureau of Land Management (BLM) occur within the WIPP site boundary (DOE 1993). Nearly 5.2 percent of one 22,493-hectare (55,581-acre) allotment overlaps the WIPP site but does not include areas that are posted "no trespassing." About 9.5 percent of the other 31,393-hectare (77,574-acre) grazing allotment overlaps the remainder of the WIPP site boundary, including the Exclusive Use Area that is posted against trespassing and fenced to prevent grazing (DOE 1993).

The WIPP LMP focuses on management protocols for the following: administration of the plan, environmental compliance, wildlife, cultural resources, grazing, recreation, energy and mineral sources, land and realty, reclamation, security, industrial safety, emergency management, maintenance, and work control (DOE 1993).

Most land in the vicinity of the WIPP site is managed by BLM. Land use in the surrounding area includes livestock grazing, potash mining, oil and gas development, and recreation (e.g., hunting, camping, hiking, off-highway vehicle operation, horseback riding, and bird watching) (DOE 1993, 2007). The dominant land use in the WIPP vicinity is cattle grazing; smaller amounts of land are used for oil and gas extraction and potash mining. There is an existing oil well on WIPP Vicinity Section 35, adjacent to and southeast of the WIPP LWB. There is little privately owned land near WIPP, although two ranches are located within 16 kilometers (10 miles) of the site (DOE 1997). The only agricultural land within 48 kilometers (30 miles) is irrigated farmland along the Pecos River, near the municipalities of Carlsbad and Loving. No dry-land farming takes place near WIPP (DOE 1980).

The region is popular for recreation, providing opportunities for hunting, camping, hiking, and bird watching. The area has a very low population density, with approximately 25 residents at various locations within 16 kilometers (10 miles) of the site. The nearest community is the village of Loving, New Mexico, which is located 29 kilometers (18 miles) west-southwest of WIPP. This community has an estimated population of about 1,300 residents.

3.2.1.2 Visual Resources

BLM is responsible for managing public lands identified for multiple uses. BLM is also responsible for ensuring that the scenic values of these public lands are considered before allowing uses that may have negative visual impacts. BLM accomplishes this through its Visual Resource Management (VRM) system, a system that involves inventorying scenic values and establishing management objectives for those values through the area resource management planning process. VRM classes are based on relative visual ratings of BLM-inventoried lands. Each class describes the different degree of modification allowed to the basic elements of the landscape.

The developed areas at WIPP and in the vicinity of WIPP occur within a BLM VRM Class IV zone. The objective of VRM Class IV is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location; minimal disturbance; and repeating the basic landscape elements of color, form, line, and texture.

3.2.2 Geology, Soils, and Geologic Hazards

The geologic resources at the WIPP Vicinity reference locations are described with respect to geology, soils, and geologic hazards. Geologic resources are consolidated or unconsolidated earth material, including ore and aggregate material, fossil fuels, and significant landforms. Soil resources are the loose surface materials of the earth in which plants grow, usually consisting of disintegrated rock, organic matter, and soluble salts. Geologic hazards can include seismic activity, landslides, volcanic eruptions, and erosional processes.

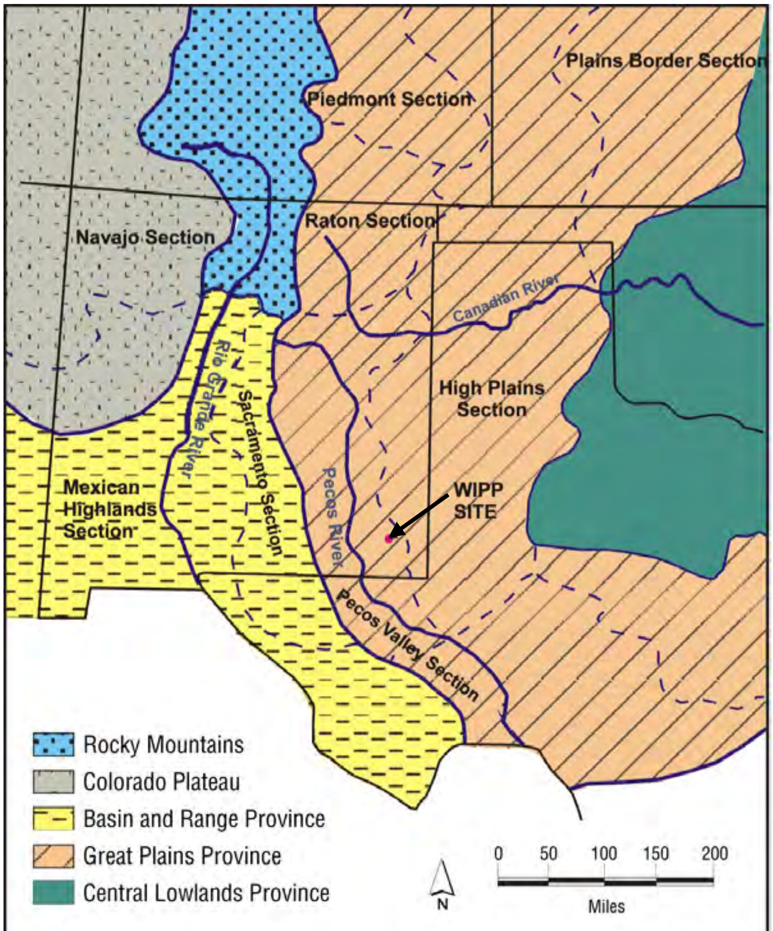
The WIPP Vicinity reference locations occupy three 2.6-square-kilometer (1-square-mile) or 260-hectare (640-acre) parcels: Section 10, which is outside and immediately adjacent to the northeast of the WIPP LWB; Section 20, which is inside the WIPP LWB; and Section 35, which is outside and immediately adjacent to the southeast of the WIPP LWB. Given the close proximity of the WIPP Vicinity reference locations to the WIPP repository site, the regional geologic setting and stratigraphy at the reference locations can be inferred from the extensive data on the WIPP site that are summarized below.

3.2.2.1 Geology

WIPP is located in southeastern New Mexico, in the Pecos Valley Section of the Great Plains physiographic province (see Figure 3–3). The terrain throughout the province varies from plains and lowlands to rugged canyons. In the immediate vicinity of WIPP, numerous small mounds formed by wind-blown sand characterize the land surface. A 410,000- to 510,000-year-old layer enriched in calcium carbonate material, the Mescalero caliche, is typically present beneath the surface layer of sand. The caliche layer overlies a 600,000-year-old volcanic ash layer (DOE 1996a). The Mescalero caliche can be found over large portions of the Pecos River drainage area and is generally considered to be an indicator of surface stability (DOE 1980).

A high plains desert environment characterizes the area. Because of the seasonal nature of the rainfall, most surface drainage is intermittent. The Pecos River, 16 kilometers (10 miles) southwest of the WIPP boundary, is a perennial river and the master drainage for the region. A natural divide lies between the Pecos River and the WIPP site. As a result, the Pecos drainage system does not currently affect the site. Local surface drainage features include Nash Draw and the San Simon Swale.

The topography of the Pecos Valley section ranges from flat plains and lowlands to rugged canyon lands, with elevations of 1,830 meters (6,000 feet) mean sea level (MSL) in the northwest, 1,520 meters (5,000 feet) MSL in the north, 1,220 meters (4,000 feet) MSL in the east, and 610 meters (2,000 feet) MSL in the south. The valley has an uneven rock floor, resulting from differential weathering of limestones, sandstones, shales, and gypsums. The Pecos Valley section is drained mainly by the Pecos River, the only perennial stream in the region. The Pecos drainage system flows to the southeast; its closest point is about 16 kilometers (10 miles) from the WIPP site. The Pecos River Valley shows characteristic lowland topography marked by widespread karst topography, with solution-subsidence features (e.g., sinkholes) resulting from dissolution of Permian rocks from the Ochoan Series (Mercer 1983; Powers et al. 1978).



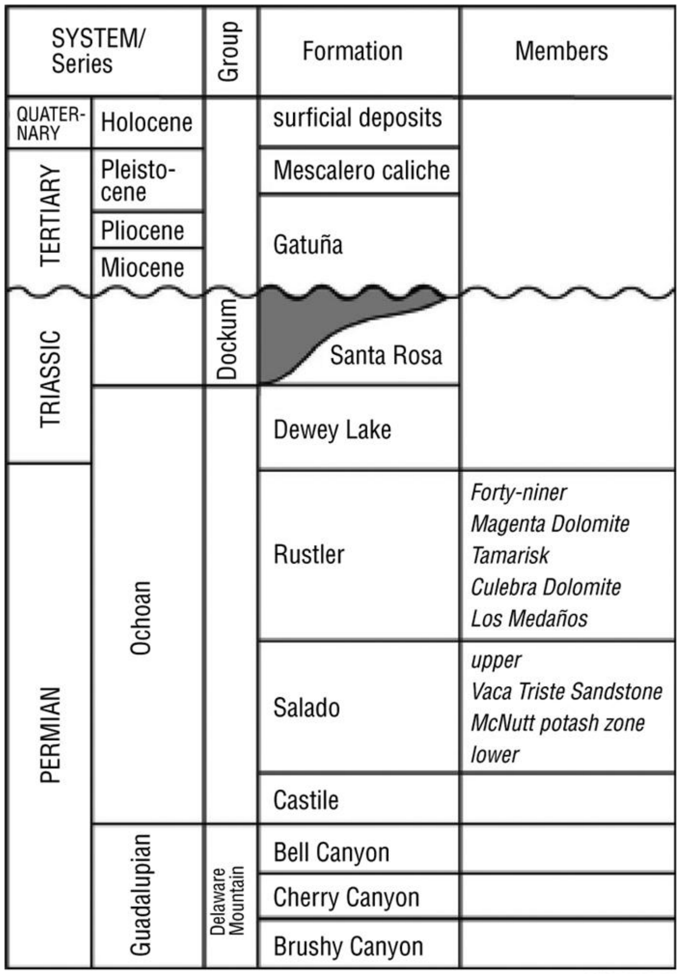
Source: DOE 1997.

Figure 3–3. Location of the Waste Isolation Pilot Plant Site Within the Great Plains Province in Southeastern New Mexico

The land surface of the WIPP site is hummocky, with numerous eolian sand ridges and dunes, and it slopes gently from an elevation of about 1,090 meters (3,570 feet) MSL at its eastern boundary to about 990 meters (3,250 feet) MSL along its western boundary. An extensive layer of hard caliche (the Mescalero caliche) lies between the surficial sand deposits and the underlying Gatuña Formation. It ranges in age from about 510,000 years at its base to 410,000 years at the top (DOE 1997; Powers et al. 1978).

The topography across the WIPP Vicinity reference locations exhibits some broad valley forms, possibly indicating areas of concentrated surface runoff and integrated drainages during prolonged rainfall events. Sand dunes are present, but are likely thinner and more uniform than local dune fields. Calcrete exposures appear as heavily vegetated semicircular features on aerial photos, particularly in a portion of WIPP Vicinity Section 35. These are thought to represent intradune areas that focus water drainage and enhance vegetation growth, causing degradation of the underlying calcrete and creating slight topographic depressions. These surface features, however, have no relationship to dissolution or subsidence of deeper evaporite units.

The WIPP site is located in the northern portion of the Delaware Basin, a structural basin underlying present-day southeastern New Mexico and western Texas that contains a thick sequence of sandstones, shales, carbonates, and evaporites. The WIPP repository is located in the Salado Formation, a massive bedded salt unit of Permian age, ranging from about 350 to 1,160 meters (1,150 to 3,800 feet) below the ground surface near the WIPP site. The WIPP disposal horizon is 655 meters (2,150 feet) below the ground surface. The sediments accumulated during the Permian period represent the thickest portion of the sequence in the northern Delaware Basin and are divided into four series (see Figure 3–4). From oldest to youngest, these series are the Wolfcampian, Leonardian, Guadalupian, and Ochoan. The Ochoan Series consists of extensive evaporite deposits; the series is divided into four formations. From oldest to youngest, these formations are Castile, Salado (the lower part of which contains the WIPP repository), Rustler, and Dewey Lake.



Source: EPA 2006. MPA011014

Figure 3–4. Stratigraphic Column for the Waste Isolation Pilot Plant Site and Surrounding Area

The following sections describe the geologic formations important to understanding the long-term performance of WIPP, starting with the host rock for the WIPP repository (the Salado Formation), the formations below the Salado (the Castile and Bell Canyon Formations), and the formations above the Salado (the Rustler, Dewey Lake, Santa Rosa, and Gatuña Formations).

- **Salado Formation.** The Permian Salado Formation is a massive bedded salt formation that is predominantly halite (sodium chloride) and is thick and laterally extensive. DOE selected the Salado Formation as the site of the WIPP repository for several geologically related reasons (DOE 1980, 1990): (1) the Salado halite units have very low permeability to fluid flow, which impedes groundwater flow into and out of the repository; (2) the Salado is regionally widespread; (3) the Salado includes continuous halite beds without complicated structure; (4) the Salado is deep with little potential for dissolution; (5) the Salado is near enough to the surface that access is reasonable; and (6) the Salado is largely free of mobile groundwater, when compared with existing mines and other potential repository sites.

The Salado Formation ranges in thickness from approximately 540 to 646 meters (1,770 to 2,120 feet). The Salado is composed of four members. From oldest to youngest, they are the Lower Member, the McNutt Potash member, the Vaca Triste Sandstone, and the Upper Member. The WIPP repository is located in the Lower Member and in the thickest part of the Salado Formation.

Although the most common Delaware Basin evaporite mineral is halite, there are less soluble layers or interbeds (dominantly anhydrite, polyhalite, and claystone) and more soluble admixtures (for example, sylvite, glauberite, kainite) within the formation. These other minerals result in chemical and physical properties of the bulk Salado that are different from those of pure halite layers contained within it. In particular, the McNutt is locally explored and mined for potassium-bearing minerals of economic interest. Within the Delaware Basin, a system is used for numbering the more significant sulfate beds within the Salado, designating these beds as marker beds (MBs) from MB100 (near the top of the formation) to MB144 (near the base). The system is generally used within the Carlsbad Potash District, as well as at and around the WIPP site. The repository is located between MB139 and MB138 (see Figure 3–4) while the potash in the McNutt is generally located between MB116 and MB126.

- **Castile Formation.** The Permian Castile Formation directly underlies the Salado Formation and typically consists of three relatively thick anhydrite/carbonate units and two thick halite units in the WIPP area. It is approximately 390 meters (1,280 feet) thick and is present from approximately 810 to 1,200 meters (2,660 to 3,940 feet) below ground surface (bgs) at the site, which is approximately 155 meters (509 feet) below the level of the repository. The more brittle anhydrite units of the Castile are locally fractured, and the fracture zones are relatively permeable and act as zones for accumulation of brine trapped in the Castile since the Permian period (DOE 1997).

- **Bell Canyon Formation.** The Permian Bell Canyon Formation underlies the Castile Formation and is composed of a layered sequence of sandstones, shales, siltstones, and limestones near the WIPP site. It is also the uppermost target of hydrocarbon exploration in the local area. It is approximately 350 meters (1,150 feet) thick and is present from approximately 1,200 to 1,550 meters (3,940 to 5,090 feet) bgs at the site. The top of the Bell Canyon is approximately 545 meters (1,790 feet) below the level of the repository.

- **Rustler Formation.** The upper Permian Rustler Formation lies above the WIPP repository and directly overlies the Salado Formation. It is divided into five members. From the base of the Rustler Formation, these members are the Los Medaños, the Culebra Dolomite, the Tamarisk, the Magenta Dolomite, and the Forty-niner. The Culebra consists of locally argillaceous and arenaceous, well to poorly indurated dolomicrite with numerous cavities (vugs), fractures, and silty zones. The Magenta is a silty, gypsiferous, laminated dolomite. The other three members contain layers of claystone or mudstone sandwiched between layers of anhydrite/gypsum. In the southeast corner of the WIPP site and farther to the east, halite beds are also present in the non-dolomite members of the Rustler Formation. The Rustler Formation is approximately 94 meters (310 feet) thick and is present from approximately 164 to 257 meters (538 to 843 feet) bgs at the WIPP site. The top of the formation dips to the east-northeast across much of the WIPP site (Powers 2009). Its base is approximately 400 meters (1,312 feet) above the level of the repository. The Rustler Formation contains the most extensive water-bearing units in the WIPP site area.

- **Dewey Lake Formation.** The Dewey Lake Formation overlies the Rustler Formation at WIPP and is Permo-Triassic in age. It consists largely of reddish-brown siltstones and claystones, with lesser amounts of very fine to fine sandstone. Sediments are typically cemented with sulfates (gypsum and anhydrite). The formation generally thickens across the WIPP site from west to east to a maximum thickness of more than 183 meters (600 feet) in the eastern part of the Delaware Basin east of the site. At the WIPP site, it is approximately 146 meters (480 feet) thick and occurs from approximately 16 to 162 meters (52 to 532 feet) bgs. The base of the Dewey Lake is approximately 495 meters (1,623 feet) above the level of the repository. The groundwater from the Dewey Lake Formation is primarily used for livestock watering and irrigation (Powers 2009).

- **Santa Rosa Formation.** The Triassic Santa Rosa Formation, the basal formation of the Dockum Group, overlies the Dewey Lake Formation and consists of light reddish-brown sandstones and conglomerates, siltstone, and claystone. The Santa Rosa Formation is several hundred feet thick east of the WIPP site, but it thins to the west. It is about 12 meters (40 feet) thick near the center of the WIPP site and is absent in the western third of the site as a result of erosion. The Santa Rosa is used as a source of groundwater to the east of the WIPP site (DOE 1996a; Powers 2009).

- **Gatuña Formation.** The Miocene-Pleistocene Gatuña Formation overlies the Santa Rosa Formation and is somewhat similar in lithology and color, although the Gatuña is also characterized by a wide range of lithologies (coarse conglomerates to gypsum-bearing claystones). The upper Gatuña contains a 600,000-year-old volcanic ash layer (DOE 1996a). The formation is generally less than 15 meters (50 feet) thick across the WIPP site and occurs at depths of 4.6 to 6.1 meters (15 to 20 feet) bgs. The Gatuña Formation is in turn overlain by the Mescalero caliche and surficial sand deposits (Powers 2009).

- **Mescalero Caliche and Other Surface Deposits.** The Mescalero caliche is a pedogenic carbonate unit that is continuous across the WIPP site, with thicknesses of up to 1.8 meters (6 feet). The unit is exposed in places but may also underlie dune sand (to depths of up to 6.1 meters [20 feet]). The continuity of the Mescalero is disrupted by erosion and solution and by plant growth. Funnel-like features called "flowerpots" can be seen throughout areas where the unit is well-exposed; mesquite and creosote bush root systems are found in some of these features. The presence of the Mescalero caliche indicates general stability across the land surface, since it took about 100,000 years to form and developed about 500,000 years ago (Powers 2009).

  Above the Mescalero is the Berino soil, a thick, reddish, semi-consolidated sand containing little carbonate, ranging in thickness from centimeters (inches) to 0.30 to 0.61 meters (1 to 2 feet). The Berino soil is likely derived from wind-blown material modified by pedogenic processes. It is often found in flowerpots and as a thin soil veneer on the surface of the Mescalero caliche (Powers 2009).

Geologic resources in the vicinity of WIPP include oil and gas and potash. Prior to 1970, most commercially related drilling in the WIPP area targeted shallow oil (1,200 to 1,400 meters [3,940 to 4,590 feet] in depth) in the Bell Canyon Formation. From 1970 to the mid-1980s, most drilling near WIPP focused on gas exploration in the deeper Morrow and Atoka Formations (approximately 4,000 meters [13,100 feet]). During the late 1980s and early 1990s, commercial oil was discovered in the Permian Cherry Canyon and Brushy Canyon Formations, which lie below the Bell Canyon Formation described above. These discoveries were made at locations adjacent to the eastern and northeastern boundary of WIPP, at a depth of approximately 2,100 to 2,400 meters (6,890 to 7,870 feet). These formations are the primary exploration and development targets in the Permian Basin, one of the most actively explored areas in the United States (Broadhead et al. 1995).

Oil and gas exploration drilling activities in the New Mexico portion of the Permian Basin (in which the WIPP site is located) have fluctuated considerably since 1997. As many as 57 rigs were working in the basin in late 1997, but the maximum number dropped to about 15 in 2000. The maximum rig count increased to approximately 65 in 2001, dropped to the low 30s in 2002, and then steadily increased to approximately 60 in 2005. It is assumed that hydrocarbon exploration drilling activities in the region of the WIPP site will continue for the foreseeable future (Crossroads 2005). At present, there are no oil wells located on WIPP Vicinity Section 10 or Section 20; however, one oil well is located on WIPP Vicinity Section 35.

Within an area extending 1 mile from the WIPP LWB, in-place oil reserves are estimated at 35.3 million barrels and in-place gas reserves are estimated at 28,780,000 cubic feet in the Morrow and Atoka Formations and in shallower Bell Canyon and Cherry Canyon Formation reservoirs (Broadhead et al. 1995).

Bedded potash (a mixture of several soluble oxide, sulfate, and chloride compounds containing potassium, used chiefly in fertilizers) was discovered in Eddy County, New Mexico, in 1925. By 1944, New Mexico was the largest domestic potash producer, representing 85 percent of consumption. Development continued through the 1950s and 1960s, reversed in the 1970s, and had declined by the mid-1990s.

Since 1997, potash mining activities in the region of the WIPP site have continued. Approximately 1,500,000 tons of potash were produced in 1997, and production has slowly declined since that time. In 2005, approximately 1,000,000 tons were produced (NMEMNRD 2006).

The majority of actively mined and potential resources of potash ore are found in the 37-meter-thick (120-foot-thick) McNutt Member of the Salado Formation, which is the host for 11 ore zones.

3.2.2.2 Soils

Soils of the region have developed mainly from Quaternary and Permian parent material. Parent material from the Quaternary System is represented by alluvial deposits of major streams, dune sand, and other surface deposits. These are mostly loamy and sandy sediments containing some coarse fragments. Parent material from the Permian System is represented by limestone, dolomite, and gypsum bedrock. Soils of the region have developed in a semiarid, continental climate with abundant sunshine, low relative humidity, erratic and low rainfall, and a wide variation in daily and seasonal temperatures. Subsoil colors are normally light brown to reddish brown but are often mixed with lime accumulations (caliche) that result from limited, erratic rainfall and insufficient leaching.

A soil association is a landscape with a distinctive pattern of soil types (series). It normally consists of one or more major soils and at least one minor soil. There are three soil associations within 8.3 kilometers (5 miles) of the WIPP site: the Kermit-Berino, the Simona-Pajarito, and the Pyote-Maljamar-Kermit. Of these three associations, only the Kermit-Berino soil series has been mapped across the WIPP site by Chugg et al. (1952, Sheet No. 113). These are sandy soils developed on eolian material. The Kermit-Berino soils include active dune areas. The Berino soil has a sandy A horizon; the B horizons include more argillaceous material and weak-to-moderate soil structures. A and B horizons are described as noncalcareous, and the underlying C horizon is commonly caliche. Bachman (1980, p. 44) interpreted the Berino soil as a paleosol that is a remnant B horizon of the underlying Mescalero. Rosholt and McKinney (1980, Table 5) applied uranium-trend methods to samples of the Berino soil from the WIPP site area and interpreted the age of formation of the Berino soil as 330,000 ± 75,000 years.

Generally, the Berino Series, which covers about 50 percent of the site, consists of deep, noncalcareous, yellow-red to red sandy soils that developed from wind-worked material of mixed origin. These soils are described as undulating to hummocky and gently sloping (0 to 3 percent slopes). The soils are the most extensive of the deep, sandy soils in the Eddy County area. Berino soils are subject to continuing wind and water erosion. If the vegetative cover is seriously depleted, the water-erosion potential is slight, but the wind-erosion potential is very high. These soils are particularly sensitive to wind erosion in the months of March, April, and May, when rainfall is minimal and winds are highest.

The Kermit Series consists of deep, light-colored, noncalcareous, excessively drained loose sands, typically yellowish-red fine sand. The surface is undulating to billowy (from 0 to 3 percent slopes) and consists mostly of stabilized sand dunes. Kermit soils are slightly to moderately eroded. Permeability is very high, and, if vegetative cover is removed, the water-erosion potential is slight, but the wind-erosion potential is very high.

The WIPP Vicinity reference locations are situated on Quaternary age alluvium, playa lake deposits, and semi-stabilized and active dune sands. These deposits compose the majority of surface exposures and most of the shallow subsurface sediments in the WIPP site region. Just below these deposits is a fairly continuous mantle of caliche (called the Mescalero). The Mescalero caliche is a well-lithified alluvial deposit of chalky, finely crystalline limestone that is fairly continuous across the WIPP site and can be up to 1.8 meters (6 feet) thick. It thickens and is more indurated to the east of the site. Overlying the Mescalero is the Berino soil, a thick, reddish, semi-consolidated sand containing little carbonate, ranging in thickness from centimeters (inches) to 0.3 to 0.6 meters (1 to 2 feet).

No natural factors within the WIPP Vicinity reference locations that would affect the engineering aspects of slope stability or subsidence have been reported. The presence of the Mescalero caliche is generally considered to be an indicator of surface stability (DOE 1997). Liquefaction of saturated sediments is a potential hazard during or immediately following large earthquakes. Whether soils will liquefy depends on several factors, including the magnitude of the earthquake, peak ground velocity, susceptibility of soils to liquefaction, and depth to groundwater. There are no saturated sediments in the area of the WIPP land withdrawal.

3.2.2.3 Geologic Hazards

No surface displacement or faulting younger than early Permian has been reported, indicating that tectonic movement since then, if any, has not been noteworthy. No mapped Quaternary (last 1.9 million years) or Holocene (last 10,000 years) faults exist closer to the site than the western escarpment of the Guadalupe Mountains, about 100 kilometers (60 miles) to the west-southwest (DOE 1997).

The strongest earthquake on record within 290 kilometers (180 miles) of the site was the Valentine, Texas, earthquake of August 16, 1931 (DOE 1997), with an estimated Richter magnitude of 6.4. A Modified Mercalli Intensity of V was estimated for this earthquake's ground shaking at WIPP. At Intensity V, ground shaking is felt by nearly everyone; a few instances of cracked plaster occur; and unstable objects are overturned. This is the strongest ground-shaking intensity known for the WIPP site.

From November 1974 to August 2006, the largest earthquake within 300 kilometers (184 miles) of the WIPP site occurred on April 14, 1995 (based on a search of the U.S. Geological Survey [USGS] National Earthquake Information Center data). It was located 32 kilometers (20 miles) east-southeast of Alpine, Texas (approximately 240 kilometers [150 miles] south of the site), and was assigned a Richter magnitude of 5.7. It was the largest event within 300 kilometers (184 miles) of the site since the Valentine, Texas, earthquake, and had no effect on any structures at WIPP (Sanford et al. 1995). From 1974 to 2006, recorded earthquakes within a 300-kilometer (184-mile) radius of WIPP have ranged from magnitude 2.3 to 5.7 (USGS 2010).

Earthquake-produced ground motion is expressed in units of percent *g* (force of acceleration relative to that of Earth's gravity). For the purposes of comparing the relative seismic hazard based on predicated earthquake-produced ground motions among the various mercury storage candidate sites evaluated in the January 2011 *Mercury Storage EIS* (DOE 2011a) and this SEIS, the latest probabilistic peak (horizontal) ground acceleration (PGA) data from USGS are used. The PGA values cited are based on a 2 percent probability of exceedance in 50 years. This corresponds to an annual probability (chance) of occurrence of about 1 in 2,500. For the WIPP site, the calculated PGA is approximately 0.08 *g* (USGS 2012).

Potash mining in the vicinity of WIPP outside of the LWB is subterranean and uses both room-and-pillar and modified long wall production techniques. In March 2012, WIPP registered a seismic event associated with a large mine roof fall approximately 8.7 kilometers (5.4 miles) west-southwest of the WIPP facility with an estimated Richter magnitude of 2.9 to 3.2. Although events of this significance are not usually expected, mining in the vicinity of the WIPP site would be expected to cause some gradual subsidence over time relative to the mining techniques used (Rutley 2012).

The nearest potentially active volcanoes are in the Zuni-Bandera volcanic field in northwestern New Mexico. Volcanoes in this area are of the cinder cone (basaltic) type. They have not been active in at least 2,000 years and are considered to be dormant (NMBGMR 2008).

3.2.3 Water Resources

3.2.3.1 Surface Water

There are no natural surface-water bodies within the boundaries of the WIPP site. Widespread eolian (sand dune) deposits that are of Holocene age or older indicate that little surface drainage has developed within and around the site. The nearest significant surface-water body, Laguna Grande de la Sal, is located about 13 kilometers (8 miles) west-southwest of the site in Nash Draw,[2] where there are shallow brine ponds. Small, manmade earthen livestock watering holes (called "tanks") occur around the WIPP site, particularly to the south, but are not hydrologically connected to the formations overlying the WIPP repository. The watering holes are constructed to hold runoff and not allow it to infiltrate. There may be minor leakage through the unsaturated zone beneath them that eventually reaches a Dewey Lake water table. The predominant use of surface water in the region is for livestock watering and irrigation (DOE 1997, 2008a; Powers 2009).

The Pecos River is the only perennial stream in the region (see Figure 3–1). The river flows to the south-southeast and is, at its closest point (the Malaga Bend), about 16 kilometers (10 miles) west of the WIPP site. The WIPP site is within the Pecos River drainage basin, although a natural divide lies between the Pecos River and the WIPP site. As a result, the Pecos drainage system does not currently affect the site. At least 90 percent of the mean annual precipitation at the WIPP site (30 centimeters [12 inches]) is lost by evapotranspiration, although precipitation rates may exceed evapotranspiration during intense thunderstorms that produce runoff and percolation. The average annual streamflow of the Pecos River at Malaga Bend (from 1938 through 2008) was 4.6 cubic meters per second (164.5 cubic feet per second) (USGS 2009). The maximum recorded streamflow (with a monthly mean of 119 cubic meters per second [4,200 cubic feet per second]) occurred in August 1996 at the Malaga Bend; its maximum elevation was 90 meters (300 feet) below the surface elevation of the WIPP site (DOE 1997, 2006; USGS 2009).

Surface-water samples collected along the Pecos River and from various tanks around the WIPP site are routinely analyzed for radionuclides, including uranium, plutonium, americium, potassium-40, cobalt-60, cesium-137, and strontium-90. In 2007, uranium and plutonium concentrations were compared to baseline levels observed between 1985 and 1989. The highest concentrations of uranium-234, uranium-235, and uranium-238 detected in the Pecos River and surrounding tanks were found to fall

[2] Nash Draw is a surface depression, about 32 kilometers (20 miles) long and 8 to 19 kilometers (5 to 12 miles) wide, located about 6 kilometers (3.7 miles) to the west of the WIPP site (Lorenz 2006). The valley is notable for its karst features and for exposures of some of the geologic units underlying the WIPP region.

within the ranges of baseline levels. Plutonium-238, plutonium-239, and plutonium-240 were not detected. Americium-241 was found in water (at 1.14×10^{-3} becquerels per liter) from Tut tank, northwest of the border of the WIPP site, but no baseline data were available for comparison. The only other radionuclide detected in 2007 that exceeded its baseline range was potassium-40, found in a sample from an onsite sewage lagoon at 148 becquerels per liter (the baseline value for potassium-40 was 76 becquerels per liter) (DOE 2008a). Again in 2011, potassium-40 was the only radionuclide found to exceed baseline ranges in a water sample taken from the same onsite sewage lagoon at 235 becquerels per liter. Sewage contains significant potassium from human excretions and potassium-40 makes up 0.012 percent of all naturally occurring potassium. Since potassium-40 was not detected in any other surface-water sample, sewage is the likely source (DOE 2012).

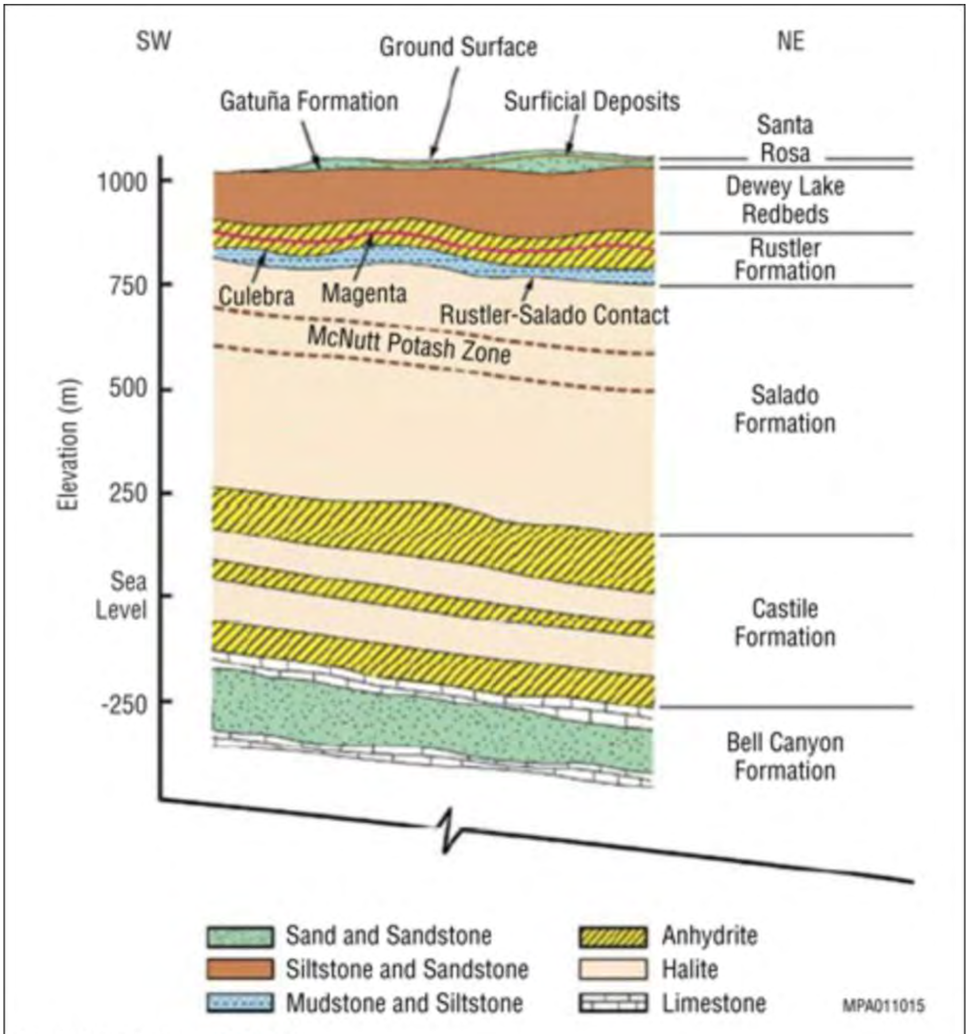
3.2.3.2 Groundwater

Several water-bearing zones have been identified and extensively studied at and near the WIPP site. Limited amounts of potable water are found in the middle Dewey Lake Formation and the overlying Triassic Dockum Group (Santa Rosa Sandstone) in the southern part within the WIPP LWB. Two water-bearing units in the Rustler Formation, the Culebra and Magenta Dolomite Members, produce brackish to saline water at the WIPP site and surrounding locations. Another very-low-transmissivity, saline water-bearing zone occurs along the contact between the Rustler and Salado Formations (DOE 2008a). Mercer (1983) reports no evidence of water in the Gatuña Formation or surficial materials at the WIPP site. Figure 3–5 shows the stratigraphic relationships of these aquifer units.

- **Lower Water-Bearing Horizons (below Salado Formation).** The term "water-bearing horizons" is used in this discussion because nothing below the Salado can properly be termed an aquifer. The Castile Formation is the basal unit of the Ochoan series and represents the oldest of the water-bearing units at the WIPP site. The formation is about 390 meters (1,280 feet) thick. It consists of three thick anhydrite units interbedded with halite and acts as an aquitard between the overlying Salado Formation and the underlying water-bearing sandstones, shales, and limestones of the Bell Canyon Formation (Guadalupian series). No regional groundwater flow system appears to be present in the Castile Formation in the WIPP site area. Fracturing within an anhydrite layer of the upper Castile has created isolated, high-permeability regions (brine reservoirs) that contain brine at higher-than-hydrostatic pressure (DOE 1996b, 1999, 2008a; Popielak et al. 1983).

- **Salado Formation.** The Salado Formation is a regional aquiclude made up of massive halite beds. Estimated hydraulic conductivities range from 10^{-16} to 10^{-11} meters per second for impure halite intervals and from 10^{-13} to 10^{-10} meters per second in anhydrite (Beauheim and Roberts 2002; Roberts et al. 1999). Although the hydraulic conductivity of the Salado Formation is extremely low, it is not dry. Brine content within the Salado is estimated at 1–2 percent by weight, and thin clay seams have been observed to contain up to 25 percent brine by volume (DOE 1999).

  Occurrence of groundwater in the Salado Formation is restricted because halite does not have primary porosity, solution channels, or open fractures. No evidence of circulating water has been found in the unit; however, small trapped pockets of brine (e.g., in MB139, which is an anhydrite rather than a halite) and nonflammable gas have been found. Inflow of trapped brine into the repository excavation has been observed in boreholes and from "weeps," which are localized brine seeps issuing from the surfaces of the repository walls, floors, and roofs. These flows are created when intact rock is disturbed by mining. The volumes of brine observed from these occurrences have been small, and flow into the repository ceased within 3 years of initial observation.



Source: Modified from DOE 2008b.

Figure 3–5. Stratigraphy of Aquifer Units at the Waste Isolation Pilot Plant Site

- **Upper Water-Bearing Horizons.** Directly above the Salado Formation in Nash Draw is a zone of dissolution residue capable of transmitting water. The transmissivity of this interval, referred to as the "Rustler-Salado contact," decreases from Nash Draw eastward to the WIPP site area. Small quantities of brine were found in this zone in WIPP site test holes (DOE 2008a).

  The 95-meter-thick (310-foot-thick) Rustler Formation, which directly overlies the Salado Formation, ranges in depth from 164 to 257 meters (538 to 843 feet) at the WIPP site. There are five members of the Rustler Formation. In ascending order, these members are the Los Medaños Member, Culebra Dolomite Member, Tamarisk Member, Magenta Dolomite Member, and Forty-niner Member. Only the Culebra and Magenta Dolomite Members have enough transmissivity to produce water to wells. The other three members act as aquitards (DOE 1996b).

  The Culebra Dolomite Member of the Rustler Formation is composed predominantly of fractured, microcrystalline dolomite and ranges in thickness from 5.8 to 12.5 meters (19 to 41 feet) in the WIPP site region. It is the first significant water-bearing unit above the Salado Formation at the WIPP site. Regional flow of groundwater in the Culebra Dolomite is generally to the south. Because of its lateral continuity and high transmissivity (as high as 10^{-3} square meters per second [DOE 2008b]), it is considered to be the most likely pathway if contaminants were to be released from the WIPP site in the event of a postulated future human intrusion. Estimates of hydraulic conductivity in the Culebra Dolomite vary widely, but in general, they decrease from 10^{-4} meters per second in Nash Draw to 10^{-14} meters per second east of the WIPP site (DOE 1999). These conductivity variations are believed to be controlled by the relative abundance of pore-filling cements, stress-relief fracturing, and fracturing related to dissolution of the upper Salado Formation rather than by primary depositional features of the unit. Porosities measured in core samples from the Culebra range from 0.03 to 0.30 (Kelley and Saulnier 1990; TerraTek, Inc. 1996). Although the dolomite matrix provides most of the unit's storage capacity, fluid movement occurs mainly through fractures and vugs. Recent studies of the Culebra show that it is a heterogeneous system with anisotropic characteristics, suggesting variability of fracture orientations on a local scale, especially in the WIPP site area (DOE 2008a; Lorenz 2006). These studies support the interpretation that the Culebra Dolomite and other members of the Rustler Formation are unkarsted strata (DOE 2008b; Lorenz 2006).

The Magenta Dolomite Member of the Rustler Formation is above the Culebra Dolomite and is separated from it by the Tamarisk Member. The Magenta is about 8 meters (26 feet) thick and consists of fine-grained gypsiferous dolomite. The Magenta Dolomite is less transmissive (about 10^{-7} square meters per second [DOE 2008b]) than the Culebra Dolomite, having hydraulic conductivities one to two orders of magnitude less than those of the Culebra in most locations (from 10^{-9} to 10^{-3} meters per second). Like those of the Culebra Dolomite, its hydraulic conductivities increase to the west toward Nash Draw. The hydraulic gradient of the Magenta also increases toward the west, ranging from 0.003 to 0.0038 on the east side of the WIPP site to 0.0061 along its west side (DOE 1997, 1999).

The reddish-brown fine sandstone, siltstone, and silty claystone of the Dewey Lake Red Beds Formation overlie the Rustler Formation. The formation is about 150 meters (490 feet) thick at the center of the WIPP site, thinning to the west. The upper portion of the Dewey Lake consists of a fairly thick (up to 80 meters [164 feet]) unsaturated zone. Just below this zone is a saturated zone perched above a cementation change from carbonate (above) to sulfate (below). The saturated zone, which makes up the middle portion of the Dewey Lake, occurs at depths of about 50 to 80 meters (164 to 262 feet). In this zone, water is transmitted through open fractures. Below it, fractures tend to be completely filled with gypsum (DOE 1999, 2008a).

The Santa Rosa Formation thins from being 66 meters (217 feet) thick along the eastern WIPP site boundary to zero near the center of the WIPP site. Anthropogenic water has been found in the formation in the center part of the WIPP site. The Gatuña Formation unconformably overlies the Santa Rosa. It ranges in thickness from about 6 to 9 meters (19 to 31 feet) and consists of silt, sand, and clay, with deposits formed in localized depressions. Saturation in the Gatuña occurs in discontinuous perched zones. This water may also have an anthropogenic source (DOE 1999, 2008a).

Groundwater samples from monitoring wells in the Culebra Member of the Rustler Formation have been characterized as saline to brine, with total dissolved solid concentrations ranging from 4,000 to 360,000 milligrams per liter. Water from the Culebra has been classified as Class III water by U.S. Environmental Protection Agency (EPA) guidelines and is not acceptable for human consumption or for agricultural purposes (DOE 2007; Richey et al. 1985).

Groundwater in the overlying Dewey Lake Formation is of better quality, with an average total dissolved solids value of 3,350 milligrams per liter. This water has been classified as Class II water by EPA guidelines and is suitable for livestock consumption (DOE 2007).

3.2.4 Meteorology, Air Quality, and Noise

3.2.4.1 Meteorology and Air Quality

Located in Eddy County in the Chihuahuan Desert of southeastern New Mexico, the regional climate around the WIPP site is semiarid, characterized by warm temperatures, low precipitation and humidity, and a high rate of evaporation (DOE 1997).

In 2006, about 40 percent of the time, winds blew inclusively from the east-southeast to south-southeast, with the highest winds from the southeast (DOE 2007). Windspeeds categorized as calm (less than 0.5 meters per second [1.1 miles per hour]) occurred less than 0.5 percent in 2006. Winds of 3.71 to 6.30 meters per second (8.30 to 14.1 miles per hour) were the most prevalent, occurring about 36 percent of the time.

For the 1986–2007 period, the annual average temperature at the WIPP site was 17.9 degrees Celsius (°C) (64.3 degrees Fahrenheit [°F]) (WRCC 2008). December was the coldest month, averaging 7.2 °C (44.9 °F) and ranging from –1.3 °C to 15.6 °C (29.6 °F to 60.1 °F), and July was the warmest month, averaging 28.4 °C (83.2 °F) and ranging from 20.6 °C to 36.4 °C (69.1 °F to 97.5 °F). For the same period, the highest temperatures reached 50.0 °C (122 °F) and the lowest reached –17.2 °C (1 °F). Days with a maximum temperature of higher than or equal to 32.2 °C (90 °F) occurred about one-third of the time, while those with a minimum temperature of less than or equal to 0 °C (32 °F) occurred about 20 percent of the time.

Annual precipitation at the WIPP site averages about 33.8 centimeters (13.32 inches) (WRCC 2008). Precipitation is the highest in summer and tapers off markedly in winter. About 60 percent of the precipitation from June through September is in the form of high-intensity, short-duration thunderstorms, sometimes accompanied by hail (DOE 2004a). Rains are brief but occasionally intense and can result in flash flooding in arroyos and along the floodplains. Measurable snow is rare and, if it occurs, remains on the ground for only a short time. Light snow typically occurs from December to January, and the annual average snowfall in the area is about 2.3 centimeters (0.9 inches).

Strong winds are common and can blow from any direction, creating potentially violent windstorms that carry large volumes of dust and sand (DOE 2004a). In late winter and spring, there are strong west winds and dust storms. On rare occasions, a tropical hurricane may cause heavy rain in eastern and central New Mexico as it moves inland from the western part of the Gulf of Mexico, but there is no record of serious wind damage from these storms (WRCC 2008).

Fujita Scale of Tornado Intensities

F0	Gale	18–32 meters per second (m/s) 40–72 miles per hour (mph)
F1	Moderate	33–50 m/s 73–112 mph
F2	Significant	51–70 m/s 113–157 mph
F3	Severe	71–92 m/s 158–206 mph
F4	Devastating	93–116 m/s 207–260 mph
F5	Incredible	117–142 m/s 261–318 mph

Tornadoes in the area surrounding the WIPP site, which is located on the edge of the tornado alley in the central United States, are common but less frequent and destructive than those in the tornado alley. For the period 1950–2008, 512 tornadoes were reported in New Mexico (an average of about 9 tornadoes per year); they occurred mostly at lower elevations in eastern New Mexico near Texas (NCDC 2008). For the same period, a total of 52 tornadoes (an average of about 1 tornado per year) were reported in Eddy County, which includes the WIPP site. However, most tornadoes occurring in Eddy County were relatively weak (i.e., 49 were F0 or F1, and 3 were F2 on the Fujita tornado scale). No deaths and 29 injuries were associated with these tornadoes.

Both the State of New Mexico and the EPA have authority for regulating compliance with portions of the Clean Air Act Amendments. On the basis of an initial 1993 air emissions inventory, the WIPP site is not required to obtain Clean Air Act permits (DOE 2007). WIPP was required to obtain a New Mexico Air Quality Control Regulation 702 operating permit (recodified in 2001 as 20.2.72 *New Mexico Administrative Code* [NMAC], "Construction Permits") for two backup diesel generators at the site in 1993. There have been no activities or modifications to the operating conditions of the diesel generators that would require reporting under the conditions of the permit in 2006.

Annual emissions for major facility sources and total point and area sources for 2002 for criteria pollutants and volatile organic compounds (VOCs) in Eddy County, New Mexico, including the WIPP site, are presented in Table 3–2 (EPA 2008a). Data for 2002 are the most recent emission inventory data available on the EPA website (EPA 2009). Area sources consist of nonpoint and mobile sources. Point sources account for most total sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) emissions in the county; SO_2 is emitted equally from industrial fuel combustion and from petroleum and related industries, and NO_2 is emitted mostly from industrial fuel combustion. For carbon monoxide (CO) and particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), area sources account for most of total emissions in the county; for VOCs and particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$), emissions from area sources are higher than those from point sources. CO is emitted from on-road sources. PM_{10}/$PM_{2.5}$ are emitted from miscellaneous sources, and VOCs are omitted from many different activities, with the highest contribution coming from petroleum and related industries.

Table 3–2. Annual Emissions of Criteria Pollutants and Volatile Organic Compounds from Selected Major Facilities and Total Point and Area Source Emissions in Eddy County Encompassing the Waste Isolation Pilot Plant Site

Emission Category	Emission Rates (tons per year)[a]					
	SO_2	**NO_2**	**CO**	**VOCs**	**PM_{10}**	**$PM_{2.5}$**
Agave Gas Plant	*2,099*	*2.0*	*0.6*	*20.2*	*0.0*	*0.0*
Artesia Gas Plant	*838*	*919*	*301*	*52.6*	*1.9*	*1.9*
Empire Abo Plant	*0.0*	*29.1*	*1.0*	*2.2*	*1,307*	*1,143*
Indian Basin Gas Plant	*2,040*	*361*	*396*	*60.4*	*2.4*	*2.2*
Navajo Refining Co.–Artesia	*1,975*	*387*	*394*	*1,204*	*187*	*112*
Total point sources	7,515	6,661	5,399	3,444	1,847	1,569
Total area sources	268	1,776	20,326	4,778	25,479	3,175
County total	**7,783**	**8,437**	**25,725**	**8,222**	**27,326**	**4,744**

[a] Data in *italics* are examples of selected major facilities and are not added to yield total.

Note: Emissions for selected major facilities are total point and area sources for 2002.

Key: CO=carbon monoxide; NO_2=nitrogen dioxide; PM_n=particulate matter with an aerodynamic diameter less than or equal to *n* micrometers; SO_2=sulfur dioxide; VOC=volatile organic compound.

Source: EPA 2009.

Among criteria pollutants (SO_2, NO_2, CO, ozone [O_3], PM_{10} and $PM_{2.5}$, and lead), the New Mexico State Ambient Air Quality Standards are identical to the National Ambient Air Quality Standards for NO_2 (EPA 2008b; 20.2.3 NMAC), as shown in Table 3–3. The State of New Mexico has established more stringent standards for SO_2 and CO but has no standards for O_3, particulate matter, or lead. In addition, the state has adopted standards for hydrogen sulfide and total reduced sulfur and has still retained the standard for total suspended particulates, which used to be one of the criteria pollutants but was replaced by PM_{10} in 1987.

Table 3–3. National Ambient Air Quality Standards or New Mexico State Ambient Air Quality Standards and Highest Background Levels Representative of the Waste Isolation Pilot Plant Area, 2003–2007

Criteria Pollutants	Averaging Period	Most Stringent Standard or Guideline[a]	Maximum Waste Isolation Pilot Plant Area Concentration[b, c]
Carbon monoxide	8 hours	8.7 ppm	3.5 ppm (40%) Albuquerque, Bernalillo County (2004)[d]
	1 hour	13.1 ppm	9.6 ppm (73%) Albuquerque, Bernalillo County (2003)[d]
Nitrogen dioxide	Annual	0.05 ppm	0.006 ppm (12%) Artesia, Eddy County (2003)
	1 hour	0.10 ppm[e]	f
Ozone[g]	8 hours	0.075 ppm[e]	0.076 ppm (101%) Carlsbad, Eddy County (2006)
PM_{10}	24 hours	150 $\mu g/m^3$[e]	88 $\mu g/m^3$ (59%) Hobbs, Lea County (2003)
$PM_{2.5}$	Annual	15.0 $\mu g/m^3$[e]	7.3 $\mu g/m^3$ (49%) Hobbs, Lea County (2007)
	24 hours	35 $\mu g/m^3$[e]	18 $\mu g/m^3$ (51%) Hobbs, Lea County (2005)
Sulfur dioxide	Annual	0.02 ppm	0.001 ppm (5.0%) Artesia, Eddy County (2007)
	24 hours	0.10 ppm	0.004 ppm (4.0%) Artesia, Eddy County (2006)
	3 hours	0.50 ppm	0.017 ppm (3.4%) Artesia, Eddy County (2006)
	1 hour	0.075 ppm	f
Lead	Calendar quarter[h]	1.5 $\mu g/m^3$[e]	0.03 $\mu g/m^3$ (2.0%) Bernalillo County (2003)[d]
	Rolling 3-month	0.15 $\mu g/m^3$[e]	f

a The more stringent standard between the National Ambient Air Quality Standards (NAAQS) and the State Ambient Air Quality Standards (SAAQS) is listed when both are available.

b Monitored concentrations are the highest arithmetic mean for calendar-quarter lead; second-highest for 1-hour, 3-hour, and 24-hour sulfur dioxide, 1-hour and 8-hour carbon monoxide, 1-hour ozone, and 24-hour PM_{10}; fourth-highest for 8-hour ozone; 98th percentile for 24-hour $PM_{2.5}$; arithmetic mean for annual sulfur dioxide, nitrogen dioxide, PM_{10}, and $PM_{2.5}$.

c Values in parentheses are monitored concentrations as a percentage of SAAQS or NAAQS.

d These locations with highest observed concentrations in the state of New Mexico are not representative of the Waste Isolation Pilot Plant site but are presented to show that these pollutants are not a concern over the state of New Mexico.

e Values are NAAQS. No SAAQS exists.

f No measurement is available.

g On June 15, 2005, the U.S. Environmental Protection Agency revoked the 1-hour ozone standard for all areas except the 8-hour ozone nonattainment Early Action Compact areas. (Those do not yet have an effective date for their 8-hour designations.) The 1-hour standard will be revoked for these areas 1 year after the effective date of their designation as attainment or nonattainment for the 8-hour ozone standard.

h Used old standard because no data in the new standard format are available.

Key: $\mu g/m^3$=micrograms per cubic meter; PM_n=particulate matter with an aerodynamic diameter less than or equal to *n* micrometers; ppm=parts per million.

Note: New Mexico also has ambient standards for total suspended particulates, hydrogen sulfide, and total reduced sulfur, but no ambient values were reported representative of the area.

Source: EPA 2008a, 2009; 20.2.3 *New Mexico Administrative Code*.

The WIPP site is located in Eddy County. Currently, the entire county, including the WIPP site, is designated as being in attainment for all criteria pollutants (40 CFR 81.332). The whole state is designated as an attainment area, except for a small portion in the south-central part of the state, Anthony (adjacent to El Paso, Texas), which is not in attainment for PM_{10}.

Seven classes of EPA-regulated pollutants have been monitored at WIPP since August 1986. Monitoring results indicated that air quality around the WIPP site usually met Federal and state standards, except for occasional exceedances for total suspended particulates during periods of high wind and blowing sands and infrequent exceedances for SO_2 (DOE 1997). After notifying the EPA, on October 30, 1994, DOE terminated onsite monitoring of criteria pollutants at the WIPP site because there was no longer a regulatory requirement to do so. Currently, VOC monitoring is performed to comply with the provisions of the WIPP Hazardous Waste Facility Permit. In 2006, three of the nine target compounds were detected above the method reporting limit (DOE 2007). The most substantial results were at least three orders of magnitude below the lower action level as described by the Hazardous Waste Facility Permit.

To establish representative background concentrations for the WIPP site, nearby urban or suburban measurements were used. The highest concentration levels for SO_2, NO_2, PM_{10}, and $PM_{2.5}$ around the WIPP site are less than or equal to 59 percent of their respective standards in Table 3–3 (EPA 2008b). The highest annual O_3 concentrations reported in 2006 were slightly higher than the standard; however, compliance with the O_3 standard is based on the 3-year average of the fourth highest value reported annually. The annual concentration for 8-hour ozone was 0.066 parts per million (ppm) in 2007, 0.076 ppm in 2006, 0.067 ppm in 2005, 0.065 ppm in 2004, and 0.065 ppm in 2003 (EPA 2012). The highest 3-year average during the 2003–2007 timeframe was 0.070 ppm, which is in compliance with the standard. No measurement data for CO and lead around the WIPP site are available, but those values are expected to be lower. They would be lower for CO because of the distance from urban areas and major highways, and they would be lower for lead because of the distance from industrial processes, such as smelters.

The WIPP site and its vicinity are classified as Prevention of Significant Deterioration (PSD) Class II areas. The nearest Class I area is Carlsbad Caverns National Park, about 61 kilometers (38 miles) west-southwest of WIPP (40 CFR 81.421). Guadalupe Mountains National Park in Texas is about 100 kilometers (62 miles) west-southwest of WIPP (40 CFR 81.429). There are no facilities currently operating at the WIPP site that are subject to PSD regulations.

3.2.4.2 Noise

The State of New Mexico and Eddy County have established no quantitative noise-level regulations.

The major noise sources associated with disposal operations at WIPP include traffic noise from site workforce vehicles, salt haulage vehicles, and waste transport vehicles; from the Waste Handling Building during normal operations; and from infrequent emergency diesel generator testing. The *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* reported that an overall sound pressure level of 50 decibels A-weighted (dBA) might occur 120 meters (400 feet) away as a result of normal operations (DOE 1997). Because the WIPP facility is more than 2.4 kilometers (1.5 miles) from the fence line, generator noise is inaudible at the fence line and hence at any nearby residence.

The ambient noise level in the WIPP area before construction was 26 to 28 dBA, similar to wilderness natural background noise levels (DOE 1997). For the general area surrounding the WIPP site, the countywide day–night average sound level (L_{dn}) based on population density is estimated to be 33 dBA for Eddy County, typical of the lower end of the range for rural areas (33–47 dBA) (Eldred 1982).

3.2.5 Ecological Resources

3.2.5.1 Terrestrial Resources

The area surrounding the WIPP site is characterized by large, stabilized sand dunes. It is located within a transition area between the northern extension of the Chihuahuan Desert (desert grassland) and the southern Great Plains (short-grass prairie) and shares the vegetative characteristics of both areas (DOE 1980). More than 100 species of plants have been identified within the WIPP LWB (DOE 1993). Numerous species of forbs and perennial grasses are present. The dominant shrubs include shinnery oak *(Quercus havardii)*, mesquite *(Prosopis glandulosa)*, sand sagebrush *(Artemisia filifolia)*, dune yucca *(Yucca campestris)*, and smallhead snakeweed *(Gutierrezia microcephala)* (DOE 1980, 1997). Russian thistle *(Salsola kali)* is a nonnative species that is commonly established in disturbed areas (DOE 1980).

More than 45 mammal species (including 15 bat species) occur within Lea and Eddy Counties, with 39 species occurring in the WIPP site area (DOE 1980). Mule deer *(Odocoileus hemionus)*, pronghorn *(Antilocapra americana)*, and coyote *(Canis latrans)* are among the larger mammals found in the area (DOE 1980, 1997).

More than 120 species of birds have been documented on or near the WIPP site (DOE 1980). Common bird species include the loggerhead shrike *(Lanius ludovicianus)*, pyrrhuloxia *(Cardinalis sinuatus)*, and black-throated sparrow *(Amphispiza bilineata)* (DOE 1997). The availability of nesting sites may limit bird populations in the project area (DOE 1980).

Twenty-three reptile and 10 amphibian species occur in the area (DOE 1980, 1993). Most desert amphibians are generally seen only following spring or summer rains (DOE 1993).

3.2.5.2 Wetlands

No wetlands occur on the WIPP site or in the immediate vicinity of the site.

3.2.5.3 Aquatic Resources

The two-county region lies within the drainage basin of the Pecos River. However, the only permanent aquatic habitats near the WIPP site include earthen watering ponds for livestock (DOE 1997). These manmade livestock watering holes, which are not hydrologically connected to the formations overlying the WIPP site, are located several miles away (DOE 2007). Two salt pile evaporation ponds, a detention basin, and two manmade ponds occur within the developed portions of the WIPP site. However, these ponds do not provide productive aquatic habitats.

3.2.5.4 Threatened and Endangered Species

The endangered, threatened, and other special status species reported from the area of Eddy and Lea Counties, including the WIPP Vicinity reference locations, are listed in Table 3–4. (Special status aquatic species and species that primarily occur near major aquatic habitats are not included because no aquatic habitats in which those species occur are located near the WIPP site.) None of the species listed in Table 3–4 were observed within the WIPP LWB in 1996, and there is no designated critical habitat for federally listed species at the WIPP site (DOE 1997). Critical habitat for the gypsum wild-buckwheat *(Eriogonum gypsophilum)* is over 30 miles (48 kilometers) from the WIPP site. Favorable habitat for the lesser prairie-chicken *(Tympanuchus pallidicinctus)*, a Federal candidate species, does occur within the WIPP LWB and other surrounding areas (DOE 2007). WIPP employees have instituted measures, in consultation with BLM, to protect the lesser prairie-chicken and its habitat. They include the establishment of periods during which offsite field activities may not be performed during the species' breeding season (DOE 2007).

Table 3–4. Federally and State-Listed Species Potentially Occurring at the Waste Isolation Pilot Plant Site

Common Name	Scientific Name	Federal Status	State Status
Plants			
Glass Mountain coral-root	*Hexalectris nitida*		Endangered
Guadalupe jewelflower	*Streptanthus sparsiflorus*		Species of Concern
Gypsum wild-buckwheat	*Eriogonum gypsophilum*	Threatened	Endangered
Hershey's cliff daisy	*Chaetopappa hersheyi*		Species of Concern
Kuenzler hedgehog cactus	*Echinocereus fendleri* var. *kuenzleri*	Endangered	Endangered
Lee's pincushion cactus	*Escobaria sneedii* var. *leei*	Threatened	Endangered
Sneed pincushion cactus	*Coryphantha sneedii* var. *sneedii*	Threatened	Endangered
Wright's water-willow	*Justicia wrightii*		Species of Concern
Birds			
American peregrine falcon	*Falco peregrinus anatum*		Threatened
Arctic peregrine falcon	*Falco peregrinus tundrius*		Threatened
Baird's sparrow	*Ammodramus bairdi*		Threatened
Least tern (interior population)	*Sterna antillarum athalassos*	Endangered	Endangered
Lesser prairie-chicken	*Tympanuchus pallidicinctus*	Candidate	
Southwestern willow flycatcher	*Empidonax trallii extimus*	Endangered	Endangered
Sprague's pipit	*Anthus spragueii*	Candidate	
Mammals			
Black-footed ferret	*Mustela nigripes*	Endangered	

Source: BISON 2012; NMRPTC 2012; USFWS 2012.

3.2.6 Cultural and Paleontological Resources

Roughly 1,370 hectares (3,380 acres) of the 4,140 hectares (10,240 acres) managed by WIPP have been surveyed for cultural resources. The surveys identified approximately 60 archaeological sites and 90 isolated finds (DOE 2002a). The largest survey was done in 1987 by Mariah and Associates. The 1987 survey examined portions of 45 sections surrounding the WIPP facility (DOE 2002b).

3.2.6.1 Prehistoric Resources

People have been living in the desert southwest for more than 10,000 years. Prehistoric people tended to live nomadic lifestyles, collecting resources from different areas at different times of the year (DOE 2002b). Most prehistoric archaeological sites in the WIPP area represent short-term use. In the mid-1500s, the Jumano and Apachean people used the area. They collected goods seasonally and traded with nearby Puebloan people. The Spanish were the first Europeans to cross what would become southeastern New Mexico. In historic times, the region was only lightly populated because of a lack of resources. Some ranching took place on the WIPP property during the 1940s and 1950s. Evidence of these activities is still visible in some locations.

WIPP Vicinity Section 10 is located on BLM-managed land just to the northeast of the WIPP LWB, WIPP Vicinity Section 20 is in the WIPP LWB, and WIPP Vicinity Section 35 is located on BLM-managed land just to the southeast of the WIPP LWB. The majority of Section 10, Section 20, and Section 35, all within Township 22 South, Range 31 East, have not been examined for the presence of cultural resources. However, some cultural resource surveys have been undertaken in anticipation of development. No archaeological sites have been found in WIPP Vicinity Section 10 or Section 20. Seven archaeological sites have been identified within WIPP Vicinity Section 35. Of the seven resources identified, one is currently recommended as being potentially eligible for listing on the National Register of Historic Places. Another site has been very heavily impacted by past activities and no longer requires consideration. Most of the discovered resources appear to be the remains of camps that show evidence of food preparation.

A review of cultural resource information for the region revealed that the Maroon Cliffs Archaeological District is located northwest of WIPP. It is the closest archaeological district to the reference locations. The 4,770-hectare (11,780-acre) district contains evidence of habitation ranging from the Archaic period (5000 B.C.) to the Jornada Mogollon period (A.D. 900 to 1450) (BLM 1988). Pit houses have been reported among the archaeological sites documented at this location. The district includes a wide variety of topographic features. The district is located roughly 11 kilometers (7 miles) northwest of the project area.

From about 10,000 B.C. to the late 1800s, southeastern New Mexico was inhabited by aboriginal hunters and gatherers who subsisted on various wild plants and animals. In the late 1800s, the region was settled by ranchers and farmers. Known archaeological sites in the vicinity of WIPP are primarily the remains of prehistoric camps and short-term settlements. These areas are generally marked by hearth features, scattered burned rock, flaked stone projectile points, cutting and scraping tools, pottery fragments, and ground stone implements. Locations generally represent short-term, seasonal occupations by small, nomadic groups of hunters and gatherers who used the plants and animals in the dune lands east of the Pecos River. In a few cases, sites with evidence of structures have been reported, probably associated with occupations of several weeks to months.

3.2.6.2 Historic Resources

Historic remains or features (more than 50 years old) are rare but have occasionally been identified. These include features and debris related to agricultural ranching in the twentieth century, including fences that may still be in use. The majority of historic sites identified to date include elements that could contribute to their eligibility for listing in the National Register of Historic Places.

With few exceptions, cultural resources known or anticipated in the area covered by the WIPP LWB are significant; they must be identified, recorded, assessed through an inventory, and considered in any plan of development for the area. When compared with most other portions of southeastern New Mexico, the locations (and nature) of cultural resources within the WIPP LWB can be described relatively well on the basis of an intensive inventory of portions of the area, limited excavation, and other investigative work on some sites.

Several surveys have been completed in the WIPP LWB, and 59 archaeological sites and 91 isolated occurrences (single artifact or only a few artifacts, or isolated features that can be fully recorded in the field) have been identified to date. The sites and isolates identified are almost exclusively prehistoric. Only one site with both prehistoric and historic components was noted. Approximately 37 percent of the area within the WIPP LWB has been inventoried for cultural resources. Extrapolating the current number of resources located to date to the rest of the (unsurveyed) area indicates that about 99 additional sites and 153 isolates could be present at the site. The land within the WIPP LWB appears to represent a potentially significant contributor of cultural resources and should be regarded as such when land management decisions are made (DOE 2002b).

3.2.6.3 American Indian Resources

There are no known American Indian sacred sites or burials in the WIPP Vicinity reference locations.

3.2.6.4 Paleontological Resources

Paleontological resources are the physical remains, impressions, or traces of plants or animals from a former geological age that may be sources of information on paleoenvironments and the evolutionary development of plants and animals. No paleontological resources have been identified in the WIPP Vicinity reference locations.

3.2.7 Site Infrastructure

3.2.7.1 Ground Transportation

The WIPP site can be reached by rail or highway. Rail access to WIPP is provided by a rail line connecting with a spur of the Burlington Northern Santa Fe (BNSF) Railroad near the Mosaic Potash Nash Draw Mine, 9.6 kilometers (6 miles) southwest of the site. This section of rail, which was constructed under the auspices of Right-of-Way Reservation NM 55699, granted on September 27, 1983, is approximately 8 kilometers (5 miles) in length. The rail line includes an adjacent service road. Both the railroad and service road were constructed on an easement width of 46 meters (150 feet).

The WIPP site can also be accessed by the North and South Access Roads constructed for the WIPP project. The North Access Road, also known as Louis Whitlock Road, is approximately 21 kilometers (13 miles) in length, with an easement width of 37 meters (120 feet). Use of this road is restricted to DOE personnel, agents, and contractors of DOE on official business related to the WIPP project or to BLM personnel, permittees, licensees, or lessees. Signs are placed and maintained at the turnout of U.S. Route 62/180 stating the restrictions on access. Persons desiring access to Texas State Route 128 can use Lea County Line Road immediately to the east. The South Access Road, also known as WIPP Road, is approximately 6.4 kilometers (4 miles) in length, with an easement width of 43 meters (140 feet). Multiple-use access for the South Access Road will be allowed unless it is determined that access by industry or the general public represents a significant safety risk to WIPP personnel or to the public. Upon determination, general access of the South Access Road may be restricted at the boundary of the 580-hectare (1,450-acre) Off-Limits Area in accordance with DOE Manual 470.4-2, *Physical Protection*. Average daily traffic on the access roads is estimated to be 800 vehicles on the North Access Road and 400 vehicles on the South Access Road (NMED 2007).

3.2.7.2 Electricity

Electricity is supplied to the WIPP area by Xcel Energy. Xcel owns a substation on the WIPP land withdrawal area located just to the east of the Property Protection Area, and owns the 115-kilovolt transmission lines to the substation. The peak load use is estimated to be 4 megawatts, with an available peak load capacity of 20 megawatts.

3.2.7.3 Fuel

WIPP utilizes gasoline and diesel as fuel for mobile equipment, the site emergency generators, and the diesel fire pump upon failure of the electric-powered fire pump. WIPP has attempted to partner with private industry for bio-fuels for both gasoline and diesel. WIPP has not been successful in obtaining bio-fuels or bio-fuel blends due to lack of availability. Fuel consumption in fiscal year 2011 was 73,615 liters (19,447 gallons).

3.2.7.4 Water

The WIPP site water supply is categorized as a nontransient, noncommunity system for reporting and testing requirements. Water service for the WIPP facility is furnished by the City of Carlsbad from a city-owned waterline that originates at the Double Eagle South Well Field 31 miles (50 kilometers) north of the facility. The volume capacity of the waterline is such that it meets all water requirements for the operation of the WIPP facility. As specified in a bill of sale transferring this waterline from DOE to the City of Carlsbad in June 2009, Carlsbad will provide up to 25 million liters per year (6.6 million gallons per year) of water to the WIPP facility free of charge for the next 100 years. Annual water use at the WIPP site is approximately 15 million liters per year (4 million gallons per year).

The City of Carlsbad is serviced by two separate well fields: Sheep's Draw and Double Eagle. Approximately 98 percent of Carlsbad's water is supplied by groundwater pumped from nine wells located 11 kilometers (7 miles) southwest of Carlsbad in an area called Sheep's Draw in the foothills of the Guadalupe Mountains. The other 2 percent comes from the Double Eagle water system. The Double Eagle well system is located near Maljamar, New Mexico. It serves the Ridgecrest Subdivision, Connie Road, Blackfoot Road, Hobbs Highway Industrial Park Area, Brantley Lake State Park, and the WIPP site. In 2007, the city of Carlsbad's water supply system pumped 9.5 billion liters (2.5 billion gallons) of water (Carlsbad 2008a).

The Double Eagle system that supplies water to the WIPP site has 29 wells in two well fields (north and south). Twelve of the wells are operational in the north well field; two are operational in the south well field. The south well field is the main source of water for the WIPP site and a handful of other users. Double Eagle water is withdrawn from the Ogallala Aquifer (Carlsbad 2008a, 2008b). The Double Eagle system has a total capacity of approximately 9.5 billion liters per year (2.5 billion gallons per year). Existing storage facilities include a 11.4-million-liter (3-million-gallon) reservoir, a 1.6-million-liter (0.42-million-gallon) reservoir, and a 3.8-million-liter (1-million-gallon) reservoir. A 7.6-million-liter (2-million-gallon) reservoir has also been added to the south well field.

3.2.8 Waste Management

WIPP is the Nation's only underground repository for the permanent disposal of defense-generated TRU waste. WIPP holds a Hazardous Waste Facility Permit under the Resource Conservation and Recovery Act from the State of New Mexico for TRU-mixed waste storage and disposal. In addition, the WIPP facility is a large-quantity generator of hazardous waste, generating about 10,800 kilograms (23,700 pounds) of hazardous waste in 2011.

Site-generated nonhazardous solid waste that is not recycled is shipped off site and disposed of at the Eddy County Sandpoint Landfill, the nearest municipal solid waste landfill to the site. In 2011, WIPP generated 98 metric tons (108 tons) of solid waste. WIPP has an onsite construction and demolition debris landfill for site-generated construction and demolition (C&D) wastes. Disposal in the onsite C&D landfill is limited to 23 metric tons (25 tons) per day. In 2011, WIPP generated about 64 metric tons (70 tons) of C&D waste.

Support structures at the WIPP facility used to manage waste generated from facility operations include a sewage treatment system. The sewage treatment system at WIPP is a zero-discharge facility consisting of two primary settling lagoons, two polishing lagoons, a chlorination system, and four evaporation basins. The sewage treatment system is designed to dispose of domestic sewage and site-generated brine waters from observation well pumping and from underground dewatering activities at WIPP (Sandia 2008). The existing sewage treatment system for WIPP site operations is located approximately one-half mile from the site and is designed and permitted for 87,000 liters (23,000 gallons) per day. In 2011, approximately 12 million liters (3.1 million gallons) were managed in the sewage treatment system, or on average, 31,650 liters (8,360 gallons) per day.

3.2.8.1 Waste Minimization

An active Pollution Prevention Program has been in place at WIPP since the 1990s with recycling as a key component of the program. As a result, WIPP has long recycled the waste streams that can be recycled within its regional infrastructure. These include a narrow scope of nonhazardous, C&D,

hazardous, universal, and New Mexico special waste streams. Nonhazardous wastes that are recycled are paper, plastics, cardboard, and aluminum cans. C&D wastes that are recycled are metals and, during fiscal year 2011, asphalt. Other wastes recycled or recovered include circuit boards, used oil, used antifreeze, and batteries. Computers and electronics are either donated for reuse or sent to UNICOR for recycling. WIPP also encourages its onsite subcontractors to recycle.

3.2.9 Occupational and Public Health and Safety

This section summarizes the environmental health risks arising from the effects of exposures to hazardous chemicals and ionizing radiation during normal operations, facility accidents, and transportation activities.

3.2.9.1 Normal Operations

The following discussion is based on current operations at WIPP and is assumed to be applicable to all three WIPP Vicinity reference locations. According to the *Waste Isolation Pilot Plant Annual Site Environmental Report for 2010* (DOE 2011c), WIPP continues to have no reportable, unauthorized contaminant (both ionizing radiation and hazardous chemicals) releases.

3.2.9.1.1 Exposure to Ionizing Radiation

The dose limit for WIPP operations is given in Title 40 of the *Code of Federal Regulations* (CFR) Part 191, Subpart A, and requires that the combined annual dose equivalent to any member of the general public in the vicinity of the site not exceed 25 millirem per year to the whole body and 75 millirem per year to any critical organ. Potential radiation exposures of the offsite general public can occur as a result of three pathways: (1) air transport, (2) water ingestion, and (3) ingestion of game animals. Of these three pathways, only the air pathway is considered to be credible. Elevated concentrations of radionuclides have not been detected in groundwater or game animals in the site vicinity.

In 2011, the whole body dose to the highest-exposed individual from airborne releases was estimated to be less than 1.75×10^{-5} millirem per year (DOE 2012). This individual was assumed to reside 7.5 kilometers (4.6 miles) west-northwest of the site. A hypothetical individual residing at the site fence line in the northwest sector was estimated to receive a whole body dose of less than 1.29×10^{-3} millirem per year (DOE 2012). These values are well below the dose limit of 100 millirem per year from all exposure pathways set by DOE to protect the general public from the operation of its facilities.

In 2011, the collective dose to the population living within 80 kilometers (50 miles) of WIPP was calculated to be 2.67×10^{-5} person-rem per year (DOE 2012). If this dose were distributed uniformly to all individuals living within 80 kilometers (50 miles) of the site – a total of 92,599 people – the average dose to each person would be about 2.88×10^{-7} millirem per year (DOE 2012). This is an extremely small fraction of the average dose of 620 millirem per year to members of the general public from exposure to natural background and manmade sources of radiation (NCRP 2009).

Before operations started at WIPP for receipt and disposal of TRU waste, estimates were developed for the doses that could be expected to occur to workers (Bradley et al. 1993). The doses for each worker during normal contact-handled (CH) waste handling operations at WIPP were estimated to be as follows: waste handlers would receive 0.70 rem per year; radiation control technicians, 0.60 rem per year; and an average individual, 0.68 rem per year. The estimated annual doses to these three categories of workers for handling all TRU (CH and remote-handled [RH]) waste are given as 0.79 rem per year, 0.87 rem per year, and 0.81 rem per year, respectively. The average individual represents the dose associated with the range of activities at WIPP and is thus a composite (or average) worker. The waste acceptance criteria for WIPP limit the contact dose rate to 200 millirem per hour for CH wastes and 1,000 rem per hour for RH wastes. The project has a self-imposed limit of 1 rem per year for worker exposure at WIPP, which is lower than the occupational exposure limit of 5 rem per year given in 10 CFR 835.

Data on actual operations at WIPP indicate that workers are receiving very low doses from external gamma radiation (Jierree 2009; McCauslin 2010). The total annual worker dose commitment for the years 1999 through 2009 was 12.4 person-rem (or an average of about 1.1 person-rem per year) and ranged from a low of 0.331 person-rem per year to a maximum of 2.298 person-rem per year. Of the more than 1,100 workers who were monitored for radiation exposure in 2009, 68 had reportable doses. Most of the individuals who had reportable doses were waste handlers and radiological control technicians.

The proposed mercury storage facility(ies) would contain no radioactive materials and thus would not alter the current exposure of members of the public or workers to ionizing radiation.

3.2.9.1.2 Exposure to Hazardous Chemicals

Polychlorinated biphenyls (PCBs) are a class of compounds regulated by the Toxic Substances Control Act. The PCB storage and disposal regulations are listed in the applicable subparts of 40 CFR Part 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions."

WIPP handles TRU waste[3] containing PCBs. On May 15, 2003, EPA Region VI approved the disposal of waste containing PCBs at the WIPP facility. PCBs exist in DOE's TRU waste as mixtures of synthetic organic chemicals with physical properties ranging from oily liquids to waxy solids. The WIPP facility began receiving PCB-contaminated waste on February 5, 2005. The EPA renewed the disposal authority on April 30, 2008. The required PCB annual report, containing information on PCB waste received and disposed of at the WIPP facility in 2011, was submitted to EPA Region VI on July 13, 2012. Exposure of workers and the public to PCBs has been and remains minimal (DOE 2004b).

In addition, WIPP monitors VOCs. The nine compounds monitored are 1,1,1-trichloroethane, 1,1,2,2-tetrachloroethane, 1,1-dichloroethylene, 1,2-dichloroethane, carbon tetrachloride, chlorobenzene, chloroform, methylene chloride, and toluene. The running annual average for repository VOC sample results remained below the concentrations of concern as listed in the WIPP permit (DOE 2011c).

3.2.9.2 Facility Accidents

According to the *Waste Isolation Pilot Plant Annual Site Environmental Report for 2010* (DOE 2011c), WIPP continued to have no reportable, unauthorized contaminant releases. There is no record of accidental fires, explosions, ionizing radiation releases, or hazardous chemical releases.

3.2.9.3 Transportation

The principal business of WIPP is to receive and dispose of TRU waste. To that end, shipping containers for TRU waste are brought onto the site by truck. In the first 10 years of WIPP operations, there were a total of eight traffic accidents involving WIPP trucks (DOE 2009), with no injuries or fatalities.

For the *Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations* (DOE 2009), DOE estimated the routine exposures of the populations along the transportation routes to WIPP to ionizing radiation and concluded that the estimated mean number of latent cancer fatalities (LCFs) over the entire shipping campaign would be 0.23. Occupational exposures would amount to 0.29 LCFs over the same period of time. There is no routine exposure to hazardous chemicals because these are inside the shipping container. DOE (2009) also reports on analyses of hypothetical severe accidents. Bounding analysis of worst-case severe accidents predicts a mean number of LCFs of 0.1, and bounding individual probabilities

[3] TRU waste is waste that contains alpha particle-emitting radionuclides with atomic numbers greater than uranium (92) and half-lives greater than 20 years, in concentrations greater than 100 nanocuries per gram of waste.

of an LCF of about 2.3×10^{-7}. Bounding analyses of worst-case releases of VOCs show that no human health effects would be expected from such scenarios.

3.2.10 Socioeconomics

Socioeconomic variables at WIPP are associated with community growth and development within the WIPP ROI that could potentially be affected, directly or indirectly, by project-related changes. Included are economic characteristics, the region's demography, housing, and local transportation.

WIPP is located in southeastern New Mexico, approximately 32 kilometers (20 miles) east of Carlsbad. The majority of people employed at WIPP reside in two counties: Eddy and Lea. Therefore, these two counties are identified as the ROI in this socioeconomics analysis. Approximately 1,100 persons are employed at WIPP (DOE 2011b:4-35).

3.2.10.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of the ROI increased by approximately 27 percent to 58,157. During this period, the unemployment rate of the ROI decreased from 5.5 percent to 4.9 percent. The unemployment rate in the ROI peaked during 2010 at 6.5 percent. By July 2012, the unemployment rate of the ROI was 4.5 percent, which was lower than the unemployment rate for New Mexico (7.4 percent) (BLS 2012).

3.2.10.2 Demographic and Housing Characteristics

In 2010, the population of the two-county ROI was 118,556. From 2000 to 2010, the ROI population grew by approximately 11 percent, compared with 13 percent growth throughout the State of New Mexico. The percentage of the ROI population under the age of 18 was approximately 28 percent; Women ages 18 to 39 composed approximately 28 percent of the population (Census 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. There were 47,504 housing units in the ROI in 2010, 64 percent of which were owner-occupied, 26 percent were renter-occupied, and 10 percent were vacant (Census 2011b, 2011c).

3.2.10.3 Local Transportation

As discussed in Section 3.2.7.1, the WIPP site can be reached by rail or highway. Rail access to WIPP is provided by a rail line connecting with a spur of the BNSF Railroad near the Mosaic Potash Nash Draw Mine, 9.6 kilometers (6 miles) southwest of the site. The WIPP site can also be accessed by the North and South Access Roads constructed for the WIPP project. The North Access Road is restricted to DOE personnel, agents, and contractors of DOE on official business related to the WIPP project or to BLM personnel, permittees, licensees, or lessees. Multiple-use access for the South Access Road will be allowed unless it is determined that access by industry or the general public represents a significant safety risk to WIPP personnel or to the public. Traffic in the vicinity of WIPP has experienced temporary increases in volume at various times due to oil production activities.

3.2.11 Environmental Justice

Under Executive Order 12898, DOE is responsible for identifying and addressing any disproportionately high and adverse impacts on minority and low-income populations. Minority persons are those who identify themselves as American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino (of any race), Native Hawaiian or other Pacific Islander, or multiracial (CEQ 1997). Persons who report that their income is less than the Federal poverty threshold are designated as low-income.

A 16-kilometer (10-mile) radius was chosen as the ROI for this analysis to provide a reasonable estimate of the potentially affected population surrounding the facility(ies). An additional ROI of those residing within an approximately 3.2-kilometer (2-mile) radius of each candidate site was used as a subset of the 16-kilometer (10-mile) ROI to guard against inadvertently diluting represented minority and low-income populations most likely to experience any potentially adverse impacts associated with mercury storage.

The 16-kilometer (10-mile) radius surrounding the candidate storage locations at WIPP encompasses parts of two counties in New Mexico: Eddy and Lea. Figure 3–6 shows populations residing in the two-county area, as reported in the 2000 and 2010 censuses (Census 2001a, 2011d). In this figure, lightly shaded bars show populations in 2000 and the darker bars show those in 2010. From 2000 to 2010, the population of Eddy and Lea Counties increased by approximately 11 percent to 118,556. Over this period, the total minority population increased by approximately 32 percent to 62,600 and the low-income population decreased by approximately 13 percent to 17,540 (Census 2001a, 2001b, 2011d, 2011e).

Demographic data from the 2010 census show that the total minority population residing in the two-county area composed approximately 53 percent of the total population. The White Hispanic population residing in the two-county area composed approximately 55 percent of the county's total minority population, while those self-identified as "some other race" (meaning those who provided write-in entries such as Mexican, Puerto Rican, or Cuban) composed approximately 31 percent of the county's total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 48 percent of the total population and approximately 91 percent of the total minority population residing in Eddy and Lea Counties in 2010.

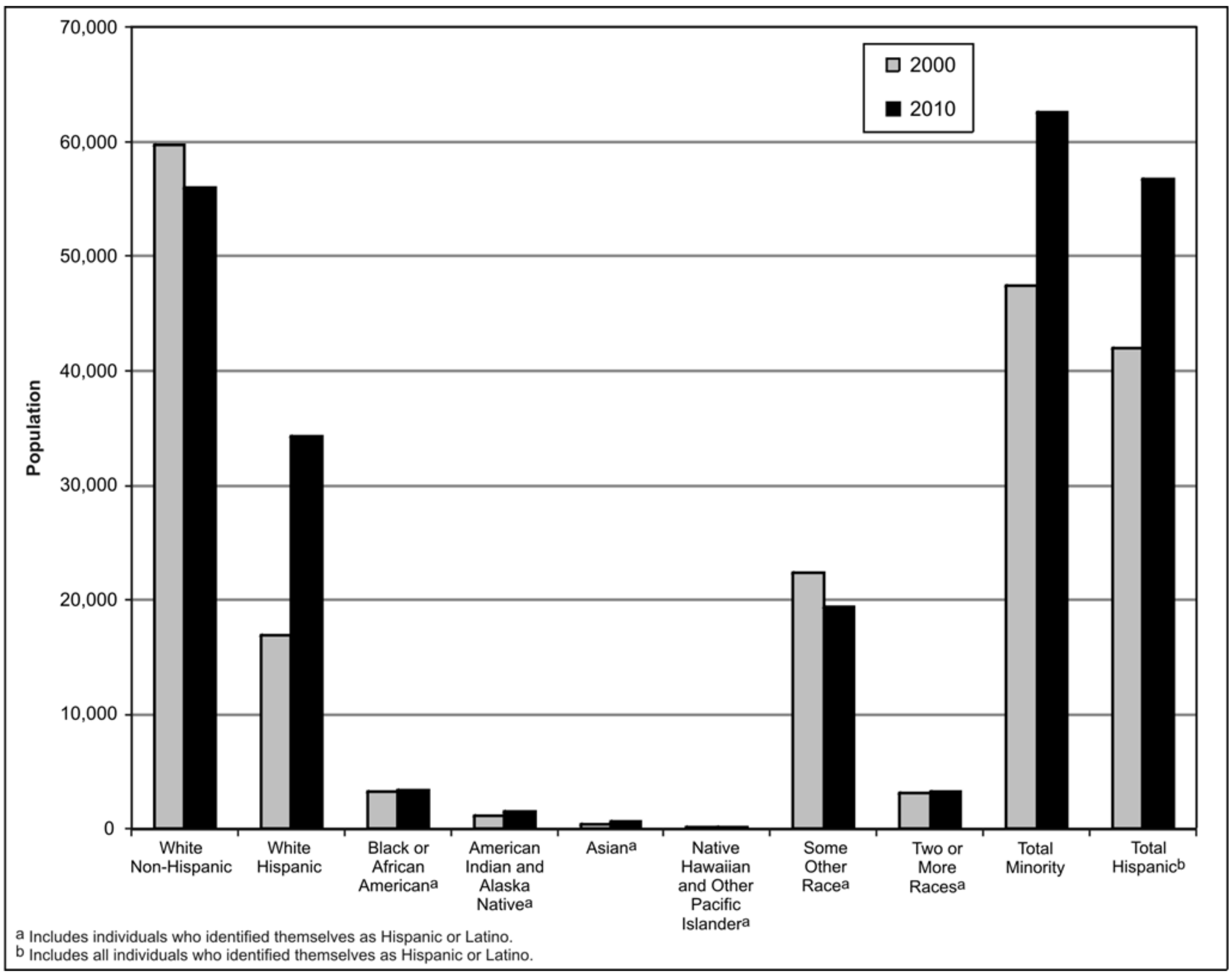


Figure 3–6. Populations Residing in the Two-County Area Surrounding the Waste Isolation Pilot Plant in 2000 and 2010

3.2.11.1 WIPP Vicinity Section 10

In 2010, 550 people lived within 16 kilometers (10 miles) of WIPP Vicinity Section 10. This area included an estimated 44 percent minority and 6 percent low-income population. By comparison, Eddy and Lea Counties included a 53 percent minority and 16 percent low-income population, and New Mexico included a 60 percent minority and 18 percent low-income population. There are five census block groups located within the 16-kilometer (10-mile) radius surrounding Section 10, none of which contained a minority or low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and as updated in Appendix B, Section B.3, of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population. Figure 3–7 shows the cumulative populations living at a given distance from Section 10. It is estimated that approximately 36 people reside within approximately 3.2 kilometers (2 miles) of Section 10, consisting of a 45 percent minority population and a 5 percent low-income population (Census 2011d, 2011e).

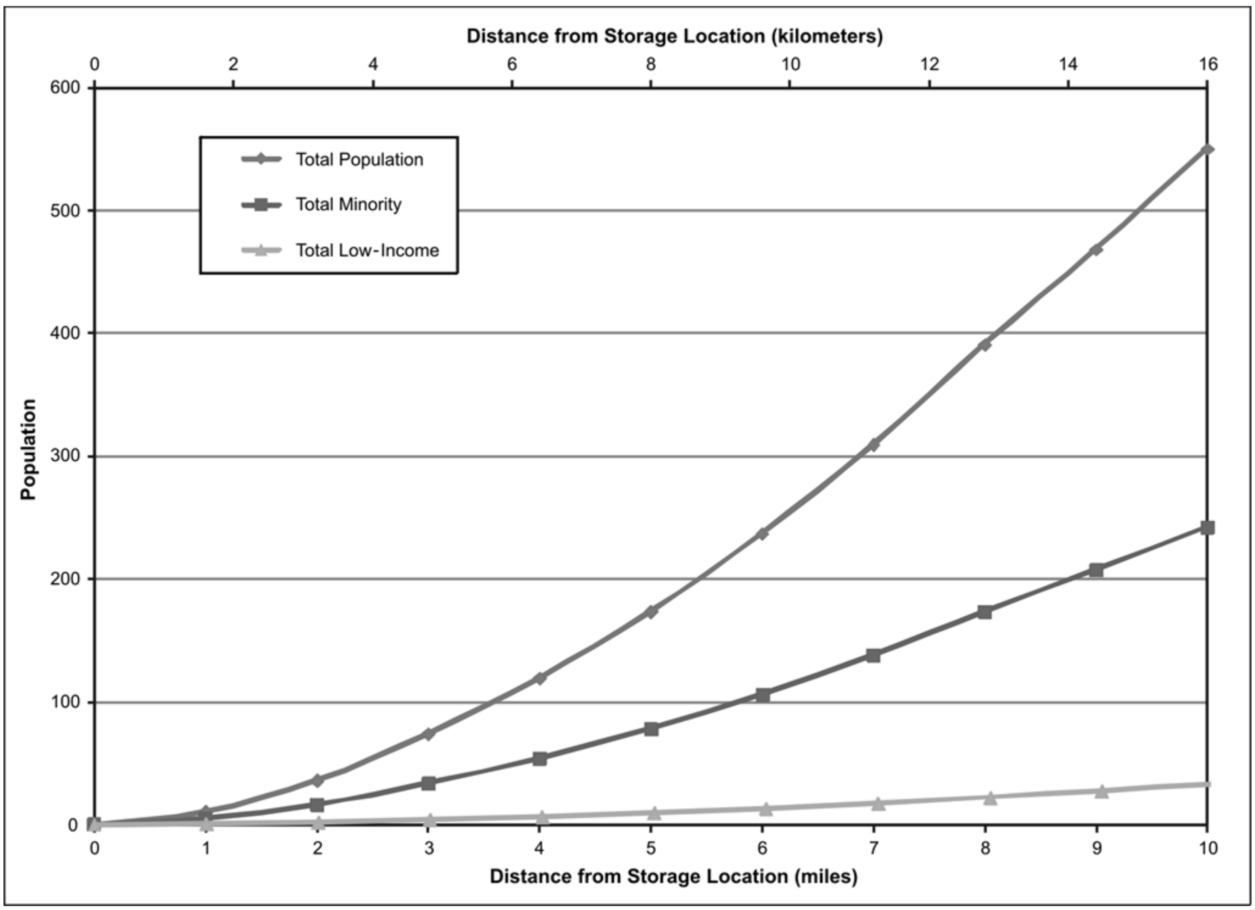


Figure 3–7. Populations Residing Within 16 Kilometers (10 miles) of the Storage Location at Waste Isolation Pilot Plant Vicinity Section 10

3.2.11.2 WIPP Vicinity Section 20

In 2010, 575 people lived within 16 kilometers (10 miles) of WIPP Vicinity Section 20. This area included an estimated 45 percent minority and 5 percent low-income population. By comparison, Eddy and Lea Counties included a 53 percent minority and 16 percent low-income population, and New Mexico included a 60 percent minority and 18 percent low-income population. There are three census block groups located within the 16-kilometer (10-mile) radius surrounding Section 20, none of which contained a minority or low-income population. Figure 3–8 shows the cumulative populations living at a given distance from Section 20. It is estimated that approximately 21 people reside within approximately 3.2 kilometers (2 miles) of Section 20, consisting of a 46 percent minority population and a 5 percent low-income population (Census 2011d, 2011e).

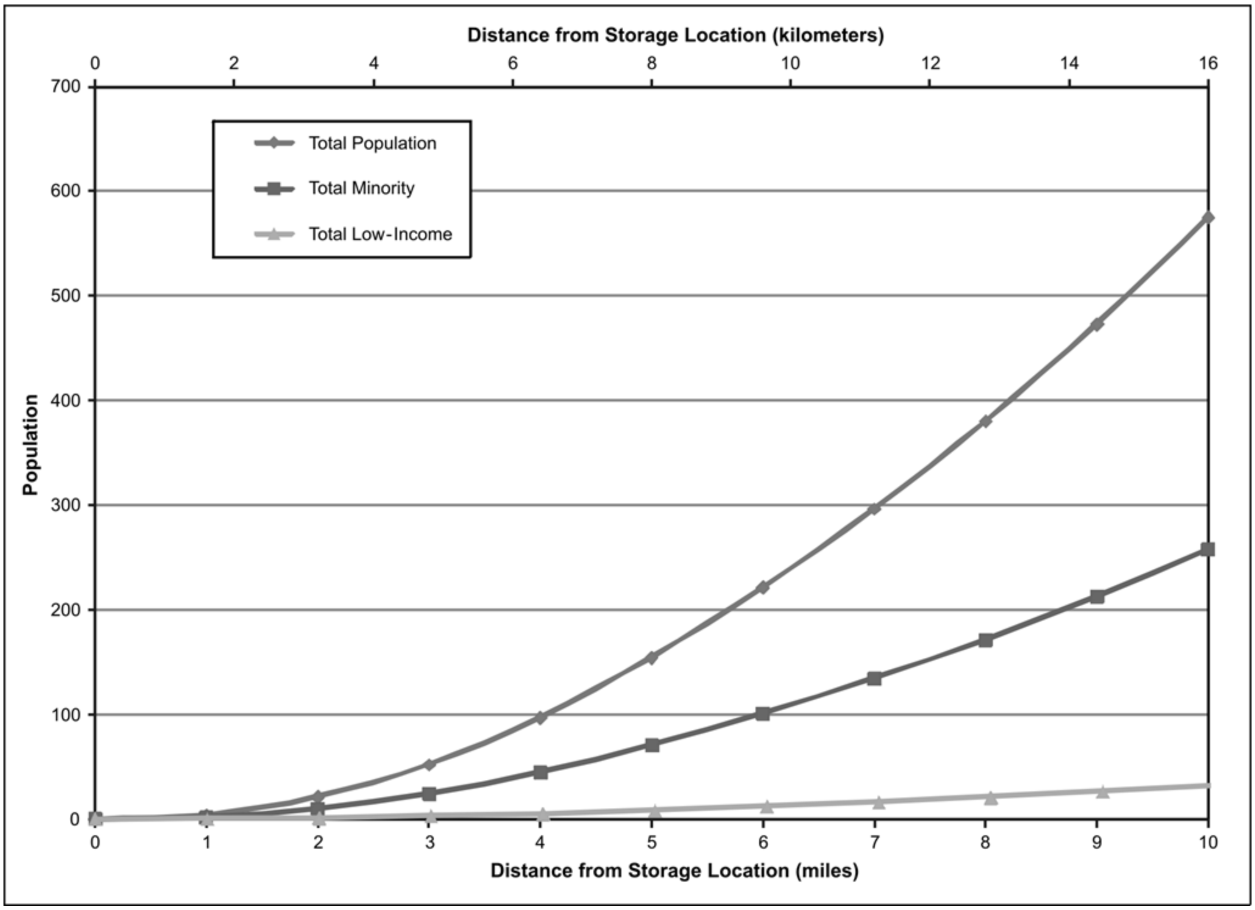


Figure 3–8. Populations Residing Within 16 Kilometers (10 miles) of the Storage Location at Waste Isolation Pilot Plant Vicinity Section 20

3.2.11.3 WIPP Vicinity Section 35

In 2010, 430 people lived within 16 kilometers (10 miles) of WIPP Vicinity Section 35. This area included an estimated 44 percent minority and 6 percent low-income population. By comparison, Eddy and Lea Counties included a 53 percent minority and 16 percent low-income population, and New Mexico included a 60 percent minority and 18 percent low-income population. There are three census block groups located within the 16-kilometer radius surrounding Section 35, none of which contained a minority or low-income population. Figure 3–9 shows the cumulative populations living at a given distance from Section 35. The total population living within 16 kilometers of Section 35 is primarily concentrated to the north and northwest along the outskirts of Carlsbad. The distribution of the total minority and low-income populations is similar to that of the total population. It is estimated that approximately 13 people reside within approximately 3.2 kilometers (2 miles) of Section 35, consisting of a 47 percent minority population and a 5 percent low-income population (Census 2011d, 2011e).

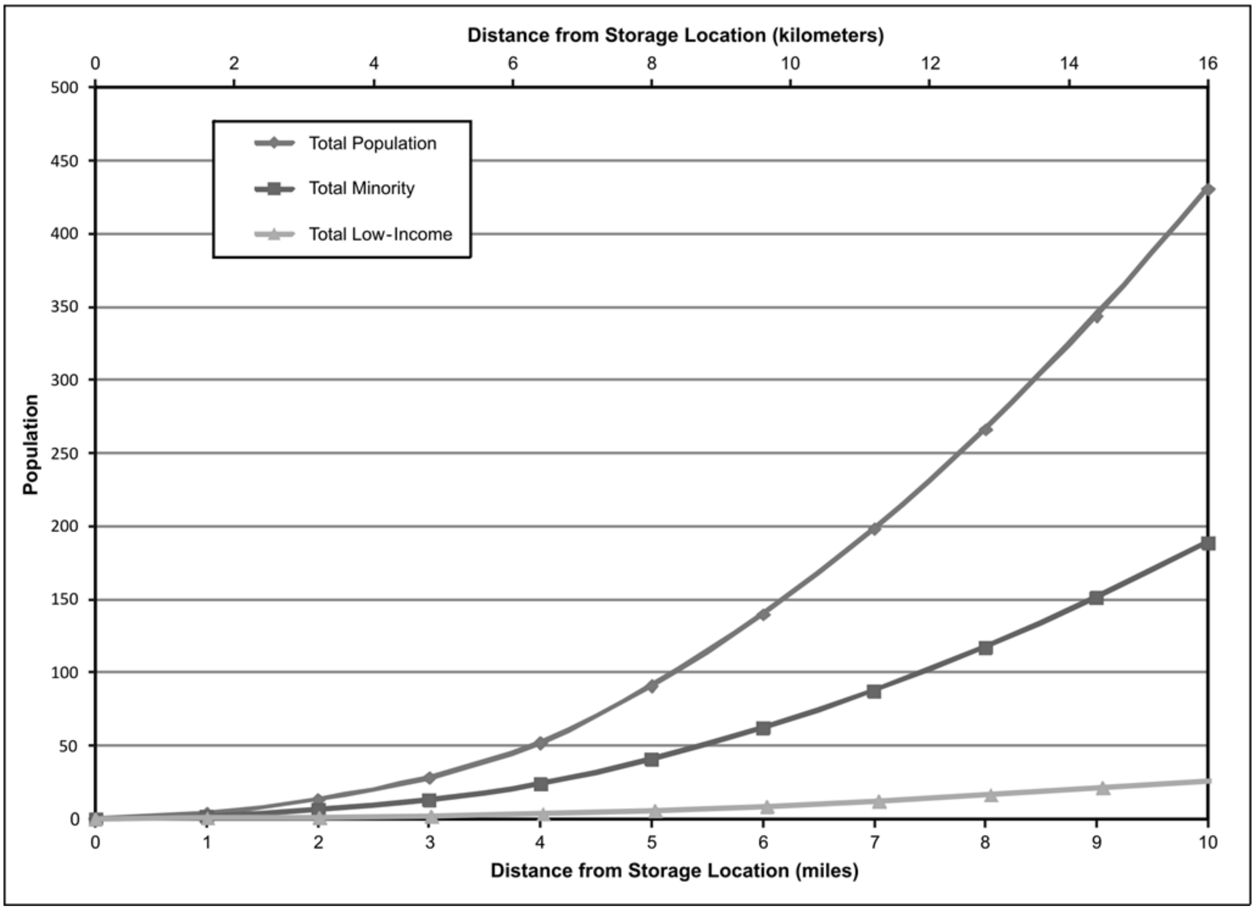


Figure 3–9. Populations Residing Within 16 Kilometers (10 miles) of the Storage Location at Waste Isolation Pilot Plant Vicinity Section 35

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CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

Chapter 4 presents the potential impacts on the human environment of implementing the alternative locations that are being considered in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*. Seven candidate sites were evaluated as alternatives for long-term mercury storage in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* (DOE 2011a), and a discussion of the impacts associated with these candidate sites can be found in Chapter 4 of the January 2011 *Mercury Storage EIS*. The analyses presented in the January 2011 *Mercury Storage EIS* remain valid and are incorporated into this *Mercury Storage SEIS* with two exceptions: (1) the occupational and public health and safety analysis; and (2) the socioeconomics and environmental justice analysis. This *Mercury Storage SEIS* includes updates to the occupational and public health and safety analysis resulting from changes to the definition of severity levels (i.e., magnitude of impacts) for acute-inhalation exposures to the public under certain accident scenarios. This *Mercury Storage SEIS* also includes updates to the socioeconomics and environmental justice analyses to incorporate 2010 decennial census information that was not available at the time the January 2011 *Mercury Storage EIS* was published. The updates to the analyses are presented in Appendix B and Appendix E of this *Mercury Storage SEIS.* A No Action Alternative was also evaluated in the January 2011 *Mercury Storage EIS*, which includes the impacts of continued storage of elemental mercury in the absence of a facility(ies) designated by the U.S. Department of Energy. Potential impacts associated with each Waste Isolation Pilot Plant Vicinity reference location are discussed in Section 4.2. Activities and impacts associated with closure of a mercury storage facility(ies) are presented in Section 4.3. Cumulative impacts, mitigation measures, and resource commitments are presented in Sections 4.4, 4.5, and 4.6, respectively.

4.1 INTRODUCTION

This chapter describes the potential environmental and human health impacts associated with implementation of the three Waste Isolation Pilot Plant (WIPP) Vicinity reference locations considered in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*. As presented in Chapter 1, the U.S. Department of Energy's (DOE's) proposed action is to select a suitable location(s) for the long-term management and storage of elemental mercury[1] generated in the United States.

A detailed description of the WIPP Vicinity reference locations is provided in Chapter 2, Section 2.3. A summary comparison of the projected environmental effects among all alternatives analyzed in this SEIS and in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* is presented in Chapter 2, Section 2.6. Site-specific information for the WIPP Vicinity reference locations for each of the environmental disciplines and resource areas considered is presented in Chapter 3; this information provides the basis for this environmental consequences analysis. Specifically, the environmental impact analyses performed consider all disciplines where the potential exists for effects on the natural and human environment, including consideration of resource conditions that could affect the implementation of alternatives, as follows:

- Land use and visual resources
- Geology, soils, and geologic hazards
- Water resources
- Meteorology, air quality, and noise
- Ecological resources
- Cultural and paleontological resources
- Site infrastructure
- Waste management
- Occupational and public health and safety

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

- Ecological risk
- Socioeconomics
- Environmental justice

These disciplines were analyzed in a manner commensurate with the importance of the issue or the relative expected level of impact under a specific alternative—the sliding-scale assessment approach (DOE 2004:1, 2).

Although the Mercury Export Ban Act of 2008 (P.L. 110-414) contemplates indefinite storage, DOE has used a 40-year period of analysis for the purposes of evaluating potential environmental impacts associated with long-term storage. This 40-year timeframe corresponds to the planning projection for receipt into storage of up to 10,000 metric tons (11,000 tons) of elemental mercury, as described in Chapter 2, Section 2.1. A 40-year period of analysis is consistent with the timeframe used in previous analyses by the Defense Logistics Agency (DLA 2004:1-1) and the U.S. Environmental Protection Agency (EPA) (EPA 1997a–e). These are estimates with a degree of uncertainty; therefore, it is possible that more or less than 10,000 metric tons of mercury could eventually require storage for a period longer or shorter than 40 years. There currently is no approved method of treating high-purity elemental mercury for disposal. It is not known when such a treatment method might become available. The new mercury storage facility(ies) could be constructed in a modular fashion to accommodate storage of mercury on an as-needed basis (see Chapter 2, Sections 2.2.2). The ability to build the storage facility(ies) in a modular fashion would also ensure that the facility(ies) is sized correctly for the amount of mercury that would eventually require storage. As a conservative assumption, the impact analyses presented in this chapter evaluate the construction and operation of a new, full-size mercury storage facility with 13,950 square meters (150,000 square feet) of storage space, which is necessary to accommodate the projected volume of elemental mercury over the 40-year period of analysis. Additional National Environmental Policy Act (NEPA) analysis would be required to expand the facility(ies) to accept more than 10,000 metric tons of mercury or extend its operations beyond the 40-year period of analysis. Closure of the storage facility(ies) would occur at the end of storage activities, as discussed in Section 4.3.

The results of the environmental impacts analysis performed for the alternatives evaluated in the January 2011 *Mercury Storage EIS* and this SEIS were calculated using appropriate computer models and by applying projected facility construction and operations parameters, as appropriate. Appendix B describes the general impact assessment methods employed for each discipline and presents the region of influence (ROI) for each resource area evaluated. Appendix C presents data that were used to support the analysis of impacts from construction and operation of a mercury storage facility(ies) at each of the alternative locations analyzed in this SEIS. Finally, Appendix D includes overviews of input data and analysis assumptions, and mercury toxicity and approach to evaluating risk from normal operations, facility accidents, and transportation. Additional detail for these subject areas can also be found in Appendices B, C, and D of the January 2011 *Mercury Storage EIS*.

4.2 WASTE ISOLATION PILOT PLANT SITE

Under this alternative, elemental mercury would be stored at one of three WIPP Vicinity reference locations, as described in Chapter 2, Section 2.3. WIPP is the Nation's only underground repository for the permanent disposal of defense-generated transuranic waste. The WIPP site is located in Eddy County in the Chihuahuan Desert of southeastern New Mexico (see Chapter 3, Figure 3–1). The site is about 42 kilometers (26 miles) east of Carlsbad in a region known as Los Medaños, a relatively flat, sparsely inhabited plateau with little surface water. The WIPP site encompasses approximately 41 square kilometers (16 square miles) under the jurisdiction of DOE pursuant to the Waste Isolation Pilot Plant Land Withdrawal Act (LWA) (P.L. 102-579). Under this alternative, a new mercury storage facility would be constructed at or in the vicinity of the WIPP site. The new mercury storage facility would be similar to that proposed at some of the other candidate sites previously analyzed in the January 2011

Mercury Storage EIS. Many of the impacts on resource areas are similar for all of the WIPP Vicinity reference locations; however, differences in potential impacts among the three locations are identified, where appropriate.

4.2.1 Land Use and Visual Resources

4.2.1.1 WIPP Vicinity Section 10

Minor impacts on land use and visual resources are expected from construction and operation of a new mercury storage building at WIPP Vicinity Section 10. Construction of this new facility would require the disturbance of approximately 3.1 hectares (7.6 acres) for building construction and laydown areas (see Chapter 2, Section 2.2.2). The proposed mercury storage facility would be located on relatively undisturbed land in Section 10 adjacent to and north of the WIPP land withdrawal boundary (LWB). The mercury storage facility would be located outside of the WIPP LWB. The completed facility boundary would similarly encompass approximately 3.1 hectares (7.6 acres) within its fenced perimeter. The footprint of the mercury storage building would occupy approximately 1.6 hectares (3.9 acres) of this area. Mercury storage operations in this area would be compatible with current WIPP waste management and storage operations. Pursuant to the Federal Land Policy and Management Act of 1976, this land would be withdrawn from all forms of entry, appropriation, and disposal under the public land laws and reserved for the purposes of operating a mercury storage facility. DOE would prepare a land management plan, as appropriate, and provide opportunities for the public and for Federal, state, and local agencies to participate in the land use planning. Potash mining in the region surrounding WIPP, including an existing lease for future underground mining operations in Section 10, may influence the ability to site a mercury storage facility due to the potential for increased risk of land subsidence. Since the mercury storage facility would occupy approximately 1 percent of the 260 hectares (640 acres) that comprise Section 10, it is expected that there would be negligible impacts on livestock grazing activities. Future land use activities that would be permitted within or immediately adjacent to the mercury storage facility would be limited to those that would not jeopardize the integrity of the facility, create a security risk, or create a worker or public safety risk. The low profile of the new building would have a negligible impact on the overall viewshed of this area from offsite vantage points. Therefore, mercury storage operations would not result in a change to U.S. Bureau of Land Management visual resource management classifications.

4.2.1.2 WIPP Vicinity Section 20

Minor impacts on land use and visual resources are expected from construction and operation of a new mercury storage building at WIPP Vicinity Section 20. The proposed mercury storage facility would be located on relatively undisturbed land to the west of WIPP directly across North Access Road. The mercury storage facility would be located within the WIPP LWB. Impacts would be similar to those described above for WIPP Vicinity Section 10; however, visual impacts would be less noticeable due to the proximity to other structures associated with WIPP. Use of WIPP Vicinity Section 20 would need to be considered against requirements described in the WIPP LWA. Use of WIPP Vicinity Section 20 for construction and operation of a facility for the long-term management and storage of elemental mercury would alter the current land use and could require Federal legislation.

4.2.1.3 WIPP Vicinity Section 35

Minor impacts on land use and visual resources are expected from construction and operation of a new mercury storage building at WIPP Vicinity Section 35. The proposed mercury storage facility would be located on relatively undisturbed land in Section 35 adjacent to and east of the WIPP LWB. The mercury storage facility would be located outside of the WIPP LWB. Impacts would be similar to those described above for WIPP Vicinity Section 10; however, Section 35 is not currently under an existing lease for potash mining. One oil well exists within Section 35. Use of WIPP Vicinity Section 35 would require this land to be withdrawn from all forms of entry, appropriation, and disposal under the public land laws and reserved for the purposes of operating a mercury storage facility. Use of WIPP Vicinity Section 35 for construction and operation of a facility for the long-term management and storage of elemental mercury would alter the current land use.

4.2.2 Geology, Soils, and Geologic Hazards

4.2.2.1 WIPP Vicinity Section 10

4.2.2.1.1 Geology and Soils

Construction of a new mercury storage facility under this alternative is expected to temporarily disturb no more than about 3.1 hectares (7.6 acres) of land at WIPP. The depth of excavation required would be less than about 0.6 meters (2 feet), as the new facility would be constructed on a reinforced-concrete slab atop a gravel base. Additional trenching may be necessary to install foundation footings or connect the new mercury storage facility to regional utility infrastructure; trenches could be about 0.6 meters (2 feet) wide by 1.2 meters (4 feet) deep. Geologic resources would be required to support the construction effort, including approximately 4,760 cubic meters (6,200 cubic yards) of concrete and 3,900 cubic meters (5,100 cubic yards) of gravel (see Appendix C, Table C–2). These resources would be procured from local and/or regional commercial vendors.

Although soils cleared for construction would briefly be subject to wind and water erosion, adherence to standard best management practices for soil erosion and sediment control (e.g., use of sediment fencing, staked hay bales, mulching and geotextile matting) during facility construction would serve to minimize soil erosion and loss. Fugitive dust emissions are discussed further in Section 4.2.4.1.2, and potential mitigation measures are discussed in Section 4.5.

At WIPP, the Mescalero caliche could present site development limitations due to the presence of this calcium carbonate cemented unit (see Chapter 3, Section 3.2.2). However, due to the limited depth of excavation and the limited thickness of the caliche layer, it should not present substantial constraints for construction. A site survey and geotechnical study would be conducted to confirm site geologic and hydrogeologic characteristics for facility siting and engineering purposes. This would include an analysis to assess the potential for subsurface dissolution features and land subsidence. Location of the building footprint and adherence to best management practices would serve to minimize construction impacts.

During operations, previously disturbed areas would not be subject to long-term soil erosion, as the areas within the footprint of the completed mercury storage facility would be engineered to minimize soil erosion or would be returned to natural conditions. There would be no additional impact on geology and soils from operations.

4.2.2.1.2 Geologic Hazards

Hazards from large-scale geologic conditions, such as earthquakes, and other site geologic conditions with the potential to affect WIPP are summarized in Chapter 3, Section 3.2.2.3. Site geologic conditions would be unlikely to affect the mercury storage facility over the 40-year period of analysis.

The WIPP region is considered to be an area of low-to-moderate seismicity. Earthquakes have historically produced ground motion effects equivalent to Modified Mercalli Intensity V in the vicinity of the site (see the January 2011 *Mercury Storage EIS:* Appendix B, Table B–4). As described in Chapter 3, Section 3.2.2.3, Section 10 is located about 100 kilometers (60 miles) from the closest potentially active fault. In addition, the predicted peak ground acceleration at the site from an earthquake with an annual probability of occurrence of 1 in 2,500 is 0.08 *g*. Ground motion in this range could cause slight damage to ordinary structures, but is not expected to affect modern structures designed and constructed to withstand the assessed hazard. DOE applies the seismic engineering provisions from the latest building codes as the minimum standard for the design, construction, and upgrade of its facilities. As further described in the January 2011 *Mercury Storage EIS*, Appendix B, Section B.3.2, DOE Order 420.1B and its companion guide (DOE Guide 420.1-2) require that facilities be designed, constructed, and operated so that the public, workers, and environment are protected from adverse impacts of natural phenomena hazards, including earthquakes. Thus, the mercury storage facility would be sited and designed to address the risk from geologic hazards, and the predicted ground motion would be unlikely to cause a breach in mercury containers from structural failure. An analysis of potential environmental consequences resulting from an earthquake-induced accident is described in Section 4.2.9.1.2.

Potash mining in the region surrounding WIPP, including an existing lease for future underground mining operations in Section 10, may influence the ability to site a mercury storage facility due to the potential for increased risk of land subsidence.

4.2.2.2 WIPP Vicinity Section 20

As described in Chapter 3, Section 3.2.2, the geology, soils and geologic hazards of Sections 10 and 20 are similar. Therefore, the environmental impacts of construction and operation of a mercury storage facility at Section 20 would be similar to that described in Section 4.2.2.1 for Section 10.

4.2.2.3 WIPP Vicinity Section 35

As described in Chapter 3, Section 3.2.2, the geology, soils and geologic hazards of Sections 10 and 35 are similar. Therefore, the environmental impacts of construction and operation of a mercury storage facility at Section 35 would be similar to that described in Section 4.2.2.1 for Section 10.

4.2.3 Water Resources

4.2.3.1 WIPP Vicinity Section 10

4.2.3.1.1 Surface Water

Facility construction activities at the WIPP site are not anticipated to have direct impacts on surface-water features that are within or adjacent to the site boundary. The WIPP site has no natural surface-water bodies within the site boundary, and the nearest significant surface-water bodies, Laguna Grande de la Sal and the Pecos River, are located 13 kilometers (8 miles) west-southwest and 16 kilometers (10 miles) west of the site, respectively. As discussed in Chapter 3, Section 3.2.3.1, the topography in the vicinity of the WIPP site exhibits some broad valley forms, potentially indicative of areas of concentrated surface runoff and integrated drainages during prolonged rainfall events. In general, the Pecos River drainage system drains to the southeast. The WIPP site is within the Pecos River drainage basin; however, a drainage divide occurs between the Pecos River and the WIPP site.

Section 10 is not located within or adjacent to the 100- or 500-year floodplains of the Pecos River. DOE Order 420.1B and its companion guide (DOE Guide 420.1-2) require that DOE facilities be designed, constructed, upgraded as necessary, and operated to protect the public, workers, and the environment from natural phenomena hazards, including flooding, and specifically that DOE facilities adhere to the flood design and evaluation criteria specified in DOE Standards 1020-2002 and 1023-95. Additional surveys and a site-specific flood hazard analysis would be conducted, as necessary, as part of the site selection and design process for a new mercury storage facility.

During facility construction, adherence to best management practices for soil erosion and sediment control, such as the use of sediment fencing, hay bales, mulching, geotextile matting, and rapid reseeding would minimize soil erosion and loss. Additionally, spill prevention and waste management practices would be utilized to minimize suspended sediment, the transport of other deleterious materials, and potential water quality impacts. WIPP does not have an existing National Pollutant Discharge

Elimination System permit or construction stormwater discharge permit. Regulatory notification to either EPA or the authorized state regulatory compliance division of the intent to provide long-term storage and management of elemental mercury would be required for WIPP. Communication and coordination with all applicable regulatory agencies, including site-specific discussions and facility-specific permitting requirements (application for new permits or modification to existing permits), will be required for the long-term management and storage of elemental mercury.

Design, construction, and operation of the proposed mercury facility would incorporate structural controls and practices to prevent the release of elemental mercury and to prevent any spills or other releases. Structural elements include containment and other engineering features, including the use of spill trays, sloped floors, and floors constructed to be impervious to liquid mercury releases, as further described in Appendix C, Section C.2.1, of the January 2011 *Mercury Storage EIS* (DOE 2011a). Facility operations would also be conducted in accordance with an integrated contingency plan and spill prevention, control, and countermeasures plan, or equivalent plans as mandated by facilities permitted under the Resource Conservation and Recovery Act (RCRA) (40 CFR 264.50 et seq.) In the event that abnormal operating conditions occur, and there is a release of elemental mercury, the structural controls and practices will prevent contamination from reaching the soil or other surfaces where it could be transferred to surface waters or groundwater.

It is conservatively estimated that construction activities for a new mercury storage facility would require approximately 1,270,000 liters (336,000 gallons) of water over a 6-month construction period. This volume would primarily be required for dust control and soil compaction. For the proposed facility in Section 10, it is anticipated that water would be trucked to the construction site and stored in a temporary storage tank that would be sufficient to supply this volume. There would be no diversion of nearby surface water or onsite groundwater during the construction phase. During operations, water use would generally be limited to that required to serve the potable and sanitary needs of the storage facility workforce. Total annual consumption is estimated to be about 88,500 liters (23,375 gallons). There would be no direct discharge of effluents to either surface water or groundwater from storage facility operations and no impact on water quality. Only nonhazardous sanitary wastewater (sewage) would be generated and managed via a separate nonhazardous sanitary liquid waste storage and treatment or septic system that would be installed.

4.2.3.1.2 Groundwater

As described in Chapter 3, Section 3.2.3.2, there are no known natural groundwater features within Section 10 that would affect the engineering aspects of slope stability or subsidence. The Gatuña Formation, which unconformably overlies the Santa Rosa, is also known to have saturated zones occurring in discontinuous perched zones that may be due to an anthropogenic source (DOE 1999a, 2008). Facility construction is not expected to have any impact on groundwater hydrology due to the depth of the excavation. Excavation for preparing the site and laying the foundation is not expected to exceed a depth of 0.6 meters (2 feet), with the exception of small trenches, which could be approximately 1.2 meters (4 feet) deep, for connecting the utilities or installing concrete footers. In the event that perched groundwater was encountered by trenching to depths of no greater than 1.2 meters (4 feet), excavations may have to be dewatered and the groundwater contained for testing and treatment, if found contaminated, prior to discharge. Because the facility would be designed and operated to prevent any spills from reaching the ground, there would be no impact on groundwater from routine operations.

4.2.3.2 WIPP Vicinity Section 20

Surface-water impacts would be consistent with those addressed in Section 4.2.3.1 for Section 10. However, it is anticipated that any water needed for the construction of the proposed facility in Section 20 would be obtained from the existing WIPP supply system instead of being trucked in to the site as described for Section 10. It is conservatively estimated that construction activities for a new mercury storage facility would require approximately 1,270,000 liters (336,000 gallons) of water over a 6-month construction period.

Groundwater impacts would be consistent with those addressed above for Section 10. As described in Chapter 3, Section 3.2.3.2, there are no known natural groundwater features within Section 20 that would affect the engineering aspects of slope stability or subsidence. However, anthropogenic water has been found near the center part of WIPP in the Santa Rosa Formation, which is also near Section 20. Facility construction is not expected to have any impact on groundwater hydrology due to the depth of the excavation. Because the facility would be designed and operated to prevent any spills from reaching the ground, there would be no impact on groundwater from routine operations.

4.2.3.3 WIPP Vicinity Section 35

Surface-water impacts would be consistent with those addressed in Section 4.2.3.1 for Section 10. It is anticipated that any water needed for the construction of the proposed facility in Section 35 would be trucked in to the site as described for Section 10.

Groundwater impacts would be consistent with those addressed above for Sections 10 and 20. Facility construction is not expected to have any impact on groundwater hydrology due to the depth of the excavation. Because the facility would be designed and operated to prevent any spills from reaching the ground, there would be no impact on groundwater from routine operations.

4.2.4 Meteorology, Air Quality, and Noise

4.2.4.1 WIPP Vicinity Section 10

4.2.4.1.1 Meteorology

Meteorological events can result in damage to buildings such as mercury storage warehouses. The frequency and consequences of such events were considered in selecting the accident events evaluated in Chapter 4, Section 4.9.9.2, of the January 2011 *Mercury Storage EIS* (DOE 2011a). As previously stated, DOE Order 420.1B and its companion guide (DOE Guide 420.1-2) require that facilities be designed, constructed, and operated so that the public, workers, and the environment are protected from adverse impacts of natural phenomena hazards, including meteorological events. RCRA-permitted facilities, such as the proposed mercury storage facility, must also meet applicable design, construction, and operation requirements under Title 40 of the *Code of Federal Regulations* (CFR), Section 264.31, and applicable state RCRA requirements to prevent the release of stored wastes. As the WIPP region is susceptible to regular occurrence of high winds, the new mercury storage facility at Section 10 would be designed and constructed to withstand potential high winds and tornadoes and other meteorological events.

4.2.4.1.2 Air Quality

Minor short-term air quality impacts would result from construction of a mercury storage building within Section 10. These impacts would include an increase in criteria and toxic air pollutant concentrations and fugitive dust (i.e., particulate matter) from construction equipment emissions (see Appendix C, Section C.2.3). These emissions would occur over a 6-month construction period and are not expected to result in exceedance of air quality standards. However, mitigation measures would be considered where possible to address these impacts. Potential mitigation measures during construction are discussed in Section 4.5.

Emissions from operations of the new mercury storage facility would be very small, consisting of emissions from employee vehicles, trucks or trains, semiannual testing of emergency generators, and possibly mercury vapor from any spills or from mercury containers. No localized emissions from space heating are anticipated associated with mercury storage facility operations, as electric heating is anticipated for areas requiring climate control. Compliance with the conformity regulations is discussed in Appendix B, Section B.5.1.2, of the January 2011 *Mercury Storage EIS* (DOE 2011a).

Exposures to mercury vapor could arise during normal operating conditions from small amounts of elemental mercury vapor escaping from storage containers or residual contamination. Mercury vapor transported downwind could then be inhaled by noninvolved workers (those outside the storage facility) or nearby offsite individuals. Section 4.2.9.1 presents a conservative analysis that shows that for a long-term, undetected slow leak inside the proposed mercury storage facility, the predicted long-term average concentration in the building wake never exceeds about 20 nanograms per cubic meter for new construction within Section 10. The EPA threshold for chronic exposure to airborne mercury is 300 nanograms per cubic meter, so slow releases of mercury would have a negligible effect on noninvolved workers and the public, with a corresponding negligible risk.

Minor short-term air quality impacts would result from an increase in truck or rail activity while mercury is moved to any of the WIPP Vicinity reference locations for long-term management and storage. Truck and rail transport are discussed in more detail in Section 4.2.9.1.3. Estimated emissions from truck and rail transportation are presented in Tables 4–1 and 4–2. Over the 40-year period of analysis, the estimated number of truck or rail shipments would diminish over time and resulting emissions would decrease.

Table 4–1. Air Pollutant Emissions from Transportation of Elemental Mercury by Truck to All WIPP Vicinity Reference Locations

Pollutant	Truck Emissions by Pollutant (metric tons)						
Site	Carbon Monoxide	Nitrogen Dioxide	Volatile Organic Compounds	$PM_{2.5}$	PM_{10}	Sulfur Dioxide	Carbon Dioxide
WIPP Vicinity Section 10, 20, or 35	2.56	9.53	0.51	0.204	0.257	0.0159	1,700

Note: Emissions are based on truck mileage and emission factors calculated using the U.S. Environmental Protection Agency's mobile source emission factor model, Mobile6 (EPA 2003); to convert metric tons to tons, multiply by 1.1023. Values represent total emissions over 40 years.

Key: PM_n=particulate matter with an aerodynamic diameter less than or equal to *n* micrometers; WIPP=Waste Isolation Pilot Plant.

Table 4–2. Air Pollutant Emissions from Transportation of Elemental Mercury by Rail to All WIPP Vicinity Reference Locations

Pollutant	Locomotive Emissions by Pollutant (metric tons)						
Site	Carbon Monoxide	Nitrogen Dioxide	Volatile Organic Compounds	$PM_{2.5}$	PM_{10}	Sulfur Dioxide	Carbon Dioxide
WIPP Vicinity Section 10, 20, or 35[a]	2.1	12.4	0.69	0.36	0.371	0.247	806

[a] Transportation by rail to Section 10 or 35 would involve intermodal transportation: rail to WIPP, then truck from WIPP to the Section 10 or 35 location. The additional emissions from transportation by truck from WIPP to the Section 10 or 35 location (approximately 300 miles per year) are negligible.

Note: Emissions are based on locomotive fuel usage and the U.S. Environmental Protection Agency emission factors for locomotives (EPA 2009); to convert metric tons to tons, multiply by 1.1023. Values represent total emissions over 40 years.

Key: PM_n=particulate matter with an aerodynamic diameter less than or equal to *n* micrometers; WIPP=Waste Isolation Pilot Plant.

Annual carbon dioxide emissions would be highest during construction. The second highest year of carbon dioxide emissions would be during the first 2 years of operations, when the mercury is delivered to the site. Emissions during these first 2 years of operations would be approximately 258 metric tons (285 tons) per year, which would be more than rail emissions. As similarly noted in Chapter 4, Section 4.3.4.2, of the January 2011 *Mercury Storage EIS*, such emissions would minimally add to global and U.S. annual emissions of carbon dioxide. Global climate change is further discussed in Section 4.11.4.2 of the January 2011 *Mercury Storage EIS*.

4.2.4.1.3 Noise

Short-term noise impacts near WIPP Vicinity Section 10 could result from construction of a new mercury storage facility. These impacts would include some increase in traffic to the site and an increase in noise resulting from construction employee vehicles, equipment delivery, and heavy equipment operation. These impacts would occur during the 6-month construction period. Since the nearest residence is located more than 5 kilometers (3 miles) from the site, the increase in noise levels at this location from construction equipment is expected to be negligible. The estimated average noise level during the daytime (8-hour equivalent sound level) from four items of construction equipment operating at this distance is estimated to be 17 decibels A-weighted (dBA), which is well below background sound levels. The increase in traffic noise levels along Texas State Route 128 from construction activity is expected to be less than 1 dBA since the increase in traffic resulting from construction would be much less than the existing traffic on State Route 128.

Short-term noise impacts could occur along State Route 128 as a result of increased truck activity during the period that elemental mercury is transported to the site. The resulting increase in day-night average noise levels along State Route 128 is expected to be less than 1 dBA. As such, the change in truck traffic is not expected to result in a change in noise levels along this route or other shipping routes that would be noticeable to the public or result in an increase in annoyance. If the mercury is shipped by rail instead of by truck, some additional rail activity from placing railcars at the site could result in some increase in noise levels near the site.

Operation of a new mercury storage facility at WIPP Vicinity Section 10 is expected to have a negligible impact on noise levels around the site since the noise sources associated with mercury storage would be limited to a few employee vehicles, occasional delivery trucks, and semiannual testing of the emergency generator.

4.2.4.2 WIPP Vicinity Section 20

Meteorological impacts on a facility at WIPP Vicinity Section 20 would be similar to those on a facility at WIPP Vicinity Section 10, discussed in Section 4.2.4.1.1.

Air quality impacts from construction and operation of a facility at WIPP Vicinity Section 20 would be similar to those from a facility at WIPP Vicinity Section 10, discussed in Section 4.2.4.1.2. Emissions from truck and rail shipments are presented in Tables 4–1 and 4–2.

Noise impacts from construction and operation of a facility at WIPP Vicinity Section 20 would be similar to those from a facility at WIPP Vicinity Section 10, discussed in Section 4.2.4.1.3.

4.2.4.3 WIPP Vicinity Section 35

Meteorological impacts on a facility at WIPP Vicinity Section 35 would be similar to those on a facility at WIPP Vicinity Section 10, discussed in Section 4.2.4.1.1.

Air quality impacts from construction and operation of a facility at WIPP Vicinity Section 35 would be similar to those from a facility at WIPP Vicinity Section 10, discussed in Section 4.2.4.1.2. Emissions from truck and rail shipments are presented in Tables 4–1 and 4–2.

Noise impacts from construction and operation of a facility at WIPP Vicinity Section 35 would be similar to those from a facility at WIPP Vicinity Section 10, discussed in Section 4.2.4.1.3.

4.2.5 Ecological Resources

Anticipated impacts on ecological resources include the permanent disturbance of 3.1 hectares (7.6 acres) of land needed for the construction and operation of the proposed mercury storage facility. Following the decommissioning phase, it is assumed that the land disturbed by the construction and operation of the facility would eventually return to its original vegetative state through succession. Disturbed habitat types within the required footprint include mainly desert grassland and short-grass prairie. Although Section 10 and Section 20 are relatively undisturbed when compared to the developed center of WIPP (the area inside of the Property Protection Area boundary and vicinity), Section 10 is farther from the developed center of the WIPP site.

4.2.5.1 WIPP Vicinity Section 10

4.2.5.1.1 Terrestrial Resources

Terrestrial habitats present within Section 10 include desert grassland and short-grass prairie ecosystems. A total of 3.1 hectares (7.6 acres) of land within these ecosystems would be permanently disturbed for the construction and operation of the proposed mercury storage facility.

4.2.5.1.2 Wetlands and Aquatic Resources

No wetlands or aquatic resources exist within Section 10; thus, no impacts on wetlands or aquatic habitats are anticipated.

4.2.5.1.3 Threatened and Endangered Species

Although no threatened or endangered species have been observed at WIPP during historical surveys and no federally designated critical habitat exists on site, DOE would nonetheless consult immediately with the U.S. Fish and Wildlife Service, as well as the New Mexico Department of Game and Fish, for guidance on how to proceed in the event that a listed species is identified within the proposed mercury storage area. In addition, DOE has instituted measures, in consultation with the U.S. Bureau of Land Management, to protect the lesser prairie-chicken and its habitat at WIPP. These measures would be adhered to during the construction and operation phases of the project and include the establishment of periods during which offsite field activities may not be performed during the species' breeding season (DOE 2011b).

4.2.5.2 WIPP Vicinity Section 20

Existing conditions at Section 20 are similar to those within Section 10, and impacts on ecological resources within Section 20, including terrestrial resources, wetlands and aquatic resources, and threatened and endangered species, would be similar to those described for Section 10 in Section 4.2.5.1. The same precautions and measures discussed in Section 4.2.5.1.3 regarding protection of these resources would be adopted and adhered to in the event that the mercury storage facility is constructed in Section 20.

4.2.5.3 WIPP Vicinity Section 35

Existing conditions at Section 35 are similar to those within Section 10, and impacts on ecological resources within Section 35, including terrestrial resources, wetlands and aquatic resources, and threatened and endangered species, would be similar to those described for Section 10 in Section 4.2.5.1. The same precautions and measures discussed in Section 4.2.5.1.3 regarding protection of these resources would be adopted and adhered to in the event that the mercury storage facility is constructed in Section 35.

4.2.6 Cultural and Paleontological Resources

DOE initiated consultation with the New Mexico State Historic Preservation Division, State Historic Preservation Officer (SHPO) to support the analysis in this section (see Chapter 5, Section 5.4.2, and Appendix I). In its August 31, 2012, response to DOE, the State Historic Preservation Division agreed with DOE on the need for preconstruction surveys and construction monitoring, where applicable (see Appendix I). If one of the WIPP Vicinity reference locations is selected for a mercury storage facility, procedures would be developed in consultation with the SHPO to properly manage any inadvertent discoveries of resources and to perform required consultations. Inadvertent discoveries of such resources would be handled in accordance with 36 CFR 800.11 (for historic properties) or 43 CFR 10.4 (for American Indian human remains, funerary objects, sacred objects, or objects of cultural patrimony), as appropriate.

4.2.6.1 WIPP Vicinity Section 10

4.2.6.1.1 Prehistoric Resources

No impacts on prehistoric resources are expected from construction or operation of a new mercury storage facility at Section 10. The closest archaeological district is located roughly 11 kilometers (7 miles) northwest of the project area. The land within the WIPP LWB has been determined to represent a potentially significant contributor of cultural resources and DOE direction includes regarding it as such when land management decisions are made (DOE 2002a). Although Section 10 is not within the WIPP LWB, due to its proximity, it is anticipated that resources of cultural significance might be encountered. If any resources are discovered during construction, DOE would follow the procedures established with the SHPO to ensure they were handled in accordance with 36 CFR 800.11 or 43 CFR 10.4, as appropriate.

4.2.6.1.2 Historic Resources

No impacts on historic resources are expected from construction or operation of a new mercury storage facility at Section 10. However, only roughly 1,370 hectares (3,380 acres) of the 4,140 hectares (10,240 acres) managed by WIPP have been surveyed for cultural resources. If the mercury storage facility is constructed on undisturbed land within Section 10 and historic resources are discovered, DOE would work with the New Mexico SHPO to properly manage the discovery site and to perform required consultations, as described in Section 4.2.6.

4.2.6.1.3 American Indian Resources

There would be no impact on American Indian resources as none have been identified on or near the site.

4.2.6.1.4 Paleontological Resources

There would be no impact on unique paleontological resources as none have been identified or are likely to occur on the site.

4.2.6.2 WIPP Vicinity Section 20

As described in Chapter 3, Section 3.2.6, the cultural and paleontological resources of WIPP Vicinity Sections 10 and 20 are similar. Therefore, the environmental impacts of construction and operation of a mercury storage facility at Section 20 would be similar to those described in Section 4.2.6.1 for Section 10. No American Indian resources have been identified on or near the site.

The majority of Section 20 has not been examined for the presence of cultural resources; however, no archaeological sites have been located from the cultural resources surveys that have been conducted within the section (see Chapter 3, Section 3.2.6.1).

Historic remains or features (more than 50 years old) are rare but have occasionally been identified within Section 20 (see Chapter 3, Section 3.2.6.2). With few exceptions, cultural resources known or anticipated in the area covered by the WIPP LWB are significant; they must be identified, recorded, assessed through an inventory, and considered in any plan of development for the area. Fifty-nine archaeological sites and 91 isolated occurrences have been identified to date. The sites and isolates identified are almost exclusively prehistoric. Only one site with both prehistoric and historic components was noted. The land within the WIPP LWB has been determined to represent a potentially significant contributor of cultural resources, and DOE direction includes regarding it as such when land management decisions are made (DOE 2002a). If the mercury storage facility is constructed within Section 20 and prehistoric or historic resources are discovered, DOE would work with the New Mexico SHPO to properly manage the discovery site and to perform required consultations, as described in Section 4.2.6.

4.2.6.3 WIPP Vicinity Section 35

As described in Chapter 3, Section 3.2.6, the cultural and paleontological resources of WIPP Vicinity Sections 10 and 35 are similar. Therefore, the environmental impacts of construction and operation of a mercury storage facility at Section 35 would be similar to those described in Section 4.2.6.1 for Section 10. No American Indian resources have been identified on or near the site.

The WIPP Vicinity reference location in Section 35 is located on BLM-managed land just to the southeast of the WIPP LWB. The majority of Section 35 has not been examined for the presence of cultural resources; however, some cultural resource surveys were undertaken, and archaeological sites were found (see Chapter 3, Section 3.2.6.1). Currently there are seven known cultural resources located in Section 35. Of the seven resources, only one, 54373, is currently recommended as being potentially eligible for listing on the National Register of Historic Places. The land in the vicinity of WIPP has been determined to represent a potentially significant contributor of cultural resources, and DOE direction includes regarding it as such when land management decisions are made (DOE 2002a). If the mercury storage facility is constructed within Section 35 and prehistoric or historic resources are discovered, DOE would work with the New Mexico SHPO to properly manage the discovery site and to perform required consultations, as described in Section 4.2.6.

4.2.7 Site Infrastructure

Infrastructure requirements for a new mercury storage facility, presented below, can be found in Appendix C.

4.2.7.1 WIPP Vicinity Section 10

4.2.7.1.1 Ground Transportation

Construction and operation of a new mercury storage facility outside the LWB in Section 10 are not expected to appreciably increase demands on the road system leading to the site. Projected traffic volumes and the number of shipments associated with mercury storage operations are presented in Section 4.2.11.

4.2.7.1.2 Electricity, Fuel, and Water

To support construction, electric power would likely be supplied via a diesel-fired generator. Diesel fuel would also be required to operate construction equipment. Total diesel fuel demand for construction is estimated at 193,000 liters (51,000 gallons) over the 6-month construction timeframe. Liquid fuels are not considered to be limiting resources as they would be provided by local or regional suppliers and delivered to the point of use as needed. Raw water would be required for dust control, soil compaction, and other construction uses; some potable water would also be required for sanitary uses by the construction workforce. Raw water would likely be delivered to the site via a refillable water truck. Construction is projected to require approximately 1,230,000 liters (325,000 gallons) of raw water and about 40,900 liters (10,800 gallons) of potable water, for a total of 1,270,000 liters (336,000 gallons).

On an annualized basis, utility demands for mercury storage facility operations would be relatively small compared with construction. Electricity requirements would total 253 megawatt-hours annually for facility lighting, ventilation, and heating. A new service connection to the Xcel Energy powerline would need to be established that is separate from the electrical substation that supports WIPP operations, leading to a moderate impact on electrical infrastructure.

An estimated 606 liters (160 gallons) of diesel fuel would be consumed annually for operation of an emergency onsite generator used to support a mercury storage facility. Compared to the 73,615 liters (19,447 gallons) of gasoline and diesel fuel used at WIPP for mobile vehicles and emergency generators, the projected fuel requirements for emergency generator operations at a mercury storage facility would be negligible and would be supplied from local vendors.

Water use would be limited to that required to support the potable and sanitary needs of the facility workforce and would total about 88,500 liters (23,400 gallons) per year. Potable water would either be trucked to the site and stored for use or would be made available through a tie-in to a nearby public water supply main.

4.2.7.2 WIPP Vicinity Section 20

4.2.7.2.1 Ground Transportation

Construction and operation of a new mercury storage facility inside the LWB in Section 20 are not expected to appreciably increase demands on the road system leading to the site. Projected traffic volumes and the number of shipments associated with mercury storage operations are presented in Section 4.2.11.

4.2.7.2.2 Electricity, Fuel, and Water

Demands for electricity, fuel, and water would be similar to those described for WIPP Vicinity Section 10 as discussed above in Section 4.2.7.1.2; however, delivery of these services for operation of the storage facility may be different. Most infrastructure tie-ins could be made directly to WIPP's existing infrastructure. The electrical distribution infrastructure would need to be upgraded to provide adequate electricity for mercury storage facility operations, leading to a moderate impact on electrical infrastructure. Access to potable water would be made available through tie-in to the existing water supply at WIPP.

4.2.7.3 WIPP Vicinity Section 35

4.2.7.3.1 Ground Transportation

Construction and operation of a new mercury storage facility outside the LWB in Section 35 are not expected to appreciably increase demands on the road system leading to the site. Projected traffic volumes and the number of shipments associated with mercury storage operations are presented in Section 4.2.11.

4.2.7.3.2 Electricity, Fuel, and Water

Demands for electricity, fuel, and water would be similar to those described for WIPP Vicinity Section 10 as discussed above in Section 4.2.7.1.2.

4.2.8 Waste Management

4.2.8.1 WIPP Vicinity Section 10

Waste generation associated with the proposed construction and operation of the RCRA-permitted mercury storage facility outside the WIPP LWB in Section 10 would have a negligible impact on the site considering the relatively small volumes of hazardous and nonhazardous waste projected to be generated.

Construction of the proposed mercury storage facility is estimated to generate 270 cubic meters (355 cubic yards) of nonhazardous solid waste (construction debris) and approximately 9,850 liters (2,600 gallons) of nonhazardous sanitary liquid waste. Construction debris may be disposed of in the permitted WIPP site construction and demolition landfill provided it does not exceed the daily limit on disposal; otherwise, this waste would be transported off site for disposal at the Eddy County Sandpoint Landfill. Sanitary solid waste would be shipped to the Eddy County Sandpoint Landfill. Portable toilet facilities, serviced by a local or regional contractor, would be used to serve the nonhazardous sanitary liquid waste needs of the construction workforce.

It is estimated that 910 55-gallon (208-liter) drums of hazardous waste would be generated over the 40-year period of analysis for mercury storage facility operations. This generation volume equates to an average annual generation rate of 23 55-gallon drums, or approximately 5 cubic meters (6.5 cubic yards) (approximately 1 metric ton [1.1 tons or 2,200 pounds] by weight) of hazardous waste. This waste would primarily consist of cleaning rags used during facility maintenance activities, personal protective equipment (PPE) used during monitoring activities, materials used during spill response activities, and mercury vapor filters used in the Handling Area. In comparison, operations at WIPP currently generate approximately 53.5 cubic meters (70 cubic yards) of hazardous waste. The estimated yearly generation rate of mercury-contaminated waste generated by mercury storage facility operations would be a relatively small volume compared with most facilities that manage hazardous waste. As necessary, mercury-contaminated waste would be disposed of off site using licensed hazardous waste disposal contractors.

New mercury storage facility operations would also generate an estimated 2,360,000 liters (623,000 gallons) of nonhazardous liquid sanitary waste over the 40-year period of analysis, or 58,960 liters (15,575 gallons) annually, or approximately 161.5 liters (43 gallons) per day. In comparison, 31,649 liters (8,361 gallons) per day of nonhazardous sanitary waste were generated by WIPP operations in 2011. Since the new mercury storage facility would be located outside the LWB, a separate nonhazardous sanitary liquid waste storage and treatment or septic system would be installed.

4.2.8.2 WIPP Vicinity Section 20

Waste generation associated with the proposed construction and operation of the mercury storage facility inside the WIPP LWB in Section 20 would have a negligible impact on the site considering the relatively small volumes of hazardous and nonhazardous waste projected to be generated. The amounts of waste generated during construction and operation would be similar to those described for WIPP Vicinity Section 10 discussed above in Section 4.2.8.1.

As stated above for WIPP Vicinity Section 10, operation of a new mercury storage facility would generate an estimated 2,360,000 liters (623,000 gallons) of nonhazardous liquid sanitary waste over the 40-year period of analysis or 58,960 liters (15,575 gallons) annually, or approximately 161.5 liters

(43 gallons) per day. By comparison, 31,649 liters (8,361 gallons) per day of nonhazardous sanitary waste was generated by WIPP operations in 2011. WIPP's sanitary disposal system is designed for 87,000 liters (23,000 gallons) per day, or almost 32 million liters (8.4 million gallons) annually (DOE 2010: 28). Liquid sanitary waste generation from mercury storage facility operations, therefore, would have less than a 1 percent impact on WIPP's sanitary liquid waste system.

4.2.8.3 WIPP Vicinity Section 35

Waste generation associated with the proposed construction and operation of the mercury storage facility inside the WIPP LWB in Section 35 would have a negligible impact on the site considering the relatively small volumes of hazardous and nonhazardous waste projected to be generated. The amounts of waste generated during construction and operation would be similar to those described for WIPP Vicinity Section 10 discussed above in Section 4.2.8.1.

4.2.9 Occupational and Public Health and Safety

Descriptions of the assumptions, data, and methods of analysis are summarized in Appendix D of this SEIS. Additional detail is provided in Appendix D of the January 2011 *Mercury Storage EIS* (DOE 2011a), as updated in Appendices B and E of this SEIS.[2] Many of the analytical considerations and many of the results are the same for all three WIPP Vicinity Sections 10, 20, and 35, as well as the alternative sites analyzed in the January 2011 *Mercury Storage EIS*. Therefore, the reader is frequently referred to Appendix D of this SEIS and Appendix D of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this SEIS), where appropriate, to avoid excessive repetition. Details or results specific to the WIPP Vicinity reference locations are discussed in the appropriate sections on occupational and public health and safety.

4.2.9.1 WIPP Vicinity Section 10

4.2.9.1.1 Normal Operations

Normal operations are discussed in Appendix D, Section D.4.1, of the January 2011 *Mercury Storage EIS*. The considerations there are common to all of the proposed storage sites. Consequences to the involved worker are predicted to be negligible because involved workers would never be exposed to airborne concentrations of mercury vapor above the American Conference of Governmental Industrial Hygienists' 8-hour time-weighted average/threshold limit value of 0.025 milligrams per cubic meter of mercury vapor. This corresponds to keeping exposures to the involved worker in the Severity Level (SL)-I (negligible) range.[3] This would be achieved by adherence to good operating practices, in particular attention to ventilation, inspection, monitoring, and use of PPE, as described in the *U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury (Interim Guidance)* (DOE 2009). As discussed in the *Interim Guidance*, the design, installation, and operation of ventilation systems would be in accordance with the American Society of Heating, Refrigerating, and Air-Conditioning Engineers standards. Therefore, the risks to involved workers would be negligible during normal operations.

[2] Since publication of the January 2011 *Mercury Storage EIS*, DOE has published new criteria for assessing the severity of exposure to mercury vapor. This has resulted in changes to the definition of severity levels (i.e., magnitude of impacts) for assessing acute-inhalation exposures to the public under certain accident scenarios. Appendix B and Appendix E of this SEIS update parts of Chapter 4 and Appendix D of the January 2011 *Mercury Storage EIS*. The impact analyses for the WIPP Vicinity reference locations discussed in this SEIS have incorporated the revised criteria.

[3] For definitions of SLs for various types of exposures, see Appendix D, Section D.3.1, of this SEIS. For a discussion of how risk is assessed, see Appendix D, Section D.2, of this SEIS and Appendix D, Section D.1.1, of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2 of this SEIS).

For people outside the building during normal operations (noninvolved workers[4] and members of the public), a chronic, long-term release is bounded by consideration of a full spill tray under a pallet of 3-liter flasks that remains undetected indefinitely (a highly conservative assumption given the expected inspection and monitoring activities within the storage building). The steady state release from this source of mercury vapor is assumed to leak from the building and to be mixed into its turbulent building wake. The January 2011 *Mercury Storage EIS* Appendix D, Section D.4.1.2, shows that the predicted long-term average concentration in the building wake for new construction is about 2.0×10^{-5} milligrams per cubic meter. This value is well below EPA's chronic-inhalation-exposure reference concentration of 3.0×10^{-4} milligrams per cubic meter. Hence, consequences would be in the SL-I range, and the risk to both noninvolved workers and the public would be negligible.

4.2.9.1.2 Facility Accidents

The analysis of potential accidents at the WIPP Vicinity reference locations differs very little from that at the other sites considered in the January 2011 *Mercury Storage EIS*. There is no difference for accidents initiated by engineering failure or human error. There are small differences in the analysis of some of the external events, but these do not make any significant difference to the analysis of accident risks at the WIPP Vicinity reference locations.

Engineering Failures and Human Errors

Appendix D, Section D.2.4, of the January 2011 *Mercury Storage EIS* contains detailed considerations of the likelihood of occurrence of candidate facility (onsite) accident scenarios initiated by failures of engineered systems or human errors. These considerations remain unchanged for potential accidents occurring at the WIPP Vicinity reference locations.

External Events

Appendix D, Section D.2.5, of the January 2011 *Mercury Storage EIS* describes candidate external events and their likelihood of occurrence. External events that were considered are listed below:

- Wildfires
- Earthquakes
- High winds or tornadoes
- Floods
- Lightning
- Snow loads
- Aircraft crashes
- Vehicle crashes
- Nearby facility fires or explosions

Each event is considered in terms of its likelihood of occurrence and its potential impact in terms of a mercury release from the flasks and 1-metric-ton (1-MT) storage containers. The potential frequency and magnitude of these events can vary significantly between the candidate sites due to the wide spectrum of climate, topography, seismology, and collocated site facilities that exist at each location. However, the analyses of wildfires, floods, lightning, snow loads, vehicle crashes, and nearby facility fire or explosions remain the same, with the only differences being in seismic events, high winds or tornadoes, and aircraft crashes.

[4] It is recognized that there may be no noninvolved workers immediately adjacent to a storage facility in Section 10 or 35, which is outside the WIPP LWB. However, for the sake of conservatism, it is assumed that there could be workers near the storage facility engaged in operations other than those related to the handling of mercury.

Earthquakes

Earthquake-produced ground motion is expressed in units of percent *g* (force of acceleration relative to that of Earth's gravity). The latest probabilistic peak ground acceleration (PGA) data from the U.S. Geological Survey are used to assess seismic hazard among the various mercury storage candidate sites. The PGA values cited are based on a 2 percent frequency of exceedance in 50 years. This corresponds to an annual frequency (chance) of occurrence of about 1 in 2,500 years or 4×10^{-4} per year. For all three potential sites at WIPP, this acceleration is 0.08 *g* (USGS 2012). At any of the WIPP Vicinity reference locations, the new facility would be designed to withstand this acceleration. This frequency is moderate (Frequency Level [FL]-III), as it is at all of the other candidate sites.

The PGA value varies at the other sites considered in the January 2011 *Mercury Storage EIS*, from 0.05 *g* at the Kansas City Plant to 0.57 *g* at the Hawthorne Army Depot. However, the buildings at each site are designed to withstand these design-basis earthquakes, with the result that the frequency of an earthquake severe enough to damage the storage building is the same at all of the sites, FL-III. The subsequent consequence analysis also is unchanged from that at other sites with new buildings, with the result that predicted risk from seismic events is little to no different in the vicinity of WIPP than it is at the other sites.

For an earthquake accident in this SEIS, it is conservatively assumed that all flasks would release their entire contents of mercury with no retention of any of the mercury within the flasks. In addition, it is conservatively assumed that the earthquake would cause the building roof to collapse and that the roof would then fall onto and breach all 1-MT mercury storage containers. As a result, a pool of mercury within the storage building would become the source of release to the environment. The following two alternative earthquake scenarios are considered:

- The building remains sufficiently intact so that the spill can still be regarded as occurring inside the building, and the building still generates a turbulent building wake (see Appendix D, Section D.7.2.1, of the January 2011 *Mercury Storage EIS*).

- The building collapses and the spilled pool of mercury is, for all intents and purposes, in the open air.

No attempt was made to assess the relative conditional probabilities of these two scenarios, i.e., they are both assigned a moderate (FL-III) frequency.

The possibility that there could be a fire subsequent to the earthquake remains. In some environmental impact statements, a seismic event that then causes a fire is only considered when there is a natural gas main, hydrogen, propane, or solvents in the building (e.g., DOE 1999b:E-5.4; 2001:D-82, D-83). In one document, the presence of a natural gas pipeline within a building that could be ruptured by an earthquake and cause a subsequent fire was not analyzed because the earthquake-induced damage to the building would result in a dilution of the released natural gas to below its flammability limit (DOE 2002b:C-11). Since a new facility would be constructed at WIPP with the sole purpose of storing mercury, the building would have no fuel pipelines or stored fuels. The frequency of an earthquake with subsequent fire would be negligible.

Tornadoes

In Appendix D, Table D–6, of the January 2011 *Mercury Storage EIS*, data are presented on tornado occurrence frequency and severity, using the Fujita or "F" Scale, for the seven sites considered for mercury storage and the Y–12 National Security Complex (Y–12). Tornadoes of severity F1 and F0 are not expected to cause storage building damage sufficient to result in any significant mercury release to the environment. Many well-constructed buildings would survive an F2 tornado without serious damage to the roof or walls. However, for the purposes of the present analysis, it is conservatively assumed that an F2 tornado would cause the building to collapse and release the contents of all flasks and 1-MT storage vessels – the same source term as for an earthquake.

In the vicinity of WIPP, the historical frequency of occurrence of tornadoes of F2 severity or greater is 1.08 per year, including a frequency of 0.06 per year of tornadoes of severity F3 (Tornadohistoryproject 2012). Using this frequency of occurrence of F2 or greater tornadoes, and the same methodology that was used in the January 2011 *Mercury Storage EIS* Appendix D, the predicted frequency of a damaging tornado strike on a new storage facility at any of the WIPP Vicinity reference locations is 8.78×10^{-8} per year (just under 1 chance in 10 million per year). This is a negligible frequency. Since the source term is conservatively assumed to be the same as for an earthquake, which, as noted above, has a moderate frequency (F-III), tornado risks are bounded by earthquake risks.

Other High Winds

The WIPP Vicinity reference locations are not located in an area prone to hurricanes. Therefore, the frequency of high straight-line winds that would be as damaging as a tornado of F2 or greater severity is negligible.

Aircraft Crashes

There is an existing study of aircraft crashes at WIPP (DOE 2011b). This shows that the predicted frequency of occurrence of an aircraft crash anywhere on the WIPP site is 9.5×10^{-7} per year (just under 1 chance in 1 million per year). This is a negligible frequency. This is because there are no airports close to WIPP – the nearest are at Cavern City (44.3 kilometers [27.5 miles], commercial aircraft), Lea County Regional (64.2 kilometers [39.9 miles], general aviation), JAL (66 kilometers [41 miles], general aviation), and Zip Franklin Memorial (73.7 kilometers [45.8 miles], general aviation).[5] The frequency of a crash into a specific building would be even lower.

Summary of Candidate Onsite Scenarios

Table 4–3 summarizes the results of the analysis of onsite scenarios. These results are the same for all potential storage sites and do not provide a means of discriminating between them.

Table 4–4 lists the accident scenarios that remain for consequence analysis after eliminating those with negligible (FL-I) frequency from Table 4–3. These accident scenarios are the same for all candidate storage sites.

The frequencies of all of the scenarios in Table 4–4 are low (FL-II) or moderate (FL-III). Combining this with a consequence in the SL-I to SL-II range gives a risk in the negligible-to-low range for the involved worker in a mercury storage building at any of the WIPP Vicinity reference locations.

[5] This information was obtained from www.airnav.com, accessed on August 16, 2012. Commercial airports handle a range of aircraft up to and including large passenger and cargo aircraft. General aviation airports, which include air taxi, handle small aircraft.

Table 4–3. Summary of Candidate Onsite Accident Scenarios and Their Likelihood of Occurrence

Hazard	Activity	Postulated Scenario	Frequency of Release[a]	Evaluated Further	Comments[a]
Kinetic	Onsite material handling	Single flask is dropped during handling, resulting in breach.	Moderate (FL-III)	Yes	Consolidation of partially filled pallets could lead to a relatively large number of handling events per year. Could only occur inside building.
Kinetic	Onsite material handling	Single pallet is dropped during transfer to storage racks, resulting in breach.	Moderate (FL-III)	Yes	Assumes pallet dropped from 3.7 meters (12 feet) and all 49 flasks breached. Conservatively assumed that could occur outside the building as well as inside.
Kinetic	Onsite material handling	Triple-pallet collapse.	Moderate (FL-III)	Yes	Requires failure of storage rack. Could only occur inside building.
Kinetic	Onsite material handling	Single 1-MT container drop.	Moderate (FL-III)	Yes	Could occur inside or outside building. Assumes container dropped from a height of less than 1.5 meters (5 feet).
Fire	Onsite storage	Building fire involving multiple flasks or 1-MT containers.	Negligible (FL-I)	No	Limited ignition sources, electric forklift,[b] controls on flammable materials, reliable fire protection system, building constructed of nonflammable materials.
Fire/ explosion nearby	All activities	Fire/explosion at nearby building impacts mercury containers.	Negligible (FL-I)	No	No other facilities containing explosives or potentially flammable materials close enough to impact storage building.
Wildfire	All activities	Wildfire consumes storage building.	Negligible (FL-I)	No	Although wildfires are common, fire monitoring, prevention and suppression systems greatly reduce the likelihood of mercury release.
Earthquake	All activities	Earthquake results in building damage and causes pallets and/or flasks to fall and spill.	Moderate (FL-III)	Yes	Requires an earthquake and failure of flasks or 1-MT containers. Two alternatives considered: building remains recognizably intact or building collapses completely.[c]
Flood	All activities	Storage building floods, causing failure of 3-L flasks or 1-MT containers.	Moderate (FL-III)	Yes	Requires failure of flasks or 1-MT containers. Bounded by earthquake scenario.

Table 4–3. Summary of Candidate Onsite Accident Scenarios and Their Likelihood of Occurrence *(continued)*

Hazard	Activity	Postulated Scenario	Frequency of Release[a]	Evaluated Further	Comments[a]
Weather	All activities	High winds or tornadoes result in roof failure and cause pallets and/or flasks to fall.	Low (FL-II) or negligible (FL-I) (tornadoes); negligible (FL-I) (high winds)	Yes	Requires failure of flasks or 1-MT containers. Bounded by earthquake scenario.
Weather	All activities	Lightning strike causes small building fire involving limited number of mercury containers.	Negligible (FL-I)	No	Lightning strike as initiator of building fire not considered credible. Assumes building lightning protected as required by building codes.
Weather	All activities	Snow load causes roof collapse, resulting in mercury containers' falling.	Negligible (FL-I)	No	Assumes building designed to requirements of building codes.
Surface transportation	Onsite storage	Vehicle or train crashes into building, resulting in mercury container breach.	Negligible (FL-I)	No	Slow vehicle speeds in vicinity of building.
Aircraft crash	All activities	Aircraft crashes into building, resulting in fire, mercury container breach.	Negligible (FL-I)	No	Limited target area given type of aircraft, flight vectors, and size of storage area within building.

[a] For justification of frequency assignments and comments, see Appendix D, Sections D.2.4 and D.2.5, of the January 2011 *Mercury Storage EIS* (DOE 2011a).

[b] The *Final Mercury Management Environmental Impact Statement* (DLA 2004) determined that the frequency of a forklift fuel fire was negligible to low; the use of an electric forklift reduces this frequency to negligible. See Appendix D, Section D.2.4.5, of the January 2011 *Mercury Storage EIS*.

[c] No effort is made to split the moderate frequency between earthquake with building collapse and earthquake without building collapse (i.e., conservatively, the frequency of occurrence of both scenarios is moderate).

Key: 1-MT=1-metric-ton; 3-L=3-liter; DOE=U.S. Department of Energy; FL=frequency level.

Table 4–4. Summary of Types of Accidents Considered in Onsite Spill Analysis

Accident Scenario	Could Occur Indoors?	Could Occur Outdoors?
Single-flask spill	Yes	No[a]
Single-pallet spill	Yes	Yes
Triple-pallet spill	Yes	No[b]
1-metric-ton container spill	Yes	Yes
Earthquake spill[c]	Yes[d]	Yes[e]

[a] Mercury flasks are transported and stored in pallets in a 7- by 7-flask configuration. Flasks may be removed from a pallet if they are leaking or if flasks from partially filled or smaller pallets are consolidated.

[b] Triple-pallet collapse could only occur when the pallets are inside on the storage racks.

[c] This scenario also encompasses the risk from tornadoes, high winds, and floods.

[d] Earthquake leaves building relatively intact.

[e] Earthquake causes building collapse.

Under all of the scenarios in Table 4–4, both indoors and outdoors (except the earthquake with building collapse), the evaporating mercury would mix into the building wake. Appendix D, Section D.4.2.3, of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this SEIS) shows that, for new construction, the predicted concentrations in the wake are all in the SL-I range, even taking into consideration the revised Protective Action Criterion 1 of 0.15 milligrams per cubic meter. Therefore, the risks to the noninvolved worker and the public from all of these scenarios at the WIPP Vicinity reference locations would be negligible.

For the specific case of an earthquake with building collapse, the spilled mercury would evaporate as if in the open air. Appendix D, Section D.7.1.2, of the January 2011 *Mercury Storage EIS* describes how the release rate is calculated in these circumstances. For a new building, that release rate in Atmospheric Stability Class D with a windspeed u of 4.5 meters per second would be 8.45×10^{-4} kilograms per second. Equations 7–2 and 7–3 in Appendix D of the January 2011 *Mercury Storage EIS* show that the evaporation rate for other windspeeds u is proportional to $(u/4.5)^{0.8}$. These release rates were input into a ground-level Gaussian dispersion model, which calculated downwind concentrations in six Atmospheric Stability Classes A–F, each with four discrete windspeeds, 1.5, 4.5, 6.5, and 8.5 meters per second, i.e., 24 weather conditions in all.[6] The maximum predicted distances to consequence SL-II, SL-III, and SL-IV are shown Appendix E, Table E–2. The maximum downwind distance from new construction to which a concentration could exceed SL-IV would be less than 100 meters (330 feet); SL-III could be exceeded to a distance of about 200 meters (660 feet); and SL-II could be exceeded to a distance of about 790 meters (2,600 feet). There are similar results for existing buildings.

In the vicinity of Section 10, the nearest structures are oil wells, with the closest being at a distance of 500 meters (1,600 feet), while the closest storage/transfer facility is at a distance of 1,200 meters (3,850 feet). Oil wells are rarely visited. Therefore, the storage/transfer facility is assumed to be the nearest facility at which there might be a member of the public during an earthquake with building collapse. That person would never see concentrations at the SL-II, SL-III, or SL-IV level. The maximum concentration might be in the SL-I range. This corresponds to negligible risk. Section 20 is inside the WIPP LWB and is 2,000 meters (6,400 feet) from the closest site boundary, so the risk to the public is negligible for this site also.

Table 4–5 summarizes the calculated risks for all of the hypothetical accidental releases considered for a new storage facility constructed on WIPP Vicinity Section 10.

6 These 24 weather conditions are representative of the full range of weather conditions that can occur at each of the potential storage locations, including the WIPP Vicinity reference locations.

Table 4–5. Summary of Risks of All Onsite Elemental Mercury Spill Scenarios – All WIPP Vicinity Reference Locations

Scenario	Frequency	Consequence[a]	Risk
Spills Inside Building[b]			
Involved worker	FL-II – FL-III	SL-I – SL-II	N–L for all inside spills
Noninvolved worker	FL-II – FL-III	SL-II	N for all inside spills
Member of the public	FL-II – FL-III	SL-II	N for all inside spills
Spills Outside Building			
Involved worker	FL-II – FL-III	SL-I – SL-II	N–L for outside earthquake spill; N for all other outside spills
Noninvolved worker	FL-II – FL-III	SL-I – SL-II	
Member of the public			
1-metric-ton container spill	FL-II	SL-I	N
Single-pallet spill	FL-III	SL-I	N
Earthquake with building collapse[c]	FL-III	SL-I	N

[a] For definitions of severity levels, see Appendix D, Section D.3.1.
[b] The inside spill scenarios considered are single flask, single pallet, triple pallet, 1-metric-ton container, full spill tray under a pallet, and earthquake with intact building walls.
[c] This scenario encompasses the risk from floods, high winds, and tornadoes.
Key: FL=frequency level; L=low; N=negligible; SL=severity level.

4.2.9.1.3 Transportation

This subsection considers transportation by road or rail. The potential truck routes considered are conventional commercial routes that have no hazardous material restrictions. The potential domestic truck and rail routes considered and their estimated mileage were obtained using DOE's TRAGIS [Transportation Routing Analysis Geographic Information System] (Johnson and Michelhaugh 2003). Origination and destination points in TRAGIS are defined by nodes; therefore, the closest TRAGIS node to a given site was used for a particular origination or destination point. Details of the assumptions about the transportation analysis are given in Appendix D, Section D.2.2.

These assumptions, together with estimated mileage of potential truck routes determined using DOE's TRAGIS and known historical frequencies of crashes of various types, can be combined to produce estimates of the frequency at which crashes might occur anywhere along the routes traveled by mercury trucks or railcars. Frequencies estimated for five types of consequences are shown in Table 4–6:

- Crash with spill of elemental mercury onto the ground without fire
- Crash with spill of elemental mercury into water
- Crash with fire in dry weather conditions (without rain) (to analyze the effects of dry deposition)
- Crash with fire in wet weather conditions (with rain) (to analyze the effects of wet deposition)
- Crash with death caused by mechanical impact

The frequency of accidents with fire in wet weather was obtained from the frequency of accidents in dry weather by multiplying by the fraction of the time it rains each year. For the WIPP site, hourly data were available from an onsite meteorological station over a period of 5 years from 2007–2011. The number of hours for which there was rainfall over the 5 years was counted and then divided by the total number of hours in 5 years (43,800) to give the probability of rain in the vicinity of WIPP, which is 0.015.

Table 4–6. Frequency Analysis of Truck and Railcar Accidents – All WIPP Vicinity Reference Locations

Scenario	Truck Miles	Frequency of Accidents (per year)	Frequency of Accidents with Spills (per year)	Frequency of Accidents with Fires in Dry Weather (per year)	Frequency of Accidents with Fires in Wet Weather (per year)	Frequency of Accidents with Death[a] (per year)
Truck – Scenario 1[b]	1,046,223	1.2×10^{-2}	2.1×10^{-3}	1.7×10^{-4}	5.4×10^{-6}	5.9×10^{-4}
	–	High – FL-IV	Moderate – FL-III	Moderate – FL-III	Low – FL-II	Moderate – FL-III
Truck – Scenario 2[b]	1,868,523	1.8×10^{-2}	3.7×10^{-3}	3.0×10^{-4}	9.6×10^{-6}	1.0×10^{-3}
	–	High – FL-IV	Moderate – FL-III	Moderate – FL-III	Low – FL-II	Moderate – FL-III
Railcar[c]	426,212	2.6×10^{-3}	1.2×10^{-5}	2.8×10^{-5}	8.9×10^{-7}	1.7×10^{-4}
	–	Moderate – FL-III	Low – FL-II	Low – FL-II	Negligible – FL-I	Moderate – FL-III

[a] Fatality caused by mechanical impact, not by exposure to mercury.
[b] Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.
[c] Transportation by rail to Section 10 or 35 would involve intermodal transportation: rail to WIPP, then truck from WIPP to the Section 10 or 35 location. The risk associated with additional truck miles to Section 10 or 35 (approximately 300 miles per year) is negligible.
Note: To convert miles to kilometers, multiply by 1.60934.
Key: FL=frequency level.

For comparison, the comparable figures for the other potential storage sites ranged from 0.016 at the Hawthorne Army Depot to 0.056 at the Savannah River Site, with an average of 0.032 (see Appendix D, Table D–16, in the January 2011 *Mercury Storage EIS*). Since, for any given site, the transportation routes run through many different parts of the United States, this average was chosen as the multiplier to estimate the frequency of crashes with fire during rain starting with the frequency of crashes with fire in dry weather. Considering all potential candidate sites, including the WIPP Vicinity reference locations, the average reduces slightly to 0.030. However, for consistency with the January 2011 *Mercury Storage EIS*, the multiplicative factor is left at a slightly conservative 0.032. Thus, in Table 4–6, the frequency of accidents with fires in wet weather is obtained from the frequency of accidents with fires in dry weather multiplied by 0.032.

The frequencies shown in Table 4–6 are for an accident anywhere along any of the transportation routes taken to WIPP over a 40-year period of analysis. The frequency of accidents with spills or accidents with fires in dry weather would be moderate under both Truck Scenarios and low under the Railcar Scenario. The frequency of crashes with fires in wet weather would be low under both Truck Scenarios and negligible under the Railcar Scenario. The frequency of accidents with death caused by mechanical impact would be moderate under all scenarios.

As noted, the above frequencies are for an accident anywhere along any of the transportation routes taken to WIPP over a 40-year period of analysis. A crash that occurs in the last mile of the trip was used to estimate the frequency of an onsite crash in the vicinity of the storage building. The frequency of such accidents with spills would be low under both Truck Scenarios and negligible under the Railcar Scenario. The frequency of crashes with fires or death would be negligible under all scenarios.

4.2.9.1.3.1 Transportation Accident with Spill of Elemental Mercury onto the Ground

For exposures occurring via evaporation from a spill of elemental mercury with no fire during a transportation accident, the fraction of the mercury being carried by the truck or railcar that would be spilled is highly uncertain. It is extremely unlikely that all 3-liter flasks or all 1-MT (1.1-ton) containers would be breached. However, to be conservative, it is assumed that such a catastrophic release could take place. The largest amount of mercury that can be carried in a truck or railcar is that contained in 54 1-MT containers. Assuming that all of this mercury is spilled and spreads until the pool is at its capillary depth of 0.36 centimeters (0.14 inches) (so conservative as to be essentially inconceivable in an outdoor spill),[7] the predicted rate of evaporation in a windspeed u of 4.5 meters per second would be 7.35×10^{-5} kilograms per second, with the evaporation rates for different windspeeds u being scaled by the factor $(u/4.5)^{0.8}$ (see Appendix D, Section D.7.1.2, of the January 2011 *Mercury Storage EIS*).

Running these rates of release through the Gaussian model of atmospheric dispersion and ranging over all possible combinations of atmospheric stability class and windspeed, the predicted maximum distances to the airborne toxic benchmarks are as follows: SL-IV, less than 100 meters (330 feet); SL-III, less than 100 meters (330 feet);[8] and SL-II, about 230 meters (750 feet). As a result, a specific individual could not be exposed to concentrations that are greater than SL-I if he or she lives more than 230 meters (750 feet) from a crash. Conservatively, assuming that the individual lives immediately adjacent to the road, that specific individual could only be exposed above SL-I if the crash occurs along a 460-meter (1,500-foot) stretch of road (230 meters [750 feet] on each side). This is a small fraction of any of the routes (for example, the average length of a truck trip to the WIPP Vicinity reference locations is approximately 2,400 kilometers [1,500 miles]). The frequency of occurrence of a truck crash with spill on the truck routes to WIPP is 0.0037 per year; see Table 4–6 (Truck Scenario 2). The product of the fraction of the route and the frequency of occurrence is about 7.0×10^{-7} per year, a negligible (FL-I) frequency. Under Truck Scenario 1 and the Railcar Scenario, similar reasoning shows that the corresponding frequencies would also be negligible (FL-I). Therefore, the individual risk to a member of the public from transportation spills onto the ground without fire en route to WIPP would be negligible under all transportation scenarios.

4.2.9.1.3.2 Transportation Accident with Spill of Elemental Mercury Directly into Water

The consequences of the spillage of elemental mercury into a water body are discussed in Appendix D, Section D.5.4.2, of the January 2011 *Mercury Storage EIS*. In summary:

- The available understanding of the behavior of elemental mercury spilled into a river or other water body is subject to great uncertainty so that an estimate of the consequences to humans (and ecological receptors) is not possible.

- Should such a spillage occur, it appears that the processes that convert elemental mercury into forms that are potentially hazardous to humans (inorganic compounds of mercury and methylmercury) are slow and would generally allow ample time for cleanup.

- If the spillage occurs onto the banks of a river or water body, but not directly into it, transportation to the water body would be slow, again allowing ample time for cleanup.

The foregoing observations might break down if there is spillage into a fast-flowing river.

The overall conclusion is that a direct spillage of mercury into a body of water could be of concern if it is not cleaned up, but that there is generally adequate time for such cleanup. Hence, the consequences to humans could be managed so that they are negligible or low. Given this assumption and the fact that the frequency of crashes with spills during transportation to the WIPP Vicinity reference locations is no more than moderate (and this is an upper bound on the frequency of spills directly into water), the risk would be negligible or low for all transportation routes. However, because of the above-mentioned uncertainty

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7 Surface tension is what prevents the mercury pool from spreading any further. However, the mercury will only spread until the pool is at its capillary depth of 0.36 centimeters (0.14 inches) if the surface is perfectly smooth. If the surface is rough, the mercury will pool in hollows and depressions and the effective surface area for evaporation will be less than it would be for a smooth surface. See Appendix D, Section D.7.1.4, of the January 2011 *Mercury Storage EIS*.

8 The predicted distance for SL-IV is in fact different from and less than that for SL-III. However, both distances are less than 100 meters (330 feet). Since the atmospheric dispersion model is not valid at distances from the source less than 100 meters (330 feet), both distances are written as "less than 100 meters (330 feet)."

about fast-flowing rivers, this observation should be tempered by noting that the uncertainty regarding this prediction of risk is very large.

Table 4–7 summarizes the risks arising from spillages of elemental mercury during transportation to WIPP.

Table 4–7. Summary of Transportation Risks to Human Receptors, Spills of Elemental Mercury onto the Ground or into Water – All WIPP Vicinity Reference Locations

	Truck Scenario 1[a]	Truck Scenario 2[a]	Railcar Scenario
Spill onto the Ground			
Frequency[b]	FL-I	FL-I	FL-I
Consequence	SL-II	SL-II	SL-II
Risk	*Negligible*	*Negligible*	*Negligible*
Spill into Water			
Frequency[c]	FL-III	FL-III	FL-II
Consequence	SL-I – SL-II	SL-I – SL-II	SL-I – SL-II
Risk[d]	*Negligible to low*	*Negligible to low*	*Negligible to low*

[a] Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.
[b] Frequency at which spill occurs close enough to a specific individual to cause Acute Exposure Guideline Level 2 to be exceeded.
[c] Frequencies of railcar or truck crashes with spills from Table 4–6.
[d] These estimates of risk are subject to large uncertainty.
Key: FL=frequency level; SL=severity level.

4.2.9.1.3.3 Transportation Accident with Fire

For wooden pallets of 49 3-liter flasks, the material of combustion is the wood of the crate.[9] It is assumed that the amount of wood in a truck or railcar full of 1-MT containers is bounded by the amount of wood in a truck or railcar full of pallets. Either the crash itself or the heat of the fire would rupture an indeterminate number of flasks or 1-MT containers. The mercury is assumed to spread out over the bed of the truck or railcar, with the burning wood standing in or near the pool and causing evaporation by radiative heat transfer. The maximum extent of the pool area that could potentially be affected by radiative heat transfer is limited to the size of the bed of the truck or railcar, regardless of the number of flasks or 1-MT containers that might be ruptured. It is believed that this is a conservative scenario—more than likely the mercury would run out of the damaged truck or railcar so that the optimum configuration of burning materials and the pool (i.e., optimum for radiative heat transfer to the pool) is unlikely to occur or the number of ruptured containers would be far less than that required to fill the bed of the truck or railcar. Essentially, the mercury would reach its boiling point and evaporate at that temperature (at a rate controlled by the windspeed over the surface) until all the available fuel has burned.

Appendix D, Section D.7.4.1, of the January 2011 *Mercury Storage EIS* shows that the calculated rate of evaporation for a truck pallet fire is 1.3 kilograms per second and for a railcar pallet fire is 1.6 kilograms per second, with corresponding durations of release of 762 and 1,308 seconds, respectively, with a windspeed of 4.5 meters per second. The corresponding rates with a windspeed of 1.5 meters per second are 0.55 and 0.68 kilograms per second, respectively. Appendix D, Section D.7.4.1, of the January 2011 *Mercury Storage EIS* also considers how high the plume, containing products of combustion, mercury vapor, and entrained air, would rise. The analysis shows that 100 meters (330 feet) is realistic or conservative for all conditions of atmospheric stability class and windspeed for the Truck and Railcar

[9] The *Interim Guidance* (DOE 2009) envisages that 3-liter flasks or 1-MT containers may be transported in either wooden or metal pallets. In this SEIS, the assumption is that the pallets are made of wood because this gives a conservatively high estimate of the heat that might be available to evaporate mercury.

Scenarios. The plume is therefore assumed to rise to a height of 100 meters immediately above the source of release, at which point it defines the input for the Gaussian dispersion model. Using standard plume rise models, the initial radius of the plume at this height is taken to be about $0.6\Delta h$, where Δh is the height of plume rise.

Mercury released during a fire is converted into the divalent inorganic mercury form. Conservatively, it is assumed that 20 percent of it is converted into the divalent form (see Appendix D, Section D.7.3.3, of the January 2011 *Mercury Storage EIS*). In this form, mercury can deposit by dry deposition or wet deposition. The January 2011 *Mercury Storage EIS* Appendix D, Section D.7.3.3, also discusses the choice of dry deposition velocities and the rainfall scavenging rate for use in the Gaussian dispersion model.

The Gaussian model calculations for the fire scenarios were carried out in three weather conditions that are representative of the full range of weather conditions:

- Atmospheric Stability Class A with a windspeed of 1.5 meters per second, representative of conditions of low windspeed and high ambient thermally generated turbulence
- Atmospheric Stability Class D with a windspeed of 4.5 meters per second, representative of “average” weather conditions dominated by mechanically generated turbulence
- Atmospheric Stability Class F with a windspeed of 1.5 meters per second, representative of conditions with low ambient turbulence

<u>Human Exposure – Inhalation Pathway (Transportation Fire Scenarios)</u>

The generic results of the calculations for the inhalation pathway following a crash with fire for any potential site are shown in Table 4–8.

Table 4–8. Predicted Range of Distances (meters) Downwind Within Which Acute Airborne Severity Levels Are Exceeded – Crashes with Fires

Type of Accident	Atmospheric Stability Class/Windspeed	PAC-1 (SL-II)	AEGL-2 (SL-III)	AEGL-3 (SL-IV)
Truck crash, wooden pallets	A/1.5 m/s	<100–3,500	<100–130	Nowhere
	D/4.5 m/s	<100–25,000	Nowhere	Nowhere
	F/1.5 m/s	<100–>40,000[a]	500–1,200	Nowhere
Railcar crash, wooden pallets	A/1.5 m/s	<100–3,700	130–830	Nowhere
	D/4.5 m/s	<100–30,000	550–2,300	Nowhere
	F/1.5 m/s	<100–>40,000[a]	350–2,050	Nowhere

[a] The limit of validity of the dispersion model is 40,000 meters (approximately 25 miles).

Note: To convert meters to feet, multiply by 3.281.

Key: <=less than; AEGL=Acute Exposure Guideline Level; m/s=meters per second; PAC=Protective Action Criterion; SL=severity level.

The combination of the consequence results above with the frequencies of crashes with fires is explained in Appendix D, Section D.4.5, of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this SEIS), and produces the results in Table 4–9.

Table 4–9. Summary of Acute-Inhalation Risks to Human Receptors, Accidents with Fires, Transportation Routes to All WIPP Vicinity Reference Locations

	Both Truck Scenarios[a] with Wooden Pallets	Railcar Scenario with Wooden Pallets
Frequency[b]	FL-III	FL-II
Consequence[c]	SL-II	SL-II
Risk	*Low*	*Low*

[a] Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.
[b] Frequencies of railcar or truck crashes with spills and fires from Table 4–8.
[c] The consequence in any weather (dry or wet) condition that yields the highest risk.
Key: FL=frequency level; SL=severity level.

Note that the risks presented in the above scenario are individual risks: they are the answer to the question, "What is the risk to me?" This is not the same as the risk that, somewhere along a transportation route, airborne concentrations would exceed the various SLs. Those risks would in fact be higher.

<u>Human Exposure – Deposition on the Ground</u>

The analyses performed for this SEIS show that, under all fire scenarios listed in Table 4–10, with and without rain, mercury deposited on the ground would never cause the benchmark of 180 milligrams per kilogram to be exceeded. Therefore, the corresponding risks would be negligible.

Table 4–10. Predicted Range of Distances (meters) Downwind to Which Lakes Could Potentially Be Contaminated Above Levels Safe for Consumption of Fish – Accidental Truck and Railcar Crashes with Fires

Type of Accident/Frequency Level	Atmospheric Stability Class/Windspeed	Consumption of Fish		
		National Average	Subsistence Fisherman	
			Average	95th Percentile
Truck Crash with Fire, Dry Deposition/FL-III[a]	A/1.5 m/s	Nowhere	Nowhere	500–700
	D/4.5 m/s	Nowhere	Nowhere	Nowhere
	F/1.5 m/s	Nowhere	Nowhere	Nowhere
Truck Crash with Fire, Wet Deposition/FL-II[b]	A/1.5 m/s	<100	500–700	2,000–3,000
	D/4.5 m/s	Nowhere	700–1,000	3,000–5,000
	F/1.5 m/s	<100	1,000–2,000	5,000–7,000
Railcar Crash with Fire, Dry Deposition/FL-II[c]	A/1.5 m/s	100–200	300–500	700–1,000
	D/4.5 m/s	Nowhere	Nowhere	2,000–3,000
	F/1.5 m/s	Nowhere	Nowhere	Nowhere
Railcar Crash with Fire, Wet Deposition/FL-I[b]	A/1.5 m/s	200–300	1,000–2,000	3,000–5,000
	D/4.5 m/s	300–500	1,000–2,000	5,000–7,000
	F/1.5 m/s	700–1,000	3,000–5,000	7,000–10,000

[a] From Appendix D, Tables D–13 and D–14, of the January 2011 *Mercury Storage EIS*.
[b] From Appendix D, Table D–17, of the January 2011 *Mercury Storage EIS*.
[c] From Appendix D, Table D–15, of the January 2011 *Mercury Storage EIS*.
Note: To convert meters to feet, multiply by 3.281.
Key: <=less than; FL=frequency level; m/s=meters per second.

Human Exposure – Consumption of Fish

Appendix D, Section D.1.1.2.7, of the January 2011 *Mercury Storage EIS*, presents the reasons for the choice of 0.3 milligrams of methylmercury per kilogram of fish tissue, wet weight, as the boundary between SL-I and SL-II for the accumulation of methylmercury in fish to levels that could be harmful to humans if consumed at the national average rate of 0.0175 kilograms per day. Appendix D, Section D.1.1.2.7, of the January 2011 *Mercury Storage EIS* also considers subsistence fishermen. Based on data provided by EPA (2001), a subsistence fisherman would on average consume 0.059 kilograms per day, while the 95th percentile of fish consumption is 0.170 kilograms per day (about 62 kilograms per year). Table 4–10 summarizes the results of the analysis of distances downwind to which bodies of water might be contaminated with methylmercury to levels at which fish caught there would be unsafe for human consumption.

Appendix D, Section D.4.5, of the January 2011 *Mercury Storage EIS*, presents a semi-quantitative analysis of these results and the associated risks. Should a truck or rail accident with fire occur, the risk to fishermen (that eat fish at both the national average and subsistence consumption rates) would be negligible, with the possible exception of a low risk for a subsistence fisherman that eats fish at the 95th percentile consumption rate following a railcar fire with dry deposition. However, irrespective of frequency, should such an accident occur within a few kilometers upwind of a body of water used by subsistence fishermen, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements of mercury concentrations in waters and fish stocks.

Table 4–11 summarizes the human health risks associated with all transportation spills.

Table 4–11. Summary of Transportation Risks to Human Receptors – All WIPP Vicinity Reference Locations

Spill Scenario	Truck Scenario 1[a]	Truck Scenario 2[a]	Railcar Scenario
Elemental mercury, spill onto ground	Negligible	Negligible	Negligible
Elemental mercury, spill into water	Negligible to low within a large range of uncertainty	Negligible to low within a large range of uncertainty	Negligible to low within a large range of uncertainty
Spill with fire, inhalation	Low	Low	Low
Spill with fire, dry and wet deposition onto soils	Negligible	Negligible	Negligible
Fish consumption pathway – national average	Negligible	Negligible	Negligible
Fish consumption pathway – average subsistence fisherman	Negligible	Negligible	Negligible
Fish consumption pathway – 95th percentile subsistence fisherman	Negligible	Negligible	Negligible to low – dry deposition Negligible – wet deposition

[a] Truck Scenarios 1 and 2 are defined in Appendix D, Section D.2.2.

4.2.9.1.4 Intentional Destructive Acts

A wide range of intentional destructive acts (IDAs) involving a release of mercury can be postulated for the WIPP Vicinity Section 10 site itself and transportation routes being considered. Each involves an action by intruders or insiders that affects mercury inventories either at the storage facility or during transportation to the storage facility. The human health impacts of an IDA are directly related to the amount of mercury available for dispersion, as well as the means of dispersing it to the environment. Other factors that affect impacts include population density, distance to the population, and meteorology.

IDA scenarios were selected based on the amount of mercury at the storage facility or in a transport vehicle. Other factors that were considered include the nature of the IDA event that would result in the highest dispersion of mercury to the environment. The likelihood or frequency of the IDA scenarios analyzed in this section cannot be quantified because of the dependence on unpredictable intruder actions and security measures that would be employed by DOE or hazardous material transporters. Each IDA scenario assumes multiple actions by intruders with no successful mitigation or protection measures. Conservative analytical assumptions are also imposed on the calculations. The results are presented in terms of consequences, but not annual risks because of the lack of an annual probability or frequency for these IDA events.

The accident analyses in Appendix D of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this SEIS) show that the largest airborne and ground mercury concentrations would result from scenarios in which a quantity of mercury in containers is exposed to a fire. The energy of a fire would increase the mercury release rate and plume release height. Since the accident analysis evaluates fire scenarios involving available fuel in a truck or railcar that contains mercury, the IDA scenarios were developed to incorporate larger quantities of flammable material in concert with mercury in containers on a truck or railcar. The largest easily accessible and mobile source of large quantities of flammable material is a gasoline tank truck, which may contain between 18,927 and 34,069 liters (5,000 and 9,000 gallons) of gasoline. The IDA scenario postulates that a group of individuals hijack a fully loaded 34,069-liter (9,000-gallon) gasoline tank truck, which they then drive into either another truck or a railcar loaded with mercury being carried in either 34.6-kilogram (76-pound) flasks or 1-MT (1.1-ton) containers. Another postulated scenario would involve two groups of armed intruders: one hijacking the loaded tanker truck and the other disabling the train or truck carrying mercury.

The postulated armed intruders would incapacitate any persons accompanying the shipment; release the gasoline in the gasoline tanker on and around the mercury storage containers; and set the gasoline on fire, thereby engulfing the mercury cargo in an unmitigated fire. This IDA event may occur either in transit or at the unloading location at the mercury storage facility. The same quantity of gasoline and mercury are assumed to be available under both scenarios; these quantities would only be limited by the transport capacity of the truck or railcar. The most vulnerable large quantities of mercury were determined to be truck or rail shipments either in transit or at the facility prior to unloading.

IDA scenarios involving an attack on the storage facility other than during unloading of a truck or railcar are considered to be less likely because of the distribution of mercury within the facility, presence of security, and facility design features that would ameliorate mercury releases to the environment.

Appendix D, Section D.2.6, of the January 2011 *Mercury Storage EIS* describes a fire caused by an IDA. The parameters needed for input into the atmospheric dispersion model are discussed in Appendix D, Section D.7.4.2, of the January 2011 *Mercury Storage EIS*, where it is explained that the railcar fire is a somewhat conservative bounding case for the truck fire. The results of the analyses are as follows.

Human Exposure – Atmospheric Pathway

Per Appendix D, Table D–64, of the January 2011 *Mercury Storage EIS*, the duration of release is 10,660 seconds (approximately 3 hours). Interpolation from Appendix D, Table D–6, gives a corresponding Acute Exposure Guideline Level (AEGL)-2 (SL-III) of 1 milligram per cubic meter (1.0×10^{-6} kilograms per cubic meter) and an AEGL-3 (SL-IV) of 4.4 milligrams per cubic meter (4.4×10^{-6} kilograms per cubic meter). The "surrogate AEGL-1" is the American Conference of Governmental Industrial Hygienists' threshold limit value of 0.025 milligrams per cubic meter as a time-weighted average for an 8-hour workday exposure, as discussed in Appendix B.

The results of the atmospheric dispersion analyses and predictions of potential acute-inhalation exposures are shown in Table 4–12.

Table 4–12. Predicted Range of Distances (meters) Downwind to Which Acute Airborne Severity Levels Are Exceeded – IDA Fires

Type of Accident	Atmospheric Stability Class/Windspeed	ACGIH TLV 8-hour TWA (SL-II)	AEGL-2 (SL-III)	AEGL-3 (SL-IV)
Truck crash	A/1.5 m/s	<100–9.000	370–780	Nowhere
	D/4.5 m/s	<100–>40,000[a]	Nowhere	Nowhere
	F/1.5 m/s	<100–>40,000[a]	100–5,700	680–870

[a] The limit of validity of the dispersion model is 40,000 meters (approximately 25 miles).

Note: To convert meters to feet, multiply by 3.281.

Key: <=less than; ACGIH=American Conference of Governmental Industrial Hygienists; AEGL=Acute Exposure Guideline Level; IDA=intentional destructive act; m/s=meters per second; SL=severity level; TLV=threshold limit value; TWA=time-weighted average.

Comparisons with the railcar crash results in Table 4–8 show that the predicted downwind distances are, as expected, generally greater for the IDA fire. As noted above, because frequencies are not assigned to IDA scenarios, it is not possible to match the concentrations described above with corresponding estimates of risk.

Human Exposure – Inorganic Mercury Deposited on the Ground

The calculations predict that the threshold for SL-II (180 milligrams per kilogram) would not be exceeded anywhere following an IDA.

Human Exposure – Consumption of Fish

The predicted ranges of distances downwind to which bodies of water could be contaminated with methylmercury at levels that would be unsafe for human consumption of fish caught there are shown in Table 4–13.

As can be seen, lakes located up to tens of kilometers (tens of miles) downwind could be contaminated to levels unacceptable for subsistence fishermen; lakes up to 10 kilometers (approximately 6 miles) downwind could be unacceptable for people who consume fish at the national average rate. However, as noted previously, it is not possible to associate risks with these predictions.

Table 4–13. Predicted Range of Distances (meters) Downwind to Which Lakes Could Potentially Be Contaminated Above Levels Safe for Consumption of Fish – Intentional Destructive Acts

Type of Accident	Atmospheric Stability Class/Windspeed	Consumption of Fish		
			Subsistence Fisherman	
		National Average	Average	95th Percentile
IDA Fire, Dry Deposition	A/1.5 m/s	Nowhere	1,000–2,000	2,000–3,000
	D/4.5 m/s	Nowhere	Nowhere	10,000–20,000
	F/1.5 m/s	Nowhere	Nowhere	1,000–2,000
IDA Fire, Wet Deposition	A/1.5 m/s	2,000–3,000	7,000–10,000	10,000–20,000
	D/4.5 m/s	5,000–7,000	10,000–20,000	30,000–40,000
	F/1.5 m/s	7,000–10,000	10,000–20,000	20,000–30,000

Note: To convert meters to feet, multiply by 3.281.
Key: IDA=intentional destructive act; m/s=meters per second.

4.2.9.2 WIPP Vicinity Section 20

The consequences to involved and noninvolved workers remain the same for WIPP Vicinity Section 20 as they were presented for WIPP Vicinity Section 10 in Section 4.2.9.1. Because WIPP Vicinity Section 20 is located inside the WIPP LWB and is a further distance from potential public receptors, the consequences to the public would also be smaller than those calculated in the previous sections for WIPP Vicinity Section 10.

4.2.9.3 WIPP Vicinity Section 35

The consequences to involved and noninvolved workers remain the same for WIPP Vicinity Section 35 as they were presented for WIPP Vicinity Section 10 in Section 4.2.9.1.

4.2.10 Ecological Risk

4.2.10.1 WIPP Vicinity Section 10

The following is a summary of the generic analysis of ecological risks that appears in Appendix D, Section D.5, of the January 2011 *Mercury Storage EIS*. It applies equally to all of the sites being considered as possibilities for mercury storage, including WIPP.

The ecological risk assessment considers chronic exposures to the following potentially sensitive ecological receptors:

- Plants
- Soil invertebrates
- The short-tailed shrew
- The American robin
- The red-tailed hawk
- The great blue heron
- The river otter
- Aquatic biota
- Sediment-dwelling (i.e., benthic) biota

Appendix D, Section D.5, of the January 2011 *Mercury Storage EIS* contains a discussion of why these representative receptors were chosen. Ecological exposures from elemental mercury deposited onto surface soil, sediment, and surface water are expected to pose the greatest risk to ecological receptors. The ecological health consequence levels for these receptors are expressed in terms of environmental-medium- and receptor-specific ecological benchmark values or equivalent screening values that are the upper concentration limits for mercury in soil, sediment, and/or surface water. The screening values are expressed in milligrams per kilogram or micrograms per liter depending on whether they are for mercury in soil/sediment or mercury in water, respectively. Appendix D, Section D.5, of the January 2011 *Mercury Storage EIS* describes how these values are calculated.

Table 4–14 provides the screening values for the receptors listed above. The output of the atmospheric dispersion model provides airborne concentrations in kilograms per cubic meter and amounts of deposited mercury in kilograms per square meter. For ease of comparison with these outputs, the ecological screening values can be converted into equivalent levels of deposited mercury (independent of the mercury release scenario). Note that, for each receptor, there are two screening values: one for ingestion of whatever portion of the deposited mercury is converted into methylmercury in the soil, sediment, or water and one for the portion that remains in the inorganic form.

Table 4–14. Screening Values and Equivalent Deposited Screening Values

Ecological Receptor, Pathway	Inorganic or Methylmercury	Screening Value (mg/kg or µg/L)	Equivalent Deposited Screening Value (kg/m^2)
Plants	Inorganic	3.00×10^{-1}	2.76×10^{-5}
Soil invertebrates	Inorganic	1.00×10^{-1}	9.18×10^{-6}
Short-tailed shrew	Inorganic	1.10×10^{2}	1.01×10^{-2}
American robin	Inorganic	2.00×10^{0}	1.84×10^{-4}
Red-tailed hawk	Inorganic	1.62×10^{3}	1.49×10^{-1}
Great blue heron, sediment	Inorganic	7.36×10^{2}	3.12×10^{-2}
Great blue heron, water	Inorganic	1.40×10^{0}	3.61×10^{-2}
River otter, sediment	Inorganic	5.26×10^{3}	2.23×10^{-1}
River otter, water	Inorganic	1.03×10^{1}	2.67×10^{-1}
Aquatic biota	Inorganic	1.30×10^{0}	3.36×10^{-2}
Sediment-dwelling biota	Inorganic	1.50×10^{-1}	6.35×10^{-6}
Plants	Methyl	None	None
Soil invertebrates	Methyl	2.50×10^{0}	1.13×10^{-2}
Short-tailed shrew	Methyl	8.00×10^{-2}	3.60×10^{-4}
American robin	Methyl	1.00×10^{-2}	4.50×10^{-5}
Red-tailed hawk	Methyl	6.86×10^{0}	3.09×10^{-2}
Great blue heron, sediment	Methyl	2.09×10^{0}	5.02×10^{-4}
Great blue heron, water	Methyl	3.20×10^{-2}	3.11×10^{-3}
River otter, sediment	Methyl	5.40×10^{-1}	1.31×10^{-4}
River otter, water	Methyl	8.00×10^{-3}	7.78×10^{-4}
Aquatic biota	Methyl	2.80×10^{-3}	2.72×10^{-4}
Sediment-dwelling biota	Methyl	None	None

Key: µg/L=micrograms per liter; kg/m^2=kilograms per square meter; mg/kg=milligrams per kilogram.

The SL to which a particular ecological consequence estimate is assigned is obtained by dividing the predicted exposure concentration of mercury by the appropriate screening value for ecological effects. If the ratio is 20 or higher, SL-IV is assigned; between 10 and 20, SL-III; between 1 and 10, SL-II; and below 1, SL-I (which is predicted to correspond to negligible consequences).

4.2.10.1.1 Slow Leaks, Accidental Spills at Storage Sites, and Spills Without Fires During Transportation

Ecological risks associated with slow leaks during normal operations and accidental spills arise from the escape of mercury vapors from containers during storage and handling. For ecological receptors, ingestion of soil contaminated with mercury represents the greatest plausible long-term threat from mercury releases. As discussed in Appendix D of the January 2011 *Mercury Storage EIS*, deposition of airborne mercury is the primary mechanism of soil contamination. However, elemental mercury is not subject to significant atmospheric deposition, unlike divalent mercury. As a result, risks to ecological receptors from slow leaks, accidental spills at storage sites, and spills without fires during transportation (other than those directly into a water body) are considered to be negligible at all storage sites and along all transportation routes.

4.2.10.1.2 Spills of Elemental Mercury into Water Bodies

It is conceivable that, during transportation, there could be a crash and a resulting spill of elemental mercury into a river or other body of water. For an assessment of the physical and chemical phenomena that would control how such a spill might affect ecological receptors, see Appendix D, Section D.5.4.2, of the January 2011 *Mercury Storage EIS*, which also makes the following conclusions regarding the consequences of the spillage of elemental mercury into a water body. In summary:

- The available understanding of the behavior of elemental mercury spilled into a river or other water body is subject to great uncertainty so that an estimate of the consequences to ecological receptors is not possible.

- Should such a spillage occur, it appears that the processes that convert elemental mercury into forms that are potentially hazardous to ecological receptors (inorganic compounds of mercury and methylmercury) are slow and would generally allow ample time for cleanup.

- If the spillage occurs onto the banks of a river or water body, but not directly into it, transportation to the water body would be slow, again allowing ample time for cleanup.

Based on the comments above about cleanup, consequences to ecological receptors would likely be in the negligible-to-low range. However, the foregoing observations might break down if there is spillage into a fast-flowing river.

The overall conclusion is that, except for a direct spillage of elemental mercury into a body of water, the consequences to ecological receptors would be negligible. For direct spillages, the fact that the frequency of crashes with spills on any of the transportation routes is no more than moderate (and this is an upper bound on the frequency of spills directly into water), the risk to ecological receptors would be negligible or low for all transportation routes. However, because of the above-mentioned uncertainty about fast-flowing rivers, this observation should be tempered by noting that the uncertainty in the above statement regarding this prediction is large.

4.2.10.1.3 Transportation Spills with Fires

Ecological risks associated with transportation spills with fires principally arise from ingestion of mercury in soil, wetland sediments, or water bodies. Some of this mercury subsequently is converted to methylmercury; this conversion is taken into account in the analysis in Appendix D, Section D.5, of the January 2011 *Mercury Storage EIS*.

The following analysis of consequences considers truck and railcar crashes with fires, in each case with wooden pallets. The analysis uses the same computer runs as were used for the analysis of human receptors. Analyses have been carried out for the following three weather conditions (the same as for the human health risk assessment):

- Atmospheric Stability Class A with a windspeed of 1.5 meters per second
- Atmospheric Stability Class D with a windspeed of 4.5 meters per second
- Atmospheric Stability Class F with a windspeed of 1.5 meters per second

Truck Fires – Dry Deposition

Table 4–15 presents the predicted ranges of distances downwind to which ecological receptors might be exposed in SL-II, SL-III, and SL-IV following a truck crash with fire for each of the three weather conditions for which calculations were performed.

Table 4–15. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Truck Spill with Wooden Pallet Fire and No Rain

Ecological Receptor	Distance (meters) to Which Benchmark is Exceeded (A[a], 1.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (D[a], 4.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (F[a], 1.5 m/s[b])		
	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV
Sediment-dwelling biota	1,000–2,000			3,000–5,000					
Soil invertebrates	700–1,000			2,000–3,000					
Plants	300–500								
American robin									
River otter									
Aquatic biota									
Short-tailed shrew									
Great blue heron									
Red-tailed hawk									

[a] Atmospheric Stability Class.
[b] Windspeed measured at 10 meters.
Note: Shaded cells denote no exceedance of the appropriate benchmark. The ranges in this table indicate that there is uncertainty in the predicted distance to which the various benchmarks are exceeded. The distances downwind at which the various concentrations are first encountered can conservatively be set to 0. To convert meters to feet, multiply by 3.281.
Key: m/s=meters per second; SL=severity level.

Table 4–16 shows that, for a truck crash with a pallet fire but no rain, no ecological receptors could be exposed to deposited mercury in the SL-IV and SL-III ranges in any weather conditions. Two receptors (sediment-dwelling biota and soil invertebrates) could be exposed in the SL-II range in Atmospheric Stability Class D with a windspeed of 4.5 meters per second. Three receptors (sediment-dwelling biota, soil invertebrates, and plants) could be exposed in the SL-II range in Atmospheric Stability Class A with a windspeed of 1.5 meters per second.

The consequences above can be combined with the predicted frequencies of crashes with fires presented in Appendix D, Tables D–13 and D–14, of the January 2011 *Mercury Storage EIS* to provide risks. Tables D–13 and D–14 show that the predicted frequencies of spills with fires are in the FL-III range under both Truck Scenarios and for all of the candidate storage sites. Conservatively, these frequencies are associated with the highest SL predicted in any weather condition in Table 4–15, a conservative assumption.[10] Table 4–16 summarizes the FL, consequence level, and risk to ecological receptors and applies to all candidate storage sites.

Table 4–16. Frequencies, Consequences, and Risks to Ecological Receptors from Truck Crashes with Wooden Pallet Fires and No Rain, All Sites[a]

Ecological Receptor	Frequency Level (FL) of Crash with Fire[b]	Consequence Severity Level (SL)[c]	Risk[d]
Sediment-dwelling biota	FL-III (moderate)	SL-II	Low
Soil invertebrates	FL-III (moderate)	SL-II	Low
Plants	FL-III (moderate)	SL-II	Low
American robin	FL-III (moderate)	SL-I	Negligible
River otter	FL-III (moderate)	SL-I	Negligible
Aquatic biota	FL-III (moderate)	SL-I	Negligible
Short-tailed shrew	FL-III (moderate)	SL-I	Negligible
Great blue heron	FL-III (moderate)	SL-I	Negligible
Red-tailed hawk	FL-III (moderate)	SL-I	Negligible

[a] Applies equally to all candidate sites.
[b] Frequencies of truck crashes with fires from Table 4–6.
[c] The highest consequence in any weather condition from Table 4–15.
[d] Applies to both Truck Scenarios 1 and 2.

As can be seen, only three receptors have a non-negligible risk: sediment-dwelling biota, soil invertebrates, and plants.

<u>Truck Fires – Wet Deposition</u>

The wet deposition analysis proceeded exactly as for the dry deposition, except that the quantity against which equivalent deposited screening values were compared was the amount of mercury deposited on the ground by the action of rain instead of by dry deposition. Table 4–17 is analogous to Table 4–15, but for wet deposition instead of dry deposition.

Table 4–17 shows that, for a truck crash with a pallet fire and rain, sediment-dwelling biota could be exposed to deposited mercury in the SL-IV range over distances of up to 500 meters (1,640 feet); in the SL-III range, up to 2,000 meters (6,600 feet); and in the SL-II range, up to about 20,000 meters (approximately 12.4 miles). The consequences above can be combined with the predicted frequencies of crashes with fires and rain from the January 2011 *Mercury Storage EIS* Appendix D, Table D–17, to provide risks; see Table 4–18. The predicted frequencies of truck spills with fire and rain are in the low (FL-II) range for all of the candidate storage sites and under both Truck Scenarios. Conservatively, these frequencies are associated with the highest SL predicted in any weather condition in Table 4–17. Table 4–18 summarizes the FL, consequence level, and risk to ecological receptors.

Table 4–18 shows that, for all candidate sites, there is a moderate risk that, somewhere along the truck routes, for truck crashes with pallet fires and rain, areas could contain deposited mercury in the SL-IV range for sediment-dwelling biota. Per the risk matrix in Appendix D, Section D.3.1, these indicate situations of concern. Furthermore, though not shown explicitly in Table 4–18, there could be a

[10] In principle, one could calculate the probability that, conditional on the occurrence of the crash with fire, an SL-IV consequence for (say) sediment-dwelling biota could occur. This probability is less than unity, because it does not occur in all weather conditions. It might be small enough that, when multiplied by the FL-III frequencies in Table 4–16, it would drop those frequencies into a lower frequency range. However, this is not possible because the calculations reported in Table 4–16 were only done for the three representative weather conditions, not all weather conditions. Nevertheless, omitting this step in the calculation of frequency does add considerable conservatism.

low risk that areas along truck routes could contain deposited mercury in the SL-III range for sediment-dwelling biota.

Table 4–17. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Truck Spill with Wooden Pallet Fire and Rain

Ecological Receptor	Distance (meters) to Which Benchmark is Exceeded (A[a], 1.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (D[a], 4.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (F[a], 1.5 m/s[b])		
	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV
Sediment-dwelling biota	3,000–5,000	300–500	100–200	10,000–20,000	500–700	100–200	10,000–20,000	1,000–2,000	300–500
Soil invertebrates	3,000–5,000	200–300		7,000–10,000	300–500		7000–10,000	700–1,000	
Plants	1,000–2,000			1,000–2,000			3,000–5,000		
American robin	500–700			700–1,000			2,000–3,000		
River otter	100–200						300–500		
Aquatic biota									
Short-tailed shrew									
Great blue heron									
Red-tailed hawk									

[a] Atmospheric Stability Class.
[b] Windspeed measured at 10 meters.
Note: Shaded cells denote no exceedance of the appropriate benchmark. The ranges in this table indicate that there is uncertainty in the predicted distances to which the various benchmarks are exceeded. The distances downwind at which the various concentrations are first encountered can conservatively be set to 0. To convert meters to feet, multiply by 3.281.
Key: m/s=meters per second; SL=severity level.

Table 4–18. Frequencies, Consequences, and Risks to Ecological Receptors from Truck Crashes with Wooden Pallet Fires and Rain, All Sites[a]

Ecological Receptor	Frequency Level (FL) of Crash with Fire[b]	Consequence Severity Level (SL)[c]	Risk[d]
Sediment-dwelling biota	FL-II (low)	SL-IV	Moderate
Soil invertebrates	FL-II (low)	SL-III	Low
Plants	FL-II (low)	SL-II	Low
American robin	FL-II (low)	SL-II	Low
River otter	FL-II (low)	SL-II	Low
Aquatic biota	FL-II (low)	SL-I	Negligible
Short-tailed shrew	FL-II (low)	SL-I	Negligible
Great blue heron	FL-II (low)	SL-I	Negligible
Red-tailed hawk	FL-II (low)	SL-I	Negligible

[a] Applies equally to all candidate sites.
[b] Frequencies of truck crashes with fires and rain from Table 4–6.
[c] The highest consequence in any weather condition from Table 4–17.
[d] Applies to both Truck Scenarios 1 and 2.

For all candidate sites, there is a low risk that, for the same event, somewhere along the truck routes, areas could contain deposited mercury in the SL-III range for soil invertebrates. Per the risk matrix in Appendix D, Section D.3.1, these indicate situations of minimal concern. Furthermore, though not shown explicitly in Table 4–18, there is a low risk that areas along truck routes could contain deposited mercury in the SL-II range for sediment-dwelling biota and soil invertebrates.

For all candidate sites, there is a low risk that, for the same event, somewhere along the truck routes, areas could contain deposited mercury in the SL-II range for plants, the American robin, and the river otter. Per the risk matrix in Appendix D, Section D.3.1, these indicate situations of minimal concern.

For all candidate sites, the risk to aquatic biota, the short-tailed shrew, the great blue heron, and the red-tailed hawk is negligible.

<u>Railcar Fires</u>

The risks associated with railcar fires are calculated in the same way as for truck fires. Table 4–19 shows the risk results for dry deposition. As can be seen, only sediment-dwelling biota can be exposed in the SL-III range, with a corresponding low risk. Soil invertebrates, plants, and the American robin could be exposed in the SL-II range, also with a corresponding low risk. Consequences and risks to all other receptors are negligible.

Per Table 4–6, the frequencies of railcar crashes with subsequent fire and rain would be negligible for the rail routes to every site. Therefore, all corresponding risks would be negligible.

Table 4–19. Frequencies, Consequences, and Risks to Ecological Receptors from Railcar Crashes with Wooden Pallet Fires and No Rain, All Sites[a]

Ecological Receptor	Frequency Level (FL) of Crash with Fire[b]	Consequence Severity Level (SL)	Risk
Sediment-dwelling biota	FL-II (low)	SL-III	Low
Soil invertebrates	FL-II (low)	SL-II	Low
Plants	FL-II (low)	SL-II	Low
American robin	FL-II (low)	SL-II	Low
River otter	FL-II (low)	SL-I	Negligible
Aquatic biota	FL-II (low)	SL-I	Negligible
Short-tailed shrew	FL-II (low)	SL-I	Negligible
Great blue heron	FL-II (low)	SL-I	Negligible
Red-tailed hawk	FL-II (low)	SL-I	Negligible

[a] Applies equally to all candidate sites.
[b] Frequencies of railcar crashes with fires from Table 4–6.

4.2.10.1.4 Consequences – Intentionally Initiated Fire with Mercury Spill

Tables 4–20 and 4–21 summarize the results of calculations of the impact on ecological receptors resulting from an intentionally initiated gasoline tanker fire (IDA fire), described in Appendix D, Section D.2.6, of the January 2011 *Mercury Storage EIS*. As described previously, the railcar fire is taken as the surrogate for both railcar and truck IDA fires. Table 4–20 is for dry deposition and Table 4–21 is for wet deposition.

Table 4–20. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Intentionally Initiated Railcar Spill with Fire, No Rain

Ecological Receptor	Distance (meters) to Which Benchmark is Exceeded (A[a], 1.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (D[a], 4.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (F[a], 1.5 m/s[b])		
	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV
Sediment-dwelling biota	3,000–5,000	1,000–2,000		30,000–40,000			5,000–7,000		
Soil invertebrates	3,000–5,000			20,000–30,000			3,000–5,000		
Plants	1,000–2,000			3,000–5,000			700–1,000		
American robin	1,000–2,000								
River otter									
Aquatic biota									
Short-tailed shrew									
Great blue heron									
Red-tailed hawk									

[a] Atmospheric Stability Class.
[b] Windspeed measured at 10 meters.
Note: Shaded cells denote no exceedance of the appropriate benchmark. The ranges in this table indicate that there is uncertainty in the predicted distances to which the various benchmarks are exceeded. The distances downwind at which the various concentrations are first encountered can conservatively be set to 0. To convert meters to feet, multiply by 3.281.
Key: m/s=meters per second; SL=severity level.

Table 4–20 shows the following for an intentionally initiated railcar fire with dry deposition:

- No receptors would be exposed at the SL-IV level.
- Sediment-dwelling biota could be exposed up to SL-III levels, but only in Atmospheric Stability Class A with a low windspeed, and then out to no more than 2,000 meters (6,600 feet).
- Soil invertebrates, plants, and the American robin could be exposed at the SL-II level to considerable distances downwind.

Table 4–21. Summary of Potential Exposure of Receptors to Consequence Severity Levels II, III, and IV – Intentionally Initiated Railcar Spill with Fire and Rain

Ecological Receptor	Distance (meters) to Which Benchmark is Exceeded (A^a, 1.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (D^a, 4.5 m/s[b])			Distance (meters) to Which Benchmark is Exceeded (F^a, 1.5 m/s[b])		
	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV	SL-II	SL-III	SL-IV
Sediment-dwelling biota	20,000–30,000	5,000–7,000	3,000–5,000	>40,000[c]	10,000–20,000	5,000–7,000	30,000–40,000	10,000–20,000	10,000–20,000
Soil invertebrates	20,000–30,000	3,000–5,000	2,000–3,000	>40,000[c]	7,000–10,000	3,000–5,000	30,000–40,000	10,000–20,000	7,000–10,000
Plants	10,000–20,000	1,000–2,000	300–500	20,000–30,000	2,000–3,000	1,000–2,000	20,000–30,000	5,000–7,000	2,000–3,000
American robin	7,000–10,000	500–700	200–300	10,000–20,000	2,000–3,000	500–700	10,000–20,000	3,000–5,000	1,000–2,000
River otter	3,000–5,000	100–200		5,000–7,000			7,000–10,000	1,000–2,000	200–300
Aquatic biota	1,000–2,000			3,000–5,000			5,000–7,000	200–300	
Short-tailed shrew	700–1,000			2,000–3,000			3,000–5,000		
Great blue heron	300–500			2,000–3,000			3,000–5,000		
Red-tailed hawk									

[a] Atmospheric Stability Class.
[b] Windspeed measured at 10 meters.
[c] The limit of validity of the model is 40,000 meters (approximately 25 miles).
Note: Shaded cells denote no exceedance of the appropriate benchmark. The ranges in this table indicate that there is uncertainty in the predicted distances to which the various benchmarks are exceeded. The distances downwind at which the various concentrations are first encountered can conservatively be set to 0. To convert meters to feet, multiply by 3.281.
Key: >=greater than; m/s=meters per second; SL=severity level.

Table 4–21 shows that the IDA fire with rain could lead to severe consequences to ecological receptors at considerable distances downwind.

It is not possible to estimate the frequencies of IDAs, so the risks are not tabulated.

4.2.10.2 WIPP Vicinity Section 20

The consequences to ecological resources remain the same for WIPP Vicinity Section 20 as they were presented for WIPP Vicinity Section 10 in Section 4.2.10.1.

4.2.10.3 WIPP Vicinity Section 35

The consequences to ecological resources remain the same for WIPP Vicinity Section 35 as they were presented for WIPP Vicinity Section 10 in Section 4.2.10.1.

4.2.11 Socioeconomics

4.2.11.1 WIPP Vicinity Section 10

Employment during construction is expected to average 18 people for approximately 6 months. Operation of the facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately 5 to 6 individuals thereafter, resulting in a possible increase of the WIPP workforce of approximately 0.7 percent and an increase in the ROI of approximately 0.01 percent. This estimate assumes that new employees would be hired for construction and operation of the new facility rather than drawn from existing onsite personnel. Regardless, neither construction nor operation of a new facility is expected to generate substantial direct or indirect employment. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

Construction-related transportation, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is assumed that there would be approximately 1.5 employees per vehicle, and every vehicle is counted twice to account for round trips. It is estimated that average construction transportation of 45 vehicles a day could increase the average annual daily traffic count by approximately 0.9 percent on U.S. Route 62 or up to approximately 3.2 percent on Texas State Route 128. Fifty-three percent of these vehicles would be attributed to employee transportation. Impacts on traffic during construction would be minor.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of mercury to the site for storage. Appendix C, Section C.1, provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual traffic count by approximately 0.2 percent on U.S. Route 62 or up to approximately 0.9 percent on State Route 128. At the peak of operations, it is estimated that up to 79 shipments would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be minor.

Traffic in the vicinity of WIPP has experienced temporary increases in volume at various times due to oil production activities; however, these impacts are perceived to be transient in nature and would not impact shipments of mercury to the site.

4.2.11.2 WIPP Vicinity Section 20

The socioeconomic impacts would be identical to those described above in Section 4.2.11.1 for Section 10. Therefore, negligible impacts on socioeconomic conditions in the ROI would result from implementation of this alternative. Impacts on traffic during construction and operation would be minor.

4.2.11.3 WIPP Vicinity Section 35

The socioeconomic impacts would be identical to those described above in Section 4.2.11.1 for Section 10. Therefore, negligible impacts on socioeconomic conditions in the ROI would result from implementation of this alternative. Impacts on traffic during construction and operation would be minor.

4.2.12 Environmental Justice

4.2.12.1 WIPP Vicinity Section 10

None of the block groups within either the 16-kilometer (10-mile) radius or the 3.2-kilometer (2-mile) radius surrounding WIPP Vicinity Section 10 contain a minority or low-income population (see Chapter 3, Section 3.2.11.1). Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

4.2.12.2 WIPP Vicinity Section 20

None of the block groups within either the 16-kilometer (10-mile) radius or the 3.2-kilometer (2-mile) radius surrounding WIPP Vicinity Section 20 contain a minority or low-income population (see Chapter 3, Section 3.2.11.2). Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

4.2.12.3 WIPP Vicinity Section 35

None of the block groups within either the 16-kilometer (10-mile) radius or the 3.2-kilometer (2-mile) radius surrounding WIPP Vicinity Section 35 contain a minority or low-income population (see Chapter 3, Section 3.2.11.3). Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

4.3 CLOSURE

At the end of their useful lives, proposed mercury storage facilities would be subject to closure. This would occur under all the action alternatives. Under the No Action Alternative, existing mercury storage facilities could also be subject to closure.

The DOE mercury storage facilities would be closed in a manner that (1) minimizes the need for further maintenance and (2) controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, postclosure escape of hazardous waste, hazardous constituents, and contaminated runoff to the ground or surface waters or to the atmosphere from the facility (40 CFR 264.11). All hazardous waste and hazardous waste residues would be removed from the facility, and remaining containers and any soil containing or contaminated with hazardous waste or hazardous waste residues would be decontaminated or removed (40 CFR 264.178).

Closure would be executed in accordance with a detailed closure plan prepared by the facility operator (i.e., by DOE or DOE's authorized contractor). This plan would be subject to review and approval by EPA or the state's environmental protection agency responsible for permitting the long-term elemental mercury storage facility. The closure plan would also contain a credible site-specific cost estimate for these actions to allow DOE to allocate adequate funding such that closure activities could be conducted in a timely manner.

Closure activities would involve removing any remaining elemental mercury in storage and transporting it to suitable treatment, storage, and disposal facilities, as appropriate. In addition, the closure plan would include a detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during closure (40 CFR 264.112(b)(4)). For example, storage facilities would be inspected for residual mercury contamination. Affected surfaces would then be cleaned with a mercury-absorbing cleaner, as appropriate. Any contaminated materials would be isolated and contained. Workers performing such inspections, testing, and cleanup activities would wear appropriate personal protective gear, including disposable coveralls and air filtration systems.

Contaminated debris or soils, contaminated PPE, and other contaminated materials used for cleanup would be packaged prior to transport off site to a commercial hazardous waste management facility for mercury recovery, recycling, and/or disposal.

It is not possible to project the volume of mercury-contaminated material that may be generated from closure activities. It is likely, however, that much less waste would be generated during closure than during normal facility operations.

Closure activities are expected to occur mostly inside the storage facilities, except for the transport of wastes, and are expected to result in negligible air and water emissions. The cleaning procedure would be designed to minimize the release of any material to the air or water (i.e., mercury or cleaning agent). Therefore, air and water quality impacts from such activities are expected to be minor and human health risks to be low. Because the shipment of wastes resulting from closure should be limited to a few truck trips, impacts on traffic and transportation are expected to be negligible. As there would be little air or water emissions and no land disturbance, no impacts are expected on land use and visual resources, geology and soils, water resources, air quality and noise, ecological resources, cultural and paleontological resources, site infrastructure, or socioeconomics.

Further analysis of alternatives for future use of mercury storage facilities is not possible at this time. Future plans for facility reuse or other disposition would be the subject of additional NEPA analysis, as appropriate.

4.4 CUMULATIVE IMPACTS

The cumulative impacts analysis has been conducted in accordance with the Council on Environmental Quality (CEQ) regulations that implement NEPA and the CEQ handbook, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997).

4.4.1 Methodology and Analytical Baseline

The CEQ regulations implementing NEPA define cumulative effects as "impacts on the environment which result from the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). The regulations further explain that "cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." The cumulative impacts assessment is based on both geographic and time considerations.

The ROI used in the cumulative impacts analysis is assumed to be within a 16-kilometer (10-mile) radius of the WIPP Vicinity reference locations. The general approach to the analysis involves the following process:

- Baseline impacts from past and present actions were identified (i.e., these are the baseline conditions described in Chapter 3).
- The potential impacts produced by the management and storage alternatives were identified (as described in Chapter 4).
- Reasonably foreseeable future actions were identified.
- Cumulative impacts of the proposed action at the WIPP Vicinity reference locations were estimated.

The analysis of constructing and operating a mercury storage facility at any of the WIPP Vicinity reference locations determined that impacts on the various resource areas ranged from none to moderate. In keeping with CEQ regulations (40 CFR 1508.7), those resource areas that were predicted to be impacted at greater than a negligible level were evaluated for their potential to contribute to cumulative impacts within the ROI. Where impacts were predicted not to occur or were negligible, cumulative impacts were not analyzed since there would be either no, or only a very small incremental increase in impacts on the resource within the ROI. This does not mean that other site activities associated with these resource areas are negligible; it means that impacts associated with a mercury storage facility would have a negligible contribution to their cumulative impacts.

4.4.2 Potential Cumulative Actions

Actions that may contribute to cumulative impacts at any of the WIPP Vicinity reference locations include on- and offsite projects conducted by government agencies, businesses, or individuals that are within the 16-kilometer (10-mile) ROI. The potential actions listed in Table 4–22 are those that may contribute to cumulative impacts on or within the ROI.

Table 4–22. Actions That May Contribute to Cumulative Impacts

Location	Description	Reference
Waste Isolation Pilot Plant		
Onsite DOE Action	Construction of a facility to dispose of greater-than-Class C low-level radioactive waste. Disposal in a trench, borehole, vault, or underground repository is being considered; one of the locations being considered is WIPP Vicinity Section 35.	DOE 2011b
Offsite Action	No known actions proposed by the U.S. Bureau of Land Management, the predominant land steward within the region of influence.	DOE 2011b
	Also present within the region of influence are a number of oil wells and underground potash mines located in the vicinity of WIPP, including an existing potash mine lease on WIPP Vicinity Section 10 and one oil well in WIPP Vicinity Section 35.	Rutley 2012 DOE 2011b

Key: DOE=U.S. Department of Energy; WIPP=Waste Isolation Pilot Plant.

A fluorine extraction and depleted uranium deconversion facility has been proposed for a site located 22.5 kilometers (14 miles) west of Hobbs, New Mexico (NRC 2012). Analysis of this project has projected that it would generally have small impacts on the environment. Additionally, the facility site is 64 kilometers (40 miles) northeast of the proposed mercury storage site. Thus, this project would not be expected to contribute to cumulative impacts.

4.4.2.1 Waste Isolation Pilot Plant Vicinity Reference Locations

The cumulative impacts of locating a mercury storage facility at any of the WIPP Vicinity reference locations on land use, air quality, infrastructure, and ecological resources were evaluated and predicted to be greater than negligible. Since there were either no or negligible impacts associated with locating a storage facility at any of the WIPP Vicinity reference locations on visual resources, geology and soils, water resources, cultural and paleontological resources, waste management, occupational and public health and safety, socioeconomics, and environmental justice, these resources were not evaluated with respect to their contribution to cumulative impacts.

Section 4.2.9.1.3 discusses the potential for impacts due to transportation accidents involving mercury shipments. The frequency of an accident with a spill within 1 mile of a DOE facility would be low for truck transport and negligible for rail transport. A maximum of 79 shipments of elemental mercury would be made to the proposed mercury storage facility during the peak year of operation, equivalent to approximately one shipment every 4 or 5 days. The majority of elemental mercury that is anticipated to be received at a DOE facility would be shipped from commercial locations. Shipments of elemental mercury from Y–12 would consist of fully loaded trucks or railcars. Elemental mercury and transuranic waste would not be shipped together. Transuranic waste received at WIPP would be shipped from various DOE sites. Shipments of transuranic waste to WIPP must use transportation casks certified by the U.S. Nuclear Regulatory Commission to withstand a wide range of hypothetical accident scenarios without failing. In conclusion, the likelihood of an accident between a shipment of transuranic waste and a shipment of elemental mercury involving the release of both types of materials is considered negligible. Therefore, the contribution to cumulative risk from transporting elemental mercury to any of the WIPP Vicinity reference locations would be negligible.

4.4.2.1.1 Land Use

A mercury storage facility could be constructed at the Section 10 site located just to the north of the WIPP site boundary, the Section 20 site located within the Off-Limits Area, or the Section 35 site located just to the southeast of the WIPP site boundary (see Figure 4–1). At any of the WIPP Vicinity reference locations, the facility would require 3.1 hectares (7.6 acres). The mercury storage facility would be located on relatively undisturbed, rural land. The only major DOE project planned within the 16-kilometer (10-mile) ROI is the proposed greater-than-Class C (GTCC) waste disposal facility, also located in close proximity to WIPP, including an option to locate the facility in Section 35 (see Figure 4–1). Depending on the type of facility selected (i.e., borehole, trench, vault, or underground repository), the GTCC waste disposal facility could require up to 44 hectares (110 acres) (DOE 2011b). A mercury storage facility and GTCC waste disposal facility could be located within the 260-hectare (640-acre) area that comprises Section 35 without interference with operations or compromising the safety and security of these facilities. Also present within the ROI are a number of oil wells and extensive potash mining that occur in the vicinity of WIPP outside of the LWB. Although the mercury storage facility would slightly increase development with the ROI, due to the limited area of disturbance, its contribution to cumulative impacts on land use would be negligible.

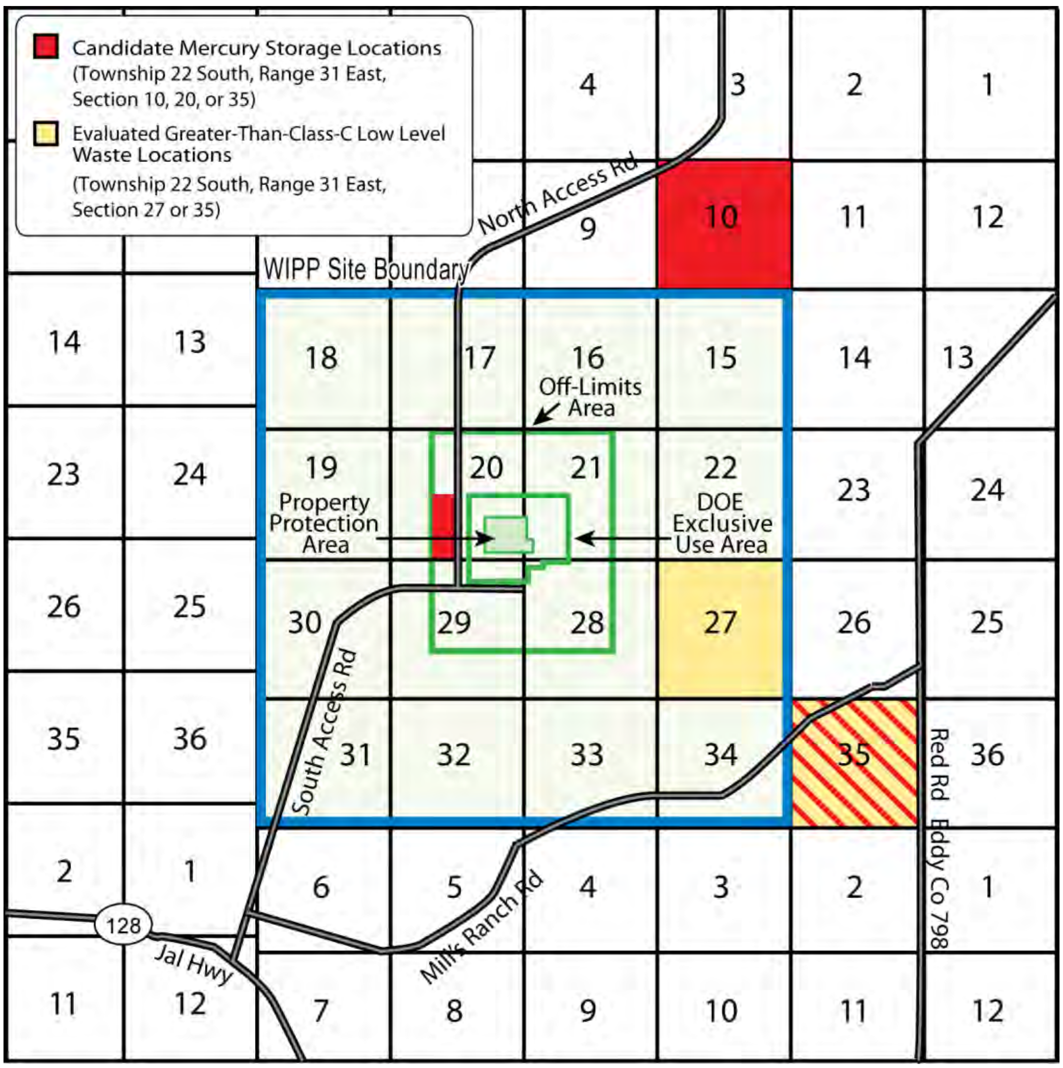

Figure 4–1. Candidate Mercury Storage and Greater-Than-Class C Waste Disposal Facility Locations

4.4.2.1.2 Air Quality

Construction of a mercury storage facility at any of the WIPP Vicinity reference locations would result in minor short-term impacts on air quality. Emissions would occur over a 6-month construction period and are not expected to result in exceedance of the ambient air quality standards. Also, it has been estimated that total peak-year emission rates for construction of a facility for disposal of GTCC waste would be small (DOE 2011b). Thus, due to the projected low levels of emissions and the fact that peak air pollutant concentrations from the two proposed facilities would likely occur at different times, the mercury storage facility would be unlikely to contribute to cumulative air quality impacts.

Exposures to the public from small amounts of mercury vapor emitted from storage containers or residual contamination during operation of a mercury storage facility are expected to have a negligible effect on public health. Further, since such emissions are not expected from other activities within the ROI, there would be no cumulative impacts related to mercury emissions.

Transportation of mercury to a storage facility at any of the WIPP Vicinity reference locations would result in minor short-term air quality impacts; as is the case for construction, these impacts are not likely to overlap in place and time with other projects and activities within the ROI. Since transportation-related air quality impacts associated with mercury storage and other activities within the ROI would be short term and are not expected to substantially change existing baseline conditions, their contribution to cumulative impacts would be negligible.

4.4.2.1.3 Site Infrastructure

Construction and operation of a mercury storage facility are not expected to appreciably increase demands on the transportation systems leading to the WIPP Vicinity reference locations. A maximum of 79 shipments would be made to the proposed mercury storage facility during the peak year of operation (see Appendix C). Depending on the alternative, the proposed GTCC waste disposal facility would involve 630 to 1,685 truck trips per year during its 20 years of operations (DOE 2011b). Since WIPP received its first shipment of transuranic waste in 1999, WIPP has received 10,244 shipments through 2011, an average of approximately 800 shipments per year (DOE 2012).

Fuel and water requirements during construction and operation of the mercury storage facility would be minimal and would not impact regional supplies. During construction, both would be delivered by truck on an as-needed basis. During operations, fuel oil would continue to be supplied via truck; however, potable water would be supplied through tie-in to the existing water supply at WIPP. Fuel oil needed for construction and operation of the proposed GTCC waste disposal facility would also be delivered by truck and water use would be small, with impacts on the water supply system being negligible (DOE 2011b). Demand for these resources is not expected to impact local or regional supplies. Thus, cumulative impacts on fuel and water supplies are not expected.

Electricity demand during construction of the mercury storage facility would be minimal and would likely be supplied by a diesel-fired generator. However, during operations, electric power requirements would increase the annual electrical energy consumption at the WIPP site, resulting in the need to provide a new service connection to the Xcel Energy powerline that is separate from the electrical substation that supports WIPP operations (see Section 4.2.7). This would lead to a moderate impact on electrical infrastructure. In additional to the proposed mercury storage facility and WIPP, the proposed GTCC waste disposal facility would create a small increase in the electrical energy demand (DOE 2011b). However, the increase in electric power demand from these projects is not expected to have a cumulative impact on the ability of Xcel Energy to supply power within the ROI.

4.4.2.1.4 Ecological Resources

None of the WIPP Vicinity reference locations have been disturbed by current development, and each exhibits terrestrial resources common to the area (see Chapter 3, Section 3.2.5.1). Construction of a mercury storage facility would result in the loss of 3.1 hectares (7.6 acres) of desert grassland and short-grass prairie habitat. There are no wetlands or aquatic habitat at any of the sites, nor have any federally threatened or endangered species or critical habitat been identified. Depending on the type of facility selected (i.e., borehole, trench, vault, or underground repository), the GTCC waste disposal facility could disturb up to 44 hectares (110 acres) of similar habitat within and adjacent to the WIPP site boundary. Although mercury storage facility construction would remove a small area of habitat, its contribution to cumulative impacts on terrestrial resources would be negligible. Due to the lack of occurrence of wetlands, aquatic resources, or threatened or endangered species within the potential development sites, the new facility would not contribute to cumulative impacts on those resources.

4.5 MITIGATION MEASURES

This section summarizes the mitigation measures that could be used to avoid or reduce environmental impacts resulting from implementation of the alternatives, as described in the preceding sections. As specified in CEQ's NEPA regulations (40 CFR 1508.20), mitigation includes the following:

- Avoiding impacts altogether by not taking a certain action or parts of an action
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- Rectifying impacts by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating impacts over time by preserving and maintaining the affected environment throughout the duration of the action
- Compensating for impacts by replacing or providing substitute resources or environments

Following the completion of an environmental impact statement and its associated Record of Decision (ROD), DOE is required to prepare a mitigation action plan that addresses any mitigation commitments expressed in the ROD (10 CFR 1021.331). If the ROD contains no mitigation commitments, a mitigation action plan is not required. The mitigation action plan would explain how certain measures would be planned and implemented to mitigate any adverse environmental impacts identified in the ROD. The mitigation action plan would be prepared before DOE would take any action requiring mitigation.

As described throughout this chapter, the impacts of construction and normal operations of the DOE-designated mercury storage facility(ies) would be negligible to minor and would not require mitigation to reduce impacts to acceptable levels. Activities associated with the establishment of a new mercury storage facility(ies) would follow standard procedures for minimizing construction impacts on such resources as air quality and surface water, as well as operational impacts on public health and safety, including accident prevention. These practices are required by Federal and state licensing and permitting requirements, as noted throughout this chapter and further discussed in Chapter 5. Further, DOE has considered mitigation in the formulation of the alternatives as currently proposed, which serve to prevent or reduce short- and/or long-term environmental impacts. Specifically, site location, design, and construction of the proposed new mercury storage facility(ies) would be conducted in accordance with the standards specified under 40 CFR 264 for hazardous waste treatment, storage, and disposal facilities. These include, but are not limited to, the location and performance standards for new RCRA-permitted facilities under 40 CFR 264.18 that address seismic considerations, floodplains, and other natural hazards.

Construction activities would generate criteria air pollutants and fugitive dust, as discussed in Section 4.2.4.1.2. Emissions from construction equipment would be mitigated by maintaining the equipment to ensure that the emissions control systems and other components function at peak efficiency. Additional air quality mitigation measures for construction emissions could include the following:

- Using ultra-low sulfur diesel fuel in off-road construction equipment with an engine horsepower rating of 60 horsepower or above
- Considering the use of alternative fuels (e.g., natural gas and electricity) for smaller equipment when practicable
- Where practicable, using diesel engine retrofit technology (e.g., diesel oxidation catalysts) in off-road equipment to further reduce emissions
- Limiting unnecessary idling times on diesel-powered engines
- Locating diesel-powered exhausts away from fresh air intakes
- Reducing the number of heavy equipment trips and placing speed limits on earth-moving equipment
- Siting laydown areas as far from residences and sensitive receptors as practicable

Soils and unconsolidated sediments exposed in excavations and slope cuts during new facility construction would be subject to wind erosion if left exposed. In addition, fugitive dust emissions would occur as a result of land disturbance by heavy equipment and motor vehicles, causing suspension of soil particles in the air. Construction emissions would be mitigated using standard mitigation techniques, including watering and/or use of surfactants to control dust emissions from exposed areas, revegetation of exposed areas, watering of roadways, and minimizing construction activity under dry or windy conditions. To further ensure that airborne contaminants are not released to the atmosphere during soil excavation, the excavation work could take place beneath containment structures.

Nonetheless, mitigation measures could be used to further reduce potential mercury vapor emissions from mercury storage facility(ies) operations. Although mercury vapor emissions from the Storage Area of the facility during normal operations would be below all applicable standards, emissions could be further reduced by using mercury vapor filters and by lowering the temperature of the air in the storage building through the use of air conditioning. Filters would actively remove mercury vapor as air passes through the filters, and air conditioning would reduce mercury vapor emissions because cooler temperatures result in less mercury vaporization. Although mercury vapor filters could be used to further reduce mercury emissions, these filters would be expensive to operate and maintain in order to achieve relatively small decreases in emissions that would already be low. They would also generate additional hazardous waste (e.g., spent filters) requiring disposal. Although air conditioning could be used to further reduce mercury vapor emissions, air conditioning equipment would be expensive both to install and to operate (e.g., maintenance and energy costs) and would consume electrical energy that may be generated by burning greenhouse-gas-generating fossil fuels.

As a mitigation measure, emergency response planning for a facility accident would take into account the potential for individuals to be linguistically isolated and implement appropriate steps to ensure timely communication of hazards that may adversely affect such offsite individuals. DOE works closely with Federal, state, and local agencies that would provide first responders. Emergency response planning would take into account the applicable procedures in DOE's *Emergency Management Guide* (DOE Guide 151.1-4).

Irrespective of frequency, should a transportation accident occur within a few kilometers upwind of a body of water used by subsistence fishermen, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish and to post appropriate advisories to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements of mercury concentrations in waters and fish stocks.

4.6 RESOURCES

This section describes any unavoidable adverse environmental impacts that could result from siting a mercury storage facility(ies) at any of the candidate sites evaluated in the January 2011 *Mercury Storage EIS* and in this SEIS; irreversible and irretrievable commitments of resources; and the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Unavoidable adverse environmental impacts are impacts that would occur after implementation of all feasible mitigation measures. A resource commitment is considered irreversible when direct and indirect impacts from its use limit future use options. Irreversible commitments apply primarily to nonrenewable resources, such as cultural resources, and also to those resources that are renewable only over long periods of time, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for future use. Irretrievable commitment applies to the loss of production, harvest, or natural resources. The relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity addresses issues associated with the condition and maintenance of existing environmental resources used to support the proposed action and the function of these resources after their use.

4.6.1 Unavoidable Adverse Environmental Impacts

Siting a mercury storage facility(ies) at any of the candidate sites considered in the January 2011 *Mercury Storage EIS* and this SEIS for the long-term storage of elemental mercury would result in unavoidable adverse impacts on the human environment. In general, these impacts are expected to be negligible overall and would arise from incremental impacts attributed to the construction and normal operations of new and/or modified mercury storage facilities at any of the candidate sites.

As further described in this chapter, construction of a new mercury storage facility(ies) at any site would result in land disturbance, generation of fugitive dust and noise, soil erosion, consumption of utilities and natural resources, and increased vehicle traffic that would be unavoidable, even with the application of best management and conservation practices. These activities would generally occur in or adjacent to previously disturbed areas with existing complementary land uses. Construction activities are expected to have negligible impacts overall and would be temporary in nature (i.e., lasting up to 6 months). A full-size mercury storage facility would occupy up to 3.1 hectares (7.6 acres) of land over the long term (assumed, for purposes of analysis, to be up to 40 years). Activities performed to modify or upgrade existing facilities for long-term storage of elemental mercury would also result in some unavoidable adverse impacts that would generally be similar to but less than those noted above for construction of a new storage facility.

Operations of new or modified facilities at any of the candidate sites would have minimal unavoidable adverse impacts on air quality associated with semiannual testing of diesel fuel–fired emergency generators. Emissions would also be generated from employee vehicle trips, relatively infrequent delivery vehicle trips, and truck trips for transporting elemental mercury to the facility(ies). The associated emissions would not measurably degrade ambient air quality or jeopardize compliance with air quality standards around any candidate site.

Also unavoidable would be the generation of small amounts of hazardous and industrial waste associated with normal facility(ies) operations. Any waste generated during operations would be collected, packaged, and eventually removed for suitable recycling or disposal in accordance with applicable EPA and/or state regulations. Sanitary wastewater would also be generated and disposed of through onsite sewage disposal systems or municipal sanitary sewer systems, as appropriate for each site.

Under the No Action Alternative, operation of non-DOE mercury storage facilities and Y–12 would also result in some unavoidable adverse impacts in terms of air emissions, consumption of utility resources, and waste generation. However, at some storage locations, mercury storage may necessitate that the owners provide for expanded storage, resulting in additional construction and operational environmental impacts (see Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*).

Future closure of mercury storage facilities (see Chapter 4, Section 4.10, of the January 2011 *Mercury Storage EIS*) would result in the one-time generation of waste material. Such waste would be collected, packaged as appropriate, and removed for suitable recycling or disposal in accordance with applicable EPA and/or state regulations.

4.6.2 Irreversible and Irretrievable Commitment of Resources

This section summarizes the major irreversible and irretrievable commitments of resources that have been identified under each alternative considered in the January 2011 *Mercury Storage EIS* and this SEIS. Implementation of any of the alternatives considered for long-term storage of elemental mercury, including the No Action Alternative, would entail the commitment of land, energy (e.g., electricity, fossil fuels), water, construction materials (e.g., steel, concrete), geologic resources, equipment, human labor, and capital. In general, the commitments of energy, materials, labor, and capital would be irreversible and, once committed, these resources would be unavailable for other purposes. Capital would be committed permanently. In addition, the generation of waste would indirectly entail the irreversible and irretrievable commitment of resources due to the land required for landfill space, utilities consumed to operate disposal facilities, and human labor.

Key resource commitments for construction and operation of a new mercury storage facility(ies) are presented in Appendix C. The No Action Alternative would entail the least commitment of land, material, and energy resources based on the analyses presented in Chapter 4 of the January 2011 *Mercury Storage EIS*.

4.6.2.1 Land Use

Operation of modified existing facilities or proposed new facilities for mercury storage would require the commitment of land to the prescribed use over the 40-year period of analysis. Thus, the commitment of land is irreversible in the short term, but not necessarily irreversible over the long term. Over the long term, the land that would be occupied by either existing or proposed facilities could ultimately be returned to open space uses if buildings, roads, and other structures were removed and the land revegetated. Alternatively, the facilities could be modified for use in other DOE programs.

4.6.2.2 Energy and Water

Energy expended directly or indirectly to support long-term storage of mercury would be in the form of electricity to operate equipment and fossil fuels to operate equipment and vehicles. Electricity and fuels would be purchased from commercial sources. Consumption of electricity and fossil fuels would be an irretrievable commitment of nonrenewable resources. Water consumed for construction and operation would constitute an irreversible commitment and would not be available for other uses. Water would be obtained via each site's existing water supply system, as described in this chapter. However, these resources are readily available, and the amounts projected to be required are not expected to deplete available supplies.

4.6.2.3 Materials and Geologic Resources

The irreversible and irretrievable commitment of materials, equipment, and other resources comprises those used in the modification or new construction of mercury storage facilities at the candidate sites. This includes materials that cannot be recovered or recycled, materials that are contaminated and cannot be effectively decontaminated, and materials consumed or reduced to unrecoverable forms of waste. Principal construction materials would include steel, concrete (a product of cement, sand, gravel, and other minerals), asphalt, and gravel, although other materials such as wood, plastics, and other metals would also be used (see Appendix C). For practical purposes, materials including concrete, steel, and other materials incorporated into the framework of existing or new facilities would be unrecoverable and irretrievably lost. Certain materials and equipment used during operation of the storage facilities could be recycled when the facilities are closed. All materials and commodities would be procured from commercial vendors in the regions surrounding each candidate site, and all are commonly available materials that are not expected to be in short supply in the affected regions.

4.6.2.4 Waste

Mercury storage operations at any candidate site would generate nonrecyclable waste streams, such as solid waste, sanitary wastewater, and potentially hazardous (mercury-contaminated) waste. The treatment and disposal of any solid waste would cause irreversible and irretrievable commitments of landfill space, energy, and materials. Hazardous waste disposal would require an irreversible and irretrievable commitment of land. This space would be unavailable for wastes from other sources. Sanitary wastewater generated and discharged to treatment systems and/or to the land would eventually be recycled through the ecosphere and would not entail a permanent commitment or impairment of resources.

4.6.3 Relationship Between Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

Under each action alternative, adverse impacts from short-term use of resources would be balanced by long-term benefits and enhancement of long-term productivity associated with the reduction of elemental mercury in the environment. Each of the action alternatives would entail similar relationships between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity. However, there would be differences in the relative magnitude of the short-term uses based on differences in location, including use of existing and/or new storage facilities, utility and transportation infrastructure availability, and labor availability and utilization. Regardless, upon completion of mercury storage activities at any of the candidate locations, land and facilities could be returned to other uses, including long-term productive uses.

Under the No Action Alternative, environmental resources have already been committed to activities at Y–12 and at some existing source locations. There could be environmental impacts at non-DOE storage sites in the short term associated with the need to provide for new or increased storage requirements. Such activities could adversely affect the long-term productivity of the environment.

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40 CFR 1508.7, Council on Environmental Quality, "Terminology and Index: Cumulative Impact."

40 CFR 1508.20, Council on Environmental Quality, "Terminology and Index: Mitigation."

43 CFR 10.4, Office of the Secretary of the Interior, "Human Remains, Funerary Objects, Sacred Objects, or Objects of Cultural Patrimony from Federal or Tribal Lands: Inadvertent Discoveries."

U.S. Department of Energy Directives

DOE Guide 151.1-4, *Response Elements Emergency Management Guide*, July 11, 2007.

DOE Guide 420.1-2, *Guide for the Mitigation of Natural Phenomena Hazards for DOE Nuclear Facilities and Nonnuclear Facilities*, March 28, 2000.

DOE Order 420.1B, *Facility Safety*, December 22, 2005.

DOE Standard 1020-2002, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*, January 2002.

DOE Standard 1023-95, *Natural Phenomena Hazards Assessment*, April 2002.

U.S. Public Laws

P.L. 102-579, The Waste Isolation Pilot Plant Land Withdrawal Act.

P.L. 110-414, Mercury Export Ban Act of 2008.

CHAPTER 5

ENVIRONMENTAL LAWS, REGULATIONS, PERMITS, AND OTHER POTENTIALLY APPLICABLE REQUIREMENTS

CHAPTER 5
ENVIRONMENTAL LAWS, REGULATIONS, PERMITS, AND OTHER POTENTIALLY APPLICABLE REQUIREMENTS

Chapter 5 presents the laws, regulations, permits, and other requirements that could potentially apply to the proposed action. The proposed action would be implemented in accordance with all applicable Federal, state, and local laws and regulations and in full compliance with U.S. Department of Energy policies, orders, procedures, and guidance documents. Consultations have been initiated with Federal and state agencies in accordance with applicable requirements.

5.1 INTRODUCTION

In compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, Council on Environmental Quality (CEQ) NEPA regulations (40 CFR 1500–1508), and U.S. Department of Energy (DOE) NEPA implementing procedures (10 CFR 1021), DOE must consider applicable environmental regulations and any permitting or licensing requirements (including permit applications for new permits or permit modifications for existing permits) when evaluating alternatives for implementing the proposed action. The initial Notice of Intent (NOI) announcing the preparation of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* (DOE 2011), issued on July 2, 2009 (74 FR 31723), and the NOI announcing the preparation of this supplement to the January 2011 *Mercury Storage EIS*, issued on June 5, 2011 (77 FR 33204), identify that one of the issues to be considered is compliance with all applicable Federal, state, and local statutes and regulations and required Federal and state environmental permits, consultations, and notifications. Chapter 5 of the January 2011 *Mercury Storage EIS* discusses a range of potentially applicable Federal laws, regulations, and laws from the states where the potential candidate sites evaluated in the January 2011 *Mercury Storage EIS* are located. This chapter includes a range of potentially applicable Federal laws and regulations, and laws from New Mexico applicable to the three candidate sites identified near the Waste Isolation Pilot Plant (WIPP) that are evaluated in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*: two outside the land withdrawal boundary (LWB) and one within the LWB in the vicinity of WIPP. These locations will be referred to individually as "WIPP Vicinity Section 10," "WIPP Vicinity Section 20," or "WIPP Vicinity Section 35," or together as the "WIPP Vicinity reference locations." State statutes typically mirror the Federal statutes in that they are required to be, at a minimum, equally as stringent.

This chapter identifies major requirements that could be applicable to the proposed action, which is to designate and operate a facility(ies) for the long-term management and storage of elemental mercury generated within the United States.[1] Section 5.2 describes the laws, regulations, and other applicable requirements that set environmental protection requirements that could apply to the WIPP Vicinity reference locations in New Mexico. Section 5.3 discusses potentially applicable permits. Section 5.4 describes applicable consultations.

5.2 LAWS, REGULATIONS, AND OTHER POTENTIALLY APPLICABLE REQUIREMENTS

This section describes the Mercury Export Ban Act of 2008 and the Waste Isolation Pilot Plant Land Withdrawal Act of 1992. Chapter 5, Sections 5.1 and 5.2, of the January 2011 *Mercury Storage EIS* (DOE 2011) describe additional Federal laws, regulations, and other potentially applicable requirements as they relate generally to Federal actions, specifically to elemental mercury management and storage, and to the construction and operation of a long-term management and storage facility(ies) for elemental

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[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

mercury at any of the candidate sites, including the WIPP Vicinity reference locations. These additional Federal laws, regulations, and potentially applicable requirements are identified in the January 2011 *Mercury Storage EIS*. Mercury is addressed in numerous U.S. Environmental Protection Agency regulations, including regulations pertaining to air quality, water quality, hazardous waste management, and pollution prevention.

The Mercury Export Ban Act of 2008

On October 14, 2008, President George W. Bush signed into law the Mercury Export Ban Act of 2008 (the Act), Public Law No. 110-414. The overarching purpose of the Act is "to prohibit the sale, distribution, transfer, and export of elemental mercury."

Section 3 of the Act amends the Toxic Substances Control Act (TSCA) to prohibit any Federal agency from selling, distributing, conveying, or transferring to any other Federal, state, or local agency, or any private entity or individual, any elemental mercury under the control or jurisdiction of the Federal agency, effective beginning on the date of enactment of the Act. The Act sets forth two exceptions to this prohibition: (1) "a transfer between Federal agencies of elemental mercury for the sole purpose of facilitating storage of mercury to carry out this Act; or" (2) "a conveyance, sale, distribution, or transfer of coal."

Section 4 amends TSCA to prohibit the export of elemental mercury from the United States effective January 1, 2013. Section 4 also establishes certain reporting requirements and provides an essential use exemption.

Section 5, entitled "Long-Term Storage," directs DOE to designate a facility(ies) for the long-term management and storage of elemental mercury generated within the United States. It states that DOE's facility(ies) must be operational by January 1, 2013, and ready to accept custody of elemental mercury delivered to such a facility(ies). The Act also requires DOE to assess fees based upon the *pro rata* costs of long-term management and storage of the elemental mercury. The Act establishes October 1, 2012, as the date on which DOE must make public the fee schedule. Section 5(d)(1) further provides that the elemental mercury stored at the facility(ies) is subject to the requirements of the Solid Waste Disposal Act (SWDA), including the hazardous waste management requirements under Subtitle C of the SWDA; however, the Act provides that the elemental mercury stored at the DOE facility(ies) "shall not be subject to the storage prohibition of Section 3004(j) of the SWDA."

DOE's designation of a facility(ies) for the purpose of long-term management and storage of elemental mercury is a Federal action that is governed by NEPA and is the basis for DOE's preparation of this supplemental environmental impact statement.

Federal Land Policy and Management Act of 1976, as amended

On October 21, 1976, President Gerald R. Ford signed into law the Federal Land Policy and Management Act (FLPMA) of 1976, Public Law No. 94-579. FLPMA governs the way in which the public lands administered by the U.S. Bureau of Land Management (BLM) are managed. The passage of FLPMA is called the "organic act" because it consolidated many of BLM's responsibilities. Various land and resource management policies, statutes, and authorities were established, amended, or repealed by FLPMA. FLPMA addresses land use planning, land acquisition, fees and payments, administration of Federal land, range management, and rights-of-way on Federal land. FLPMA also establishes the concept of multiple use of public lands, which means they are utilized in a combination that will best meet present and future needs.

Two of the WIPP vicinity candidate sites considered for the long-term management and storage of elemental mercury are in Section 10 and Section 35, areas located outside the WIPP LWB. BLM-administered land outside the WIPP LWB used for construction and operations of a long-term management and storage facility for elemental mercury would be withdrawn from all forms of entry, appropriation, and disposal under the FLPMA and reserved for the purposes of operating a mercury storage facility, as was done for the WIPP land withdrawal.

The Waste Isolation Pilot Plant Land Withdrawal Act of 1992, as amended

On October 30, 1992, President George H.W. Bush signed into law the Waste Isolation Pilot Plant Land Withdrawal Act of 1992, Public Law No. 102-579, subsequently amended by the Waste Isolation Pilot Plant Land Withdrawal Act Amendments of 1996, Public Law No. 104-201 (WIPP LWA). The WIPP LWA withdrew land from the public domain for the purpose of creating and operating WIPP, the geologic repository in New Mexico designated as the national disposal site for transuranic waste generated by atomic energy defense activities.

One of the WIPP vicinity candidate sites considered for the long-term management and storage of elemental mercury is in Section 20, an area located inside the WIPP LWB. Land inside the WIPP LWB used for construction and operations of a long-term management and storage facility for elemental mercury would be subject to the provisions of the WIPP LWA (as discussed for WIPP) and may require Federal legislation.

5.3 PERMITS AND NOTIFICATIONS

This section summarizes the general requirements for either permit modification or permit application for the WIPP Vicinity reference locations, noting that there is a degree of uncertainty in the permitting process. Regulatory agencies responsible for applicable permitting at these locations are also identified. Table 5–1 summarizes the existing and potential new environmental permits for air, water, and hazardous waste for the WIPP Vicinity reference locations.

Regulatory notification to either the U.S. Environmental Protection Agency or the authorized New Mexico regulatory compliance divisions of the intent to provide long-term storage and management of elemental mercury and any treatment, storage, and disposal (TSD) facility design changes, modifications, etc., would be required. Communication and coordination with all applicable regulatory agencies, including site-specific discussions and facility-specific permitting requirements (application for new permits or modification to existing permits), will be required for the long-term management and storage of elemental mercury at the selected site. For example, because of the requirement that the elemental mercury storage facility(ies) operate under a permit pursuant to Section 3005 of SWDA, hazardous waste TSD facility requirements and all associated permitting will be necessary.

WIPP has experience applying for and operating under air quality and hazardous waste facility permits. The WIPP Vicinity reference locations would require new permits or modifications to existing permits, where appropriate. These new or modified permits would be subject to approval by the applicable regulatory agency.

Table 5–1. Environmental Permit Summary

Permits	WIPP Vicinity Reference Locations New Mexico
Air	
Existing Permit(s)	None for WIPP Vicinity reference locations. However, WIPP has an Air Quality Permit (310-M-2) issued by the State of New Mexico for the operation of two emergency generators.
New Permit Application	Yes, State
Permit Modification	No
Regulatory Notification	Yes, State
Water	
National Pollutant Discharge Elimination System	
Existing Permit(s)	No
New Permit Application	Yes, State
Permit Modification	No
Regulatory Notification	Yes, State
General Construction Stormwater Permit	
Existing Permit(s)	No
New Permit Application	Yes, State
Permit Modification	No
Regulatory Notification	Yes, Federal
Hazardous Waste	
Existing Permit(s)	None for WIPP Vicinity reference locations. However, WIPP has a Hazardous Waste Facility Permit (NM 4890139088) issued by the State of New Mexico for mixed transuranic waste storage and disposal.
New Permit Application	Yes, State
Permit Modification	No
Regulatory Notification	Yes, State

Potential permits that may be required for the WIPP Vicinity reference locations are described below.

***New Mexico Statutes Annotated* (NMSA), Chapter 74, Environmental Improvement, Article 2, Air Pollution, and Implementing Regulations at *New Mexico Administrative Code* (NMAC), Title 20, Environmental Protection, Chapter 2, Air Quality.** Establishes air quality standards and requires a permit prior to construction or modification of an air contaminant source. Also requires an operating permit for major producers of air pollutants and imposes emission standards for hazardous air pollutants.

NMSA, Chapter 74, Article 6, Water Quality, and Implementing Regulations at NMAC, Title 20, Chapter 6, Water Quality. Establishes water quality standards and requires a permit prior to the construction or modification of a water discharge source.

NMSA, Chapter 74, Article 9, Solid Waste Act, and Implementing Regulations at NMAC, Title 20, Chapter 9, Solid Waste. Requires a permit prior to construction or modification of a solid waste disposal facility.

NMSA, Chapter 74, Article 4, Hazardous Waste, and Implementing Regulations at NMAC, Title 20, Chapter 4, Hazardous Waste. Establishes permit requirements for construction, operation, modification, and closure of a hazardous waste management facility and establishes state standards for cleanup of releases from leaking underground storage tanks.

Environmental Oversight and Monitoring Agreement. Agreement in Principle between DOE and the State of New Mexico. Provides DOE support for state activities in environmental oversight, monitoring, access, and emergency response.

5.4 CONSULTATIONS

NEPA and CEQ regulations require DOE and other Federal agencies to consult with Federal agencies, federally recognized tribal governments, and state and local agencies with jurisdiction or special expertise regarding any environmental impact of Federal actions. Agencies involved include those with authority to issue applicable permits, licenses, and other regulatory approvals, as well as those responsible for protecting significant resources (e.g., endangered species, critical habitats, or historic resources). The majority of consultations are in the areas of ecological and cultural resources, and American Indian heritage, religious and cultural areas. In addition, DOE policies require consultation with American Indian tribal governments with regard to any DOE action that might affect any property to which these governments attach religious or cultural importance. DOE is committed to fulfilling its responsibilities of providing open communication and full consultations with federally recognized tribal governments.

If a proposed action has the potential to disturb sensitive species or habitats, ecological resource consultations with the appropriate agencies are required. If a proposed action has the potential to disturb or disrupt a cultural resource or an archaeological site, cultural resource consultations are required.

If, at any time during implementation of a proposed action, an inadvertent discovery is made with potential impacts on ecological, cultural, or American Indian artifacts or materials or human remains, all activity would cease until consultation with affected agencies, organizations, and/or governments is completed. Actions would not resume until a plan is established to mitigate any potential adverse impacts and all applicable consultations have been completed. Table 5–2 provides a summary of consultations pertaining to the WIPP Vicinity reference locations. Chapter 5, Table 5–4, of the January 2011 *Mercury Storage EIS* (DOE 2011) presents a summary of consultations for all other candidate sites.

Table 5–2. Summary of Consultations[a]

Subject	Consultation Letter Addressed to
Ecological Resources	Mr. Wally Murphy, Field Supervisor U.S. Fish and Wildlife Service New Mexico Ecological Services Office 2105 Osuna NE Albuquerque, NM 87113
	Matthew Wunder, Division Chief Conservation Services New Mexico Department of Game and Fish P.O. Box 25112 Santa Fe, NM 87504
	Tony Delfin, State Forester Forestry Division 1220 South Saint Francis Drive Santa Fe, NM 87505
Cultural Resources	Jan Biella, State Historic Preservation Officer Historic Preservation Division Department of Cultural Affairs Bataan Memorial Building 407 Galisteo Street, Suite 236 Santa Fe, NM 87501

[a] Copies of consultation letters and responses are presented in Appendix I.

5.4.1 Consultations Regarding Ecological Resources

Consultations with applicable organizations regarding ecological resources for the WIPP Vicinity reference locations have been initiated (see Table 5–2). The consultations support the process to obtain input regarding the potential for ecological impacts on threatened, endangered, or otherwise protected species or habitats. Consultation letters and responses are presented in Appendix I.

5.4.2 Consultations Regarding Cultural Resources

Consultation with the New Mexico State Historic Preservation Officer has been initiated for the WIPP Vicinity reference locations (see Table 5–2). The consultation supports the process to obtain input regarding the potential for impacts on cultural resources. Consultation letters and responses are presented in Appendix I.

5.4.3 Consultations Regarding American Indian Resources

DOE has not identified any American Indian resources on or near the WIPP Vicinity reference locations; therefore, it was concluded that there were no tribes or tribal resources that would be affected and there was no need for consultation.

5.5 REFERENCES

DOE (U.S. Department of Energy), 2011, *Final Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement*, DOE/EIS-0423, Office of Environmental Management, Washington, DC, January.

CHAPTER 6
GLOSSARY

CHAPTER 6
GLOSSARY

accident – An unplanned sequence of events resulting in undesirable consequences, such as the release of hazardous material to the environment.

active fault – A fault that is likely to have another earthquake sometime in the future. Faults are commonly considered to be active if they have moved one or more times in the last 10,000 years. In assessing seismic hazard as part of the U.S. Geological Survey's National Earthquake Hazard Reduction Program, faults for which there is surface evidence of tectonic activity during the Quaternary Period are considered active.

acute – Severe but of short duration; not chronic.

Acute Exposure Guideline Levels (AEGLs) – Threshold values published by the National Research Council and National Academy of Sciences for use in chemical emergency planning, prevention, and response programs. AEGLs represent threshold exposure limits for the general population, including susceptible individuals, and are developed for exposure periods of 10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours. AEGL values are defined for varying degrees of severity of toxic effects, as follows:

> **AEGL-1:** The airborne level of concentration of a substance above which the exposed population could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects would not be disabling and would be transient and reversible upon cessation of exposure.
>
> **AEGL-2:** The airborne level of concentration of a substance above which the exposed population could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
>
> **AEGL-3:** The airborne level of concentration of a substance above which the exposed population could experience life-threatening health effects or death.

air pollutant – Generally, an airborne substance that could, in high-enough concentrations, harm living things or cause damage to materials. From a regulatory perspective, an air pollutant is a substance for which emissions or atmospheric concentrations are regulated or for which maximum guideline levels have been established due to potential harmful effects on human health and welfare.

air quality – The cleanliness of the air as measured by the levels of pollutants relative to the standards or guideline levels established to protect human health and welfare. Air quality is often expressed in terms of the pollutant for which concentrations are the highest percentage of a standard (e.g., air quality may be unacceptable if the level of one pollutant is 150 percent of its standard, even if levels of other pollutants are well below their respective standards).

air quality control region – Geographic subdivisions of the United States designed to deal with pollution on a regional or local level. Some regions span more than one state.

alloy – A mixture containing mostly metals. For example, brass is an alloy of copper and zinc. An amalgam is an alloy (e.g., an amalgam of mainly silver and mercury).

alluvium (alluvial) – Unconsolidated, poorly sorted detrital sediments, ranging from clay to gravel sizes, deposited by streams.

ambient – Surrounding.

ambient air – The atmosphere around people, plants, and structures.

ambient air quality standards – Regulations prescribing the levels of airborne pollutants that may not be exceeded during a specified time in a defined area.

American Indian Religious Freedom Act of 1978 – An act that protects and preserves for American Indians their traditional religious rights, including the rights of access to religious sites, use and possession of sacred objects, and worship through traditional ceremonies and rites.

anthropogenic – Caused or produced by humans.

aquatic – Living or growing in, on, or near water.

aquifer – An underground geologic formation, group of formations, or part of a formation capable of yielding a significant amount of water to wells or springs.

aquitard – A relatively less permeable geologic unit that inhibits the flow of water.

Archaeological Resources Protection Act of 1979 – An act protecting cultural resources on federally owned lands. This act requires a permit for archaeological excavations or the removal of any archaeological resources on public or American Indian lands. It also prohibits interstate or foreign trafficking in cultural resources taken in violation of state or local laws and requires Federal agencies to develop plans for surveying lands under their control.

archaeological site – Any location where humans have altered the terrain or discarded artifacts during prehistoric or historic times.

artifact – An object produced or shaped by human beings and of archaeological or historic interest.

artisanal gold mining – A general term used in reference to small-scale mining operations prevalent in some developing countries that employ the crude and highly polluting process of mixing mercury with sediments from river bottoms and adjacent areas to extract gold.

atmospheric dispersion – The distribution of pollutants from their source into the atmosphere by wind, turbulent air motion attributable to solar heating of Earth's surface, or air movement over rough terrain and variable land and water surfaces.

attainment area – An area considered to have air quality as good as or better than the National Ambient Air Quality Standards for a given pollutant. An area may be in attainment for one pollutant and nonattaining for others. (See also *nonattainment area*.)

basalt – The most common volcanic rock, dark gray to black in color, high in iron and magnesium and low in silica. It is typically found in lava flows.

baseline – A quantitative expression of conditions, costs, schedule, or technical progress that constitutes the standard against which to measure the performance of an effort. For National Environmental Policy Act evaluations, baseline is defined as the existing environmental conditions against which impacts of the proposed action and its alternatives can be compared. The environmental baseline is the site environmental conditions as they exist or are estimated to exist in the absence of the proposed action.

basin – Geologically, a circular or elliptical downwarp or depression in the Earth's surface that collects sediment. Younger sedimentary beds occur in the center of basins. Topographically, a depression into which water from the surrounding area drains.

bedding plane – Surface separating layers of sedimentary rocks and deposits. Each bedding plane marks the termination of one deposit and the beginning of another of different character, such as a surface separating a sandstone bed from an overlying mudstone bed. Rock tends to break or separate readily along bedding planes.

bedrock – The solid rock that lies beneath soil and other loose surface materials.

bioaccumulation – The accumulation or buildup of contaminants in living systems by biological processes. Methylmercury can bioaccumulate in animal tissue.

bioaccumulation factor – The ratio of the concentration of a chemical in an organism to its concentration in a medium to which the organism is exposed.

bound – An analysis of impacts or risks such that the result overestimates or describes a limit on (i.e., "bounds") potential impacts or risks.

bounding analysis – An analysis designed to overestimate or determine an upper limit to potential impacts or risks.

cancer – The name given to a group of diseases characterized by uncontrolled cellular growth where the cells have invasive characteristics that enable the disease to transfer from one organ to another.

carbon dioxide – A colorless, odorless, nonpoisonous gas that is a normal component of the ambient air and an expiration product of normal animal life.

carbon monoxide – A common air pollutant formed by incomplete combustion; a colorless, odorless gas that is toxic if breathed in high concentrations over an extended period; when humans are exposed to lower concentrations, it can result in chronic effects.

carbonate – A sedimentary rock made mainly of calcium carbonate ($CaCO_3$). Limestone and dolomite are common carbonate sedimentary rocks. (See *dolomite* and *limestone*.)

carcinogen – A substance or agent that produces or incites cancerous growth.

chronic – Lasting for a long period or marked by frequent recurrence.

Class I area – A specifically designated area where the degradation of air quality is stringently restricted (e.g., many national parks, wilderness areas). (See *Prevention of Significant Deterioration*.)

Class II area – Most of the country that is not designated as Class I is designated as Class II. Class II areas are generally cleaner than air quality standards require, and moderate increases in new pollution are allowed after a regulatory-mandated impacts review.

clay – The name for a family of finely crystalline sheet silicate minerals that commonly form as a product of rock weathering. Also, any soil particle smaller than or equal to about 0.002 millimeters (0.00008 inches) in diameter.

Clean Air Act – An act mandating and providing for the enforcement of regulations to control air pollution from various sources.

Clean Air Act Amendments of 1990 – Amendments expanding the U.S. Environmental Protection Agency's enforcement powers and adding restrictions on air toxics, ozone-depleting chemicals, stationary and mobile emission sources, and emissions implicated in acid rain and global warming.

Code of Federal Regulations – A publication in codified form of all Federal regulations in force.

colluvium (colluvial) – A loose deposit of rock debris accumulated at the base of a cliff or slope.

conformity – As defined in the Clean Air Act, "the nation's compliance with an implementation plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of such standards. Activities in conformity will not (1) cause or contribute to any new violation of any standard in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reduction or other milestones in any area."

conglomerate – A sedimentary rock made of rounded rock fragments, such as pebbles, cobbles, and boulders, in a finer-grained matrix. To be classified as a conglomerate, some of the constituent pebbles must be at least about 2 millimeters (one-thirteenth of 1 inch) across.

criteria pollutant – An air pollutant that is regulated by National Ambient Air Quality Standards. The U.S. Environmental Protection Agency must describe the characteristics and potential health and welfare effects that form the basis for setting, or revising, the standard for each regulated pollutant. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter, less than 10 micrometers (0.0004 inches) in diameter, and less than 2.5 micrometers (0.0001 inches) in diameter. New pollutants may be added to, or removed from, the list of criteria pollutants as more information becomes available. (See *National Ambient Air Quality Standards*.) *Note: Sometimes pollutants regulated by state laws are also called criteria pollutants.*

critical habitat – Habitat essential to the conservation of an endangered or threatened species that has been designated as critical by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR 424). (See *endangered species* and *threatened species*.)

The lists of critical habitats can be found in Title 50 of the *Code of Federal Regulations*, Sections 17.95 (fish and wildlife) and 17.96 (plants), and in Part 226 (marine species).

cultural resources – Archaeological sites, architectural features, historic resources, traditional-use areas, and American Indian sacred sites.

cumulative impacts – Impacts on the environment that result when the incremental impact of a proposed action is added to the impacts from other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes the other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

day-night average sound level – The 24-hour, A-weighted equivalent sound level expressed in decibels. A 10-decibel penalty is added to sound levels between 10:00 P.M. and 7:00 A.M. to account for increased annoyance due to noise during night hours.

decibel – A unit for expressing the relative intensity of sounds on a logarithmic scale from zero for the average least perceptible sound to about 130 for the average level at which sound causes pain to humans. For traffic and industrial noise measurements, the A-weighted decibel, a frequency-weighted noise unit, is widely used. The A-weighted decibel scale corresponds approximately to the frequency response of the human ear and thus correlates well with loudness.

decibel, A-weighted – A unit of sound measurement that incorporates a metering characteristic and the "A" weighting specified by the American National Standards Institute in S1.4–1983 (R 2001) to account for the frequency response of the human ear.

decontamination – The removal of chemical contamination from facilities, equipment, or soils by washing, heating, chemical or electrochemical action, mechanical cleaning, or other techniques.

deposition – In geology, the laying down of potential rock-forming materials; sedimentation. In atmospheric transport, the settling out on ground and building surfaces of atmospheric aerosols and particles ("dry deposition") or their removal from the air to the ground by precipitation ("wet deposition").

dip – A measure of the angle between the flat horizon and the slope of a sedimentary layer, fault plane, metamorphic foliation, or other geologic structure.

discharge – In surface-water hydrology, the amount of water issuing from a spring or in a stream that passes a specific point in a given period of time.

dolomite – A mineral composed of calcium-magnesium-carbonate ($CaMg[CO_3]_2$) that is the chief constituent of a sedimentary rock commonly called dolomite, as well as of some kinds of marble. It is thought to form by the alteration of limestone by seawater. (See *carbonate*.)

drainage basin – The land area drained by a particular stream.

drinking water standards – The level of constituents or characteristics in a drinking water supply specified in regulations under the Safe Drinking Water Act as the maximum permissible.

earthquake – A sudden ground motion or vibration of the Earth. It can be produced by a rapid release of stored-up energy along an active fault.

ecology – A branch of science dealing with the interrelationships of living organisms with one another and with their nonliving environment.

ecosystem – A community of organisms and their physical environment interacting as an ecological unit.

effluent – A waste stream flowing into the atmosphere, surface water, groundwater, or soil.

endangered species – Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, following the procedures outlined in the Endangered Species Act and its implementing regulations (50 CFR 424). (See *threatened species*.) The lists of endangered species can be found in Title 50 of the *Code of Federal Regulations*, Sections 17.11 (wildlife), 17.12 (plants), and 222.23(a) (marine organisms).

Endangered Species Act of 1973 – An act requiring Federal agencies, with the consultation and assistance of the Secretaries of the Interior and Commerce, to ensure that their actions will not likely jeopardize the continued existence of any endangered or threatened species or adversely affect the habitat of such species.

environmental assessment (EA) – A concise public document that a Federal agency prepares under the National Environmental Policy Act (NEPA) to provide sufficient evidence and analysis to determine whether a proposed agency action would require preparation of an environmental impact statement (EIS) or a Finding of No Significant Impact. A Federal agency may also prepare an EA to aid its compliance with NEPA when no EIS is necessary or to facilitate preparation of an EIS when one is necessary. An EA must include brief discussions of the need for the proposal, alternatives, environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted. (See *Finding of No Significant Impact, environmental impact statement,* and *National Environmental Policy Act*.)

environmental impact statement – The detailed written statement that is required by Section 102(2)(C) of the National Environmental Policy Act (NEPA) for a proposed major Federal action significantly affecting the quality of the human environment. A U.S. Department of Energy (DOE) EIS is prepared in accordance with applicable requirements of the Council on Environmental Quality NEPA regulations in Title 40 of the *Code of Federal Regulations* (CFR), Parts 1500–1508, and DOE NEPA regulations in Title 10 of the CFR, Part 1021. The statement includes, among other information, discussions of the environmental impacts of the proposed action and all reasonable alternatives, adverse environmental effects that cannot be avoided should the proposal be implemented, the relationship between short-term uses of the human environment and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources.

environmental justice – The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, or commercial operations or the execution of Federal, state, local, or tribal programs and policies. Executive Order 12898 directs Federal agencies to make achieving environmental justice part of their missions by identifying and addressing disproportionately high and adverse effects of agency programs, policies, and activities on minority and low-income populations. (See *minority population* and *low-income population*.)

erosion – Removal of material by water, wind, or ice.

Exclusive Use Area – A 112-hectare (277-acre) area surrounded by a barbed-wire fence that is restricted for the exclusive use of the U.S. Department of Energy and its contractors and subcontractors in support of Waste Isolation Pilot Plant activities. The area is marked with "no trespassing" signs and is patrolled by WIPP security personnel.

exposure – The condition of being subject to the effects of, or acquiring a dose of, a potential stressor such as a hazardous chemical agent; also, the process by which an organism acquires a dose of a chemical such as mercury. Exposure can be quantified as the amount of the agent available at various boundaries of the organism (e.g., skin, lungs, gut) and available for absorption.

exposure limit – The level of exposure to a hazardous chemical (set by law or a standard) at which or below which adverse human health effects are not expected to occur. (See *reference concentration* and *reference dose.*)

exposure pathway – The course a chemical or physical agent takes from the source to the exposed organism. An exposure pathway describes a mechanism by which chemicals or physical agents at or originating from a release site reach an individual or population. Each exposure pathway includes a source or release from a source, an exposure route, and an exposure point. If the exposure point differs from the source, the transport/exposure medium such as air or water is also included. (See *exposure*.)

fault – A fracture or a zone of fractures within a rock formation along which vertical, horizontal, or transverse slippage has occurred. A normal fault occurs when the hanging wall has been depressed in relation to the footwall. A reverse fault occurs when the hanging wall has been raised in relation to the footwall.

Finding of No Significant Impact – A public document issued by a Federal agency briefly presenting the reasons why an action for which the agency has prepared an environmental assessment has no potential to have a significant effect on the human environment and, thus, will not require preparation of an environmental impact statement. (See *environmental assessment* and *environmental impact statement*.)

flask – A container used to store mercury. Mercury storage flasks, typically made of 0.5-centimeter-thick (0.2-inch-thick) low-carbon steel, can hold 34.6 kilograms (76 pounds) of mercury and are sealed with a threaded plug. A typical mercury storage flask is similar in size and dimensions to a 3-liter soda bottle.

floodplain – The lowlands and relatively flat areas adjoining inland and coastal waters and the flood-prone areas of offshore islands. Floodplains include, at a minimum, that area with at least a 1.0 percent chance of being inundated by a flood in any given year.

The *base floodplain* is defined as the area that has a 1.0 percent or greater chance of being flooded in any given year. Such a flood is known as a 100-year flood.

The *critical action floodplain* is defined as the area that has at least a 0.2 percent chance of being flooded in any given year. Such a flood is known as a 500-year flood.

The *probable maximum flood* is the hypothetical flood considered to be the most severe reasonably possible flood, based on the comprehensive hydrometeorological application of maximum precipitation and other hydrological factors favorable for maximum flood runoff (e.g., sequential storms and snowmelts). It is usually several times larger than the maximum recorded flood.

formation – In geology, the primary unit of formal stratigraphic mapping or description. Most formations possess certain distinctive features.

fracture – Any break in rock along which no significant movement has occurred.

geology – The science that deals with the Earth: the materials, processes, environments, and history of the planet, including rocks and their formation and structure.

global climate change – Changes in the Earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns. The greenhouse effect is the trapping and buildup of heat in the atmosphere (troposphere) near the Earth's surface. Some of the heat flowing back toward space from the Earth's surface is absorbed by water vapor, carbon dioxide, ozone, and several other gases in the atmosphere and then reradiated back toward the Earth's surface.

greater-than-Class C (GTCC) low-level radioactive waste (LLW) – LLW generated by the commercial sector that exceeds U.S. Nuclear Regulatory Commission (NRC) concentration limits for Class C LLW, as specified in "Licensing Requirements for Land Disposal of Radioactive Waste" (Title 10 of the *Code of Federal Regulations*, Part 61).

In addition to the GTCC LLW generated as a result of NRC-licensed or agreement-state-licensed activities, the U.S. Department of Energy (DOE) generates waste containing concentrations of radionuclides that are similar to GTCC LLW. This waste is referred to as "DOE GTCC-like waste."

groundwater – Water below the ground surface in a zone of saturation. It usually occurs in aquifers that may supply wells and springs, as well as baseflow, to major streams and rivers.

Hazard Index – *(ecological definition)* The sum of the individual Hazard Quotients of constituents within a class that exert effects with the same toxicological mechanism or endpoint and are additive in effect.

Hazard Index – *(human health definition)* A summation of the Hazard Quotients for all chemicals now being used at a site, as well as those proposed to be added, to yield the cumulative levels for the site. A Hazard Index value of 1.0 or less means that no adverse human health effects (noncancer) are expected to occur. (See *Hazard Quotient*.)

Hazard Quotient – The value used as an assessment of non-cancer-associated toxic effects of chemicals, e.g., kidney or liver dysfunction. It is a ratio of the estimated exposure to that level of exposure at which it is expected that adverse health effects would begin to be produced. It is independent of a cancer risk, which is calculated for only those chemicals identified as carcinogens.

hazardous air pollutants – Air pollutants not covered by National Ambient Air Quality Standards but which may present a threat of adverse human health or environmental effects. Those specifically listed in Title 40 of the *Code of Federal Regulations*, Section 61.01, are asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. More broadly, hazardous air pollutants are any of the 188 pollutants to be regulated or reviewed under Section 112(b) of the Clean Air Act. Very generally, hazardous air pollutants are any air pollutants that may realistically be expected to pose a threat to human health or welfare.

hazardous chemical – Under Title 29 of the *Code of Federal Regulations*, Part 1910, Subpart Z, hazardous chemicals are defined as "any chemical that is a physical hazard or a health hazard." Physical hazards include combustible liquids, compressed gases, explosives, flammables, organic peroxides, oxidizers, pyrophorics, and reactives. A health hazard is any chemical for which there is good evidence that acute or chronic health effects occur in exposed employees. Hazardous chemicals include carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, agents that act on the hematopoietic system, and agents that damage the lungs, skin, eyes, or mucous membranes.

hazardous material – A material, including a hazardous substance as defined by Title 49 of the *Code of Federal Regulations*, Section 171.8, that poses a risk to health, safety, and property when transported or handled.

hazardous waste – A category of waste regulated under the Resource Conservation and Recovery Act (RCRA). To be considered hazardous, a waste must be a solid waste under RCRA and must exhibit at least one of four characteristics described in Title 40 of the *Code of Federal Regulations*, Sections 261.20 through 261.24 (i.e., ignitability, corrosivity, reactivity, or toxicity) or be specifically listed by the U.S. Environmental Protection Agency in Sections 261.31 through 261.33.

historic resources – Archaeological sites, architectural structures, and objects dating from 1492 or later, after the arrival of the first Europeans to the Americas.

infrastructure – The basic facilities, services, and utilities needed for the functioning of an industrial facility. Transportation and electrical systems are part of the infrastructure.

interbedded – Occurring between beds (layers) or lying in a bed parallel to other beds of a different material.

interim status – Period during which treatment, storage, and disposal facilities subject to the Resource Conservation and Recovery Act are temporarily allowed to operate while awaiting the issuance or denial of a permanent permit.

labor force – All persons of a defined geographic area classified as employed or unemployed.

land use – A characterization of land surface in terms of its potential utility for various activities.

land withdrawal boundary (LWB) – A 4,146-hectare (10,240-acre) area that delineates the perimeter of the Waste Isolation Pilot Plant site.

limestone – A sedimentary rock composed mostly of the mineral calcite, $CaCO_3$. (See *carbonate*.)

loam – Soil material that is composed of 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

local magnitude – See *magnitude.*

low-income individuals/persons – Individuals whose income is less than the poverty threshold defined in the U.S. Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty.

low-income population – Low-income populations, defined in terms of U.S. Census Bureau annual statistical poverty levels (Current Population Reports, Series P-60 on Income and Poverty), may consist of groups or individuals who live in geographic proximity to one another or who are geographically dispersed or transient (such as migrant workers or American Indians), where either type of group experiences common conditions of environmental exposure or effect. (See *environmental justice* and *minority population*.)

magnitude – A number that reflects the relative strength or size of an earthquake. Magnitude is based on the logarithmic measurement of the maximum motion recorded by a seismograph. An increase of one unit of magnitude (for example, from 4.6 to 5.6) represents a 10-fold increase in wave amplitude on a seismograph recording or approximately a 30-fold increase in the energy released. Several scales have been defined, but the most commonly used are (1) local magnitude (M_L), commonly referred to as "Richter magnitude," (2) surface-wave magnitude (M_s), and (3) body-wave magnitude (M_b). Each is valid for a particular type of seismic signal varying by such factors as frequency and distance. These magnitude scales will yield approximately the same value for any given earthquake within each scale's respective range of validity. A fourth scale (moment magnitude [M_w]) is the latest to be applied that better estimates the size of very large earthquakes that the other scales underestimate by varying degrees.

megawatt – A unit of power equal to 1 million watts. Megawatt-thermal is commonly used to define heat produced, while megawatt-electric defines electricity produced.

mercury (elemental) – Elemental mercury is a dense, naturally occurring, silver-colored metallic element that is liquid at room temperature. Sometimes called "quicksilver," liquid mercury has been used extensively in manufacturing processes because it conducts electricity, reacts to temperature changes, and alloys with many other metals.

mercury (primary) – Unused, 'virgin' mercury that has been produced as the main product of mining activities.

mercury (secondary) – Mercury recycled from the dismantling of used products or equipment.

meteorology – The science dealing with the atmosphere and its phenomena, especially as relating to weather.

migration – The natural movement of a material through the air, soil, or groundwater; also, seasonal movement of animals from one area to another.

minority individuals – Individuals who identify themselves as a member of the following population groups: American Indian or Alaska Native; Asian; black or African American; Hispanic or Latino; Native Hawaiian or other Pacific Islander; or multiracial minority (two or more races, at least one of which is a minority race under Council on Environmental Quality guidelines). This definition is similar to that given in the Council on Environmental Quality's environmental justice guidance; however, it has been modified to reflect revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (62 FR 58782 through 58790), which is published by the Office of Management and Budget.

minority population – Minority populations exist where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than in the general population or other appropriate unit of geographic analysis (such as a governing body's jurisdiction, a neighborhood, census tract, or other similar unit). Minority populations include either a single minority group or the total of all minority persons in the affected area. They may consist of groups of individuals living in geographic proximity to one another or a geographically dispersed/transient set of individuals (such as migrant workers or American Indians), where either type of group experiences common conditions of environmental exposure or effect. (See *environmental justice* and *low-income population*.)

mitigation – Actions taken to lessen the impacts of a proposed action, including (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action; or (5) compensating for an impact by replacing or providing substitute resources or environments.

Modified Mercalli Intensity – A level on the modified Mercalli scale. A measure of the perceived intensity of earthquake ground shaking with 12 divisions, from I (not felt by people) to XII (damage nearly total). It is a unitless expression of observed effects.

mudstone – A detrital sedimentary rock composed of clay-sized particles.

National Ambient Air Quality Standards – Standards defining the highest allowable levels of certain pollutants in the ambient air (i.e., the outdoor air to which the public has access). Because the U.S. Environmental Protection Agency must establish the criteria for setting these standards, the regulated pollutants are called *criteria* pollutants. Criteria pollutants include sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and two size classes of particulate matter, less than 10 micrometers (0.0004 inches) in diameter, and less than 2.5 micrometers (0.0001 inches) in diameter. Primary standards are established to protect public health; secondary standards are established to protect public welfare (e.g., visibility, crops, animals, buildings). (See *criteria pollutant*.)

National Emission Standards for Hazardous Air Pollutants (NESHAPs) – Emission standards set by the U.S. Environmental Protection Agency for air pollutants that are not covered by the National Ambient Air Quality Standards and may, at sufficiently high levels, cause increased fatalities, irreversible health effects, or incapacitating illness. These standards are given in Title 40 of the *Code of Federal Regulations*, Parts 61 and 63. NESHAPs are given for many specific categories of sources (e.g., equipment leaks, industrial process cooling towers, drycleaning, facilities, petroleum refineries).

National Environmental Policy Act of 1969 (NEPA) – NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals (in Section 101), and provides means (in Section 102) for carrying out the policy. Section 102(2) contains action-forcing provisions to ensure that Federal agencies follow the letter and spirit of the Act. For major Federal actions significantly affecting the quality of the human environment, Section 102(2)(C) of NEPA requires Federal agencies to prepare a detailed statement that includes the environmental impacts of the proposed action and other specified information.

National Pollutant Discharge Elimination System (NPDES) – A provision of the Clean Water Act that prohibits discharge of pollutants into waters of the United States unless a special permit is issued by the U.S. Environmental Protection Agency, a state, or, where delegated, a tribal government on an American Indian reservation. The NPDES permit lists either permissible discharges, the level of cleanup technology required for wastewater, or both.

National Register of Historic Places (NRHP) – The official list of the Nation's cultural resources that are worthy of preservation. The National Park Service maintains the list under direction of the Secretary of the Interior. Buildings, structures, objects, sites, and districts are included in the NRHP for their importance in American history, architecture, archaeology, culture, or engineering. Properties included in the NRHP range from large-scale, monumentally proportioned buildings to smaller-scale, regionally distinctive buildings. The listed properties are not just of nationwide importance; most are significant primarily at the state or local level. Procedures for listing properties in the NRHP are found in Title 36 of the *Code of Federal Regulations*, Part 60.

natural phenomena hazard – A category of events (e.g., earthquake, wind, flood, and lightning) that must be considered in the U.S. Department of Energy (DOE) facility design, construction, and operations, as specified in DOE Order 420.1B.

nitrogen oxides – The oxides of nitrogen, primarily nitrogen oxide and nitrogen dioxide, produced in the combustion of fossil fuels. Nitrogen dioxide emissions constitute an air pollution problem, as they contribute to acid deposition and the formation of atmospheric ozone.

noise – Undesirable sound that interferes or interacts negatively with the human or natural environment. Noise may disrupt normal activities (e.g., hearing, sleep), damage hearing, or diminish the quality of the environment.

nonattainment area – An area that the U.S. Environmental Protection Agency has designated as not meeting (i.e., not being in attainment of) one or more of the National Ambient Air Quality Standards for sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and particulate matter. An area may be in attainment for some pollutants, but not for others.

Off-Limits Area – A 588-hectare (1,454-acre) area at the Waste Isolation Pilot Plant site where unauthorized entry and introduction of weapons and/or dangerous materials are prohibited. Prohibition signs are posted at consistent intervals along its perimeter. Unless they pose a threat to security, safety, or the environmental quality of the WIPP site, grazing and public thoroughfares can occur in this area. This area is patrolled by WIPP security personnel to prevent unauthorized activities or use.

ozone – The triatomic form of oxygen; in the stratosphere, ozone protects the Earth from the sun's ultraviolet rays, but in lower levels of the atmosphere, ozone is considered an air pollutant.

pallet – A small platform on which material is stored. Pallets are often constructed of wood and serve to lift the material off the ground to keep it dry. Pallets also enable the material to be easily lifted with a forklift.

particulate matter (PM) – Any finely divided solid or liquid material, other than uncombined (i.e., pure) water. A subscript denotes the upper limit of the diameter of particles included. Thus, PM_{10} includes only those particles equal to or less than 10 micrometers (0.0004 inches) in diameter; $PM_{2.5}$ includes only those particles equal to or less than 2.5 micrometers (0.0001 inches) in diameter. Total suspended particulates were first used as the indicator of particulate concentrations.

peak ground acceleration – A measure of the maximum horizontal acceleration (as a percentage of the acceleration due to Earth's gravity) experienced by a particle on the surface of the Earth during the course of earthquake motion.

percent *g* – In measuring earthquake ground motion, the acceleration (the rate of change in velocity) experienced relative to that due to Earth's gravity (i.e., 9.8 meters per square second).

perched aquifer/groundwater – A body of groundwater of small lateral dimensions separated from an underlying body of groundwater by an unsaturated zone.

permeability – The ability of a rock, soil, or other material to allow water to flow through its interconnected spaces.

persistence – The resistance to degradation as measured by the period of time required for complete decomposition of a material.

pH – A numeric value that indicates the relative acidity or alkalinity of a substance on a scale of 0 to 14, with the neutral point at 7.0. Acid solutions have pH values lower than 7.0, and basic (alkaline) solutions have values higher than 7.0.

plume – The elongated pattern of contaminated air or water originating at a point source such as a smokestack or hazardous waste disposal site.

$PM_{2.5}$ and **PM_{10}** – See *particulate matter.*

potable water – Water that is fit to drink.

potash – Potassium compounds or potassium-containing materials, especially those with potassium in a water soluble form. Commonly mined or manufactured as potassium-bearing salts and primarily used as a fertilizer.

prehistoric – Predating written history; in North America, also predating contact with Europeans.

Prevention of Significant Deterioration – Regulations required by the 1977 Clean Air Act amendments to limit increases in criteria air pollutant concentrations above baseline in areas that already meet the National Ambient Air Quality Standards. Cumulative increases in pollutant levels after specified baseline dates must not exceed specified maximum allowable amounts. These allowable increases, also known as increments, are especially stringent in areas designated as Class I areas (e.g., national parks, wilderness areas) where the preservation of clean air is particularly important. All areas not designated as Class I are currently designated as Class II. Maximum increments in pollutant levels are also given in Title 40 of the *Code of Federal Regulations*, Section 51.166, for Class III areas, if any such areas should be so designated by the U.S. Environmental Protection Agency. Class III increments are less stringent than those for Class I or Class II areas. (See *National Ambient Air Quality Standards*.)

Property Protection Area – A 14-hectare (35-acre) interior core of the Waste Isolation Pilot Plant site that is surrounded by a chain-link fence and is under 24-hour security.

Protective Action Criteria (PACs) – These are protective criteria introduced by the U.S. Department of Energy for use in the planning of emergency response to accidental releases of chemicals. There are three levels, PAC-1, PAC-2, and PAC-3. These are equal to the 1-hour Acute Exposure Guideline Levels (AEGL-1, -2, and -3, respectively), if available; otherwise, they are equal to the Emergency Response Planning Guidelines (ERPG-1, -2, and -3, respectively). If neither AEGLs nor ERPGs are available, PACs are equal to Temporary Emergency Exposure Limits (TEEL-1, -2, and -3, respectively).

Quaternary – The second geologic period of the Cenozoic Era, dating from about 1.6 million years ago to the present. It contains two epochs: the Pleistocene and the Holocene. It is characterized by the first appearance of human beings on Earth.

Record of Decision – A document providing a concise public record of an agency's decision on a proposed action for which an environmental impact statement was prepared. Prepared in accordance with Title 40 of the *Code of Federal Regulations*, Section 1505.2, the Record of Decision identifies the alternatives considered in reaching the decision, the environmentally preferable alternative, factors balanced by the agency in making the decision, whether all practicable means to avoid or minimize environmental harm have been adopted, and if not, why they were not.

reference concentration – The chronic exposure concentration for a given hazardous chemical at which or below which adverse human noncancer health effects are not expected to occur. (See *exposure limit* and *reference dose*.)

reference dose – The chronic exposure dose for a given hazardous chemical at which or below which adverse human noncancer health effects are not expected to occur. (See *exposure limit* and *reference concentration*.)

reflasking – The transfer of mercury from aging, damaged, or leaking 34.6-kilogram (76-pound) flasks to new 34.6-kilogram (76-pound) steel flasks.

region of influence – A site-specific geographic area. The regions of influence for different resources can vary widely in extent. For example, the region of influence for ecological resources would generally be confined to the site and nearby adjacent areas, whereas the socioeconomic region of influence would include the cities and counties surrounding each site that could be affected by the proposed action.

Resource Conservation and Recovery Act (RCRA), as amended – This law gives the U.S. Environmental Protection Agency the authority to control hazardous waste from "cradle to grave" (i.e., from the point of generation to the point of ultimate disposal), including its minimization, generation, transportation, treatment, storage, and disposal. RCRA also sets forth a framework for management of nonhazardous solid waste. (See *hazardous waste*.)

Richter magnitude – See *magnitude.*

rift – A valley caused by extension of the Earth's crust. Its floor forms as a portion of the crust moves downward along normal faults.

risk – The probability of a detrimental effect from exposure to a hazard. Risk is often expressed quantitatively as the probability of an adverse event occurring multiplied by the consequence of that event (i.e., the product of these two factors). However, separate presentation of probability and consequence is often more informative.

risk assessment (chemical) – The qualitative and quantitative evaluation performed to define the risk posed to human health and/or the environment by the presence or potential presence and/or use of specific chemical materials.

runoff – The portion of rainfall, melted snow, or irrigation water that flows across the ground and which may eventually enter surface waters.

sand – Loose grains of rock or mineral sediment formed by weathering that range in size from 0.0625 to 2.0 millimeters (0.0025 to 0.08 inches) in diameter and often consist of quartz particles.

sandstone – A sedimentary rock composed mostly of sand-size particles cemented usually by calcite, silica, or iron oxide.

sanitary waste (wastewater) – Wastes generated by normal housekeeping activities, liquid or solid (includes sludge), that are not hazardous or radioactive.

scoping – An early and open process for determining the scope of issues to be addressed in an environmental impact statement and for identifying the significant issues related to a proposed action.

sedimentary rock – Rock formed from the accumulation of sediment, which may consist of fragments and mineral grains of varying sizes from pre-existing rocks, remains or products of animals and plants, products of chemical action, or mixtures of these. Sedimentary rocks often have distinctive layering or bedding.

seismic – Pertaining to any earth vibration, especially that of an earthquake.

seismicity – The frequency and distribution of earthquakes.

sewage – The total nonhazardous organic waste and wastewater generated by an industrial establishment or a community.

sewer – A pipe or conduit (sewer) intended to carry wastewater or waterborne wastes from homes, businesses, and industries to a treatment facility.

shale – Sedimentary rock derived from mud, commonly finely laminated (bedded). Particles in shale are commonly clay minerals mixed with tiny grains of quartz eroded from pre-existing rocks. "Shaley" means like a shale or having some shale component, as in shaley sandstone.

silt – Loose particles of rock or mineral sediment that range in size from about 0.002 to 0.0625 millimeters (0.00008 to 0.0025 inches) in diameter. Silt is finer than sand, but coarser than clay.

siltstone – A fine-grained sedimentary rock composed mostly of silt-sized grains.

socioeconomics – Demographic and economic characteristics of a defined geographic area.

soils – All unconsolidated materials above bedrock. Natural earthy materials on the Earth's surface, in places modified or even made by human activity, containing living matter, and supporting or capable of supporting plants.

sole-source aquifer – A designation granted by the U.S. Environmental Protection Agency when groundwater from a specific aquifer supplies at least 50 percent of the drinking water for the area overlying the aquifer. Sole-source aquifers have no alternative source or combination of sources that could physically, legally, and economically supply all those who obtain their drinking water from the aquifer.

solid waste – In general, solid wastes are non-liquid, non-soluble discarded materials ranging from municipal garbage to industrial wastes that contain complex and sometimes hazardous substances. Solid wastes include sewage sludge, agricultural refuse, demolition wastes, and mining residues.

For purposes of regulation under the Resource Conservation and Recovery Act, solid waste is any garbage; refuse; sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; and other discarded material. Solid waste includes solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. A more-detailed regulatory definition of solid waste can be found in Title 40 of the *Code of Federal Regulations*, Section 261.2. (See *hazardous waste* and *Resource Conservation and Recovery Act*.)

spill prevention, control, and countermeasures plan – A plan prepared by a facility to minimize the likelihood of a spill and to expedite control and cleanup activities should a spill occur.

stabilize – To convert a compound, mixture, or solution to a nonreactive form.

State Historic Preservation Officer – The state officer charged with the identification and protection of prehistoric and historic resources in accordance with the National Historic Preservation Act.

stormwater – Stormwater runoff, snowmelt runoff, and surface runoff and drainage.

subsistence consumption of fish and wildlife – Dependence by a minority population, low-income population, American Indian tribe, or subgroup of such populations on indigenous fish, vegetation, and/or wildlife as the principal portion of their diet.

sulfur oxides – Common air pollutants, primarily sulfur dioxide, a heavy, pungent, colorless gas (formed in the combustion of fossil fuels, considered a major air pollutant), and sulfur trioxide. Sulfur dioxide is involved in the formation of acid rain. It can also irritate the upper respiratory tract and cause lung damage.

surface water – All bodies of water on the surface of the Earth and open to the atmosphere, such as rivers, lakes, reservoirs, ponds, seas, and estuaries.

tectonic – Of or relating to motion in the Earth's crust and occurring on geologic faults.

Temporary Emergency Exposure Limits (TEELs) – Values developed by the U.S. Department of Energy (DOE) for use in DOE facility hazard analyses and emergency planning and response for chemicals lacking Acute Exposure Guideline Levels or Emergency Response Planning Guidelines. TEEL values are applied to the peak 15-minute time-weighted average concentration at the point of interest and are defined for varying degrees of severity of toxic effects, as follows:

TEEL-1: The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor.

TEEL-2: The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.

TEEL-3: The maximum concentration in air below which it is believed nearly all individuals could be exposed without experiencing or developing life-threatening health effects.

threatened species – Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and that have been listed as threatened by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service, following the procedures set out in the Endangered Species Act and its implementing regulations (50 CFR 424). (See *endangered species*.) The lists of threatened species can be found in Title 50 of the *Code of Federal Regulations*, Sections 17.11 (wildlife), 17.12 (plants), and 227.4 (marine organisms). *Note: Some states also list species as threatened. Thus, in certain cases a state definition would also be appropriate.*

threshold limit values – The recommended highest concentrations of contaminants to which workers may be exposed according to the American Conference of Governmental Industrial Hygienists.

toxic – Poisonous (to living organisms); capable of producing disease or otherwise harmful to human health when taken into the body. Mercury is toxic.

Toxic Substances Control Act (TSCA) – This law requires that the health and environmental effects of all new chemicals be reviewed by the U.S. Environmental Protection Agency before they are manufactured for commercial purposes. This act also imposes strict limitations on the use and disposal of polychlorinated biphenyls, chlorofluorocarbons, asbestos, dioxins, certain metal-working fluids, and hexavalent chromium. In addition, the provisions of the Mercury Export Ban Act relating to the prohibition on sale, distribution, or transfer of elemental mercury by Federal agencies, and to the prohibition on the export of elemental mercury, amended Sections 6 and 12, respectively, of TSCA.

toxicity reference value – An exposure level from a valid scientific study that represents a threshold for some level of ecological effect.

traditional cultural property – A property or place that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices and beliefs that are (1) rooted in the history of a community and (2) important to maintaining the continuity of that community's traditional beliefs and practices.

transuranic (TRU) waste – Radioactive waste containing more than 100 nanocuries (3,700 becquerels) of alpha-emitting TRU isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the U.S. Environmental Protection Agency, does not need the degree of isolation required by Title 40 of the *Code of Federal Regulations* (CFR), Part 191, disposal regulations; or (3) waste that the U.S. Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

treatment – Under the Resource Conservation and Recovery Act, any method, technique, or process designed to change the physical, chemical, or biological character or composition of any hazardous waste.

unemployment rate – The number of unemployed persons as a percentage of the labor force.

viewshed – The extent of the area that may be viewed from a particular location. Viewsheds are generally bounded by topographic features such as hills or mountains.

visual resource management – A process devised by the U.S. Bureau of Land Management to assess the aesthetic quality of a landscape, and, consistent with the results of that analysis, to so design proposed activities as to minimize their visual impact on the landscape. The process consists of a rating of visual quality followed by a measurement of the degree of contrast between proposed development activities and the existing landscape. Four classifications are employed to describe different degrees of modification to landscape elements: Class I, areas where the natural landscape is preserved, including national wilderness areas and the wild sections of national wild and scenic rivers; Class II, areas with very limited land development activity, resulting in visual contrasts that are seen but do not attract attention; Class III, areas in which development may attract attention, but the natural landscape still dominates; and Class IV, areas in which development activities may dominate the view and may be the major focus in the landscape.

volatile organic compound – Any of a broad range of organic compounds, often halogenated, that vaporize at ambient or relatively low temperatures, such as benzene, chloroform, and methyl alcohol. In regard to air pollution, any organic compound that participates in atmospheric photochemical reaction, except for those determined by the U.S. Environmental Protection Agency Administrator to have negligible photochemical reactivity.

Waste Isolation Pilot Plant (WIPP) – WIPP is the Nation's only underground repository for the permanent disposal of defense-generated transuranic waste. The WIPP site is located in Eddy County in the Chihuahuan Desert of southeastern New Mexico. The site is about 42 kilometers (26 miles) east of Carlsbad in a region known as Los Medaños, a relatively flat, sparsely inhabited plateau with little surface water. The WIPP site encompasses approximately 41 square kilometers (16 square miles) under the jurisdiction of the U.S. Department of Energy pursuant to the Waste Isolation Pilot Plant Land Withdrawal Act (P.L. 102-579). (See *Waste Isolation Pilot Plant Land Withdrawal Act [WIPP LWA]*.)

Waste Isolation Pilot Plant Land Withdrawal Act (WIPP LWA) – An act that transferred responsibility of the Waste Isolation Pilot Plant withdrawal area from the Secretary of the Interior to the Secretary of Energy (P.L. 102-579).

wastewater – Water originating from human sanitary water use (domestic wastewater) and from a variety of industrial processes (industrial wastewater).

water quality standards and criteria – Limits on the concentrations of specific constituents or on the characteristics of water, often based on water use classifications (for example, drinking water, recreation, propagation of fish and aquatic life, agricultural and industrial use). Water quality standards are legally enforceable, whereas water quality criteria are nonenforceable recommendations based on biotic impacts.

water table – The boundary between the unsaturated zone and the deeper, saturated zone. The upper surface of an unconfined aquifer.

wetlands – Areas that are inundated or saturated by surface water or groundwater and that typically support vegetation adapted for life in saturated soils. Wetlands generally include swamps, marshes, bogs, and similar areas (e.g., sloughs, potholes, wet meadows, river overflow areas, mudflats, natural ponds).

WIPP Vicinity Section 10 – Section 10, Township 22 South, Range 31 East, approximately 5.6 kilometers (3.5 miles) north of the Waste Isolation Pilot Plant facility.

WIPP Vicinity Section 20 – Section 20, Township 22 South, Range 31 East, across the Waste Isolation Pilot Plant access road to the west of the Waste Isolation Pilot Plant facility.

WIPP Vicinity Section 35 – Section 35, Township 22 South, Range 31 East, approximately 5.6 kilometers (3.5 miles) southeast of the Waste Isolation Pilot Plant facility.

CHAPTER 7
LIST OF PREPARERS

CHAPTER 7
LIST OF PREPARERS

U.S. DEPARTMENT OF ENERGY

Levenstein, David
EIS Responsibilities: *Document Manager*
Education: B.S., Entomology, University of Georgia
A.A.S., Biotechnology, Farmingdale State College
Experience: 27 years

Loving, Jeannie
EIS Responsibilities: Chapter 1, "Introduction and Purpose and Need for Agency Action"
Education: B.S., Biology, George Washington University
Experience: 40 years

Edelman, Arnie
EIS Responsibilities: Chapter 3, "Affected Environment," Chapter 5, "Environmental Laws, Regulations, Permits, and Other Potentially Applicable Requirements"
Education: M.A., Physical Geography/Geomorphology, University of Arizona
B.A., Physical Geography/Geomorphology, University of Maryland
Experience: 40 years

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Cavanaugh, Sydel
EIS Responsibilities: *Public Outreach Coordinator*
Education: B.A., Interdisciplinary Studies-Personnel and Sociology, University of Maryland, Baltimore County
Experience: 27 years

DiMarzio, John
EIS Responsibilities: *Geology, Soils, and Geologic Hazards Lead*
Education: M.S., Geology, George Washington University
B.S., Geology, University of Maryland
Experience: 31 years

Dixon, Sharay
EIS Responsibilities: *Meteorology, Air Quality, and Noise Analysis*
Education: B.S., Environmental Management, University of Maryland University College
A.S., Applied Science, Weather Technology
Experience: 14 years

Gagne, Roger
EIS Responsibilities: *Website Manager*
Education: A.A., Computer Science/Business Programming, Montgomery Community College
Experience: 21 years

Gorden, Milton
EIS Responsibilities: *Transportation Risk Lead, Site Infrastructure Lead, Waste Management Lead*
Education: B.S., Nuclear Engineering, North Carolina State University
Experience: 22 years

Greene, Aaron
EIS Responsibilities: *Ecological Resources Lead;* Appendix F, "Common and Scientific Names of Plant and Animal Species"
Education: M.S., Environmental Science, Indiana University
B.S., Environmental Science, Mansfield University
Experience: 10 years

Heiser, Scott
EIS Responsibilities: *Project Manager; Land Use and Visual Resources Lead;* Chapter 2, "Facility Description, Alternatives, and Comparison of Environmental Consequences," Chapter 4, "Environmental Consequences," Appendix C, "Storage Facility Construction and Operations Data," "Comment Response Document"
Education: M.S., Engineering Management, University of Maryland
B.S., Mechanical Engineering, Virginia Polytechnic Institute and State University
Experience: 21 years

Hoffman, Robert
EIS Responsibilities: *Summary and Guide for Stakeholders*
Education: B.S., Environmental Resource Management, The Pennsylvania State University
Experience: 27 years

Kaiser, Geoffrey
EIS Responsibilities: *Occupational and Public Health and Safety Lead; Ecological Risk Lead;* Appendix B, "Impact Assessment Methodology," Appendix D, "Human Health and Ecological Risk Assessment Analysis," Appendix E, "Updates to the January 2011 *Mercury Storage EIS*"
Education: Ph.D., Theoretical Elementary Particle Physics, Cavendish Laboratory, Cambridge, United Kingdom
M.A., Natural Sciences, University of Cambridge, United Kingdom
B.A., Natural Sciences, University of Cambridge, United Kingdom
Experience: 44 years

Mielke, Matthew
EIS Responsibilities: *Socioeconomics Analysis; Environmental Justice Analysis*
Education: B.S., Environmental Science and Policy, University of Maryland, College Park
Experience: 2 years

Mirsky, Steve
EIS Responsibilities: *Occupational and Public Health and Safety Accident and Intentional Destructive Acts Analyses*
Education: M.S., Nuclear Engineering, The Pennsylvania State University
B.S., Mechanical Engineering, Cooper Union
Experience: 36 years

Preston, Margaret (Peggy)
EIS Responsibilities: *Water Resources Lead*
Education: B.S., Environmental Science, University of Maryland, Baltimore County
Experience: 7 years

Rhone, Jacquelyn
EIS Responsibilities: *Document Production Manager;* Appendix A, "The Mercury Export Ban Act of 2008, *Federal Register* Notices, and Other Public Notices," Appendix G, "Cooperating Agency Agreements," Appendix H, "Contractor National Environmental Policy Act Disclosure Statement"
Education: A.Sc., Radiological Health Technology, Central Florida Community College
Experience: 40 years

Riley, Elizabeth
EIS Responsibilities: *Document Production;* Appendix A, "The Mercury Export Ban Act of 2008, *Federal Register* Notices, and Other Public Notices," Appendix G, "Cooperating Agency Agreements," Appendix H, "Contractor National Environmental Policy Act Disclosure Statement," Appendix I, "Responses to Consultation Requests"
Education: B.A., Psychology, The Catholic University of America
Experience: 2 years

Robinson, Linda
EIS Responsibilities: *Project Quality Advisor*
Education: Executive M.B.A., Loyola College
B.S. Ed., Earth Sciences, Texas Christian University
Experience: 39 years

Schatzel, Sean
EIS Responsibilities: *Socioeconomics Lead; Environmental Justice Lead;* Appendix B, "Impact Assessment Methodology," Appendix E, "Updates to the January 2011 *Mercury Storage EIS*"
Education: B.A., Political Economics/Public Administration, Bloomsburg University
Experience: 5 years

Schinner, James
EIS Responsibilities: *Cumulative Impacts Lead*
Education: Ph.D., Wildlife Management, Michigan State University
M.S., Zoology, University of Cincinnati
B.S., Zoology, University of Cincinnati
Experience: 40 years

Smith, Alison
EIS Responsibilities: *Technical Editor Lead;* Chapter 6, "Glossary," Chapter 9, "Index"
Education: B.A., English Language and Literature, University of Maryland, College Park
Experience: 5 years

Smith, Charlotte
EIS Responsibilities: *Public Outreach Support*
Experience: 14 years

Soverow, Walter
EIS Responsibilities: *Administrative Record Coordinator; Public Outreach Support;* Chapter 7, "List of Preparers," Chapter 8, "Distribution List"
Education: B.S., Business Administration, Rochester Institute of Technology
Experience: 18 years

Upchurch, Audra
EIS Responsibilities: *Cultural and Paleontological Resources Lead;* Chapter 3, "Affected Environment," Chapter 5, "Environmental Laws, Regulations, Permits, and Other Potentially Applicable Requirements"
Education: M.N.R., Natural Resources, Virginia Polytechnic Institute and State University
Graduate Certificate, Natural Resources, Virginia Polytechnic Institute and State University
B.S., Forestry; Minor: Environmental Science, Virginia Polytechnic Institute and State University
Experience: 10 years

Werth, Robert
EIS Responsibilities: *Meteorology, Air Quality, and Noise Lead*
Education: B.A., Physics, Gordon College
Experience: 38 years

CHAPTER 8
DISTRIBUTION LIST

CHAPTER 8
DISTRIBUTION LIST

The U.S. Department of Energy provided copies of this *Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Final Mercury Storage SEIS)* to members of Congress, American Indian tribal governments, state and local governments, other Federal agencies, and organizations and individuals listed in this chapter. For stakeholders that were not part of this initial distribution, copies of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* or this *Final Mercury Storage SEIS* will be provided upon request.

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The Honorable Mark Udall

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The Honorable Johnny Isakson

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The Honorable Mike Crapo

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The Honorable Jerry Moran
The Honorable Pat Roberts

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The Honorable Claire McCaskill

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The Honorable Doc Hastings, District 4

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FEDERAL AGENCIES

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Defense Logistics Agency
U.S. Bureau of Land Management
U.S. Department of the Army
U.S. Department of the Interior
U.S. Department of Transportation
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. General Services Administration
U.S. Government Accountability Office

STATE GOVERNMENT

Colorado

Colorado Governor
John W. Hickenlooper

Senators
Steve King, District 7

Representatives
Ray Scott, District 55

Colorado Department of Natural Resources
Jim Pokrandt, Chair, Colorado Basin Roundtable
Ron Velarde, NW Regional Manager, Division of Wildlife

Colorado Department of Public Health and Environment
Martha Rudolph, Executive Director
Michael Cosby, UMTRA Property Specialist
Tammy Ottmer, WIPP Program Manager
Howard Roitman, Acting Director of Environmental Programs
Joe Schieffelin, Manager, Hazardous Materials & Solid Waste Program
Warren Smith, Community Involvement Manager

Colorado Historical Society
Edward C. Nichols, State Historic Preservation Officer

Georgia

Georgia Governor
Nathan Deal

Georgia Department of Natural Resources
Albert J. Frazier, Jr., Manager, ERT/RMP/EPCRA Programs, Environmental Protection Division

Idaho

State Officials
C.L. "Butch" Otter, Governor
Bonnie Butler, Special Assistant to the Governor, Office of the Governor

Senators
Dean Cameron, District 27
Jim Guthrie, District 28
Steve Bair, District 31
John H. Tippets, District 32
Bart M. Davis, District 33
Jeff C. Siddoway, District 35

Representatives
Robert Anderst, District 12, Seat A
Gary E. Collins, District 13, Seat B
Scott Bedke, District 27, Seat A
Fred Wood, District 27, Seat B

Representatives (continued)

Ken Andrus, District 28, Seat A
Kelly Packer, District 28, Seat B
Carolyn Meline, District 29, Seat A
Neal A. Anderson, District 31, Seat A
Julie VanOrden, District 31, Seat B
Marc Gibbs, District 32, Seat A
Tom Loertscher, District 32, Seat B
Linda B. Bateman, District 33, Seat B
Janet Trujillo, District 33, Seat A
Paul Romrell, District 35, Seat B
JoAn E. Wood, District 35, Seat A

Idaho Department of Environmental Quality

Robert E. Bullock, Hazardous Waste Permits Manager
Jess Byrne, Deputy Director
Craig Halverson, Program Manager
Curt Fransen, Director
Erick Neher, Regional Administrator

Idaho Department of Labor

Roger B. Madsen, Director

Idaho Fish and Game

Jeff Gould, Chief, Wildlife Bureau

Idaho Office of Energy Resources

John Chatburn, Energy Policy Analyst

Idaho State Historical Society

Janet Gallimore, Executive Director

Kansas

Governor

Sam Brownback

Missouri

Governor

Jay Nixon

Senators

S. Kiki Curls, District 9

Representatives

Chris Kelly, District 45

Office of Environmental Quality, Environmental Management Commission of Kansas City, Missouri

Carol T. Adams, Co-chair
Bob Berkebile, Co-chair

Missouri Department of Conservation

Doyle Brown, Policy Coordinator

Missouri Department of Health and Senior Services

Jonathan Garoutte, Environmental Specialist

Missouri Department of Natural Resources
Keith Bertels, Environmental Specialist, Hazardous Waste Program, Department of Environmental Quality
Mark A. Miles, State Historic Preservation Officer
Mark Templeton, Director

Nevada

Governor
Brian Sandoval

Senators
Mike McGinness, Central Nevada Senatorial District

Representatives
James Oscarson, District 36

Nevada Agency for Nuclear Projects
Robert J. Halstead, Executive Director
Joe Strolin

Nevada Department of Conservation and Natural Resources
Allen Biaggi, Director
Jennifer Newmark, Program Manager, Nevada Natural Heritage Program

Nevada Division of Environmental Protection
Colleen Cripps, Deputy Administrator
Eric Noack, Chief, Bureau of Waste Management

Nevada State Historic Preservation Office
Rebecca L. Palmer, Acting State Historic Preservation Officer

New Mexico

Governor
Susana Martinez
Keith Gardner, Chief of Staff
John A. Sanchez, Lieutenant Governor

Senators
Stuart Ingle, District 27
Cliff R. Pirtie, District 32
William F. Burt, District 33
Ron Griggs, District 34
Carroll Leavell, District 41
Gay Kernan, District 42

Representatives
William Gray, District 54
Cathrynn N. Brown, District 55
Jason C. Harper, District 57
Candy Spence Ezzell, District 58
Nora Espinoza, District 59
David M. Gallegos, District 61
Don Bratton, District 62

New Mexico Department of Cultural Affairs Historic Preservation Division
Jan Biella, Historic Preservation Officer
Norman B. Nelson, Archaeologist, Planning and Review

New Mexico Energy, Minerals and Natural Resources
John A. Bemis, Secretary
Anne DeLain W. Clark, Coordinator, WIPP Transportation Safety Program
Tony Delfin, State Forester, Forestry Division
Daniela Roth, Botany Coordinator
Todd Wilson, Coordinator, WIPP Route Safety

New Mexico Environment Department
F. David Martin, Secretary
Butch Tongate, Deputy Secretary
John E. Kieling, Acting Chief Hazardous Waste
Thomas Skibitski, Chief DOE Oversight

New Mexico Department of Game and Fish
Matthew Wunder, Division Chief, Conservation Services

New Mexico Department of Public Safety
Alvin Dominque

New Mexico Attorney General
Gary King

Oregon

Governor
John Kitzhaber

Senators
Jackie Dingfleder, District 23
Bill Hansell, District 29
Ted Ferrioli, District 30

Representatives
Alissa Kerry-Guyer, District 46
Mark Johnson, District 52
Greg Smith, District 57
Bob Jenson, District 58

Oregon Department of Energy, Nuclear Safety Division
Dirk Dunning, Nuclear Material Specialist
Ken Niles, Division Administrator

Oregon Department of Environmental Quality
Neil Mullane, Water Quality Division Administrator
Mitch Wolgamott, Regional Administrator

South Carolina

Governor
Nikki Haley

Senators
Tom Young, District 24
A. Shane Massey, District 25

Representatives
Don Wells, District 81
William Clyburn, District 82
Bill Hixon, District 83
James Smith, District 84
William Taylor, District 86

South Carolina Department of Archives & History
Eric Emerson, State Historic Preservation Officer

South Carolina Department of Natural Resources
D. Breck Carmichael, Jr., Deputy Director, Wildlife and Freshwater Fisheries Division
Bob Perry, Director, Office of Environmental Programs

Tennessee

Governor
Bill Haslam

Tennessee Department of Environment and Conservation
John A. Wojtowicz

Texas

Governor
Rick Perry

Senators
Kel Seliger, District 31

Representatives
Tryon D. Lewis, District 81

Texas Commission on Environmental Quality
Jim Harrison, Director, Intergovernmental Relations Division
Earl Lott, Director, Waste Permits Division
Amie Dutta Richardson, Attorney, Environmental Law Division
Mark R. Vickery, P.G., Executive Director

Texas Historical Commission
Mark S. Wolfe, State Historic Preservation Officer

Texas Parks and Wildlife Department
Clay Brewer, Director
Ross Melinchuk, Deputy Executive Director

Texas State Energy Conservation Office
Roger Mulder

Washington

Governor
Jay Inslee
Mark Rupp, Director, Governor's Washington, DC, Office

Senators

Jerome Delvin, District 8
Mark Schoesler, District 9
Janéa Holmquist, District 13
Curtis King, District 14
Jim Honeyford, District 15
Mike Hewitt, District 16

Representatives

Larry Haler, District 8, Seat B
Brad Klippert, District 8, Seat A
Susan Fagan, District 9, Seat A
Joe Schmick, District 9, Seat B
Cary Condotta, District 12, Seat A
Matt Manweller, District 13, Seat B
Judith Warnick, District 13, Seat A
Norm Johnson, District 14, Seat A
Charles Ross, District 14, Seat B
Bruce Chandler, District 15, Seat A
David Taylor, District 15, Seat B
Maureen Walsh, District 16, Seat A

Washington State Department of Ecology

Madeleine Brown, SEPA
Maria Victoria Peeler, Senior Policy Specialist
Ron Skinnarland, Waste Management Sector Manager
Ted Sturdevant, Director

Washington State Department of Fish and Wildlife

John Carleton
Jeff Tayer, Regional Program Director

Washington State Department of Health

John Martell, Manager, Division of Environmental Health, Office of Radiation Protection

Washington State Department of Natural Resources

Sandy Swope Moody, Environmental Review Coordinator, Washington Natural Heritage Program

Washington State Office of Archaeology and Historic Preservation

Allyson Brooks, Ph.D., State Historic Preservation Officer

NATIONAL ENVIRONMENTAL POLICY ACT STATE POINTS OF CONTACT

Erick Neher, Department of Environmental Quality, Idaho National Laboratory Oversight Program
Susan Burke, Department of Environmental Quality, Idaho National Laboratory Oversight Program
Robert Stout, Missouri Department of Natural Resources
Skip Canfield, Nevada State Clearinghouse, Nevada Division of State Lands
Shelly Wilson, South Carolina Department of Health and Environmental Control
Mary Parkman, Tennessee Department of Environment and Conservation
Chudi Nwangwa, Tennessee Department of Environment and Conservation
Toby Baker, Governor’s Advisor, Natural Resources and Agriculture, Texas
Terry Zrubek, Governor’s Advisor, Natural Resources, Texas
Annie Szvetecz, SEPA Policy Lead, Washington State Department of Ecology

LOCAL GOVERNMENT

Colorado

Delta County Officials
Rob Fiedler, Emergency Manager, Sheriff's Office

Grand Junction Officials
Bill Pitts, Mayor
Rich Englehart, City Manager
Drew Reekie, Hazmat Coordinator, Fire Department

Mesa County Officials
Steve Acquafresca, District 2, Board of County Commissioners
Steve DeFeyter, Director of Environmental Health, Mesa County Health Department
Dave Frankel, Mesa County Attorney's Office
James Grady, Mesa County Board of Health
Kurt Larsen, Director of Planning and Economic Development
Craig Meis, District 1, Board of County Commissioners
John Rodwick, Ph.D., Mesa County Board of Health
Donna Ross, Development Services Director, Mesa County Planning

Pitkin County, Board of County Commissioners
George Newman, Chairman

Georgia

Mayor
Deke Copenhaver, Augusta

Idaho

Mayor
Jared Fuhriman, Idaho Falls

Butte County Commissioner
Seth E. Beal, Chairman

Missouri

Kansas City Officials
Sly James, Mayor
Troy Schulte, City Manager
Scott Taylor, District 6, City Council
Dennis Murphey, Chief Environmental Officer, Office of Environmental Quality
John A. Sharp, District 6, City Council

Nevada

Mineral County, Board of County Commissioners
Jerrie C. Tipton, Chair

New Mexico

Artesia Officials
Phillip Burch, Mayor

Carlsbad Officials
Dale W. Janway, Mayor
John Tully, City Administrator

Eunice Officials
Matt White, Mayor
Martin Moore, City Manager

Hobbs Officials
Sam Cobb, Mayor
J.J. Murphy, City Manager

Lea County Officials
Mike Gallagher, County Manager
Gregory H. Fulfer, Chairman, Board of County Commissioners

Village of Loving Officials
Pete Estrada, Mayor

Roswell Officials
Del Jurney, Mayor

Oregon

Portland Officials
Charlie Hales, Mayor
Susan Anderson, Director, Bureau of Planning and Sustainability

South Carolina

Aiken City Officials
Fred Cavanaugh, Mayor
Richard Pearce, City Manager

Aiken County Officials
J. Clay Killian, County Administrator
Ronnie Young, Chairman, County Council

Texas

Andrews Officials
Robert Zap, Mayor
Wesley Burnett, Director, Economic Development
Danny Griffin, Plant Manager
Glen E. Hackler, City Manager
Dolphus Bud Jones, Chief of Police, Department of Public Safety
Richard H. Dolgener, County Judge

Washington

Benton City Officials
Lloyd Carnahan, Mayor

Benton County Officials
James Beaver, Chairman, Benton County Commissioners
Rick Garza, Deputy Director, Benton County Emergency Management
Hans Kwast, Director, Benton County Emergency Services
Gwen Luper, Executive Director, Benton-Franklin Council of Governments
Scott D. Keller, Executive Director, Port of Benton

Franklin County Officials
Brad Peck, Chairman, Board of County Commissioners

Kennewick Officials
Marie Mosely, City Manager
Steve Young, Mayor

Pasco Officials
Gary Crutchfield, City Manager
Matt Watkins, Mayor

Port of Benton (Benton County) Board of Commissioners
Robert D. Larson, President

Port of Pasco (Franklin County) Board of Commissioners
Bill Clark, President

Prosser Officials
Paul Warden, Mayor

Richland Officials
John Fox, Mayor
Cindy Johnson, City Manager
David Rose, Mayor Pro Tem

West Richland Officials
Donna Noski, Mayor

ADVISORY BOARDS

Environmental Management Site-Specific Advisory Boards (SSAB)

AMERICAN INDIAN TRIBAL REPRESENTATIVES

Colorado

No American Indian tribal representatives have been identified.

Idaho

Nez Perce Tribe
Silas Whitman, Chairman, Nez Perce Tribal Executive Committee
John Stanfill, Hanford Coordinator

Shoshone-Bannock Tribes
Nathan Small, Chairman, Fort Hall Business Council
Tino Batt, Treasurer, Fort Hall Business Council
Willie Preacher, Tribal Department of Energy Director
Roger Turner, Air Quality Manager

Kansas

No American Indian tribal representatives have been identified.

Missouri

No American Indian tribal representatives have been identified.

Nevada

Walker River Paiute Tribe
Lorren Sammaripa, Chairman

New Mexico

Pueblo of Acoma
Randall Vincente, Governor

Pueblo of Laguna
Richard Luarkie, Governor

Pueblo of Nambe
Phillip A. Perez, Governor

Pueblo of Pojoaque
George Rivera, Governor

Pueblo of San Ildelfonso
Terry Aguilar, Governor

Oregon

Confederated Tribes of the Umatilla Indian Reservation
Les Minthorn, Chairman, Board of Trustees
Thomas Bailor, Program Manager, Professional Services and Outreach, Department of Science and Engineering
Stuart Harris, Director, Department of Science and Engineering

South Carolina

Catawba Indian Nation
Bill Harris, Chief

Tennessee

No American Indian tribal representatives have been identified.

Texas

No American Indian tribal representatives have been identified.

Washington

Confederated Tribes and Bands of the Yakama Nation
Harry Smiskin, Chairman, Yakama Nation Tribal Council
Russell Jim, Manager, Yakama Nation Environmental Restoration and Waste Management Program

Confederated Tribes of the Colville Reservation
Michael O. Finley, Chairman, Colville Business Council

Wanapum People
Rex Buck, Leader

READING ROOMS AND LIBRARIES

Colorado

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503
(970) 248-6089

Mesa County Library
530 Grand Avenue
Grand Junction, CO 81502
(970) 243-4442

Georgia

Reese Library
Augusta State University
2500 Walton Way
Augusta, GA 30904
(706) 737-1745

Asa H. Gordon Library
Savannah State University
2200 Tompkins Road
Savannah, GA 31404
(912) 356-2183

Idaho

U.S. Department of Energy
Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83402
(208) 526-5190

Missouri

Mid-Continent Public Library
Blue Ridge Branch
9253 Blue Ridge Boulevard
Kansas City, MO 64138
(816) 761-3382

Nevada

Mineral County Library
First & "A" Street
Hawthorne, NV 89415
(775) 945-2778

New Mexico

Eunice Public Library
1003 Avenue N
Eunice, NM 88231
(575) 394-2336

Zimmerman Library
Government Information Department
1 University of New Mexico
Albuquerque, NM 87131
(505) 277-5441

WIPP Information Center
4021 National Parks Highway
Carlsbad, NM 88220
(505) 234-7200

Oregon

Portland State University
Government Information
Branford Price Millar Library
1875 SW Park Avenue
Portland, OR 97207
(503) 725-5874

South Carolina

Gregg-Graniteville Library
University of South Carolina-Aiken
471 University Parkway
Aiken, SC 29801
(803) 641-3320

South Carolina State Library
1500 Senate Street
Columbia, SC 29211
(803) 734-8026

Texas

Andrews County Library
109 NW 1st Street
Andrews, TX 79714
(432) 523-9819

Washington

U.S. Department of Energy
Public Reading Room
Consolidated Information Center
2770 University Drive, Room 101L
Richland, WA 99352
(509) 372-7443

University of Washington
Suzzallo-Allen Library
Government Publications
Seattle, WA 98195
(206) 543-4164

Gonzaga University
Foley Center Library
101-L East 502 Boone
Spokane, WA 99258
(509) 313-5931

Washington, DC

U.S. Department of Energy
Freedom of Information Reading Room
1000 Independence Avenue, SW, 1G-033
Washington, DC 20585
(202) 586-5955

ORGANIZATIONS/PUBLIC INTEREST GROUPS

Lesley Weinstock, Agua es Vida Action Team
Alan S. Caldwell, A. S. Caldwell and Associates
Tom Clements, Alliance for Nuclear Accountability
Robert J. Simon, American Chemistry Council
Bruce Lawrence, Bethlehem Apparatus Company
A. Turner Shipman, Bridlespur Homes Association
Jody Knox, Carlsbad Department of Development
Janet Greenwald, Citizens for Alternatives to Radioactive Dumping
Deborah Reade, Citizens for Alternatives to Radioactive Dumping
Michael Crisenberry, Clean Harbors Environmental Services, Inc.
John Tanner, Coalition 21
Dana S. Kimbal, Coeur Rochester, Inc.
David Foy, Colorado Counties, Inc.
Penelope McMullen, Community of Loretto
Joni Arends, Concerned Citizens for Nuclear Safety
Yvonne Downs, DZHC
Lisa Hardison, Economic Development Corporation of Lea County New Mexico
Charlie Smith, Economic Development Corporation of Lea County New Mexico

Matthew C. Jones, Environmental Council of the States
Louis Clark, Government Accountability Project
Mark Cohen, Government Accountability Project
Bill Keller, Greenpeace
Gerald Pollet, Heart of America Northwest
Grant Taylor, Hobbs Chamber of Commerce
Oscar Gonzales, Hobbs Hispano Chamber of Commerce
Sara Navarro, Hobbs Hispano Chamber of Commerce
T.J. Parks, Hobbs Municipal Schools District
Lance Wiseman, Hobbs Municipal Schools District Board
Judy Hanna, Hobbs News Sun
Levi Hill, Hobbs News Sun
Arjun Makhijani, Institute for Energy & Environmental Research
Robert Reid, JF Maddox Energy
Hermilo Ojeda, KLMA
Russ Ptacek, KSHB
Brenda Brooks, LES Enrichment Facility
Sharon Duncan, Linden Hill Homes and Center Planning & Development Council
Michael Bender, Mercury Policy Project
Jim Hattler, Mercury Waste Solutions
Karen Bennett, National Mining Association
Tawny A. Bridgeford, National Mining Association
Sydney Gordon, National Securities Technologies
Thomas Cochran, Natural Resources Defense Council
Susan Egan Keane, Natural Resources Defense Council
Geoff Fettus, Natural Resources Defense Council
David Goldstein, Natural Resources Defense Council
David Lennett, Natural Resources Defense Council
Robert Caudle, New Mexico Junior College
Jeff White, Newmont Mining Corporation
Jay Coghlan, Nuclear Watch New Mexico
Scott Kovac, Nuclear Watch New Mexico
Norman A. Mulvenon, Oak Ridge Reservation Local Oversight Committee
John R. Parish, Oil Operation
Elaine K. Patterson, Olin Chlor Alkali Products
Madeline Riley, Physicians for Social Responsibility
Ann Suellentrop, Physicians for Social Responsibility
Tom Smith, Public Citizen Texas
C. Mark Smith, Quicksilver Caucus
Sandy Baranich, S.M. Stoller Corporation
Darlene DePinho, S.M. Stoller Corporation
Linda Sheader, S.M. Stoller Corporation
Dan Weaks, Shoats and Weaks Inc.
Ed Hopkins, Sierra Club, Washington, DC, Office
Niki Widmayer, Sierra Club

Don Hancock, Southwest Research and Information Center
Stephanie Lindsay, Stinson Morrison Hecker, LLP
Karen Hadden, Sustainable Energy and Economic Development Coalition
Sandra Carroll, Tetra Tech
Frank Reiner, The Chlorine Institute, Inc.
Leslie Huddleston, U.S. Senate - Office of Senator Crapo
Gary Dill, University of the Southwest
Jude Van Buren, University of Washington Environmental Health Safety
Hemut Engebrecht, URENCO, Ltd.
Amy Taylor, U.S. Senate - Office of Senator James Risch
Nancy Bobbitt, U.S. Senate - Office of Senator Johnny Isakson
Phillip G. Ditter, Veolia ES Technical Solutions
Donavan Mager, Washington TRU Solutions
Samuel Alexander, Jr., Waste Control Specialists
Jay Britten, Waste Control Specialists, LLC
John Browder, Waste Control Specialists, LLC
Michael Burney, Waste Control Specialists, LLC
Juan Garza, Waste Control Specialists, LLC
Tom Jones, Waste Control Specialists, LLC
Karl Klotz, Waste Control Specialists, LLC
Jack Kraus, Waste Control Specialists, LLC
Sheila Parker, Waste Control Specialists, LLC
Charles E. Taylor, Waste Control Specialists, LLC
Ben Jaime, Xcel Energy

INDIVIDUALS

Sally Cordova
Patricia Dominguez
Morgan Drewmiany
Susan Kamat
Judy Kaul
Christopher Miller
Rebecca Mitchell
Lilly K. Rendt
Greg M. Sehoen

CHAPTER 9
INDEX

CHAPTER 9
INDEX

A

accidents, 1–6, 1–9, 2–18, 2–19, 2–21, 2–26, 2–27, 3–26, 3–27, 4–2, 4–16, 4–20, 4–22, 4–23, 4–27, 4–43
  facility, 2–18, 2–21, 2–26, 3–26, 3–27, 4–2, 4–16, 4–47
  transportation, 1–6, 2–19, 2–27, 2–28, 4–23, 4–43, 4–48
active fault, 4–4
Acute Exposure Guideline Level (AEGL), 4–25, 4–26, 4–30
affected environment, 1–5, 1–11, 1–12, 2–16, 3–1, 3–2, 4–46
air pollutant, 3–2, 4–8, 4–45, 4–47, 5–5
air quality, 1–8, 1–11, 2–18, 2–21, 2–23, 2–30, 2–31, 3–1, 3–2, 3–17, 3–18, 3–20, 4–1, 4–7, 4–8, 4–9, 4–42, 4–43, 4–45, 4–46, 4–47, 4–48, 5–2, 5–3, 5–4, 5–5
  alluvium, 3–12
  ambient, 2–23, 3–18, 3–19, 4–45, 4–48
American Indian, 1–7, 1–12, 2–25, 3–23, 3–28, 4–11, 4–12, 5–5, 5–6
American robin, 2–19, 2–29, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
animals, 1–12, 2–24
aquatic biota, 2–19, 2–29, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
aquatic resource, 3–21, 4–10, 4–46
aquatic species, 2–24, 3–21
aquifer, 3–14, 3–15, 3–25
aquitard, 3–14
archaeological site, 3–22, 3–23, 4–12, 5–5
artifact, 3–23
attainment, 3–19, 3–20

B

bedrock, 3–11
best management practice, 2–3, 2–23, 4–4, 4–5
Bethlehem Apparatus Company, 2–2
bird, 3–5, 3–21
block groups, 2–17, 2–30, 3–30, 3–31, 3–32, 4–40, 4–41
Burlington Northern Santa Fe (BNSF) Railroad, 3–24, 3–28

C

cancer, 3–27
candidate sites, 1–5, 1–7, 1–8, 1–9, 1–10, 1–11, 2–1, 2–3, 2–9, 2–10, 2–17, 2–21, 2–23, 2–30, 3–1, 3–13, 3–29, 4–1, 4–2, 4–16, 4–17, 4–23, 4–35, 4–36, 4–37, 4–48, 4–50, 5–1, 5–2, 5–3, 5–5
candidate species, 3–21
carbon dioxide, 2–18, 2–24, 4–8
carbon monoxide, 2–24, 3–18, 3–19, 4–8
carbon tetrachloride, 3–27
carbonate, 3–6, 3–9, 3–10, 3–12, 3–16, 4–4
Carlsbad Caverns National Park, 3–20
Carlsbad, New Mexico, 1–5, 1–7, 1–8, 1–9, 1–10, 2–12, 3–2, 3–5, 3–9, 3–19, 3–20, 3–24, 3–25, 3–28, 3–32, 4–2
census, 1–5, 2–16, 2–17, 2–19, 2–30, 3–1, 3–28, 3–29, 3–30, 3–31, 3–32, 4–1
census block, 2–17, 2–30, 3–30, 3–31, 3–32
Central Waste Complex (CWC), 2–10
Chihuahuan Desert, 2–12, 3–2, 3–17, 3–21, 4–2
children, 3–28
chlor-alkali, 1–3, 1–4, 2–1, 2–2, 2–4, 2–7
closure, 1–3, 1–6, 1–12, 2–1, 2–7, 4–1, 4–2, 4–41, 4–49, 5–5
Code of Federal Regulations (CFR), 1–1, 1–6, 2–4, 2–16, 2–30, 3–20, 3–26, 3–27, 4–6, 4–7, 4–11, 4–41, 4–42, 4–46, 5–1
commitments of resources
  irreversible and irretrievable, 1–12, 4–48, 4–49
commodity, 2–2, 2–10, 2–21
comparison of alternatives, 2–16
Congress, 1–4
construction, 1–6, 1–9, 1–10, 1–12, 2–4, 2–6, 2–9, 2–12, 2–15, 2–17, 2–18, 2–19, 2–21, 2–22, 2–23, 2–24, 2–25, 2–26, 2–29, 2–30, 3–18, 3–20, 3–25, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–21, 4–39, 4–40, 4–43, 4–45, 4–46, 4–47, 4–48, 4–49, 4–50, 5–1, 5–3, 5–4, 5–5
  debris, 2–25, 3–23, 3–25, 4–14, 4–41
  site, 1–1, 1–5, 1–6, 1–8, 1–9, 1–11, 2–3, 2–6, 2–8, 2–9, 2–10, 2–11, 2–12, 2–15, 2–17, 2–18, 2–19, 2–22, 2–23, 2–24, 2–25, 2–27, 2–30, 3–1, 3–2, 3–3, 3–4, 3–5, 3–6, 3–7, 3–8, 3–9, 3–10, 3–11, 3–12, 3–13, 3–14, 3–15, 3–16, 3–17, 3–18, 3–19, 3–20, 3–21, 3–22, 3–23, 3–24, 3–25, 3–26, 3–27, 3–28, 4–1, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–17, 4–18, 4–21, 4–22, 4–23, 4–26, 4–29, 4–37, 4–40, 4–41, 4–42, 4–43, 4–44, 4–45, 4–46, 4–48, 4–49, 4–50, 5–3
consultation, 1–12, 3–21, 4–10, 4–11, 5–5, 5–6
Container Storage Building (CSB), 2–11
contamination, 1–8, 2–8, 2–26, 4–6, 4–8, 4–33, 4–41, 4–45
costs, 2–1, 4–41
critical habitat, 2–24, 3–21, 4–10, 4–46, 5–5

cultural and paleontological resources, 1–8, 2–16, 2–25, 3–1, 3–2, 3–22, 4–1, 4–11, 4–12, 4–42, 4–43
cumulative impacts, 1–10, 1–12, 2–30, 2–31, 4–1, 4–42, 4–43, 4–44, 4–45, 4–46

D

damage, 2–23, 3–17, 4–4, 4–7, 4–17, 4–19
death, 4–22, 4–23
decommissioning, 1–10, 4–10
Defense Logistics Agency (DLA), 1–3, 2–3, 2–10, 4–2, 4–20
Defense National Stockpile Center (DNSC), 2–3, 2–10
Delaware Basin, 3–7, 3–9, 3–10
deposition, 1–1, 2–18, 2–19, 2–28, 2–29, 4–22, 4–26, 4–27, 4–28, 4–31, 4–33, 4–34, 4–35, 4–37, 4–38
  dry, 1–1, 2–19, 2–28, 2–29, 3–5, 3–14, 4–22, 4–23, 4–26, 4–27, 4–28, 4–31, 4–34, 4–35, 4–37, 4–38, 4–47
  wet, 1–1, 2–28, 2–29, 4–22, 4–23, 4–26, 4–27, 4–28, 4–31, 4–35, 4–38
design, 2–1, 2–6, 2–23, 2–28, 4–5, 4–6, 4–7, 4–15, 4–17, 4–29, 4–46, 5–3
Dewey Lake Formation, 3–10, 3–14, 3–16
diesel fuel, 2–25, 4–12, 4–13, 4–47, 4–48
dose, 3–26, 3–27
Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Draft Mercury Storage SEIS), 1–7, 1–9, 1–12

E

earthquake, 2–17, 2–23, 2–26, 3–12, 4–4, 4–17, 4–18, 4–19, 4–20, 4–21, 4–22
  magnitude, 1–5, 2–16, 2–19, 3–12, 3–13, 3–16, 3–20, 4–1, 4–15, 4–16, 4–46, 4–50
  peak ground acceleration, 2–23, 4–4, 4–17
  seismic, 2–6, 2–17, 2–23, 3–6, 3–12, 3–13, 4–4, 4–16, 4–17, 4–46
ecological receptor, 2–19, 2–28, 2–29, 4–24, 4–31, 4–32, 4–33, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
ecological resource, 1–8, 2–16, 2–21, 2–24, 2–30, 2–31, 3–1, 3–2, 3–21, 4–1, 4–10, 4–39, 4–42, 4–43, 4–46, 5–5, 5–6
ecological risk, 1–6, 1–8, 1–12, 2–19, 2–28, 4–2, 4–31, 4–33
economic characteristics, 3–28
Eddy County, New Mexico, 3–3, 3–11, 3–18
electricity, 1–1, 1–5, 2–6, 2–25, 3–24, 4–12, 4–13, 4–14, 4–45, 4–47, 4–49
emergency, 2–3, 2–8, 2–18, 2–23, 3–5, 3–20, 3–24, 4–7, 4–9, 4–13, 4–47, 4–48, 5–4, 5–5
  generator, 1–3, 2–8, 2–25, 3–20, 3–25, 4–9, 4–12, 4–13, 4–45
  planning, 1–3, 3–5, 4–2, 4–3, 4–47, 5–2
  response, 1–7, 1–8, 1–11, 1–12, 2–3, 2–7, 2–8, 2–26, 4–11, 4–14, 4–47, 5–5
emission, 3–18, 4–8, 4–45, 5–5
employee vehicles, 2–18, 2–23, 2–24, 4–7, 4–9, 4–40, 4–48
employment, 1–6, 2–17, 2–21, 2–29, 4–39
Energy Policy Act of 2005, 1–11
environmental assessment (EA), 2–11
environmental consequences, 1–11, 1–12, 2–1, 2–16, 2–17, 2–18, 2–19, 2–21, 2–22, 3–1, 4–1, 4–5
environmental impact, 1–5, 1–6, 1–10, 1–11, 1–12, 2–3, 3–1, 3–2, 4–1, 4–2, 4–5, 4–11, 4–12, 4–17, 4–20, 4–46, 4–48, 4–49, 4–50, 5–5
environmental impact statement (EIS), 1–1, 1–3, 1–5, 1–6, 1–10, 1–11, 2–1, 2–3, 2–9, 2–10, 2–12, 2–15, 2–16, 2–21, 2–24, 3–1, 3–2, 4–1, 4–2, 4–5, 4–9, 4–15, 4–17, 4–20, 4–21, 4–23, 4–25, 4–26, 4–28, 4–29, 4–32, 4–46, 5–1, 5–2
Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste (GTCC EIS), 1–10, 1–11, 3–1
environmental justice, 1–5, 1–8, 2–16, 2–17, 2–19, 2–21, 2–30, 3–1, 3–2, 3–28, 4–1, 4–2, 4–40, 4–43
epoxy, 2–6
erosion, 2–23, 3–10, 3–12, 4–4, 4–5, 4–47, 4–48
Exclusive Use Area, 2–12, 2–15, 3–3, 3–4, 3–5
Executive Order, 3–28
exhaust, 2–7, 2–8, 2–24
explosion, 4–19
exposure, 2–19, 2–26, 2–27, 2–28, 3–26, 3–27, 4–8, 4–15, 4–16, 4–23, 4–26, 4–27, 4–28, 4–30, 4–32, 4–34, 4–36, 4–38, 4–39
  acute, 1–5, 2–16, 2–18, 2–19, 4–1, 4–15, 4–25, 4–26, 4–27, 4–30
  chronic, 2–26, 4–8, 4–16, 4–31
  pathway, 1–8, 2–29, 3–15, 3–26, 4–26, 4–28, 4–30, 4–32

F

facility accidents, 2–18, 2–21, 2–26, 3–26, 3–27, 4–2, 4–16
fatality, 2–19, 2–27, 4–23
Federal Register (FR), 1–5, 1–7, 1–10, 1–12, 2–3, 2–15, 5–1
fence, 2–12, 3–3, 3–4, 3–20, 3–26
filter, 2–7, 2–8, 2–24
fire, 1–3, 2–3, 2–6, 2–28, 2–29, 3–24, 4–16, 4–17, 4–19, 4–20, 4–22, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–31, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39

building, 1–6, 2–3, 2–6, 2–7, 2–9, 2–11, 2–18, 2–22, 2–26, 2–27, 3–20, 4–3, 4–4, 4–7, 4–8, 4–16, 4–17, 4–18, 4–19, 4–20, 4–21, 4–22, 4–23, 4–47, 5–6
department, 1–1, 1–2, 1–4, 1–7, 2–1, 2–3, 2–17, 3–1, 4–1, 4–15, 4–20, 4–43, 5–1, 5–6
forklift, 2–26, 4–19, 4–20
suppression, 1–3, 2–3, 2–6, 2–23, 4–19
transportation accident with, 2–28
fish, 2–18, 2–19, 2–28, 4–27, 4–28, 4–30, 4–31, 4–48
flask, 2–4, 4–19, 4–20, 4–22
flood, 2–17, 2–26, 4–5, 4–19
forklift, 2–26, 4–19, 4–20
fossil fuel, 2–24, 3–6, 4–47, 4–49

G

gasoline, 2–28, 3–24, 4–13, 4–29, 4–38
gasoline tanker, 2–28, 4–29, 4–38
geology, 1–9, 2–16, 2–18, 2–22, 3–1, 3–2, 3–6, 4–1, 4–4, 4–5, 4–42, 4–43
global climate change, 2–24, 4–9
gold, 1–4, 2–1, 2–2
gold mining, 1–4
Grand Junction Disposal Site (GJDS), 1–5, 2–9, 2–10, 2–17, 2–18, 2–19
gravel, 2–23, 4–4, 4–50
great blue heron, 2–19, 2–29, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
groundwater, 2–16, 3–2, 3–8, 3–10, 3–12, 3–14, 3–15, 3–16, 3–25, 3–26, 4–6, 4–7
GTCC EIS, 1–10, 1–11, 3–1
Guadalupe Mountains National Park, 3–20
gypsum, 3–9, 3–10, 3–11, 3–16, 3–21, 3–22

H

habitat, 1–8, 2–31, 3–21, 4–10, 4–46
hail, 3–17
Handling Area, 2–3, 2–6, 2–7, 2–8, 2–23, 4–14
Hanford Site (Hanford), 1–5, 1–11, 2–9, 2–10, 2–17, 2–18, 2–19, 2–24
hawk, 2–19, 2–29, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
Hawthorne Army Depot, 1–5, 2–3, 2–9, 2–10, 4–17, 4–23
hazardous chemical, 3–26, 3–27
hazardous material, 2–4, 4–22, 4–29
hazardous waste, 2–8, 2–11, 2–26, 3–20, 3–25, 4–14, 4–41, 4–46, 4–47, 4–50, 5–2, 5–3, 5–4, 5–5
health effect, 4–28, 4–48
Health Professional Shortage Area (HPSA)
dental, 1–1
Hispanic, 3–28, 3–29
historic resources, 3–1, 3–23, 4–11, 4–12, 5–5
housing, 3–28
human health, 1–4, 1–6, 1–10, 1–12, 2–18, 2–19, 2–26, 2–27, 3–1, 3–28, 4–1, 4–28, 4–29, 4–34, 4–41
risk, 2–18, 2–19, 3–1, 4–28, 4–34, 4–41
hydrocarbon, 3–9, 3–11

I

Idaho Falls, 1–5
Idaho National Laboratory (INL), 1–5, 1–11, 2–9, 2–10, 2–17, 2–18, 2–19
Idaho Nuclear Technology and Engineering Center (INTEC), 1–5, 2–9, 2–10, 2–17, 2–18, 2–19
infrastructure, 1–5, 1–6, 1–8, 1–9, 2–15, 2–18, 2–21, 2–25, 2–30, 2–31, 3–1, 3–2, 3–24, 3–25, 4–1, 4–4, 4–12, 4–13, 4–42, 4–43, 4–45, 4–50
inhalation, 4–26, 4–27
integrated contingency plan, 4–6
intentional destructive act (IDA), 2–26, 2–28, 4–29, 4–30, 4–31, 4–38, 4–39
Interim Guidance, 2–3, 2–8, 4–15, 4–25

K

Kansas City Plant (KCP), 1–5, 2–9, 2–11, 2–17, 2–18, 2–19, 4–17

L

land disturbance, 1–6, 2–16, 2–22, 2–30, 4–42, 4–47, 4–48
land use, 1–6, 1–8, 2–11, 2–12, 2–16, 2–17, 2–18, 2–21, 2–22, 2–30, 2–31, 3–1, 3–2, 3–3, 3–5, 4–1, 4–3, 4–42, 4–43, 4–44, 4–48, 4–49, 5–2
Land Withdrawal Act (LWA), 1–5, 1–8, 1–10, 2–12, 2–17, 3–2, 4–2, 5–3
land withdrawal boundary (LWB), 1–8, 1–9, 1–11, 2–12, 2–17, 2–22, 3–1, 3–4, 3–5, 3–6, 3–11, 3–13, 3–14, 3–21, 3–22, 3–23, 4–3, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–21, 4–31, 4–44, 5–1, 5–3
landfill, 2–11, 3–25, 4–14, 4–49, 4–50
limestone, 3–11, 3–12
liquid waste, 2–25, 2–26, 4–6, 4–14, 4–15
Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS), 1–1, 1–3, 1–4, 1–5, 1–6, 1–9, 1–10, 1–11, 1–12, 2–1, 2–3, 2–7, 2–9, 2–10, 2–15, 2–16, 2–17, 2–19, 2–21, 2–22, 2–24, 3–1, 3–13, 3–30, 4–1, 4–2, 4–3, 4–4, 4–6, 4–7, 4–8, 4–9, 4–15, 4–16, 4–17, 4–18, 4–20, 4–21, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–31, 4–33, 4–34, 4–35, 4–38, 4–48, 4–49, 5–1, 5–5

Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS), 1–1, 1–3, 1–4, 1–5, 1–7, 1–11, 1–12, 2–1, 2–2, 2–9, 2–15, 3–1, 4–1, 5–1
Loving, New Mexico, 3–5

M

Maroon Cliffs Archaeological District, 3–23
Memorandum of Understanding, 2–17
mercury, 1–1, 1–2, 1–3, 1–4, 1–5, 1–6, 1–7, 1–8, 1–9, 1–10, 1–11, 1–12, 2–1, 2–2, 2–3, 2–4, 2–5, 2–6, 2–7, 2–8, 2–9, 2–10, 2–11, 2–12, 2–15, 2–16, 2–17, 2–18, 2–19, 2–21, 2–22, 2–23, 2–24, 2–25, 2–26, 2–27, 2–28, 2–29, 2–30, 2–31, 3–1, 3–13, 3–27, 3–28, 3–29, 3–30, 4–1, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–17, 4–18, 4–19, 4–20, 4–21, 4–22, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–31, 4–32, 4–33, 4–34, 4–35, 4–37, 4–38, 4–40, 4–41, 4–42, 4–43, 4–44, 4–45, 4–46, 4–47, 4–48, 4–49, 4–50, 5–1, 5–2, 5–3, 5–5
  acceptance criteria, 1–4
  byproduct, 1–4, 2–1, 2–2
  compounds, 1–4, 3–11, 3–20, 3–27, 4–24, 4–33
  cycle, 1–2, 1–6
  divalent, 1–1, 4–26, 4–33
  elemental, 1–1, 1–2, 1–4, 1–7, 1–8, 1–9, 1–10, 2–1, 2–2, 2–3, 2–4, 2–9, 2–10, 2–11, 2–12, 2–15, 2–22, 3–1, 4–1, 4–2, 4–3, 4–4, 4–6, 4–8, 4–9, 4–15, 4–22, 4–23, 4–24, 4–25, 4–28, 4–31, 4–33, 4–41, 4–43, 4–48, 4–49, 4–50, 5–1, 5–2, 5–3
  evaporation, 2–18, 2–19, 3–17, 3–21, 3–25, 4–21, 4–23, 4–24, 4–25
  export, 1–2, 1–4, 1–9, 2–22, 5–2
  inorganic, 1–1, 4–24, 4–26, 4–30, 4–32, 4–33
  inventory, 1–2, 1–3, 1–4, 1–11, 3–18, 3–23, 4–12
  methylmercury, 1–2, 2–28, 4–24, 4–28, 4–30, 4–32, 4–33, 4–48
  poisoning, 3–28
  purity, 2–1, 2–8, 4–2
  release, 1–1, 2–26, 2–28, 4–6, 4–7, 4–16, 4–17, 4–19, 4–20, 4–21, 4–23, 4–24, 4–25, 4–28, 4–29, 4–30, 4–32, 4–41, 4–43, 4–48
  retorting, 2–1
  roasting, 2–1
  source, 1–3, 1–6, 3–10, 3–14, 3–16, 3–18, 3–19, 3–22, 3–25, 4–6, 4–8, 4–16, 4–17, 4–18, 4–24, 4–26, 4–29, 4–50, 5–5
  storage, 1–1, 1–2, 1–3, 1–4, 1–5, 1–6, 1–7, 1–8, 1–9, 1–10, 1–11, 1–12, 2–1, 2–2, 2–3, 2–4, 2–6, 2–7, 2–8, 2–9, 2–10, 2–11, 2–12, 2–15, 2–16, 2–17, 2–18, 2–19, 2–21, 2–22, 2–23, 2–24, 2–25, 2–26, 2–28, 2–29, 3–1, 3–13, 3–16, 3–25, 3–27, 3–29, 3–31, 3–32, 3–33, 4–1, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–17, 4–18, 4–19, 4–20, 4–21, 4–23, 4–25, 4–26, 4–28, 4–29, 4–31, 4–32, 4–33, 4–34, 4–35, 4–40, 4–41, 4–42, 4–43, 4–44, 4–45, 4–46, 4–47, 4–48, 4–49, 4–50, 5–1, 5–2, 5–3, 5–4, 5–5
  toxicity, 1–8, 4–2
  vapor, 2–8, 2–24, 2–26, 4–7, 4–8, 4–14, 4–15, 4–16, 4–25, 4–45, 4–47
Mercury Export Ban Act of 2008, 1–1, 1–2, 1–5, 1–11, 1–12, 2–1, 2–10, 2–22, 4–2, 5–1, 5–2
Mercury Storage EIS, 1–1, 1–3, 1–5, 1–6, 1–9, 1–10, 1–11, 1–12, 2–1, 2–3, 2–7, 2–9, 2–10, 2–15, 2–16, 2–21, 2–22, 2–24, 3–1, 3–13, 3–30, 4–1, 4–2, 4–3, 4–4, 4–6, 4–7, 4–8, 4–9, 4–15, 4–16, 4–17, 4–18, 4–20, 4–21, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–31, 4–33, 4–34, 4–35, 4–38, 4–48, 4–49, 5–1, 5–5
mercury storage facility(ies), 1–3, 1–4, 1–5, 1–6, 1–8, 1–9, 1–10, 1–12, 2–1, 2–3, 2–4, 2–5, 2–6, 2–7, 2–8, 2–11, 2–15, 2–17, 2–18, 2–21, 2–22, 2–23, 2–24, 2–25, 2–26, 2–29, 2–30, 2–31, 3–27, 4–1, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–29, 4–41, 4–42, 4–43, 4–44, 4–45, 4–46, 4–47, 4–48, 4–49, 4–50, 5–3
  closure, 1–3, 1–6, 1–12, 2–1, 4–1, 4–41, 4–49, 5–5
  construction, 1–6, 1–9, 1–10, 1–12, 2–4, 2–6, 2–9, 2–12, 2–15, 2–17, 2–18, 2–19, 2–21, 2–22, 2–23, 2–24, 2–25, 2–26, 2–29, 2–30, 3–18, 3–20, 3–25, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–21, 4–39, 4–40, 4–43, 4–45, 4–46, 4–47, 4–48, 4–49, 4–50, 5–1, 5–3, 5–4, 5–5
  design, 2–1, 2–6, 2–23, 2–28, 4–5, 4–6, 4–7, 4–15, 4–17, 4–29, 4–46, 5–3
  modification, 1–3, 2–16, 2–18, 2–23, 3–5, 4–6, 4–50, 5–3, 5–4, 5–5
  module, 2–6
  operations, 1–4, 1–6, 1–9, 1–10, 2–1, 2–4, 2–7, 2–18, 2–21, 2–23, 2–24, 2–25, 2–26, 2–29, 3–5, 3–25, 3–26, 4–2, 4–3, 4–5, 4–6, 4–7, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–39, 4–40, 4–43, 4–45, 4–49, 4–50, 5–1, 5–4, 5–5
Mercury Storage SEIS, 1–1, 1–3, 1–5, 1–7, 1–11, 1–12, 2–1, 2–9, 2–15, 3–1, 4–1
miles, 1–9, 2–12, 2–17, 2–30, 3–1, 3–3, 3–4, 3–6, 3–11, 3–12, 3–25, 3–28, 3–29, 3–30, 3–31, 4–23, 4–40, 4–41, 4–42, 4–43, 4–44
  railcar, 2–7, 2–8, 2–19, 2–28, 2–29, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–34, 4–37, 4–38, 4–39
  truck, 1–6, 2–6, 2–7, 2–8, 2–15, 2–18, 2–19, 2–24, 2–25, 2–27, 2–28, 2–29, 3–27, 4–8, 4–9, 4–13, 4–22, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28,

4–29, 4–30, 4–34, 4–35, 4–36, 4–37, 4–38, 4–40, 4–41, 4–43, 4–45, 4–48
mining, 1–1, 1–4, 1–8, 1–9, 2–1, 2–2, 2–4, 2–7, 2–12, 2–17, 2–22, 3–3, 3–5, 3–11, 3–13, 3–14, 4–3, 4–5, 4–44
MM EIS, 2–3, 4–20
Modified Mercalli Intensity (MMI), 3–12, 4–4
mudstone, 3–9

N

National Ambient Air Quality Standards (NAAQS), 3–18, 3–19
National Environmental Policy Act (NEPA), 1–1, 1–3, 1–7, 1–9, 1–10, 1–11, 1–12, 2–1, 2–30, 4–2, 4–42, 4–46, 5–1, 5–2, 5–5
National Pollutant Discharge Elimination System, 4–6, 5–4
National Register of Historic Places, 2–25, 3–23, 4–12
natural gas, 1–4, 4–17, 4–47
New Mexico Department of Game and Fish, 2–24, 4–10, 5–6
nitrate, 1–4
nitrogen, 2–24, 3–18, 3–19, 4–8
  dioxide, 2–18, 2–24, 3–18, 3–19, 4–8
No Action Alternative, 2–10, 2–16, 2–17, 2–19, 2–21, 4–1, 4–41, 4–49, 4–50
noise, 1–8, 2–16, 2–23, 2–24, 3–1, 3–2, 3–17, 3–20, 4–1, 4–7, 4–9, 4–42, 4–48
  background level, 2–24, 3–19
nonhazardous waste, 3–26, 4–14, 4–15
normal operations, 2–18, 2–26, 3–20, 3–26, 4–2, 4–15, 4–16, 4–33, 4–46, 4–47, 4–48
Notice of Availability, 1–5, 1–7, 2–11
Notice of Intent (NOI), 1–7, 1–8, 2–12, 5–1

O

Office Administration Area, 2–3, 2–7, 2–8
Off-Limits Area, 2–12, 2–15, 3–3, 3–4, 3–24, 4–44
ozone, 3–18, 3–19, 3–20

P

paleontological resource, 2–25, 3–24, 4–11
pallet, 2–26, 2–29, 4–16, 4–19, 4–20, 4–22, 4–25, 4–34, 4–35, 4–36, 4–37
  fire, 1–3, 2–3, 2–6, 2–28, 2–29, 3–24, 4–16, 4–17, 4–19, 4–20, 4–22, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–31, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
  metal, 1–1, 2–6, 4–25
particulate matter (PM), 2–24, 3–18, 3–19, 4–7, 4–8
  $PM_{2.5}$, 3–18, 3–19, 3–20, 4–8
  PM_{10}, 3–18, 3–19, 3–20, 4–8
Pecos Valley, 3–6
permit, 1–12, 2–6, 2–7, 2–17, 3–18, 3–20, 3–25, 3–27, 4–6, 5–1, 5–3, 5–4, 5–5
plants, 1–1, 1–3, 1–4, 2–1, 2–2, 2–7, 2–19, 2–29, 3–1, 3–6, 3–21, 3–22, 3–23, 3–24, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
pollutant, 4–8
pollution prevention, 3–25, 5–2
population, 2–17, 2–19, 2–29, 2–30, 3–5, 3–20, 3–22, 3–26, 3–28, 3–29, 3–30, 3–31, 3–32, 4–29, 4–40
  low-income, 2–19, 2–30, 3–28, 3–29, 3–30, 3–31, 3–32, 4–40, 4–41
  minority, 2–19, 3–29, 3–30, 3–31, 3–32
  density, 3–5, 3–20, 4–29
  total, 3–29, 3–32
Preferred Alternative, 1–9, 2–15
pregnant women, 3–28
prehistoric resource, 3–22, 4–11
Prevention of Significant Deterioration (PSD), 3–20
propane, 4–17
Property Protection Area, 2–12, 3–3, 3–4, 3–5, 3–24, 4–10
proposed action, 1–1, 1–3, 1–5, 1–7, 1–11, 2–11, 2–16, 2–31, 3–1, 4–1, 4–42, 4–48, 5–1, 5–5
public hearings, 1–7
public scoping meetings, 1–7
purpose and need, 1–1, 1–2, 1–11, 2–1, 2–16

R

radioactive waste, 1–5, 1–10, 1–11, 2–9, 2–10, 2–11, 2–17, 2–19, 3–1, 4–43
Radioactive Waste Management Complex (RWMC), 1–5, 2–9, 2–10, 2–17, 2–18, 2–19
railroad, 3–24, 3–28
Receiving and Shipping Area, 2–3, 2–6
reclamation and recycling, 1–3, 1–4, 2–2, 2–4, 2–7
Record of Decision (ROD), 1–1, 1–5, 1–10, 2–3, 2–11, 2–15, 4–46
record-keeping, 2–6, 2–7, 2–8
recreation, 3–5
reference concentration, 4–16
region of influence (ROI), 1–8, 2–30, 2–31, 3–2, 3–28, 4–2, 4–39, 4–40, 4–42, 4–43, 4–44, 4–45
reptile, 3–21
residence, 3–20, 4–9
Resource Conservation and Recovery Act (RCRA), 1–3, 1–6, 1–9, 2–1, 2–3, 2–6, 2–8, 2–10, 2–17, 2–21, 2–22, 2–23, 3–25, 4–6, 4–7, 4–14, 4–46
risk assessment, 2–19
runoff, 3–7, 3–13, 4–5, 4–41

S

Salado Formation, 3–7, 3–8, 3–9, 3–11, 3–14, 3–15
sandstone, 3–9, 3–10, 3–14, 3–16
sanitary waste, 4–6, 4–14, 4–49, 4–50

Savannah River Site (SRS), 1–5, 1–11, 2–9, 2–11, 2–17, 2–18, 2–19, 4–23
scoping, 1–7, 1–8, 2–12
security, 1–3, 1–4, 1–9, 1–11, 2–3, 2–6, 2–7, 2–8, 2–11, 2–28, 2–31, 3–4, 3–5, 4–3, 4–29, 4–44
sediment control, 2–23, 4–4, 4–5
sediment-dwelling biota, 2–19, 2–29, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
seismic event, 2–23, 3–13, 4–16, 4–17
seismic risk, 2–17, 2–23
seismicity, 4–4
sensitive species, 5–5
severity level (SL), 1–5, 2–16, 2–18, 2–19, 2–26, 2–27, 2–28, 2–29, 4–1, 4–15, 4–16, 4–18, 4–21, 4–22, 4–24, 4–25, 4–26, 4–27, 4–28, 4–30, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
sewage, 3–14, 3–25, 4–6, 4–49
sewer, 4–49
shipment, 2–7, 2–8, 2–11, 4–29, 4–41, 4–43, 4–45
  rail, 1–6, 2–15, 2–18, 2–19, 2–24, 2–25, 2–27, 3–24, 3–28, 4–8, 4–9, 4–22, 4–23, 4–28, 4–29, 4–37, 4–43
  truck, 1–6, 2–6, 2–7, 2–8, 2–15, 2–18, 2–19, 2–24, 2–25, 2–27, 2–28, 2–29, 3–27, 4–8, 4–9, 4–13, 4–22, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–34, 4–35, 4–36, 4–37, 4–38, 4–40, 4–41, 4–43, 4–45, 4–48
  volume, 1–4, 1–11, 2–1, 2–6, 2–7, 2–8, 2–26, 3–14, 3–24, 3–28, 4–2, 4–6, 4–14, 4–40, 4–41
siltstone, 3–10, 3–16
snow, 3–17, 4–16, 4–20
socioeconomics, 1–5, 1–8, 2–16, 2–21, 2–29, 3–1, 3–2, 3–28, 4–1, 4–2, 4–39, 4–42, 4–43
soil, 1–1, 2–18, 2–19, 2–23, 2–28, 2–29, 3–6, 3–10, 3–11, 3–12, 4–4, 4–5, 4–6, 4–13, 4–31, 4–32, 4–33, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39, 4–41, 4–47, 4–48
  farmland, 3–5
  invertebrates, 2–19, 2–29, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
solid waste, 1–3, 2–1, 2–25, 3–25, 4–14, 4–50, 5–2, 5–5
Solid Waste Disposal Act (SWDA), 1–3, 2–1, 5–2, 5–3
special status species, 3–21
spill, 2–3, 2–6, 2–7, 2–8, 2–23, 2–26, 2–27, 2–28, 4–5, 4–6, 4–14, 4–16, 4–17, 4–19, 4–20, 4–22, 4–23, 4–24, 4–25, 4–28, 4–33, 4–34, 4–36, 4–38, 4–39, 4–43
  cleanup, 1–8, 4–24, 4–33, 4–41, 5–5
  containment, 2–3, 2–6, 2–23, 4–6, 4–41, 4–47
  prevention, control, and countermeasures (SPCC) plan, 4–6
  tray, 2–6, 4–16, 4–22
stacked
  double-stacked, 2–6
  single-stacked, 2–6
  triple-stacked, 2–6
State Historic Preservation Officer (SHPO), 4–11, 4–12
Storage Area, 2–3, 2–6, 2–7, 2–8, 2–11, 2–21, 2–23, 2–26, 4–47
stormwater, 2–23, 4–6, 5–4
  pollution prevention plan, 2–23
strontium, 3–13
sulfur dioxide, 2–24, 3–18, 3–19, 4–8
supplemental environmental impact statement (SEIS), 1–1, 1–2, 1–3, 1–5, 1–6, 1–7, 1–8, 1–9, 1–10, 1–11, 2–1, 2–9, 2–11, 2–12, 2–15, 2–16, 2–19, 2–21, 2–30, 3–1, 3–13, 3–20, 3–30, 4–1, 4–2, 4–15, 4–17, 4–21, 4–25, 4–26, 4–27, 4–29, 4–48, 4–49, 5–1, 5–2
surface water, 2–12, 3–2, 3–13, 4–2, 4–5, 4–6, 4–32, 4–41, 4–46

T

temperature, 1–1, 3–17, 4–25, 4–47
terrestrial, 2–24, 2–31, 3–21, 4–10, 4–46
  plants, 1–1, 1–3, 1–4, 2–1, 2–2, 2–7, 2–19, 2–29, 3–1, 3–6, 3–21, 3–22, 3–23, 3–24, 4–31, 4–32, 4–34, 4–35, 4–36, 4–37, 4–38, 4–39
threatened and/or endangered species, 1–8, 2–24, 3–21, 4–10, 4–46, 5–5
threshold limit value (TLV), 2–8, 4–15, 4–30
tornado, 3–17, 4–17, 4–18
toxic air pollutant, 2–18, 2–23, 4–7
Toxic Substances Control Act (TSCA), 3–27, 5–2
traffic, 2–24, 2–25, 2–29, 3–20, 3–24, 3–27, 3–28, 4–9, 4–12, 4–13, 4–40, 4–42, 4–48
transient, 4–40
transmission line, 3–24
transportation, 1–6, 1–8, 1–9, 1–10, 2–3, 2–7, 2–8, 2–18, 2–19, 2–21, 2–24, 2–25, 2–26, 2–27, 2–28, 2–29, 2–31, 3–2, 3–26, 3–27, 4–2, 4–8, 4–15, 4–20, 4–22, 4–23, 4–24, 4–25, 4–26, 4–7, 4–28, 4–29, 4–33, 4–40, 4–42, 4–43, 4–45, 4–48, 4–50
  air, 1–6, 1–8, 1–11, 2–7, 2–8, 2–18, 2–21, 2–23, 2–24, 2–30, 2–31, 3–1, 3–2, 3–17, 3–18, 3–20, 3–26, 4–1, 4–7, 4–8, 4–9, 4–15, 4–17, 4–18, 4–21, 4–25, 4–41, 4–43, 4–45, 4–46, 4–47, 4–48, 4–49, 5–2, 5–3, 5–4, 5–5
  ground, 3–24, 4–12, 4–13
  impact, 1–6, 2–19, 2–27, 2–28, 2–29, 4–40
  local, 3–28
  rail, 1–6, 2–15, 2–18, 2–19, 2–24, 2–25, 2–27, 3–24, 3–28, 4–8, 4–9, 4–22, 4–23, 4–28, 4–29, 4–37, 4–43
  route, 1–6, 1–9, 2–19, 3–27, 4–23, 4–24, 4–27, 4–29, 4–33
  truck, 1–6, 2–6, 2–7, 2–8, 2–15, 2–18, 2–19, 2–24, 2–25, 2–27, 2–28, 2–29, 3–27, 4–8, 4–9, 4–13,

4–22, 4–23, 4–24, 4–25, 4–26, 4–27, 4–28, 4–29, 4–30, 4–34, 4–35, 4–36, 4–37, 4–38, 4–40, 4–41, 4–43, 4–45, 4–48
transuranic (TRU) waste, 1–5, 1–8, 1–10, 1–11, 2–12, 3–2, 3–25, 3–26, 3–27, 4–2, 4–43, 4–45, 5–3, 5–4
treatment, storage, and disposal (TSD) facilities, 4–41, 4–46, 5–3

U

U.S. Bureau of Land Management (BLM), 1–1, 2–17, 2–22, 3–5, 3–6, 3–21, 3–22, 3–23, 3–24, 3–28, 4–3, 4–10, 4–12, 4–43, 5–2, 5–3
U.S. Department of Defense (DoD), 2–3, 2–10, 2–17
U.S. Department of Transportation (DOT), 2–4
U.S. Environmental Protection Agency (EPA), 1–1, 1–2, 1–3, 1–4, 1–5, 1–10, 2–1, 2–2, 2–15, 3–16, 3–18, 3–19, 3–20, 3–27, 4–2, 4–6, 4–8, 4–16, 4–28, 4–41, 4–49, 5–1, 5–2, 5–3
U.S. Fish and Wildlife Service (USFWS), 2–24, 3–22, 4–10, 5–6
U.S. Geological Survey (USGS), 1–2, 2–2, 3–12, 3–13, 4–17
uncertainty, 1–3, 1–4, 2–1, 2–6, 2–18, 2–19, 2–28, 4–2, 4–24, 4–25, 4–28, 4–33, 4–34, 4–36, 4–38, 4–39, 5–3
unemployment, 3–28
utility resource, 2–25, 4–49

V

vegetation, 3–7
  nonnative, 3–21
ventilation, 2–6, 4–13, 4–15
viewshed, 4–3
Visual Resource Management (VRM), 3–5, 3–6
visual resources, 1–8, 2–16, 2–18, 2–21, 2–22, 3–1, 3–2, 3–5, 4–1, 4–3, 4–42, 4–43
volatile organic compound (VOC), 2–24, 3–18, 3–20, 3–27, 4–8

W

waste acceptance criteria, 2–3, 2–8, 3–26
waste activities
  characterization, 2–11
  classification, 1–11
  generation, 2–2, 2–18, 2–26, 4–14, 4–15, 4–48, 4–49
  inventories, 1–2, 2–4, 2–7, 4–29
  remediation, 2–10
Waste Control Specialists, LLC (WCS), 1–5, 1–9, 2–9, 2–10, 2–11, 2–15, 2–17, 2–18, 2–19
Waste Isolation Pilot Plant (WIPP), 1–5, 1–6, 1–7, 1–8, 1–9, 1–10, 1–11, 2–9, 2–12, 2–13, 2–14, 2–15, 2–17, 2–18, 2–19, 2–21, 2–22, 2–23, 2–24, 2–25, 2–26, 2–27, 2–29, 2–30, 2–31, 3–1, 3–2, 3–3, 3–4, 3–5, 3–6, 3–7, 3–8, 3–9, 3–10, 3–11, 3–12, 3–13, 3–14, 3–15, 3–16, 3–17, 3–18, 3–19, 3–20, 3–21, 3–22, 3–23, 3–24, 3–25, 3–26, 3–27, 3–28, 3–29, 3–30, 3–31, 3–32, 3–33, 4–1, 4–2, 4–3, 4–4, 4–5, 4–6, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–16, 4–17, 4–18, 4–21, 4–22, 4–23, 4–24, 4–25, 4–27, 4–28, 4–29, 4–31, 4–39, 4–40, 4–41, 4–42, 4–43, 4–44, 4–45, 4–46, 5–1, 5–3, 5–4, 5–5, 5–6
Waste Isolation Pilot Plant Land Withdrawal Act (WIPP LWA), 2–12, 2–17, 2–22, 3–2, 4–2, 4–3, 5–1, 5–3
water, 1–1, 1–6, 1–8, 1–11, 2–6, 2–16, 2–17, 2–18, 2–19, 2–23, 2–25, 2–28, 3–1, 3–2, 3–7, 3–9, 3–12, 3–13, 3–14, 3–15, 3–16, 3–22, 3–24, 3–25, 3–26, 4–1, 4–4, 4–5, 4–6, 4–7, 4–12, 4–13, 4–14, 4–22, 4–24, 4–25, 4–28, 4–30, 4–32, 4–33, 4–41, 4–43, 4–45, 4–48, 4–49, 4–50, 5–2, 5–3, 5–4, 5–5
  potable, 3–14, 4–13, 4–45
  raw, 4–13
  resource, 1–8, 1–11, 2–16, 2–23, 3–1, 3–2, 3–13, 4–1, 4–5, 4–42, 4–43
  table, 3–13
  use, 3–25, 4–6, 4–13, 4–28, 4–45, 4–48
wetland, 4–33
windspeed, 4–21, 4–24, 4–25, 4–26, 4–27, 4–30, 4–31, 4–34, 4–36, 4–38, 4–39
WIPP Vicinity Section 10, 1–8, 2–9, 2–12, 2–15, 2–19, 2–22, 2–23, 2–25, 2–27, 2–30, 2–31, 3–11, 3–22, 3–30, 4–3, 4–4, 4–5, 4–7, 4–8, 4–9, 4–10, 4–11, 4–12, 4–13, 4–14, 4–15, 4–21, 4–29, 4–31, 4–39, 4–40, 4–43, 5–1
WIPP Vicinity Section 20, 2–9, 2–12, 2–15, 2–22, 2–25, 2–30, 3–22, 3–31, 4–3, 4–5, 4–6, 4–9, 4–10, 4–11, 4–13, 4–14, 4–31, 4–39, 4–40, 5–1
WIPP Vicinity Section 35, 1–8, 2–9, 2–12, 2–15, 2–22, 2–23, 2–25, 2–30, 2–31, 3–5, 3–7, 3–11, 3–22, 3–32, 4–3, 4–5, 4–7, 4–9, 4–10, 4–12, 4–13, 4–15, 4–31, 4–39, 4–40, 4–41, 4–43, 5–1
wood, 4–25, 4–50
worker, 2–7, 3–26, 3–27, 4–3, 4–15
  involved, 2–18, 2–26, 2–27, 4–15, 4–18, 4–22
  noninvolved, 2–18, 2–26, 2–27, 4–8, 4–16, 4–21, 4–22, 4–31

Y

Y–12 National Security Complex (Y–12), 1–3, 1–4, 1–6, 1–11, 2–1, 2–4, 2–7, 2–10, 2–22, 4–17, 4–43, 4–49, 4–50

APPENDIX A
THE MERCURY EXPORT BAN ACT OF 2008 AND *FEDERAL REGISTER* NOTICES

APPENDIX A
THE MERCURY EXPORT BAN ACT OF 2008 AND *FEDERAL REGISTER* NOTICES

This appendix provides a copy of the Mercury Export Ban Act of 2008 and *Federal Register* notices associated with the *Draft and Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*. *Federal Register* notices and other public notices associated with the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* are provided in Appendix A of the January 2011 *Mercury Storage EIS* and have not been reproduced here.

A.1 PUBLIC LAW 110-414: MERCURY EXPORT BAN ACT—OCTOBER 14, 2008

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

Public Law 110–414
110th Congress

An Act

To prohibit the sale, distribution, transfer, and export of elemental mercury, and for other purposes.

Oct. 14, 2008
[S. 906]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Mercury Export Ban Act of 2008. 15 USC 2601 note.

SECTION 1. SHORT TITLE.

This Act may be cited as the "Mercury Export Ban Act of 2008".

SEC. 2. FINDINGS.

15 USC 2611 note.

Congress finds that—

(1) mercury is highly toxic to humans, ecosystems, and wildlife;

(2) as many as 10 percent of women in the United States of childbearing age have mercury in the blood at a level that could put a baby at risk;

(3) as many as 630,000 children born annually in the United States are at risk of neurological problems related to mercury;

(4) the most significant source of mercury exposure to people in the United States is ingestion of mercury-contaminated fish;

(5) the Environmental Protection Agency reports that, as of 2004—

(A) 44 States have fish advisories covering over 13,000,000 lake acres and over 750,000 river miles;

(B) in 21 States the freshwater advisories are statewide; and

(C) in 12 States the coastal advisories are statewide;

(6) the long-term solution to mercury pollution is to minimize global mercury use and releases to eventually achieve reduced contamination levels in the environment, rather than reducing fish consumption since uncontaminated fish represents a critical and healthy source of nutrition worldwide;

(7) mercury pollution is a transboundary pollutant, depositing locally, regionally, and globally, and affecting water bodies near industrial sources (including the Great Lakes) and remote areas (including the Arctic Circle);

(8) the free trade of elemental mercury on the world market, at relatively low prices and in ready supply, encourages the continued use of elemental mercury outside of the United States, often involving highly dispersive activities such as artisinal gold mining;

(9) the intentional use of mercury is declining in the United States as a consequence of process changes to manufactured products (including batteries, paints, switches, and measuring devices), but those uses remain substantial in the developing world where releases from the products are extremely likely due to the limited pollution control and waste management infrastructures in those countries;

(10) the member countries of the European Union collectively are the largest source of elemental mercury exports globally;

(11) the European Commission has proposed to the European Parliament and to the Council of the European Union a regulation to ban exports of elemental mercury from the European Union by 2011;

(12) the United States is a net exporter of elemental mercury and, according to the United States Geological Survey, exported 506 metric tons of elemental mercury more than the United States imported during the period of 2000 through 2004; and

(13) banning exports of elemental mercury from the United States will have a notable effect on the market availability of elemental mercury and switching to affordable mercury alternatives in the developing world.

SEC. 3. PROHIBITION ON SALE, DISTRIBUTION, OR TRANSFER OF ELEMENTAL MERCURY.

Section 6 of the Toxic Substances Control Act (15 U.S.C. 2605) is amended by adding at the end the following:

"(f) MERCURY.—

"(1) PROHIBITION ON SALE, DISTRIBUTION, OR TRANSFER OF ELEMENTAL MERCURY BY FEDERAL AGENCIES.—Except as provided in paragraph (2), effective beginning on the date of enactment of this subsection, no Federal agency shall convey, sell, or distribute to any other Federal agency, any State or local government agency, or any private individual or entity any elemental mercury under the control or jurisdiction of the Federal agency.

Effective date.

"(2) EXCEPTIONS.—Paragraph (1) shall not apply to—

"(A) a transfer between Federal agencies of elemental mercury for the sole purpose of facilitating storage of mercury to carry out this Act; or

"(B) a conveyance, sale, distribution, or transfer of coal.

"(3) LEASES OF FEDERAL COAL.—Nothing in this subsection prohibits the leasing of coal.".

SEC. 4. PROHIBITION ON EXPORT OF ELEMENTAL MERCURY.

Section 12 of the Toxic Substances Control Act (15 U.S.C. 2611) is amended—

(1) in subsection (a) by striking "subsection (b)" and inserting "subsections (b) and (c)"; and

(2) by adding at the end the following:

"(c) PROHIBITION ON EXPORT OF ELEMENTAL MERCURY.—

"(1) PROHIBITION.—Effective January 1, 2013, the export of elemental mercury from the United States is prohibited.

Effective date.

"(2) INAPPLICABILITY OF SUBSECTION (a).—Subsection (a) shall not apply to this subsection.

"(3) REPORT TO CONGRESS ON MERCURY COMPOUNDS.—

"(A) REPORT.—Not later than one year after the date of enactment of the Mercury Export Ban Act of 2008, the Administrator shall publish and submit to Congress a report on mercuric chloride, mercurous chloride or calomel, mercuric oxide, and other mercury compounds, if any, that may currently be used in significant quantities in products or processes. Such report shall include an analysis of— Publication.

"(i) the sources and amounts of each of the mercury compounds imported into the United States or manufactured in the United States annually;

"(ii) the purposes for which each of these compounds are used domestically, the amount of these compounds currently consumed annually for each purpose, and the estimated amounts to be consumed for each purpose in 2010 and beyond;

"(iii) the sources and amounts of each mercury compound exported from the United States annually in each of the last three years;

"(iv) the potential for these compounds to be processed into elemental mercury after export from the United States; and

"(v) other relevant information that Congress should consider in determining whether to extend the export prohibition to include one or more of these mercury compounds.

"(B) PROCEDURE.—For the purpose of preparing the report under this paragraph, the Administrator may utilize the information gathering authorities of this title, including sections 10 and 11.

"(4) ESSENTIAL USE EXEMPTION.—(A) Any person residing in the United States may petition the Administrator for an exemption from the prohibition in paragraph (1), and the Administrator may grant by rule, after notice and opportunity for comment, an exemption for a specified use at an identified foreign facility if the Administrator finds that—

"(i) nonmercury alternatives for the specified use are not available in the country where the facility is located;

"(ii) there is no other source of elemental mercury available from domestic supplies (not including new mercury mines) in the country where the elemental mercury will be used;

"(iii) the country where the elemental mercury will be used certifies its support for the exemption;

"(iv) the export will be conducted in such a manner as to ensure the elemental mercury will be used at the identified facility as described in the petition, and not otherwise diverted for other uses for any reason;

"(v) the elemental mercury will be used in a manner that will protect human health and the environment, taking into account local, regional, and global human health and environmental impacts;

"(vi) the elemental mercury will be handled and managed in a manner that will protect human health and the environment, taking into account local, regional, and global human health and environmental impacts; and "(vii) the export of elemental mercury for the specified use is consistent with international obligations of the United States intended to reduce global mercury supply, use, and pollution.

"(B) Each exemption issued by the Administrator pursuant to this paragraph shall contain such terms and conditions as are necessary to minimize the export of elemental mercury and ensure that the conditions for granting the exemption will be fully met, and shall contain such other terms and conditions as the Administrator may prescribe. No exemption granted pursuant to this paragraph shall exceed three years in duration and no such exemption shall exceed 10 metric tons of elemental mercury.

"(C) The Administrator may by order suspend or cancel an exemption under this paragraph in the case of a violation described in subparagraph (D).

"(D) A violation of this subsection or the terms and conditions of an exemption, or the submission of false information in connection therewith, shall be considered a prohibited act under section 15, and shall be subject to penalties under section 16, injunctive relief under section 17, and citizen suits under section 20.

"(5) CONSISTENCY WITH TRADE OBLIGATIONS.—Nothing in this subsection affects, replaces, or amends prior law relating to the need for consistency with international trade obligations.

"(6) EXPORT OF COAL.—Nothing in this subsection shall be construed to prohibit the export of coal.".

Deadline.
42 USC 6939f.

SEC. 5. LONG-TERM STORAGE.

(a) DESIGNATION OF FACILITY.—

(1) IN GENERAL.—Not later than January 1, 2010, the Secretary of Energy (referred to in this section as the "Secretary") shall designate a facility or facilities of the Department of Energy, which shall not include the Y–12 National Security Complex or any other portion or facility of the Oak Ridge Reservation of the Department of Energy, for the purpose of long-term management and storage of elemental mercury generated within the United States.

(2) OPERATION OF FACILITY.—Not later than January 1, 2013, the facility designated in paragraph (1) shall be operational and shall accept custody, for the purpose of long-term management and storage, of elemental mercury generated within the United States and delivered to such facility.

(b) FEES.—

(1) IN GENERAL.—After consultation with persons who are likely to deliver elemental mercury to a designated facility for long-term management and storage under the program prescribed in subsection (a), and with other interested persons, the Secretary shall assess and collect a fee at the time of delivery for providing such management and storage, based on the pro rata cost of long-term management and storage of elemental mercury delivered to the facility. The amount of such fees—

Public information.

(A) shall be made publically available not later than October 1, 2012;

(B) may be adjusted annually; and

(C) shall be set in an amount sufficient to cover the costs described in paragraph (2).

(2) COSTS.—The costs referred to in paragraph (1)(C) are the costs to the Department of Energy of providing such management and storage, including facility operation and maintenance, security, monitoring, reporting, personnel, administration, inspections, training, fire suppression, closure, and other costs required for compliance with applicable law. Such costs shall not include costs associated with land acquisition or permitting of a designated facility under the Solid Waste Disposal Act or other applicable law. Building design and building construction costs shall only be included to the extent that the Secretary finds that the management and storage of elemental mercury accepted under the program under this section cannot be accomplished without construction of a new building or buildings.

(c) REPORT.—Not later than 60 days after the end of each Federal fiscal year, the Secretary shall transmit to the Committee on Energy and Commerce of the House of Representatives and the Committee on Environment and Public Works of the Senate a report on all of the costs incurred in the previous fiscal year associated with the long-term management and storage of elemental mercury. Such report shall set forth separately the costs associated with activities taken under this section.

(d) MANAGEMENT STANDARDS FOR A FACILITY.—

(1) GUIDANCE.—Not later than October 1, 2009, the Secretary, after consultation with the Administrator of the Environmental Protection Agency and all appropriate State agencies in affected States, shall make available, including to potential users of the long-term management and storage program established under subsection (a), guidance that establishes procedures and standards for the receipt, management, and long-term storage of elemental mercury at a designated facility or facilities, including requirements to ensure appropriate use of flasks or other suitable shipping containers. Such procedures and standards shall be protective of human health and the environment and shall ensure that the elemental mercury is stored in a safe, secure, and effective manner. In addition to such procedures and standards, elemental mercury managed and stored under this section at a designated facility shall be subject to the requirements of the Solid Waste Disposal Act, including the requirements of subtitle C of that Act, except as provided in subsection (g)(2) of this section. A designated facility in existence on or before January 1, 2013, is authorized to operate under interim status pursuant to section 3005(e) of the Solid Waste Disposal Act until a final decision on a permit application is made pursuant to section 3005(c) of the Solid Waste Disposal Act. Not later than January 1, 2015, the Administrator of the Environmental Protection Agency (or an authorized State) shall issue a final decision on the permit application.

Procedures.
Standards.

Deadline.

(2) TRAINING.—The Secretary shall conduct operational training and emergency training for all staff that have responsibilities related to elemental mercury management, transfer, storage, monitoring, or response.

(3) EQUIPMENT.—The Secretary shall ensure that each designated facility has all equipment necessary for routine operations, emergencies, monitoring, checking inventory, loading, and storing elemental mercury at the facility.

(4) FIRE DETECTION AND SUPPRESSION SYSTEMS.—The Secretary shall—

(A) ensure the installation of fire detection systems at each designated facility, including smoke detectors and heat detectors; and

(B) ensure the installation of a permanent fire suppression system, unless the Secretary determines that a permanent fire suppression system is not necessary to protect human health and the environment.

(e) INDEMNIFICATION OF PERSONS DELIVERING ELEMENTAL MERCURY.—

(1) IN GENERAL.—(A) Except as provided in subparagraph (B) and subject to paragraph (2), the Secretary shall hold harmless, defend, and indemnify in full any person who delivers elemental mercury to a designated facility under the program established under subsection (a) from and against any suit, claim, demand or action, liability, judgment, cost, or other fee arising out of any claim for personal injury or property damage (including death, illness, or loss of or damage to property or economic loss) that results from, or is in any manner predicated upon, the release or threatened release of elemental mercury as a result of acts or omissions occurring after such mercury is delivered to a designated facility described in subsection (a).

(B) To the extent that a person described in subparagraph (A) contributed to any such release or threatened release, subparagraph (A) shall not apply.

Records.

(2) CONDITIONS.—No indemnification may be afforded under this subsection unless the person seeking indemnification—

Notification.
Deadline.

(A) notifies the Secretary in writing within 30 days after receiving written notice of the claim for which indemnification is sought;

(B) furnishes to the Secretary copies of pertinent papers the person receives;

(C) furnishes evidence or proof of any claim, loss, or damage covered by this subsection; and

(D) provides, upon request by the Secretary, access to the records and personnel of the person for purposes of defending or settling the claim or action.

(3) AUTHORITY OF SECRETARY.—(A) In any case in which the Secretary determines that the Department of Energy may be required to make indemnification payments to a person under this subsection for any suit, claim, demand or action, liability, judgment, cost, or other fee arising out of any claim for personal injury or property damage referred to in paragraph (1)(A), the Secretary may settle or defend, on behalf of that person, the claim for personal injury or property damage.

(B) In any case described in subparagraph (A), if the person to whom the Department of Energy may be required to make indemnification payments does not allow the Secretary to settle or defend the claim, the person may not be afforded indemnification with respect to that claim under this subsection.

(f) TERMS, CONDITIONS, AND PROCEDURES.—The Secretary is authorized to establish such terms, conditions, and procedures as are necessary to carry out this section.

(g) EFFECT ON OTHER LAW.—

(1) IN GENERAL.—Except as provided in paragraph (2), nothing in this section changes or affects any Federal, State, or local law or the obligation of any person to comply with such law.

(2) EXCEPTION.—(A) Elemental mercury that the Secretary is storing on a long-term basis shall not be subject to the storage prohibition of section 3004(j) of the Solid Waste Disposal Act (42 U.S.C. 6924(j)). For the purposes of section 3004(j) of the Solid Waste Disposal Act, a generator accumulating elemental mercury destined for a facility designated by the Secretary under subsection (a) for 90 days or less shall be deemed to be accumulating the mercury to facilitate proper treatment, recovery, or disposal.

(B) Elemental mercury may be stored at a facility with respect to which any permit has been issued under section 3005(c) of the Solid Waste Disposal Act (42 U.S.C. 6925(c)), and shall not be subject to the storage prohibition of section 3004(j) of the Solid Waste Disposal Act (42 U.S.C. 6924(j)) if— Certification.

(i) the Secretary is unable to accept the mercury at a facility designated by the Secretary under subsection (a) for reasons beyond the control of the owner or operator of the permitted facility;

(ii) the owner or operator of the permitted facility certifies in writing to the Secretary that it will ship the mercury to the designated facility when the Secretary is able to accept the mercury; and

(iii) the owner or operator of the permitted facility certifies in writing to the Secretary that it will not sell, or otherwise place into commerce, the mercury.

This subparagraph shall not apply to mercury with respect to which the owner or operator of the permitted facility fails to comply with a certification provided under clause (ii) or (iii).

(h) STUDY.—Not later than July 1, 2014, the Secretary shall transmit to the Congress the results of a study, conducted in consultation with the Administrator of the Environmental Protection Agency, that— Deadline.

(1) determines the impact of the long-term storage program under this section on mercury recycling; and

(2) includes proposals, if necessary, to mitigate any negative impact identified under paragraph (1).

SEC. 6. REPORT TO CONGRESS.

At least 3 years after the effective date of the prohibition on export of elemental mercury under section 12(c) of the Toxic Substances Control Act (15 U.S.C. 2611(c)), as added by section 4 of this Act, but not later than January 1, 2017, the Administrator of the Environmental Protection Agency shall transmit to the Committee on Energy and Commerce of the House of Representatives and the Committee on Environment and Public Works of the Senate a report on the global supply and trade of elemental mercury, including but not limited to the amount of elemental mercury traded globally that originates from primary mining, where such primary mining is conducted, and whether additional primary mining has occurred as a consequence of this Act.

Approved October 14, 2008.

LEGISLATIVE HISTORY—S. 906:

SENATE REPORTS: No. 110–477 (Comm. on Environment and Public Works).
CONGRESSIONAL RECORD, Vol. 154 (2008):
Sept. 26, considered and passed Senate.
Sept. 27, 29, considered and passed House.

A.2 NOTICE OF INTENT TO PREPARE A SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY (77 FR 33204, JUNE 5, 2012)

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

33204 Federal Register / Vol. 77, No. 108 / Tuesday, June 5, 2012 / Notices

20202. Email: *equitycommission@ed.gov.* Telephone: (202) 453–6567.

John DiPaolo,

Chief of Staff, Assistant Secretary for Civil Rights, Office for Civil Rights.

[FR Doc. 2012–13499 Filed 6–4–12; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF ENERGY

Notice of Intent To Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury

AGENCY: Department of Energy.

ACTION: Notice of intent.

SUMMARY: As required by the Mercury Export Ban Act of 2008 (the Act), the Department of Energy (DOE) plans to identify a facility or facilities for the long-term management and storage of elemental mercury generated in the United States. To this end, DOE intends to prepare a supplement to the January 2011 *Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* to analyze additional alternatives, in accordance with the National Environmental Policy Act (NEPA). This supplemental EIS (SEIS) will evaluate alternatives for a facility at and in the vicinity of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

DATES: DOE invites public comment on the scope of this SEIS until July 5, 2012. The first scoping meeting will be held on June 26, 2012, from 5:30 p.m.–8 p.m., at the Skeen-Whitlock Building auditorium at the U.S. DOE, Carlsbad Field Office, 4021 National Parks Highway, Carlsbad, New Mexico 88220. An open house will be held on the same day at the same location from 4:30 p.m.–5:30 p.m. A second scoping meeting will be held on June 28, 2012, from 6 p.m.–8:30 p.m. at the Crowne Plaza Albuquerque, 1901 University Blvd. NE., Albuquerque, New Mexico 87102. An open house will be held on the same day at the same location from 4:30 p.m.–6 p.m.

ADDRESSES: Written comments on the scope of the SEIS should be sent to: Mr. David Levenstein, Document Manager, Office of Environmental Compliance (EM–11), U.S. Department of Energy, Post Office Box 2612, Germantown, Maryland 20874; to the Mercury Storage EIS Web site at *http://mercurystorageeis.com/;* or via email to *David.Levenstein@em.doe.gov.*

This Notice will be available on the Internet at *http://www.energy.gov/NEPA/* and on the project Web site at *http://mercurystorageeis.com/.*

FOR FURTHER INFORMATION CONTACT: To request further information about the SEIS or the Mercury Storage EIS, or to be placed on the SEIS distribution list, use any of the methods (mail, Web site, or email) listed under **ADDRESSES** above. In requesting a copy of the Draft SEIS, please specify a request for a paper copy of the Summary only; a paper copy of the full SEIS; the full SEIS on a computer CD; or any combination thereof.

For general information concerning DOE's NEPA process, please contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC–54), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585, either by telephone at (202) 586–4600, by fax at (202) 586–7031, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Background

The Mercury Export Ban Act of 2008 (Pub. L. 110–414) amends the Toxic Substances Control Act (TSCA) (15 U.S.C. 2605(f)) to prohibit the sale, distribution, or transfer by Federal agencies to any other Federal agency, any state or local government agency, or any private individual or entity, of any elemental mercury under the control or jurisdiction of a Federal agency (with certain limited exceptions). It also amends TSCA (15 U.S.C. 2611(c)) to prohibit the export of elemental mercury from the U.S. effective January 1, 2013 (subject to certain essential use exemptions). Section 5 of the Act, *Long-Term Storage,* directs DOE to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the U.S. Pursuant to this law, this facility is required to be operational and ready to accept custody of any elemental mercury generated within the U.S. by January 1, 2013. The Act also requires DOE to assess fees based upon the *pro rata* costs of long-term management and storage of elemental mercury delivered to the facility or facilities.

The sources of elemental mercury in the U.S. include mercury used in the chlorine and caustic soda manufacturing process (i.e., chlor-alkali industry), reclaimed from recycling and waste recovery activities, and generated as a byproduct of the gold mining process. In addition, DOE's National Nuclear Security Administration stores approximately 1,200 metric tons of elemental mercury at the Oak Ridge Reservation in Tennessee.

To evaluate the range of reasonable alternatives for siting, constructing and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS (DOE/EIS–0423) in accordance with NEPA and its implementing regulations (40 CFR parts 1500–1508 and 10 CFR part 1021) and issued the Mercury Storage Final EIS in January 2011 (76 FR 5156). DOE estimated that up to approximately 10,000 metric tons of elemental mercury would need to be managed and stored at the DOE facility during the 40-year period of analysis. These estimates do not include approximately 4,400 metric tons of elemental mercury that the Department of Defense (DOD) stores at its facility in Hawthorne, Nevada.

Purpose and Need for Action

As indicated in the Mercury Storage EIS, DOE needs to designate a facility for the long-term management and storage of elemental mercury generated within the U.S., as required by the Act.

Proposed Action

As also indicated in the Mercury Storage EIS, DOE proposes to construct one or more new facilities and/or select one or more existing facilities (including modification as needed) for the long-term management and storage of elemental mercury in accordance with the Act. Facilities to be constructed as well as existing or modified facilities must comply with applicable requirements of section 5(d) of the Act, *Management Standards for a Facility,* including the requirements of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*), and other permitting requirements.

Proposed Alternatives

The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Those candidate locations are: DOE Grand Junction Disposal site near Grand Junction, Colorado; DOE Hanford site near Richland, Washington; Hawthorne Army Depot near Hawthorne, Nevada; DOE Idaho National Laboratory near Idaho Falls, Idaho; DOE Kansas City Plant in Kansas City, Missouri; DOE Savannah River Site near Aiken, South Carolina; and Waste Control Specialists, LLC, site near Andrews, Texas.

Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Pub. L. 102–579) as amended (Act), across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3½ miles north of the WIPP facility. Through development of the SEIS, DOE will evaluate the cumulative impacts of constructing and operating a facility for long-term management and storage of elemental mercury with the ongoing and planned operations of WIPP for disposal of defense transuranic waste, as well as the potential disposal of greater-than-Class C waste (*Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-level Radioactive Waste and GTCC–Like Waste* (GTCC EIS, DOE/EIS–0375, February 2011). The locations to be evaluated in the SEIS would be suitable for an above-ground storage facility.

Identification of Environmental Issues

DOE proposes to analyze the potential environmental impacts of the two additional alternatives for management and storage of elemental mercury as they apply to the following:

- Land use and visual resources.
- Geology, soils, and geologic hazards, including seismicity.
- Water resources (surface water and groundwater).
- Meteorology, air quality and noise.
- Ecological resources (terrestrial resources, wetlands and aquatic resources, and species that are Federal- or state-listed as threatened, endangered, or of special concern).
- Cultural and paleontological resources such as prehistoric, historic, or Native American sites.
- Site infrastructure.
- Waste management.
- Occupational and public health and safety, including from construction, operations, facility accidents, transportation, and intentional destructive acts.
- Ecological risk.
- Socioeconomic impacts on potentially affected communities.
- Environmental Justice (i.e., whether long-term mercury management and storage activities have a disproportionately high and adverse effect on minority and low-income populations).
- Facility closure.
- Cumulative impacts, including global commons cumulative impacts, i.e., ozone depletion and climate change.
- Potential mitigation measures.
- Unavoidable adverse environmental impacts.
- Irreversible and irretrievable commitments of resources.
- Relationship between short-term uses of the environment and maintenance and enhancement of long-term productivity.

Public Participation in the SEIS Process

NEPA implementing regulations require an early and open process for determining the scope of an EIS (or SEIS) and for identifying the significant issues related to the proposed action. To ensure that the full range of issues related to the proposed action are addressed, DOE invites Federal agencies, state, local, and tribal governments, and the general public to comment on the scope of the SEIS, including identification of reasonable alternatives and specific issues to be addressed. DOE will hold a public scoping meeting in Carlsbad, New Mexico, on June 26, 2012, and in Albuquerque, New Mexico, on June 28, 2012, as previously described (see **DATES**).

Issued in Washington, DC, on May 24, 2012.

Mark A. Gilbertson,

Deputy Assistant Secretary for Site Restoration.

[FR Doc. 2012–13614 Filed 6–4–12; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings

May 30, 2012.

Take notice that the Commission has received the following Natural Gas Pipeline Rate and Refund Report filings:

Filings Instituting Proceedings

Docket Numbers: RP12–754–000.
Applicants: Arkansas Electric Cooperative Corp., Hot Spring Power Company, LLC.
Description: Petition for Waiver of Gas Regulations of Arkansas Electric Cooperative Corporation and Hot Spring Power Company, LLC in RP12–754.
Filed Date: 5/25/12.
Accession Number: 20120525–5153.
Comments Due: 5 p.m. ET 6/6/12.

Docket Numbers: RP12–755–000.
Applicants: MarkWest Pioneer, LLC.
Description: MarkWest Pioneer—Quarterly FRP Filing to be effective 7/1/2012.
Filed Date: 5/29/12.
Accession Number: 20120529–5201.
Comments Due: 5 p.m. ET 6/11/12.

Any person desiring to intervene or protest in any of the above proceedings must file in accordance with Rules 211 and 214 of the Commission's Regulations (18 CFR 385.211 and 385.214) on or before 5:00 p.m. Eastern time on the specified comment date. Protests may be considered, but intervention is necessary to become a party to the proceeding.

Filings in Existing Proceedings

Docket Numbers: CP10–16–001.
Applicants: Cadeville Gas Storage LLC.
Description: Abbreviated amendment of Cadeville Gas Storage LLC under CP10–16.
Filed Date: 5/15/12.
Accession Number: 20120515–5240.
Comments Due: 5 p.m. ET 6/4/12.

Any person desiring to protest in any the above proceedings must file in accordance with Rule 211 of the Commission's Regulations (18 CFR 385.211) on or before 5:00 p.m. Eastern time on the specified comment date.

The filings are accessible in the Commission's eLibrary system by clicking on the links or querying the docket number.

eFiling is encouraged. More detailed information relating to filing requirements, interventions, protests, and service can be found at: *http://www.ferc.gov/docs-filing/efiling/filing-req.pdf.* For other information, call (866) 208–3676 (toll free). For TTY, call (202) 502–8659.

Nathaniel J. Davis, Sr.,

Deputy Secretary.

[FR Doc. 2012–13552 Filed 6–4–12; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings

Take notice that the Commission has received the following Natural Gas Pipeline Rate and Refund Report filings:

Filings Instituting Proceedings

Docket Numbers: RP12–748–000.
Applicants: Algonquin Gas Transmission, LLC.
Description: AGT Negotiated Rate—Taunton 66667 to be effective 6/1/2012.
Filed Date: 5/24/12.

A.3 NOTICE OF AVAILABILITY FOR THE DRAFT SEIS FOR THE LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY

AUTHENTICATED U.S. GOVERNMENT INFORMATION GPO

23548 **Federal Register** / Vol. 78, No. 76 / Friday, April 19, 2013 / Notices

findings and draft recommendations from the Task Group "Applying Best Business Practices for Corporate Performance Management to DoD."

Meeting Agenda:

12:30 p.m.–1:45 p.m. Task Group Outbrief and Board Deliberations, "Applying Best Business Practices for Corporate Performance Management to DoD"

Public's Accessibility to the Meeting: Pursuant to 5 U.S.C. 552b and 41 CFR 102–3.140 through 102–3.165, and the availability of space, this meeting is open to the public. Seating is limited and is on a first-come basis. All members of the public who wish to attend the public meeting must contact Ms. Debora Duffy at the number listed in **FOR FURTHER INFORMATION CONTACT** no later than 12:00 p.m. on Monday, April 22, 2013 to register and make arrangements for a Pentagon escort, if necessary. Public attendees requiring escort should arrive at the Pentagon Metro Entrance with sufficient time to complete security screening no later than 12:10 p.m. on April 25. To complete security screening, please come prepared to present two forms of identification and one must be a pictured identification card.

Dated: April 16, 2013.

Aaron Siegel,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 2013–09208 Filed 4–18–13; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Department of the Navy

Extension of Public Comment Period for the Draft Environmental Impact Statement for U.S. Navy F–35C West Coast Homebasing

AGENCY: Department of the Navy, DoD.

ACTION: Notice.

SUMMARY: A Notice of Availability for the Department of the Navy's (DoN) Draft Environmental Impact Statement (EIS) for the U.S. Navy F–35C West Coast Homebasing was published in the **Federal Register** by the U.S. Environmental Protection Agency on February 15, 2013 (78 FR 11171). The public review period ends on April 22, 2013. This notice announces an extension of the public comment period until May 7, 2013.

FOR FURTHER INFORMATION CONTACT: Naval Facilities Engineering Command Southwest, Attn: Code EV21.AK (F–35C EIS Project Manager), 1220 Pacific Highway, Building 1, 5th Floor, San Diego, CA 92132.

SUPPLEMENTARY INFORMATION: This notice announces an extension of the public comment period until May 7, 2013. Comments may be submitted in writing to Naval Facilities Engineering Command Southwest, Attn: Code EV21.AK (F–35C EIS Project Manager), 1220 Pacific Highway, Building 1, 5th Floor, San Diego, CA 92132 or electronically via the project Web site (*www.navyf35cwestcoasteis.com*). All written comments must be postmarked or received (online) by May 7, 2013, to ensure they become part of the official record. All comments will be addressed in the Final EIS.

A copy of the Draft EIS (with the Draft Clean Air Act Conformity Determination) is available for electronic viewing or download at *www.navyf35cwestcoasteis.com.* In addition, paper copies of the Draft EIS are available for public review at the following libraries:

1. City of El Centro Public Library, 1140 North Imperial Avenue, El Centro, California 92243.
2. City of Imperial Public Library, 200 West 9th Street, Imperial, California 92251.
3. Imperial County Free Library, Holtville Branch, 101 East 6th Street, Holtville, California 92250.
4. Imperial County Free Library, Heber Branch, 1078 Dogwood Road, Heber, California 92257.
5. Imperial County Free Library, Seeley Library Services provided at the Seeley Community Church, 1774 West Rio Vista Street, Seeley, California 92243.
6. Kings County Library, Lemoore Branch, 457 C Street, Lemoore, California 93245.
7. Kings County Library, Hanford Branch, 401 North Douty Street, Hanford, California 93230.
8. Fresno County Public Library, Central Library, 2420 Mariposa Street, Fresno, California 93721.
9. Fresno County Public Library, Riverdale Branch Library, 20975 Malsbary Avenue, Riverdale, California 93656.
10. West Hills College Lemoore Library, 555 College Avenue, Lemoore, California 93245.

Dated: April 8, 2013.

C.K. Chiappetta,

Lieutenant Commander, Office of the Judge Advocate General, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2013–09207 Filed 4–18–13; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF ENERGY

Draft Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury

AGENCY: Department of Energy (DOE).

ACTION: Notice of Availability.

SUMMARY: The Department of Energy (DOE) announces the availability of the *Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* (Mercury Storage SEIS, DOE/EIS–0423–S1) for public comment. As required by the Mercury Export Ban Act of 2008 (hereafter referred to as "the Act"), DOE plans to identify a facility or facilities for the long-term management and storage of elemental mercury generated in the United States (U.S.) To this end, DOE issued the *Final Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* (Mercury Storage EIS, DOE/EIS–0423, January 2011) to analyze reasonable alternatives, in accordance with the National Environmental Policy Act (NEPA), for locating and developing such a facility. Subsequently, DOE identified three additional, reasonable alternative locations in the vicinity of its Waste Isolation Pilot Plant (WIPP) in Carlsbad, NM. On June 5, 2012, DOE announced its intent to prepare a supplement to the Mercury Storage EIS and held a 30-day public scoping period. This Draft Mercury Storage Supplemental EIS (Draft Mercury Storage SEIS or Draft SEIS) considered all comments received during the public scoping period.

DATES: DOE invites public comment on this Draft Mercury Storage SEIS during a 45-day public coment period commencing with the date of publication of this Notice in the **Federal Register**, and ending on June 3, 2013. In preparing the Mercury Storage SEIS, DOE will consider all comments received or postmarked by that date. Comments received after that date will be considered to the extent practicable.

ADDRESSES: DOE will hold two public hearings during the public comment period. The dates, times and locations of the public hearings are as follows.

May 7, 2013
Open house 5:00 p.m.—6:00 p.m.
Public hearing 6:00 p.m.—9:00 p.m.
Skeen-Whitlock Building Auditorium
DOE, Carlsbad Field Office
4021 National Parks Highway
Carlsbad, New Mexico 88220
May 9, 2013
Open house 5:00 p.m.—6:00 p.m.
Public hearing 6:00 p.m.—9:00 p.m.

Crowne Plaza Albuquerque Hotel
1901 University Blvd. NE
Albuquerque, New Mexico 87102.

Written comments not submitted during the public hearings may be mailed to:

Mr. David Levenstein, Document Manager, Office of Environmental Compliance (EM–11), U.S. Department of Energy, Post Office Box 2612, Germantown, Maryland 20874

Written comments may also be submitted via the Draft Mercury Storage EIS Web site at *http://mercurystorageeis.com/*.

FOR FURTHER INFORMATION CONTACT: To request further information about the Draft Mercury Storage SEIS or the Mercury Storage EIS, or to be placed on the distribution list for the Final Mercury Storage SEIS, use either of the methods (mail or Web site) listed under **ADDRESSES**. The Draft Mercury Storage SEIS contains a Summary, all chapters, appendices and other text within one volume, and includes a CD ROM of the full Draft Mercury Storage SEIS and the full 2011 Mercury Storage EIS.

For general information concerning DOE's NEPA process, please contact:

Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC–54), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585. Telephone: (202) 586–4600, by fax at (202) 586–7031, by email at *askNEPA@hq.doe.gov* or leave a message at 1–800–472–2756. The Draft Mercury Storage SEIS is available on the Internet at *http://www.energy.gov/NEPA/* and on the project Web site at *http://mercurystorageeis.com/*.

SUPPLEMENTARY INFORMATION:

Background

The Mercury Export Ban Act of 2008 (Pub. L. 110–414) amends the Toxic Substances Control Act (TSCA) (15 U.S.C. 2605(f)) to prohibit the sale, distribution, or transfer by Federal agencies to any other Federal agency, any state or local government agency, or any private individual or entity, of any elemental mercury under the control or jurisdiction of a Federal agency (with certain limited exceptions). It also amends TSCA (15 U.S.C. 2611(c)) to prohibit the export of elemental mercury from the U.S. effective January 1, 2013 (subject to certain essential use exemptions). Section 5 of the Act, *Long-Term Storage,* amends the Resource Conservation and Recovery Act (RCRA, 42 U.S.C. 6939f) and directs DOE to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the U.S.

To evaluate the range of reasonable alternatives for siting, constructing and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS in accordance with NEPA and its implementing regulations (40 CFR parts 1500–1508 and 10 CFR part 1021) and issued the Mercury Storage EIS in January 2011 (76 FR 5145). The Mercury Storage EIS and related NEPA documents are available at the Web sites listed under **ADDRESSES**. DOE estimated that up to approximately 10,000 metric tons of elemental mercury would need to be managed and stored at the DOE facility during the 40-year period of analysis. These estimates do not include approximately 4,400 metric tons of elemental mercury that the Department of Defense (DOD) stores at its facility in Hawthorne, Nevada.

Purpose and Need for Action

DOE's purpose and need for action remains unchanged from the 2011 Mercury Storage EIS. That is, DOE needs to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the U.S., as required by the Act.

Proposed Action

As also stated in the 2011 Mercury Storage EIS, DOE proposes to construct one or more new facilities and/or select one or more existing facilities (including modification as needed) for the long-term management and storage of elemental mercury in accordance with the Act. Facilities to be constructed as well as existing or modified facilities must comply with applicable requirements of section 5(d) of the Act, *Management Standards for a Facility,* including the requirements of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.), and other permitting requirements.

Proposed Alternatives

The January 2011 Mercury Storage EIS evaluated seven candidate sites for the facility or facilities, as well as a No Action Alternative as required under NEPA. The candidate sites are: DOE Grand Junction Disposal site near Grand Junction, Colorado; DOE Hanford site near Richland, Washington; Hawthorne Army Depot near Hawthorne, Nevada; DOE Idaho National Laboratory near Idaho Falls, Idaho (2 locations); DOE Kansas City Plant in Kansas City, Missouri; DOE Savannah River Site near Aiken, South Carolina; and Waste Control Specialists, LLC, site near Andrews, Texas.

Since publication of the 2011 Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS and on June 5, 2012, DOE announced its intent to prepare a supplement to the Mercury Storage EIS (77 FR 33204). DOE held two public meetings during a 30-day public scoping period and considered all comments received during that period in preparing this Draft SEIS.

The scope of this Draft Mercury Storage SEIS includes three locations for a long-term mercury storage facility at or near the WIPP site, which DOE operates for disposal of defense transuranic waste. The additional locations evaluated in the Draft Mercury Storage SEIS are in: Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Pub. L. 102–579) as amended; Section 10, Township 22 South, Range 31 East, in the vicinity of WIPP, but outside of the lands withdrawn by the WIPP Land Withdrawal Act; and Section 35, Township 22 South, Range 31 East, also outside of the lands withdrawn by the WIPP Land Withdrawal Act. Each of these locations is suitable for an above-ground storage facility and can take advantage of existing roads and other infrastructure.

DOE identified the Waste Control Specialists, LLC location near Andrews, Texas, as the Preferred Alternative in the 2011 Mercury Storage EIS. DOE has not changed its preferred alternative in the Draft Mercury Storage SEIS; however, the preferred alternative may or may not change as a result of public comment on this draft and further analysis in completing the Final Mercury Storage SEIS.

Among the potential health and environmental impacts evaluated in the Draft Mercury Storage SEIS is an evaluation of the potential cumulative impacts of constructing and operating a facility for long-term management and storage of elemental mercury with the ongoing and planned operations of WIPP for disposal of defense transuranic waste. The Draft Mercury Storage SEIS also considers the potential disposal of greater-than-Class C waste (*Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-level Radioactive Waste and GTCC-Like Waste* (DOE/EIS–0375, February 2011)), which included two separately identified locations at WIPP and the WIPP vicinity.

Public Participation in the SEIS Process

At each public hearing, DOE representatives will be available during

23550 **Federal Register** / Vol. 78, No. 76 / Friday, April 19, 2013 / Notices

an open house to greet stakeholders and review presentational materials. Participants wishing to speak during each public hearing will be asked to register and will be given 10 minutes to speak, in the order in which participants have signed up. Once all those who wish to speak have had an opportunity to do so, participants will be given additional time until time for the public hearings to conclude. A court reporter will record the proceedings at each public hearing.

DOE invites Federal agencies, state, local, and tribal governments, and the general public to comment on the Draft Mercury Storage SEIS during the public comment period. DOE will consider all public comments on the Draft SEIS equally in preparing the Final Mercury Storage SEIS. Any comments received after the deadline will be considered to the extent practicable.

Issued in Washington, DC, on April 16, 2013.

Mark Gilbertson,

Deputy Assistant Secretary for Site Restoration.

[FR Doc. 2013–09291 Filed 4–18–13; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Docket No. EERE–2012–BT–BC–0030]

Department of Energy's (DOE) Participation in Development of the International Energy Conservation Code

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice.

SUMMARY: The DOE participates in the code development process of the International Code Council (ICC), which produces the International Energy Conservation Code (IECC). DOE will continue to publish code change proposals for the IECC before submitting them to the ICC to allow interested parties an opportunity to provide suggested revisions, enhancements to and comments on DOE code change proposals. This notice outlines the process by which DOE produces code change proposals, and participates in the ICC code development process.

FOR FURTHER INFORMATION CONTACT:

Jeremiah Williams, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, Mailstop EE–2J, 1000 Independence Avenue SW., Washington, DC 20585–0121, Telephone: (202) 287–1941, Email: *jeremiah.williams@ee.doe.gov.*

Kavita Vaidyanathan, U.S. Department of Energy, Office of the General Counsel, Forrestal Building, Mailstop GC–71, 1000 Independence Ave. SW., Washington, DC 20585, Telephone: (202) 586–0669, Email: *kavita.vaidyanathan@hq.doe.gov.*

SUPPLEMENTARY INFORMATION:

I. Introduction

The U.S. Department of Energy (DOE) supports the International Energy Conservation Code (IECC) by participating in the code development processes administered by the International Code Council (ICC). As a participant in this process, DOE considers and evaluates concepts to be submitted as proposed changes to the IECC (''code''). This Notice outlines the process by which DOE produces code change proposals, and participates in the ICC code development process. Note that, if approved through the ICC code development process, DOE's proposed changes would be contained in the next edition of the IECC.

A. Statutory Requirements

Title III of the Energy Conservation and Production Act, as amended (ECPA), establishes requirements related to energy conservation standards for new buildings. (42 U.S.C. 6831–6837). Section 307 (b) of ECPA directs DOE to support voluntary building energy codes by periodically reviewing the technical and economic basis of the voluntary building codes, recommending amendments to such codes, seeking adoption of all technologically feasible and economically justified energy efficiency measures, and otherwise participate in any industry process for review and modification of such codes. (42 U.S.C. 6836(b))

B. Background

The IECC serves as a model building energy code and is adopted by many U.S. states, territories, the District of Columbia, and localities across the nation. Development of the IECC is administered by the ICC, with revisions taking place every three years under the ICC governmental consensus process. Any party can propose changes to the IECC with proposed code changes subject to the bylaws, policies and procedures as defined by the ICC.[1]

[1] See *http://www.iccsafe.org/cs/codes/pages/default.aspx.*

II. DOE's Participation in the ICC Code Development Process

As described above, under ECPA, one of the methods by which DOE supports the upgrade of voluntary building energy codes is through participation in the IECC development process. DOE participates in the ICC code development process by:

1. Developing code change proposals for submission to the ICC;
2. Gathering public input on DOE code change proposals from interested parties prior to submitting them to ICC;
3. Conducting necessary technical analyses to document the validity of DOE code change proposals; and
4. Participating in the ICC code development hearings.

DOE Proposal Development

DOE seeks to advance energy efficiency in the IECC by strengthening the code where cost-effective, and improving the criteria to be more easily understood, applied, implemented and enforced. Prior to submitting code change proposals to the ICC, DOE has and will continue to publish code change proposals that it has developed, along with documentation of concepts, for public review and comment at: *http://www.energycodes.gov/development.* This represents an opportunity for parties to provide information they wish DOE to be aware of during the evaluation of proposals for the IECC. Following the opportunity for public review and comment DOE will not provide responses to individual comments, but will consider any and all comments timely submitted in developing final code change proposals. Final proposals will be posted at the same web address for public viewing prior to submitting to the ICC.

DOE Technical Analysis

In developing concepts for submission to the ICC, DOE conducts a series of analyses to evaluate energy savings and economic impacts of potential code change proposals. As this analysis is completed, resources have been and will be published online, including: the DOE residential cost-effectiveness methodology, energy and economic assumptions, energy simulation models, investigations into special topic areas, and draft proposal language. Any interested party wishing to review or build-upon the DOE analysis can access it via the DOE Building Energy Codes Web site.[2]

DOE references all analysis and supporting documentation as required by the ICC. Analysis performed by DOE

[2] See *http://www.energycodes.gov/development.*

APPENDIX B
IMPACT ASSESSMENT METHODOLOGY

APPENDIX B
IMPACT ASSESSMENT METHODOLOGY

Appendix B of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* briefly described the methods used to assess the potential direct, indirect, and cumulative effects of the alternatives for long-term management and storage of elemental mercury. Included were impact assessment methods for land use and visual resources; geology and soils; water resources; meteorology, air quality, and noise; ecological resources; cultural and paleontological resources; site infrastructure; waste management; socioeconomics; environmental justice; and cumulative impacts. Appendix D of the January 2011 *Mercury Storage EIS* described the methodology used to assess occupational and public health and safety impacts and ecological risk. The analyses presented in the January 2011 *Mercury Storage EIS* remain valid and are incorporated into this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)* with two exceptions: (1) the occupational and public health and safety analysis; and (2) the socioeconomics and environmental justice analysis. This *Mercury Storage SEIS* includes updates to the occupational and public health and safety analysis resulting from changes to the definition of severity levels (i.e., magnitude of impacts) for acute-inhalation exposures to the public under certain accident scenarios. This *Mercury Storage SEIS* also includes updates to the socioeconomics and environmental justice analyses to incorporate 2010 decennial census information that was not available at the time the January 2011 *Mercury Storage EIS* was published. This appendix updates the methodology for conducting impacts analysis on these resource areas. Additional details of the methods for the evaluation of occupational and public health and safety and ecological risk from normal operations, facility accidents, and mercury transportation are presented separately in Appendix D of this *Mercury Storage SEIS*.

B.1 INTRODUCTION

Methods for assessing environmental impacts vary for each resource area (discipline). In addition, disciplines are analyzed in a manner commensurate with their importance and the expected level of impact on them under a specific alternative—the sliding-scale assessment approach. This is consistent with U.S. Department of Energy (DOE) guidance contained in its *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements* (known as *The Green Book*) (DOE 2004:1, 2, 19, 20), in which DOE expands on Council on Environmental Quality instructions for preparing environmental impact statements (40 CFR 1502.2) by stating that impacts should be discussed in proportion to their significance and specifically recommending the use of the sliding scale for impact identification and quantification.

For air quality, for example, pollutant emissions from the mercury[1] storage activities were evaluated for their effect on ambient concentrations and compliance with ambient air quality standards. Comparison with regulatory standards is a commonly used method for benchmarking environmental impacts and is conducted—where appropriate—to provide perspective on the magnitude of identified impacts. Impacts in all resource areas were analyzed consistently; that is, the impact values were estimated using a consistent set of input variables and computations. Moreover, efforts were made to ensure that calculations in all areas used accepted protocols and up-to-date models.

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

In this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*, impacts are typically described in terms of intensity and duration. The term "impact," when used in this SEIS, refers to adverse, long-term impacts, unless otherwise stated. A set of standardized impacts terminology was developed for use. Beneficial impacts are those that would improve current conditions, while adverse impacts would degrade current conditions. Intensities are categorized as negligible, minor, moderate, or major, with durations classified as either short term (less than or equal to 5 years) or long term. These categories are defined as follows:

- Negligible: There would be little or no impact on the resource in the region of influence (ROI). Where slight impacts occur, they would be relatively short term, and/or the impacts would not be of any perceptible consequence over the long term.

- Minor: Impacts on the resource in the ROI would be detectable, although localized, relatively small, and of little long-term consequence to the overall makeup of the ROI. Resource loss, consumption, or change would be a small percentage (i.e., generally between 1 and 10 percent) of the resource or resource indicator in the ROI. There would be no loss, damage, or alteration of any rare, unique, special status, or other legally protected resources (e.g., threatened and endangered species or critical habitat).

- Moderate: Impacts on the resource in the ROI would be readily detectable, generally long term, and localized. Resource loss, consumption, or change would be a sizable percentage (i.e., generally between 10 and 40 percent) of the resource or resource indicator in the ROI. Such impacts may prompt consideration of specific project design changes and/or compensatory mitigation for resource loss. Moderate effects may also denote resource conditions that are not expected to affect or impair project implementation but that could prompt consideration of special design or construction mitigation.

- Major: Impacts on the resource in the ROI would be obvious and long term and would have substantial consequences. Either substantial project design changes and/or compensatory mitigation for resource loss would be evaluated. Major effects may also denote resource conditions (e.g., presence of active geologic fault) prompting consideration of substantial changes in project implementation in terms of location and/or special design or construction mitigation.

These terms are used for the analysis of impacts for all resources areas, exclusive of occupational and public health and safety and ecological risk, which are presented separately in Appendix D of this SEIS.

DOE evaluated the environmental impacts of the proposed action within defined ROIs specific to each resource area and site evaluated. ROIs encompass the geographic areas within which any meaningful impact is expected to occur, and can include the area within which the proposed action would take place, the site as a whole, or nearby offsite areas. ROIs that are defined with the term "nearby offsite areas" may be different for each site depending on the extent to which meaningful impacts are expected to occur. For example, impacts on historic resources were evaluated at specific facility locations within each site, whereas human health risks to the general public were assessed for an area within a 16-kilometer (10-mile) radius of the facility location. Brief descriptions of the ROIs for each resource area are presented in Table B–1. Detailed definitions of the various ROIs can be found in Appendix B of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*.

Table B–1. General Regions of Influence

Environmental Resource Area	Region of Influence
Land use and visual resources	The project location, the site, and nearby offsite areas
Geology, soils, and geologic hazards	The project location, the site, and nearby offsite areas
Water resources	The project location, the site, and adjacent surface-water bodies and groundwater
Meteorology, air quality, and noise	For meteorology and air quality, the site and nearby offsite areas potentially affected by air pollutant emissions; for noise, the project location, the site, and surrounding areas, including transportation corridors where proposed activities might increase noise levels
Ecological resources	The project location, the site, and nearby offsite areas
Cultural and paleontological resources	The project location and adjacent areas
Site infrastructure	The project location, the site, and local areas supporting the site
Waste management	Site waste management facilities
Occupational and public health and safety and ecological risk	The site, offsite areas, and the transportation corridors
Socioeconomics	The counties where at least 90 percent of site employees reside
Environmental justice	The area within 16 kilometers (10 miles) of the site and the area within 3.2 kilometers (2 miles) of the site as a subset of the 16-kilometer (10-mile) area

B.2 UPDATES TO OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY METHODOLOGY

The occupational and public health and safety analysis presented in the January 2011 *Mercury Storage EIS* is based on DOE's Protective Action Criteria, Revision 25, published in August 2009 (DOE 2009). Since the publication of the January 2011 *Mercury Storage EIS*, DOE has published Revision 27 of the Protective Action Criteria in February 2012 (DOE 2012). This has resulted in changes to the definition of severity levels (i.e., magnitude of impacts) for assessing acute-inhalation exposures to the public under certain accident scenarios, as discussed below. Accordingly, Appendix E, Section E.2, of this SEIS updates the occupational and public health and safety analysis for the candidate sites previously analyzed in the January 2011 *Mercury Storage EIS* using these revised exposure criteria; otherwise, the methodology remains the same. The analysis for the Waste Isolation Pilot Plant Vicinity reference locations presented in Chapter 4, Section 4.2.9, and Appendix D of this SEIS uses the revised exposure criteria.

Appendix D, Section D.3.1, of this SEIS defines four severity levels (SL-I through SL-IV) varying from negligible-to-very-low exposure at SL-I, the possibility of reversible health effects at SL-II, the possibility of irreversible health effects at SL-III, and up to the potential for fatality at SL-IV. In the January 2011 *Mercury Storage EIS*, the boundary between exposures at SL-III and SL-IV was taken to be the U.S. Environmental Protection Agency's (EPA's) Acute Exposure Guideline Level 3 (AEGL-3). For the definition of AEGLs, see Appendix D, Section D.3.1, of this SEIS. The boundary between SL-II and SL-III was taken to be EPA's AEGL-2. It would be logical to assume that the boundary between SL-I and SL-II should be AEGL-1. However, EPA has not defined an AEGL-1 for mercury vapor. In the January 2011 *Mercury Storage EIS*, it was judged that the following is conservative as a "surrogate AEGL-1:"[2] the boundary between SL-I and SL-II is equal to DOE's Protective Action Criterion 1 (PAC-1) of 0.3 milligrams per cubic meter for durations of exposure up to 1 hour and equal to

[2] The use of TEEL-0 and PAC-1 in the definition of a "surrogate AEGL-1" should not be taken as having any justification or validity beyond use in this SEIS.

DOE's Temporary Emergency Exposure Limit 0 (TEEL-0) of 0.025 milligrams per cubic meter for durations of exposure exceeding 1 hour (DOE 2009). This latter assumption is highly conservative.

Since the publication of the January 2011 *Mercury Storage EIS*, there have been changes to the DOE PAC-1 and TEEL-0 guidance that warrant reconsideration of the above assumptions. First, the value of the PAC-1 for mercury has decreased from 0.3 to 0.15 milligrams per cubic meter (DOE 2012). This has necessitated reexamination of all accident scenarios with acute-inhalation exposures to the public with durations of release up to 1 hour. Second, DOE has discontinued the publication of TEEL-0 values as part of the ongoing effort to more sharply focus on those hazards that may lead to operational emergencies (DOE 2012). There are no comparable values published by DOE. Therefore, TEEL-0 cannot be referenced for the analysis in this SEIS. However, the American Conference of Governmental Industrial Hygienists (ACGIH) publishes a time-weighted average (TWA) for exposures of up to 8 hours in the workplace. For mercury vapor, this is 0.025 milligrams per cubic meter (OSHA 2012), identical to the previously published TEEL-0 value. The TWA is a level of exposure below which workers can be exposed for 8 hours a day and 40 hours a week without adverse health effects. The longest exposure of any accident scenario considered in the analysis is 3 hours. Therefore, it is judged that continuing to use a value of 0.025 milligrams per cubic meter for durations of exposure exceeding 1 hour remains conservative as a "surrogate AEGL-1." Because only the source reference changed and not the value used as a "surrogate AEGL-1" for acute-inhalation exposure exceeding 1 hour, the analyses carried out in the January 2011 *Mercury Storage EIS* remain unchanged.

B.3 UPDATES TO SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE METHODOLOGY

The socioeconomics and environmental justice analyses presented in the January 2011 *Mercury Storage EIS* are based on 2000 census data. Since the publication of the January 2011 *Mercury Storage EIS*, 2010 decennial census data have been published. Accordingly, Appendix E, Section E.3, of this SEIS updates the socioeconomics and environmental justice analyses for the candidate sites previously analyzed in the January 2011 *Mercury Storage EIS* using these 2010 census data. Furthermore, the tables shown below have been updated using 2010 census data and supersede those that were presented in Appendix B of the January 2011 *Mercury Storage EIS*; otherwise, the methodology for evaluating socioeconomics and environmental justice impacts remains the same.

The environmental justice analysis focused on potential health risks resulting from normal operations and accidents that could occur during activities associated with implementation of the alternatives for mercury storage. Environmental justice impacts are determined based on the results from the occupational and public health and safety risk analysis, as well as land use, cultural and paleontological resources, socioeconomics, and other resource area impact analyses where impacts on resources may be high and adverse.

Tables B–2, B–3, and B–4 below update Tables B–13, B–14, and B–15, respectively, in Appendix B of the January 2011 *Mercury Storage EIS*.

Table B–2. Site-Specific Thresholds for Identification of Minority and Low-Income Communities Within the 16-Kilometer (10-Mile) Region of Influence (percentage)

Population	Grand Junction Disposal Site	Hanford Site	Hawthorne Army Depot	Idaho National Laboratory	Kansas City Plant	Savannah River Site	Waste Control Specialists, LLC, Site	WIPP Vicinity Reference Locations	Y–12 National Security Complex
Minority Population	36.9[a]	47.5[b]	50.0[a]	36.0[b]	39.9[b]	50.0[b]	50.0[a]	50.0[a]	33.6[a]
Low-Income Population	32.2[b]	32.1[b]	31.9[b]	33.6[b]	32.0[a]	35.9[b]	36.9[b]	35.8[a]	34.2[a]

[a] Indicates the county(ies) as the lower general population percentage.
[b] Indicates the state(s) as the lower general population percentage.
Key: WIPP=Waste Isolation Pilot Plant.

Table B–3. Site-Specific Thresholds for Identification of Minority and Low-Income Communities Within the 3.2-Kilometer (2-Mile) Region of Influence (percentage)

Population	Grand Junction Disposal Site	Hawthorne Army Depot	Kansas City Plant	Waste Control Specialists, LLC, Site	WIPP Vicinity Reference Locations	Y–12 National Security Complex
Minority Population	36.9[a]	50.0[a]	39.0[b]	50.0[b]	50.0[a]	29.3[a]
Low-Income Population	32.2[b]	31.9[b]	34.0[b]	36.9[b]	33.6[a]	36.5[a]

[a] Indicates the county(ies) as the lower general population percentage.
[b] Indicates the state(s) as the lower general population percentage.
Key: WIPP=Waste Isolation Pilot Plant.

Table B–4. Environmental Justice Impact Assessment Protocol

Resource	Required Data		Measure of Impact
	Affected Environment	Alternative	
Minority Populations	Baseline demographic data relative to race and ethnicity of all populations reported at the block group level of spatial resolution from the 2010 decennial census, Summary File 1, Table P5, Hispanic or Latino Origin by Race - Universe: Total Population (DOC 2011a).	Location of proposed facility.	Impacts are determined based on the results from the occupational and public health and safety risk analysis, land use, cultural and paleontological resources, socioeconomics, and other resource area impact analyses, as appropriate. For a proposed action to impose disproportionately high and adverse impacts upon minority and low-income communities, first high and adverse impacts must be identified as a result of the proposed action. For resource areas with no or negligible impacts, additional environmental justice analysis is not warranted. For resource areas where there may be the potential for high and adverse impacts, additional analysis is performed to determine if conditions exist that would result in those impacts being borne disproportionately by minority or low-income communities.
Low-Income Populations	Baseline demographic data relative to income reported at the block group level of spatial resolution from the *2006–2010 American Community Survey 5-Year Estimates*, Table C17002, Ratio of Income to Poverty Level in the Past 12 Months - Universe: Population for Whom Poverty Status is Determined (DOC 2011b).		

Data relative to race and ethnicity from the 2010 decennial census, Summary File 1, Table P5, Hispanic or Latino Origin by Race (DOC 2011a), are used to identify block groups that contain disproportionately high minority populations surrounding the candidate sites for mercury storage. Table P5 provides sufficient detail to determine baseline demographic data relative to race and ethnicity for all minority populations reported at the block group level.

There are no data relative to income available from the 2010 census. The Census Bureau's *American Community Survey (ACS)* 5-year estimates is the only data set that publishes current data relative to income at the block group level of spatial resolution. The geographic boundaries from the *2006–2010 ACS 5-Year Estimates* data set are consistent with those used during the 2010 census. Therefore, data relative to income from the *2006–2010 ACS 5-Year Estimates* data set, Table C17002, Ratio of Income to Poverty Level in the Past 12 Months (DOC 2011b), are used to identify block groups that contain disproportionately high low-income populations surrounding the candidate sites for mercury storage.

B.4 REFERENCES

DOC (U.S. Department of Commerce), 2011a, *U.S. Census Bureau, 2010 Decennial Census*, Summary File 1, Table P5: Hispanic or Latino Origin by Race - Universe: Total Population, accessed through http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

DOC (U.S. Department of Commerce), 2011b, *U.S. Census Bureau, 2006–2010 American Community Survey 5-Year Estimates*, Table C17002: Ratio of Income to Poverty Level in the Past 12 Months - Universe: Population for Whom Poverty Status is Determined, accessed through http://www2.census.gov/acs2010_5yr/summaryfile/UserTools/.

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OSHA (Occupational Safety and Health Administration), 2012, *Occupational Safety and Health Guideline for Mercury Vapor*, U.S. Department of Labor, accessed through http://www.osha.gov/SLTC/healthguidelines/mercuryvapor/recognition.html, November 12.

Code of Federal Regulations

40 CFR 1502.2, U.S. Environmental Protection Agency, "Environmental Impact Statement: Implementation."

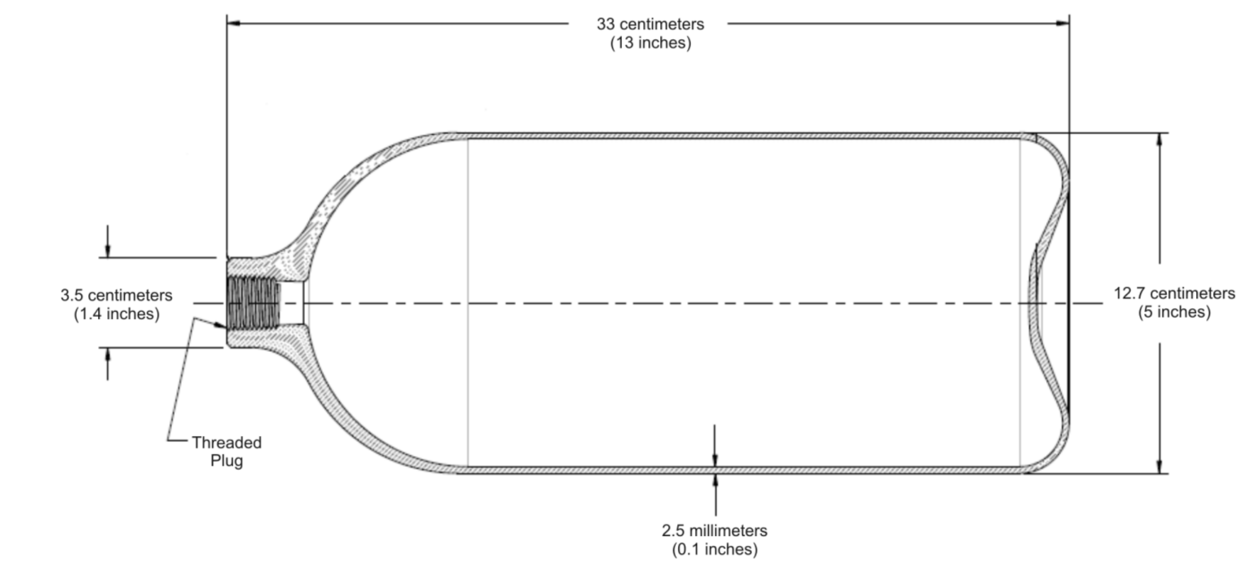
APPENDIX C
STORAGE FACILITY
CONSTRUCTION AND OPERATIONS DATA

APPENDIX C
STORAGE FACILITY CONSTRUCTION AND OPERATIONS DATA

This appendix presents data on construction and operations of a new mercury storage facility analyzed in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*. Section C.1 provides data related to the transportation of elemental mercury to the storage facility. Section C.2 provides background information regarding design criteria, a general description of physical characteristics, and construction and operations data for a new facility that would be used to store mercury. Appendix C of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* presented data on construction and operations of a new mercury storage facility, as well as data on modification of existing buildings, as appropriate to each of the seven candidate sites analyzed in the January 2011 *Mercury Storage EIS* that are still under consideration for the long-term storage of mercury. The data from the January 2011 *Mercury Storage EIS* Appendix C related to construction and operations of a new facility are applicable to the Waste Isolation Pilot Plant Vicinity reference locations considered in this *Mercury Storage SEIS*, and are reproduced in this appendix for convenience.

C.1 TRANSPORTATION REQUIREMENTS

Two acceptable container types for the mercury storage facility are 3-liter (3-L) (34.6-kilogram [76-pound]) flasks and 1-metric-ton (1-MT) (1.1-ton) containers. Figure C–1 illustrates the dimensions of a typical 3-L flask and Figure C–2 illustrates the dimensions of a typical 1-MT container. Other containers may be accepted for storage on a case-by-case basis. All containers are subject to U.S. Department of Transportation regulations regarding the transportation of elemental mercury.[1]



Note: Dimensions are approximate.

Figure C–1. Dimensions of a Typical 3-Liter Flask

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

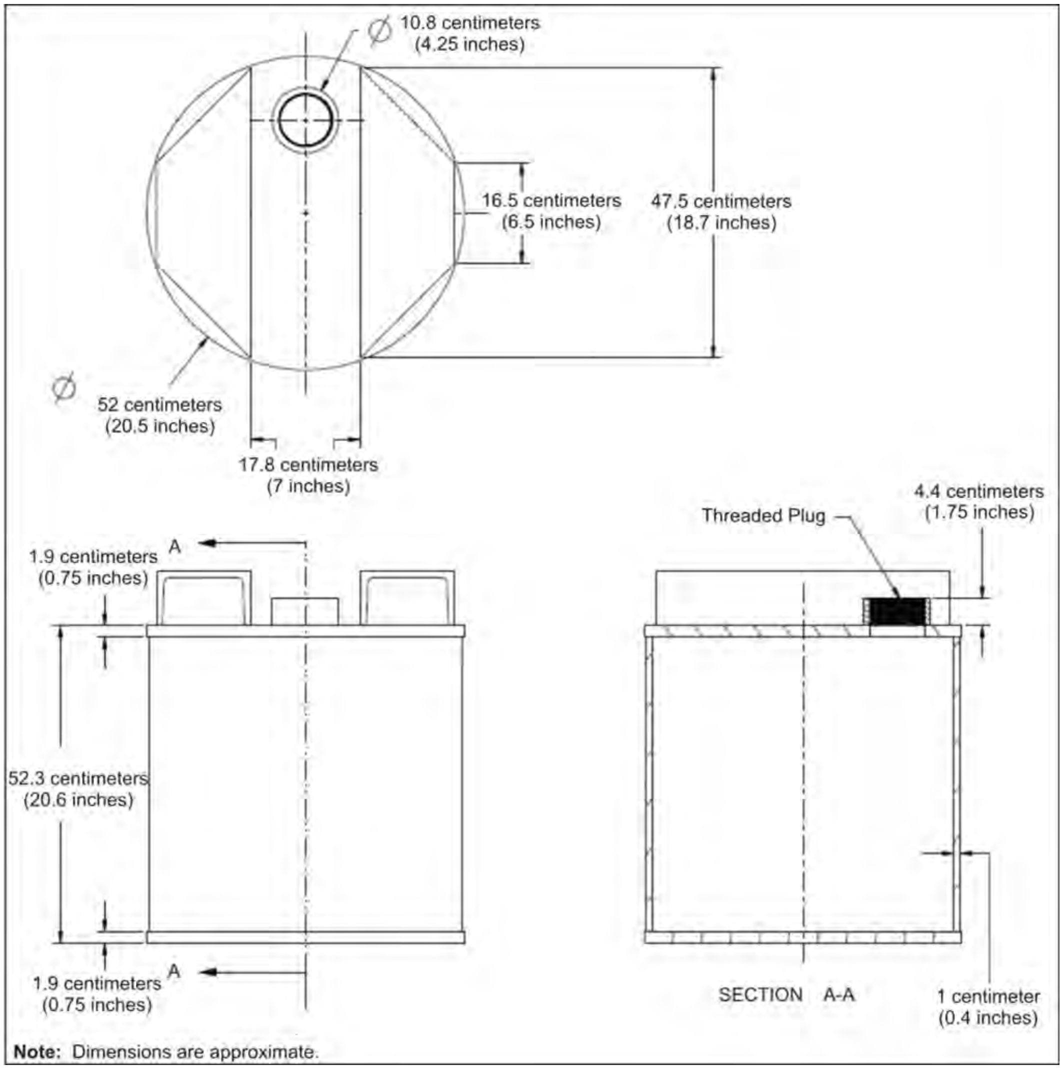


Figure C–2. Dimensions of a Typical 1-Metric-Ton Container

The 3-L flasks would be transported in pallets; such pallets may have a built-in spill tray. Each pallet would contain up to a maximum of 49 3-L flasks in a 7- by 7-flask configuration, not to exceed 1.4 meters (4.7 feet) on a side. The 3-L flasks could also be shipped in quantities of less than 49 per pallet. Full-size pallets (containing 49 3-L flasks) would be shipped "ready" for storage upon passing inspection and satisfying acceptance criteria. Smaller loads (pallets containing less than 49 3-L flasks) would be consolidated in the Handling Area at the U.S. Department of Energy (DOE) facility for efficient storage. Noncombustible (i.e., metal) or fire-resistant wooden pallets are recommended as a best management practice over non-fire-resistant wooden pallets (DOE 2009). An example of typical shipment of a full-size pallet of 49 3-L flasks is provided in Figure C–3.

The 1-MT containers would also be shipped on box pallets; however, there would be only one container per pallet. Each pallet would be constructed of wood or metal, similar to the 3-L flask pallets. Once received and visually inspected for integrity, the 1-MT containers would be removed from their shipping pallets and placed in a spill tray in long-term storage. The transportation pallets would be returned to the generator for reuse, if requested. Each spill tray would accommodate eight 1-MT containers in a 2-container by 4-container configuration (DOE 2009).

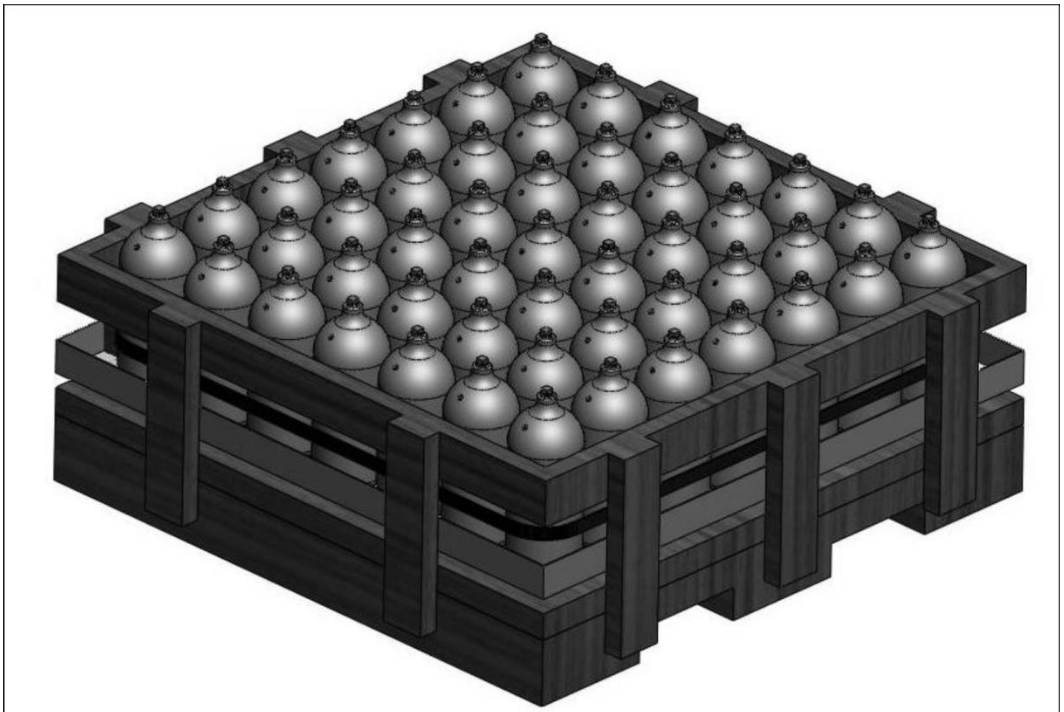


Figure C–3. Example Box Pallet for Shipping 3-Liter Flasks in a 7-Flask by 7-Flask Configuration

Consistent with the estimated amount of potentially available mercury discussed in Chapter 1, Section 1.3.1, of this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*, DOE makes the following assumptions regarding the availability of surplus mercury for storage:

- All or a portion of DOE's surplus mercury inventory of approximately 1,200 metric tons (1,300 tons) currently in storage at the Y–12 National Security Complex (Y–12) is being considered for transfer to the long-term mercury storage facility.
- The remaining chlor-alkali facilities would close by 2020, yielding approximately 1,100 metric tons (1,210 tons) of mercury that would be shipped to the long-term mercury storage facility over the first 7 years of operation.[2]
- Mining would yield approximately 4,900 metric tons (5,400 tons) of mercury during the 40-year period of analysis that would be shipped to the long-term mercury storage facility.
- Reclamation and recycling facilities would yield approximately 2,800 metric tons (3,090 tons) of mercury during the 40-year period of analysis that would be shipped to the long-term mercury storage facility.

[2] Olin Corporation has announced that its chlor-alkali plants in Tennessee and Georgia will be consolidated and converted to mercury-free technology by the end of 2012 (Pavey 2012). The fate of this mercury is uncertain and may still be eventually shipped to a DOE facility(ies) for long-term management and storage; therefore, the quantities of mercury analyzed in this *Mercury Storage SEIS* remain unchanged.

DOE makes the following assumptions regarding the quantities of mercury and when this mercury would be shipped to the long-term mercury storage facility:[3]

- First 2 Years of Operation: A total of approximately 950 metric tons (1,050 tons) would be delivered per year from Y–12 (if the decision is made to transfer the Y–12 mercury inventory to the new storage facility), chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Third Through Seventh Year of Operation: A total of approximately 350 metric tons (390 tons) would be delivered per year from chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Eighth Through Fortieth Year of Operation: A total of approximately 190 metric tons (210 tons) would be delivered per year from mines and reclamation and recycling facilities.

DOE makes the following assumptions regarding the transportation of mercury:

- A fully loaded truck can carry 9 pallets of 49 3-L flasks or 14 1-MT containers, and a fully loaded railcar can carry 24 pallets of 49 3-L flasks or 54 1-MT containers.
- Mercury from Y–12 would be shipped in 3-L flasks, mercury from chlor-alkali facilities would be shipped in 1-MT containers, and mercury from mines and reclamation and recycling facilities would be shipped in 3-L flasks and/or 1-MT containers.

Based on the above-mentioned assumptions and assuming fully loaded trucks or railcars, the number of shipments that would be required for each transportation scenario is listed below. However, it can be reasonably expected that some shipments would be smaller and not necessarily on fully loaded trucks. Truck Scenarios 1 and 2 and the Railcar Scenario are defined in Appendix D, Section D.2.2, of this *Mercury Storage SEIS*. These scenarios are summarized below.

Truck Scenario 1: Fully loaded trucks.

- First 2 Years of Operation: It is expected that 66 truck deliveries would be made per year from Y–12, chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Third Through Seventh Year of Operation: It is expected that 26 truck deliveries would be made per year from chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Eighth Through Fortieth Year of Operation: It is expected that 14 truck deliveries would be made per year from mines and reclamation and recycling facilities.

[3] For purposes of analysis, the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* assumes a 40-year operational period with the first year starting in 2013 and the fortieth year, in 2052. An operational start date is not known at this time; however, the period of analysis remains 40 years. For example, if the mercury storage facility(ies) were to start operations in 2014, the last year of operations would likewise shift to 2053, and so forth.

Truck Scenario 2: Partially loaded trucks.

- First 2 Years of Operation: It is expected that 79 truck deliveries would be made per year from Y–12, chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Third Through Seventh Year of Operation: It is expected that 39 truck deliveries would be made per year from chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Eighth Through Fortieth Year of Operation: It is expected that 27 truck deliveries would be made per year from mines and reclamation and recycling facilities.

Railcar Scenario: Fully loaded railcars.

- First 2 Years of Operation: It is expected that 23 rail deliveries would be made per year from Y–12, chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Third Through Seventh Year of Operation: It is expected that 8 rail deliveries would be made per year from chlor-alkali facilities, mines, and reclamation and recycling facilities.
- Eighth Through Fortieth Year of Operation: It is expected that 5 rail deliveries would be made per year from mines and reclamation and recycling facilities.

C.2 MERCURY STORAGE FACILITY

C.2.1 Introduction

The *U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury* (DOE 2009) serves as a basis for developing the design and operational parameters for a new mercury storage facility. For some criteria, construction and operations data for similar storage facilities were used to supplement the information taken from DOE (2009).

The DOE mercury storage facility would include the following four major physical areas that would provide the necessary functions for receipt, inspection, and long-term storage of mercury (DOE 2009):

- **Receiving and Shipping Area.** This area would include dedicated space(s) for the receipt, inspection, and handling of mercury containers. It would allow for truck docking, offloading, inspection, and transfer of received mercury to the facility. It would also allow for inspection, packaging, marking, manifesting, and truck docking and loading for shipments of secondary waste out of the DOE storage facility. It would be adjacent to the Handling and Storage Areas.
- **Handling Area.** This area would include dedicated space(s) for acceptance/verification of incoming containers and for work involving potential contamination, including (1) safely handling and cleaning palletized or individual containers that have external mercury contamination, and/or (2) repackaging mercury from containers that have failed inspection. This area is needed for non-routine and emergency response activities for leaking flasks and/or containers. The area would be enclosed and have filtered ventilation. All exhausted air would pass through a sulfur filter to remove mercury vapors.
- **Storage Area.** This area would include dedicated space for the storage of mercury containers. Composing the bulk of the facility, this enclosed area would have ample storage and aisle space for careful, tracked placement and retrieval of all containers (e.g., 3-L and 1-MT capacity). The area would be well lit, with appropriate ventilation, spill containment, and fire protection

measures. Although sufficient forced ventilation would be provided in all Storage Areas, conditioned air would not be required. Note that the Storage Area(s) may be constructed in a modular fashion to accommodate mercury inventories as they become available for storage.

- **Office Administration Area.** This area would include the management, operations, training, and all other administration functions supporting the overall mercury program. Examples include the storage and maintenance of records, waste verification documents, shipping papers, and databases. It should not be located within a hazardous area and would preferably be separated from the other three facility areas.

Key features of a Resource Conservation and Recovery Act–permitted facility used for the storage of elemental mercury include the following:

- **Location and Siting.** The selection of siting for construction of a new facility or evaluation of an existing facility would consider environmentally sensitive locations or conditions such as the existence of floodplains, wetlands, groundwater, seismic zones, karst soils or other unstable terrain, local weather phenomena, or incompatible land use.

- **Security.** At a minimum, facility security would meet the requirements for a DOE Property Protected Area, as outlined in DOE Manual 470.4-2A, *Physical Protection*. The facility would be located in an area under the control and authority of DOE and would prevent inadvertent or deliberate unauthorized access to the facility and the Storage Area(s). The facility would have a perimeter barbed-wired fence to control unauthorized access. Remote surveillance may also be employed, where necessary.

- **Containment.** The Storage Areas of the facility would be designed to properly contain any release of mercury. This would include the use of spill trays, properly sloped floors, and floors constructed to be impervious to liquid mercury releases. The facility walls and ceiling would be constructed of sufficient quality and design to shield the stored mercury from weather elements and ensure that mercury is not entrained in stormwater runoff.

- **Ventilation.** The Handling Area would be ventilated through the use of a high-negative draw system for removing high-concentration vapors from mercury "sources" (e.g., container residues, open containers, small spills). The exhaust air would pass through a sulfur filter to remove mercury vapor and be discharged to the outside. A wall-mounted air conditioning unit would be available for maintaining interior temperatures below 70 degrees Fahrenheit during times when mercury is being handled to keep its volatility low. The Storage Area would be ventilated using low-vacuum, high-volume, industrial-sized roof- or wall-mounted fans sized to provide multiple air exchanges over a short period of time and to evacuate low-concentration vapors that may accumulate in the storage spaces over time. These fans would operate on an as-needed basis prior to and during occupancy.

- **Fire Protection.** The facility would be outfitted with fire detection systems such as smoke and heat detectors, as well as a permanent fire suppression system. The fire suppression system would be a conventional wet- or dry-charge water sprinkler system augmented with readily accessible fire extinguishers.

- **Emergency Response.** The Handling Area would be designed for responding to small spills that might occur or for transferring mercury from corroding or leaking containers or from containers that have failed inspection upon arrival at the facility to new containers prior to placing them in storage. Emergency response procedures would be developed for larger releases of mercury.

- **Monitoring.** The facility would conduct mercury vapor monitoring for the detection of any unplanned releases of mercury or deterioration of flask or container integrity. Weekly inspections of containers in long-term storage would incorporate air sampling.

- **Record-Keeping.** Training records, waste receipts, inspection reports, laboratory analysis, response plans, monitoring data, etc., would be maintained in the Office Administration Area.

C.2.2 Physical Description

Construction of a new storage facility is being evaluated at all Waste Isolation Pilot Plant (WIPP) Vicinity reference locations considered in this *Mercury Storage SEIS*. Figure C–4 provides a potential conceptual layout for a generic, full-size new mercury storage facility. Figure C–5 provides detail for the Receiving and Shipping Area and Handling Area. The WIPP Vicinity reference locations would require new permits for the construction and operation of a long-term mercury storage facility. These permits would be subject to approval by the applicable regulatory agency.

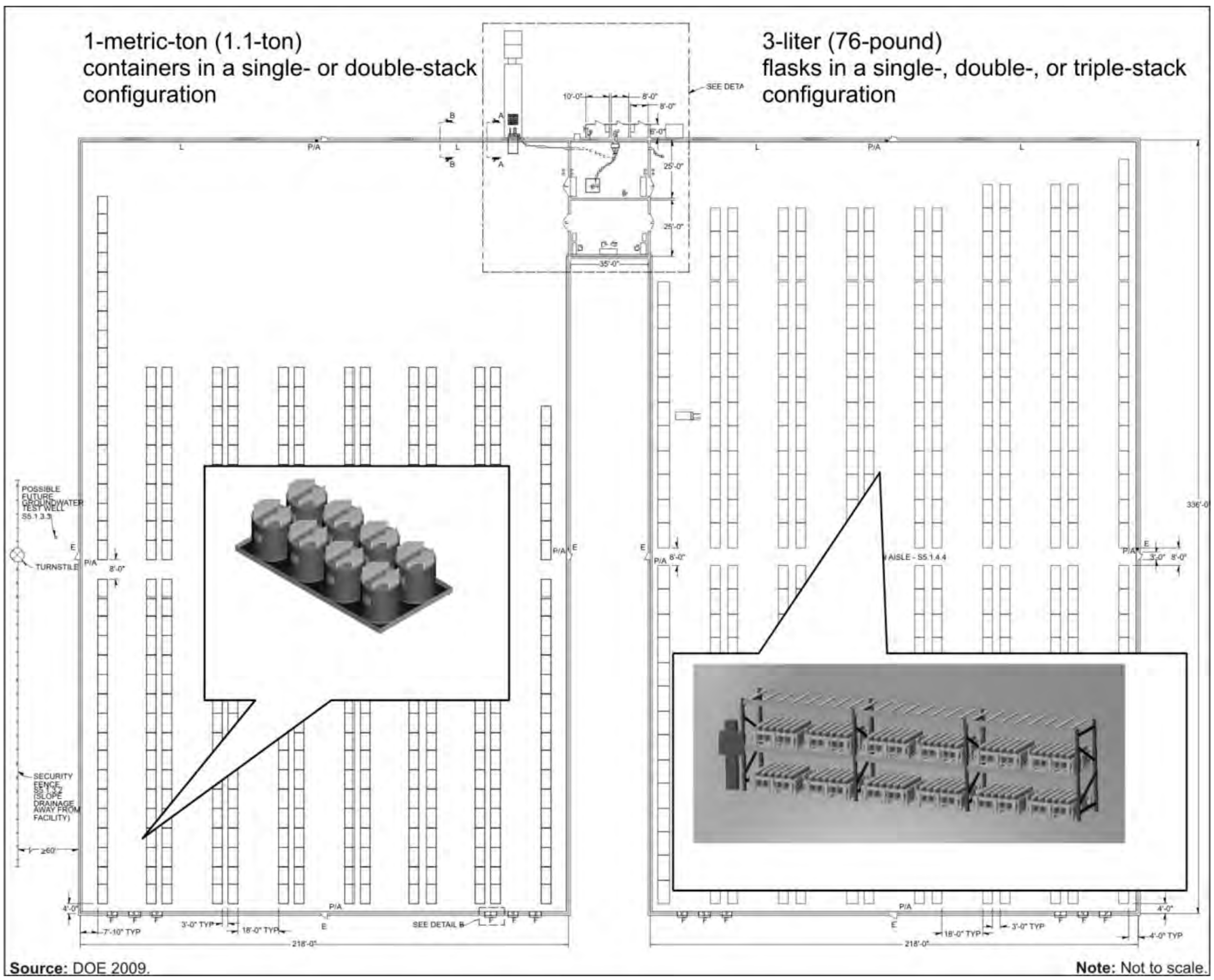
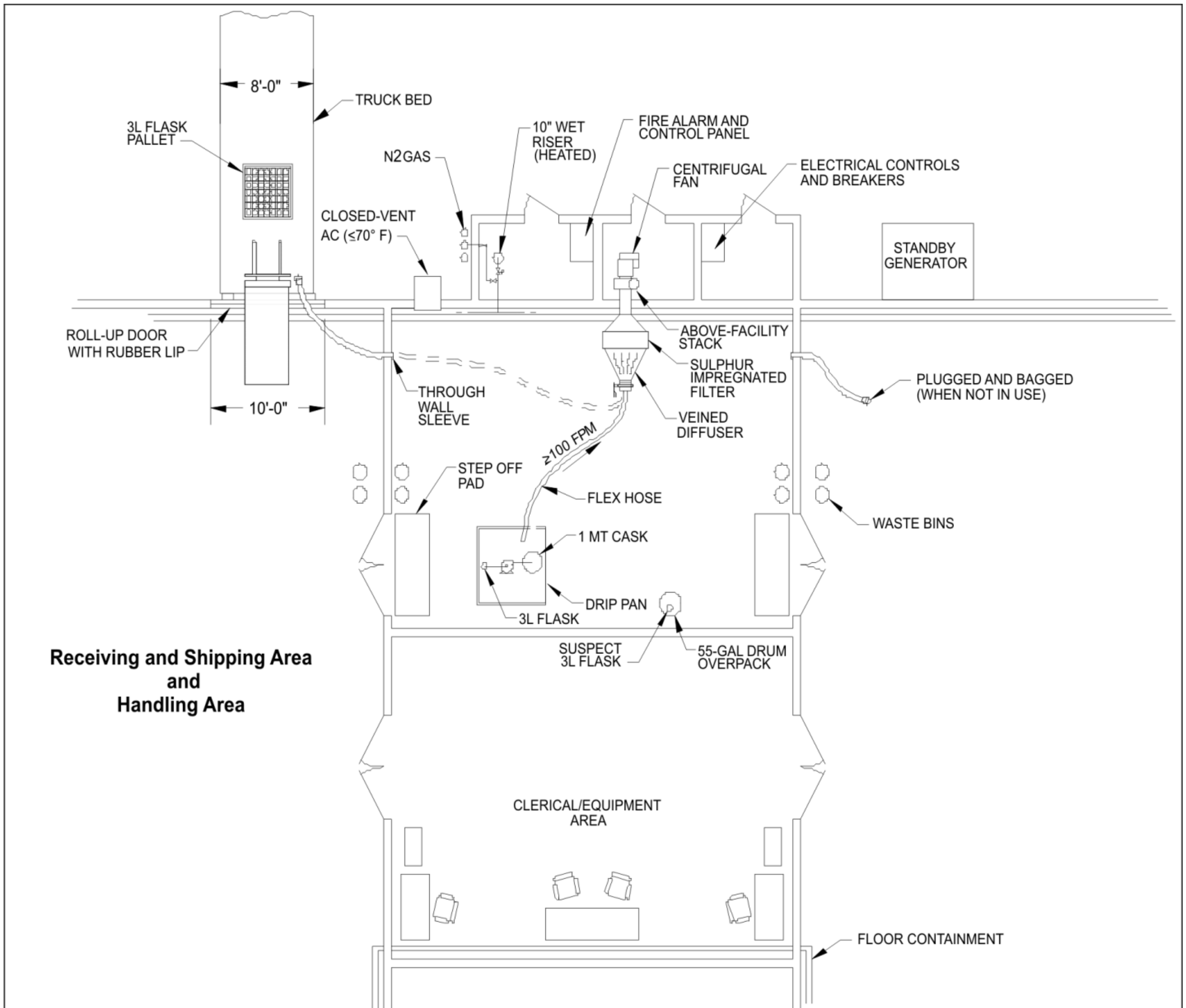


Figure C–4. Conceptual Layout for a New Mercury Storage Facility



Source: DOE 2009. **Note:** Not to scale.

Figure C–5. Conceptual Schematic for Receiving and Shipping Area and Handling Area of a New Mercury Storage Facility

Table C–1 provides general physical data for the construction of a generic, new facility for the storage of elemental mercury.

Table C–1. Data for a Mercury Storage Facility – New Construction

Parameter	New Facility[a]
Facility Footprint	20,500 square meters (220,600 square feet)
Permitted for Storage of Hazardous Waste Under Resource Conservation and Recovery Act	Yes; would be permitted.
Building Dimensions (length × width)	154×102 meters (506×336 feet)
Ceiling Height	6.1 meters (20 feet)
Number of Buildings	1
Total Space Dedicated to Storage	13,610 square meters (146,500 square feet)
Building Construction	Structural steel frame on reinforced-concrete slab and sheet metal shell; epoxy-sealed floor.
Floor Thickness	30 centimeters (12 inches)
Rail Access	Yes, with exception of Grand Junction Disposal Site location.
Access/Security	Security measures would prevent inadvertent or deliberate unauthorized access to the facility and Storage Area(s). Examples would include physical barriers such as perimeter barbed-wire fence, remote interior and exterior surveillance, and/or security personnel.
Potentially Required Building Modifications	New facility would be designed and built to desired specifications.

[a] Data for new facility construction would be similar regardless of location.
Source: DOE 2009.

C.2.3 Construction Data

Resource commitments for new facility construction would be similar regardless of location and are presented in Table C–2. DOE expects that construction of a new mercury storage facility would require approximately 6 months to complete.

Table C–2. Resource Commitments for Construction of a New Mercury Storage Facility[a]

Resource	Quantity
Land Use	
Land disturbance	3.1 hectares (7.6 acres)
Labor	
Man hours	18,500
Materials	
Concrete	4,755 cubic meters (6,220 cubic yards)
Gravel (crushed stone)	3,875 cubic meters (5.070 cubic yards)
Asphalt	670 cubic meters (872 cubic yards)
Steel	2,700 metric tons (2,970 tons)
Epoxy sealant	2,400 liters (6,330 gallons)
Utilities	
Water (non-potable)	1,230,000 liters (325,000 gallons)
Water (potable)	40,900 liters (10,800 gallons)
Diesel	193,000 liters (51,000 gallons)
Gasoline	0 liters (0 gallons)
Electricity	0 megawatt-hours
Waste	
Nonhazardous construction debris	270 cubic meters (355 cubic yards)
Nonhazardous liquid waste (sanitary wastewater)	9,850 liters (2,600 gallons)

[a] Duration of construction would be 6 months.
Source: DOE 2009.

The construction of a new facility would generate air emissions from the use of heavy equipment and the disturbance of soils from grading and site preparation. Typical heavy equipment that might be used would include dump trucks, cement trucks, dozers, graders, spreaders, compactors, cranes, etc. Air emissions from vehicle exhaust would be dependent on frequency of use, fuel efficiency, and fuel type. Particulate air emissions would be dependent on the amount of exposed land and the duration of exposure. Based on the relevant factors and an estimated construction period of 6 months, expected air emissions are listed in Table C–3.

Table C–3. Air Emissions During Construction of a New Mercury Storage Facility[a]

Pollutant	Total Emissions (metric tons)	Total Emissions (tons)
Carbon monoxide	3.01	3.32
Nitrogen dioxide	14.0	15.4
Sulfur dioxide	0.00475	0.00524
Particulate matter (with a diameter of 10 micrometers or less)	16.6	18.3
Carbon dioxide	520	573
Total organic compounds	1.14	1.26
Ammonia	0.022	0.0242
Benzene	0.00296	0.00326
1,3-Butadiene	0.0001124	0.000137
Formaldehyde	0.00374	0.00412
Toluene	0.00130	0.00143
Xylene	0.000903	0.000995

[a] Duration of construction would be 6 months.
Source: EPA 1995; USACE 2007.

Minimal site excavation would be required for the construction of a new facility. Excavation up to 60 centimeters (24 inches) may be required for site preparation and pouring the concrete foundation. Small trenches may also be required for installation of utilities or connection with existing utilities and installation of concrete footers; depths for this could be 0.6 meters (2 feet) wide and 1.2 meters (4 feet) deep. Any excess soil would be incorporated and contoured into the existing landscape. It is assumed that any new construction would take place in an uncontaminated area.

C.2.4 Operations Data

Resource commitments for operations of a mercury storage facility for the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury are presented in Table C–4. It is conservatively assumed that security personnel would guard the facility 24 hours per day, 7 days per week, although this level of security may not be necessary. Based on this assumption, site security for a standalone facility is estimated to be 350,400 man hours over the 40-year period of analysis. Considering a full-time equivalent worker works 2,080 hours per year, security would be 4 1/4 full-time equivalents. Security personnel would only be required during normal working hours for receipt and handling of mercury shipments and would be reduced to 83,200 man hours over the 40-year period of analysis. Other operations personnel would include administrative staff, labor for the receipt, inspection, and handling of incoming mercury shipments, facility maintenance, and industrial hygiene and occupational safety experts. This required operations staff would be 3 3/4 full-time equivalents for the first 7 years and 1 1/8 full-time equivalents thereafter.

Table C–4. Resource Commitments for Operation of a New Mercury Storage Facility[a]

Resource	Quantity
Land Use	
Land occupied	3.1 hectares (7.6 acres)
Labor	
Man hours	482,220 (215,020)[b]
Utilities	
Water (non-potable)	Negligible
Water (potable)	3,540,000 liters (935,000 gallons)
Diesel	24,200 liters (6,400 gallons)
Gasoline	Negligible
Electricity	10,100 megawatt-hours
Waste	
Hazardous solid waste (55-gallon drums)	910
Nonhazardous liquid waste (sanitary wastewater)	2,360,000 liters (623,000 gallons)

a Values presented are totals for the 40-year period of analysis.
b Parenthetical value represents reduced security personnel for those candidate sites that already reside within a secure Federal complex (i.e., the Hanford Site, Hawthorne Army Depot, Idaho National Laboratory, and the Savannah River Site).

Source: DOE 2009.

The long-term mercury storage facility will not treat or process mercury. The facility will only be designed to store mercury in high-integrity, tight containers. However, it may become necessary to respond to small spills or repackage mercury from failed containers. The Handling Area, where repackaging mercury into new containers would be performed, would be negatively ventilated and the exhaust air would be filtered to remove airborne mercury emissions. The binding chemical that would most likely be used to remove mercury from the air would be sulfur. Filters would be replaced on a regular schedule to maintain optimum mercury removal efficiency. Therefore, air emissions vented from the Handling Area to the outside air are expected to be negligible. Mercury vapor might accumulate in the Storage Area(s) during normal operations from storage containers or residual surface contamination and could subsequently be vented to the outside air through the exhaust fans. However, as discussed in Chapter 4, Section 4.2.9, and Appendix D, air emissions from normal operations are projected to remain well below actionable concentrations for human health exposure.

C.3 REFERENCES

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APPENDIX D
HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT ANALYSIS

APPENDIX D
HUMAN HEALTH AND
ECOLOGICAL RISK ASSESSMENT ANALYSIS

This appendix provides a summary of the discussion presented in Chapter 4, Section 4.2.9, and Appendix D of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* and includes new data specific to conducting the risk assessments for the Waste Isolation Pilot Plant Vicinity reference locations. This summary includes an overview of input data, assumptions, toxicity of mercury, and the approach to evaluating risk.

D.1 INTRODUCTION

As described in Chapter 1 of this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*, the Mercury Export Ban Act of 2008 (P.L. 110-414) requires that the Secretary of Energy designate a facility or facilities of the U.S. Department of Energy (DOE) (which shall not include the Y–12 National Security Complex [Y–12] or any other portion or facility of the DOE Oak Ridge Reservation) for the purpose of long-term management and storage of elemental mercury[1] generated within the United States.

The alternatives that are analyzed in this appendix are listed below.

- Waste Isolation Pilot Plant (WIPP) Vicinity Section 10
- WIPP Vicinity Section 20
- WIPP Vicinity Section 35

For further description of these alternatives, see Chapter 2, Section 2.3, and Appendix C of this supplemental environmental impact statement (SEIS).

D.2 OVERVIEW OF INPUT DATA AND ASSUMPTIONS

The input data and assumptions are described in Appendix D of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*, as updated in Appendices B and E of this SEIS.[2] Some of those input data and assumptions are restated here for the convenience of the reader and augmented where appropriate with data specific to the WIPP Vicinity reference locations.

D.2.1 Quantity of Mercury to Be Shipped

Mercury would be received as 99.5 percent or greater pure elemental mercury from a variety of sources, tabulated in Table D–1.

Additional detail on the estimated quantities of elemental mercury is provided in Appendix D, Section D.1, of the January 2011 *Mercury Storage EIS*. The starting point for Table D–1 is Chapter 1, Table 1–1, which provides an estimate of between 8,500 and 9,700 metric tons (8,000 and 10,700 tons) for the total amount of mercury that may be shipped to the chosen receiving site based on a 40-year period of analysis. For the purposes of this analysis, the amount was rounded up to

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

[2] Since publication of the January 2011 *Mercury Storage EIS*, DOE has published revised Protective Action Criteria for exposure to mercury vapor. This has resulted in changes to the definition of severity levels (i.e., magnitude of impacts) for assessing acute-inhalation exposures to the public under certain accident scenarios. Appendices B and E of this SEIS update parts of Chapter 4 and Appendix D of the January 2011 *Mercury Storage EIS*. The impact analyses for the WIPP Vicinity reference locations discussed in this SEIS have incorporated the revised criteria.

10,000 metric tons (11,000 tons). This is consistent with the *U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury (Interim Guidance)* (DOE 2009).[3] However, the data in Table 1–1 should not be interpreted as commitments on DOE's part (e.g., to accept mercury from Peru via New York or to move mercury from Y–12 or to the exact dates of shipments from Y–12 and the chlor-alkali facilities). They are merely intended to be a reasonable set of numbers that can be used in a screening risk assessment. Changes since the publication of the January 2011 *Mercury Storage EIS* may mean that less mercury than was contemplated at the time would actually be shipped to the mercury storage facility. However, 10,000 metric tons remains an upper bound that is kept in this *Mercury Storage SEIS* to facilitate comparisons with the other sites that are analyzed in the January 2011 *Mercury Storage EIS*.

Table D–1. Dispatching Sites, Years, and Quantities of Elemental Mercury

Site	Years of Shipments[a]	Total Mass (metric tons)
Y–12 National Security Complex	1st – 2nd	1,206
Chlor-Alkali Facilities		
Ashta Chemical, Ashtabula, Ohio	1st – 7th	108
PPG, New Martinsville, West Virginia	1st – 7th	244
Olin, Charleston, Tennessee[b]	1st – 7th	478
Olin, Augusta, Georgia[b]	1st – 7th	271
Reclamation and Recycling Facilities, Mining, Shipments into Port of New York		
Mining (Carlin, Nevada)	1st – 40th	3,687
Mining (from Peru via Port of New York)	1st – 40th	1,236
Philadelphia region (Bethlehem Apparatus)	1st – 40th	1,939
Chicago region (D.F. Goldsmith)	1st – 40th	831
Total	1st – 40th	10,000

a For purposes of analysis, the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* assumes a 40-year operational period with the first year starting in 2013 and the fortieth year, in 2052. An operational start date is not known at this time; however, the period of analysis remains 40 years. For example, if the mercury storage facility(ies) were to start operations in 2014, the last year of operations would likewise shift to 2053, and so forth.

b Olin Corporation has announced that its chlor-alkali plants in Tennessee and Georgia will be consolidated and converted to mercury-free technology by the end of 2012 (Pavey 2012). The fate of this mercury is uncertain and may still be eventually shipped to a DOE facility(ies) for long-term management and storage; therefore, the quantities of mercury analyzed in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* remain unchanged.

Note: To convert metric tons to tons, multiply by 1.1023.

Key: Bethlehem Apparatus=Bethlehem Apparatus Company, Inc.; D.F. Goldsmith=D.F. Goldsmith Chemical and Metal Corporation.

[3] The analysis in this appendix is intended to be consistent with the *Interim Guidance*.

D.2.2 Assumptions About Transportation Analysis

Offsite accidents could occur during transportation to the chosen storage site. The following are the assumptions governing the transportation analysis (some of these assumptions overlap those about the facility):

- The following three transportation scenarios are considered:
  - **Truck Scenario 1**: Full truck shipments.
  - **Truck Scenario 2**: Truck shipments are at 50 percent capacity (doubling the number of truck shipments) from reclamation and recycling (R&R) facilities, gold mines, and the Port of New York, but full truck loads from Y–12 and chlor-alkali facilities; Truck Scenario 2 also accommodates the possibility that there may be shipments of pallets containing less than 49 flasks.
  - **Railcar Scenario**: Shipments by full railcars.
  - No transportation scenarios other than by rail or truck are considered.
- All mercury from Y–12 would be transported in 3-liter (3-L) (0.8-gallon) (34.6-kilogram [76-pound]) flasks. Mercury from chlor-alkali facilities would be transported in 1-metric-ton (1-MT) containers. The overall proportion of mercury in 1-MT containers to that in 3-L flasks would be 60:40 (DOE 2009). Mercury from mining or R&R facilities in the United States could be transported in either 3-L flasks or 1-MT containers. Mercury from mining in Peru would be transported in 3-L flasks (Brooks et al. 2007).
- Packaging of the mercury at the point of origin, transportation to the R&R facilities or to a U.S. port, any processing and repackaging at the R&R facilities, and subsequent loading onto trucks or railcars are not analyzed in this *Mercury Storage SEIS* on the grounds that all of these activities would be carried out anyway, irrespective of the final disposition of the elemental mercury. Elemental mercury would be transported either by road or rail. No other mode of transportation would be considered.
- Y–12 shipments would occur in the first 2 years of operations. Chlor-alkali shipments would be spread across the first 7 years of operations. R&R shipments would be spread across the entire 40 years of operations.[4] Shipments from Peru would be imported through the Port of New York and would also be spread across 40 years. For the purposes of analysis, it is assumed that all mercury from mining in the United States would be shipped from Carlin, Nevada, also over a period of 40 years. Carlin is located near most of the major gold mines in northern Nevada; the state generates approximately 80 percent of U.S.-mined gold.
- As stated above, mercury from Y–12 would be shipped to the DOE storage facility in 3-L (0.8-gallon) flasks containing 34.6 kilograms (76 pounds) of elemental mercury. In total, 1,208,000 kilograms in 34,906 flasks would be shipped.
- As noted above, each flask would contain 34.6 kilograms (76 pounds) of elemental mercury. In addition, the total mass of the empty flask could vary with flask type. The *Interim Guidance*, for example, lists flasks varying in weight from 3.4 to 6.3 kilograms (7.5 to 13.9 pounds). For the purposes of this analysis, container type T-13, with a mass of 4.1 kilograms (9.0 pounds), is taken to be representative. Therefore, the weight of a loaded flask would be 34.6 + 4.1, or

[4] The results of the risk analysis are not sensitive to the precise details of the temporal distribution of shipments. The analysis makes use of the annual average over 40 years only.

38.7 kilograms (about 85 pounds). For a discussion of the sensitivity of the analysis to this assumption, see Appendix D, Section D.6.1.3, of the January 2011 *Mercury Storage EIS*.

- Flasks would be transported in box pallets that each contains an array of 7 × 7 flasks. The dimensions of each pallet would be 1.44 by 1.44 meters (56 by 56 inches) (DOE 2009). One pallet would contain 34.6 × 49, or 1,695 kilograms (approximately 3,738 pounds), of elemental mercury. The total mass of the loaded flasks in a pallet would be 38.7 kilograms per flask × 49 flasks, or 1,896 kilograms (approximately 4,181 pounds). The mass of the pallet and a spill tray must be added to this figure. It is assumed that these would add 100 kilograms (about 220 pounds) to the weight of the flasks, so the total weight of a loaded pallet would be 1,996 kilograms, rounded up to 2,000 kilograms (4,400 pounds) or 2 metric tons (2.2 tons).

- A 1-MT container should not weigh more than 1,250 kilograms (2,750 pounds) when loaded with 1,100 kilograms (2,400 pounds) of mercury (DOE 2009). Therefore, when loaded with 1 metric ton (about 1.1 tons) (about 1,000 kilograms [2,200 pounds]), it should not weigh more than 1,160 kilograms (2,550 pounds). During transportation, it would be sitting in a spill tray that can contain the full 1 metric ton of mercury; this tray would be approximately 10 centimeters (4 inches) less than the height of the container so that a forklift would be able to remove the 1-MT container using the lifts on top of it. The approximate dimensions of such a container are 0.62 by 0.62 by 0.41 meters (24 by 24 by 16 inches). The assembly of 1-MT container, spill tray, and pallet is assumed to weigh 100 kilograms (about 220 pounds) more than the container itself, i.e., 1,260 kilograms (2,770 pounds).

- It is assumed that the capacity of a truck is 18,180 kilograms (40,000 pounds) (DLA 2004a: Section 2.3.1.1). Therefore, one truck could ship either (18,180 kilograms/ 2,000 kilograms per pallet) = 9.09 (rounded down to 9) pallets of 49 flasks or (18,180 kilograms/ 1,260 kilograms per 1-MT container) = 14.4 (rounded down to 14) 1-MT containers. The effective floor area of a truck is 2.4 meters (8 feet) wide by 15 meters (48 feet) long. A pallet's dimensions (1.44 by 1.44 meters [56 by 56 inches or 4.67 by 4.67 feet]) would allow a row of pallets 1 wide and 10 long to be loaded into the truck, which is more than the weight limit of 9 pallets. The total of 14 1-MT containers that the truck would accommodate is also limited by weight rather than by area.

- The capacity of a railcar is approximately 68 metric tons (75 tons) (DLA 2004b). Therefore, the railcar could, in principle, ship up to (68,000 kilograms/2,000 kilograms per pallet) = 34 pallets of 49 flasks. However, the Defense Logistics Agency's (DLA's) *Final Mercury Management Environmental Impact Statement* (DLA 2004a:Section 2.3.1.1) shows that the effective usable floor area is 3 meters (10 feet) wide by 18 meters (59 feet) long, sufficient to accommodate two rows, each row with 12 pallets of 49 flasks, i.e., 24 pallets. Therefore, the railcar is limited by area to 24 pallets of 49 flasks. The railcar can accommodate (68,000 kilograms/1,260 kilograms per 1-MT container) = 54 1-MT containers; in this case, the total is not limited by available space.

- It is assumed that 70 percent of R&R mercury would be shipped from the greater Philadelphia region (assuming geographic coordinates of Bethlehem Apparatus Company, Inc.) and 30 percent from the greater Chicago region (assuming geographic coordinates for D.F. Goldsmith Chemical and Metal Corporation) to a DOE facility. See Section D.1 of the January 2011 *Mercury Storage EIS* for an explanation of these percentages.

Table D–2 summarizes the amounts of mercury that would be transported from each of the locations listed in the assumptions above, with the corresponding total expected numbers of 7- by 7-pallets and 1-MT containers transported over 40 years.

Table D–2. Estimate of Amounts of Mercury to be Transported

Site	Years of Shipments[a]	Total Mass (metric tons)[b]	Number of Pallets[c]	Number of 1-Metric-Ton Containers[d]	Number of Trucks[e]	Number of Railcars[f]
Y–12 National Security Complex	1st – 2nd	1,206	713	0	80	30
Chlor-Alkali Facilities						
Ashta Chemical, Ashtabula, Ohio	1st – 7th	108	0	108	8	2
PPG, New Martinsville, West Virginia	1st – 7th	244	0	244	18	5
Olin, Charleston, Tennessee	1st – 7th	478	0	478	35	9
Olin, Augusta, Georgia	1st – 7th	271	0	271	20	6
Reclamation and Recycling Facilities, Mining, Shipments into Port of New York – Truck Scenario 1 (full truck shipments)						
Mining (Carlin, Nevada)	1st – 40th	3,687	526	2,798	259	74
Mining (via Port of New York)	1st – 40th	1,236	731	0	82	31
Philadelphia region (Bethlehem Apparatus)	1st – 40th	1,939	277	1,472	137	40
Chicago region (D.F. Goldsmith)	1st – 40th	831	119	631	60	17
Reclamation and Recycling Facilities, Mining, Shipments into Port of New York – Truck Scenario 2 (50 percent capacity truck shipments), Railcar Scenario (full rail car shipments)						
Mining (Carlin, Nevada)	1st – 40th	3,687	526	2,798	518	74
Mining (via Port of New York)	1st – 40th	1,236	731	0	164	31
Philadelphia region (Bethlehem Apparatus)	1st – 40th	1,939	277	1,472	274	40
Chicago region (D.F. Goldsmith)	1st – 40th	831	119	631	120	17

a For purposes of analysis, the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement* assumes a 40-year operational period with the first year starting in 2013 and the fortieth year, in 2052. An operational start date is not known at this time; however, the period of analysis remains 40 years. For example, if the mercury storage facility(ies) were to start operations in 2014, the last year of operations would likewise shift to 2053, and so forth.
b Average mass transported per year during the 40-year period of analysis: 250 metric tons.
c Average number of pallets shipped per year during the 40-year period of analysis: 59.
d Average number of 1-metric-ton containers shipped per year during the 40-year period of analysis: 150.
e Average number of trucks per year during the 40-year period of analysis: approximately 18 (Truck Scenario 1) or 31 (Truck Scenario 2).
f Average number of railcars per year during the 40-year period of analysis: approximately 5.
Note: To convert metric tons to tons, multiply by 1.1023.
Key: Bethlehem Apparatus=Bethlehem Apparatus Company, Inc.; D.F. Goldsmith=D.F. Goldsmith Chemical and Metal Corporation.

In general, the probability of a transportation accident or fatality during a specified operation (such as transportation from one site to another) is calculated by multiplying the number of miles traveled during the operation by a standard factor derived from empirical statistics, which is expressed in terms of the number of accidents per mile, the number of fatalities per mile, or the number of releases of hazardous material per mile. This transportation risk assessment considers a series of assumptions for three types of accidents:

- *Accidents that cause a spill of mercury that subsequently evaporates (no fire):* The frequency of such accidents is derived from the above-mentioned empirical factor of releases per mile.

- *Accidents that cause a major fire that is sufficient to evaporate some of the mercury:* The frequency of such accidents is derived from the above-mentioned empirical factor of accidents per mile, multiplied by the probability that, given an accident, a major fire would occur.

- *Accidents that cause fatalities due to mechanical impact (i.e., accidents that are unrelated to the fact that the cargo is mercury)*: The predicted frequency of such accidents is derived from the above-mentioned empirical factor of fatalities per mile.

To calculate the frequency of occurrence of transportation accidents, certain input data are required. The input data include the definition of the transportation route, the estimation of the number of miles traveled, and the empirical accident factors and conditional probabilities discussed above.

The basic probabilities applied in the transportation risk analysis for accident, fatality, and release rates for truck and rail were calculated using data obtained from the U.S. Department of Transportation Federal Motor Carrier Safety Administration and the Federal Railroad Administration, respectively. Both the truck and rail data are from the years 2004 to 2007. The rates calculated for rail are in terms of railcar miles. The conditional probability of a fire, given a truck accident, is less than 1 percent, and given a rail accident, is 1 percent; therefore, the bounding conditional probability for both of these cases is assumed to be 1 percent (Fischer et al. 1987). Table D–3 summarizes the basic probabilities used in the transportation analysis.

Table D–3. Basic Probabilities Used in the Transportation Risk Analysis

Description	Value
Truck accident with no mercury spill and no fire	6.5×10^{-7} per truck mile
Truck accident with mercury spill (no fire)	8.5×10^{-8} per truck mile
Probability of fire after truck accident	0.01[a]
Truck accident with fire and release of mercury	6.5×10^{-9} per truck mile
Truck accident with mechanically induced fatality (no fire)	2.3×10^{-8} per truck mile
Rail accident with no mercury spill and no fire	2.6×10^{-7} per railcar mile
Rail accident with mercury spill (no fire)	1.2×10^{-9} per railcar mile
Probability of fire after rail accident	0.01
Rail accident with fire and release of mercury	2.6×10^{-9} per railcar mile
Rail accident with mechanically induced fatality	1.6×10^{-8} per railcar mile

[a] To obtain the probability per mile of a mercury spill with fire, this factor of 0.01 is applied to the probability per mile of a truck accident with no mercury spill and no fire, not to the probability per mile of a truck accident with mercury spill (no fire). This is likely conservative.

Source: Fischer et al. 1987; FMCSA 2006:39, 2007, 2008:49, 2009a, 2009b; FRA 2009; Saricks and Tompkins 1999.

D.2.3 Assumptions About the Mercury Storage Facility

If one of the WIPP Vicinity reference locations is the chosen site, a new storage facility will be built on one of three plots, as described in Chapter 2, Section 2.3, and shown in Figures 2–6 and 2–7.

The Mercury Export Ban Act of 2008 does not indicate specific features required for the storage facility (or facilities) that would be used to store elemental mercury. Such buildings may be either newly constructed or existing structures. If one of the WIPP Vicinity reference locations is the chosen site, there will be new construction. However, the *Interim Guidance* (DOE 2009) establishes the basic requirements for safe storage of mercury, including preliminary design elements of a suitable new facility.

The analysis in this *Mercury Storage SEIS* assumes that such a facility would be constructed or modified so as to be consistent with the *Interim Guidance*, which envisages that a storage facility would consist of the following four areas (not necessarily all in the same building):

- Receiving and Shipping Area—this physical area would include dedicated space(s) for the receipt, inspection, acceptance, handling, and shipment of containers.

- Handling Area—this physical area would include dedicated space(s) for work involving potential contamination, including (1) safely handling and cleaning palletized or individual flasks that have external mercury contamination and/or leaking mercury, (2) reflasking failed 3-L flasks identified during the inspections for acceptance, and (3) safely managing leaking 1-MT containers (see Section D.2.4 for a discussion of mercury containers). This area is needed for non-routine and emergency response activities in the event of leaking flasks and containers.

- Storage Area—this physical area would include dedicated space(s) for the storage and monitoring of mercury containers.

- Office Administration Area—this physical area would include dedicated space(s) for the storage and maintenance of records, waste acceptance criteria, accountability criteria, shipping papers, and databases.

The *Interim Guidance* further assumes that any DOE mercury storage facility (or facilities) would have the following characteristics:

- Resource Conservation and Recovery Act–regulated and –permitted to receive discarded elemental mercury generated in the United States

- Naturally ventilated (that is, not air conditioned)

- Adaptable to a modular design

- Operated for DOE by a contractor

The *Interim Guidance* also provides the following: (1) a conceptual scale view of the overall operational area needed for storage of up to 10,000 metric tons (11,000 tons) of elemental mercury, based on a rough assessment of a 60:40 percent breakdown by approximately 6,000 1-MT and 116,000 3-L flasks, respectively, with 3-L flasks on pallets and racks and (2) an estimate of up to 14,000 square meters (150,000 square feet) for a "comfortably-sized layout."

The storage facility would have features that would reduce the risk to the environment and maximize the efficiency of container inspection, including at least three boundaries between the mercury and the environment, including the following:

- *The container*: all containers accepted into the facility would meet DOE acceptance criteria to ensure structural integrity.

- *The spill containment tray* that is under all the containers (see Section D.2.4 for details). If a container fails, the mercury would be contained and should be quickly discovered and cleaned up.

- *The solid concrete floor*, which would be coated so as to be impermeable to mercury and water. Therefore, there is negligible risk that spillages inside the storage building would penetrate the floor and sink into the ground.

- *Perimeter curbing* or other building design features that would prevent spilled mercury from flowing out of the building.

Table D–4 summarizes the data used for new construction at the WIPP Vicinity reference locations.

Table D–4. Physical Data for a Mercury Storage Facility – New Construction

Parameter	New Facility
Facility footprint	205,536 square feet
Dimensions (length × width)	506 × 336 feet
Building height	20 feet
Number of buildings	1
Total storage space	146,496 square feet
Building construction	Structural steel frame on reinforced-concrete slab and sheet metal shell; epoxy-sealed floor.
Access/security	Manned security 24 hours per day, 7 days per week, with perimeter barbed-wire fence; remote interior and exterior surveillance.

Note: To convert square feet to square meters, multiply by 0.092903; feet to meters, by 0.3048.

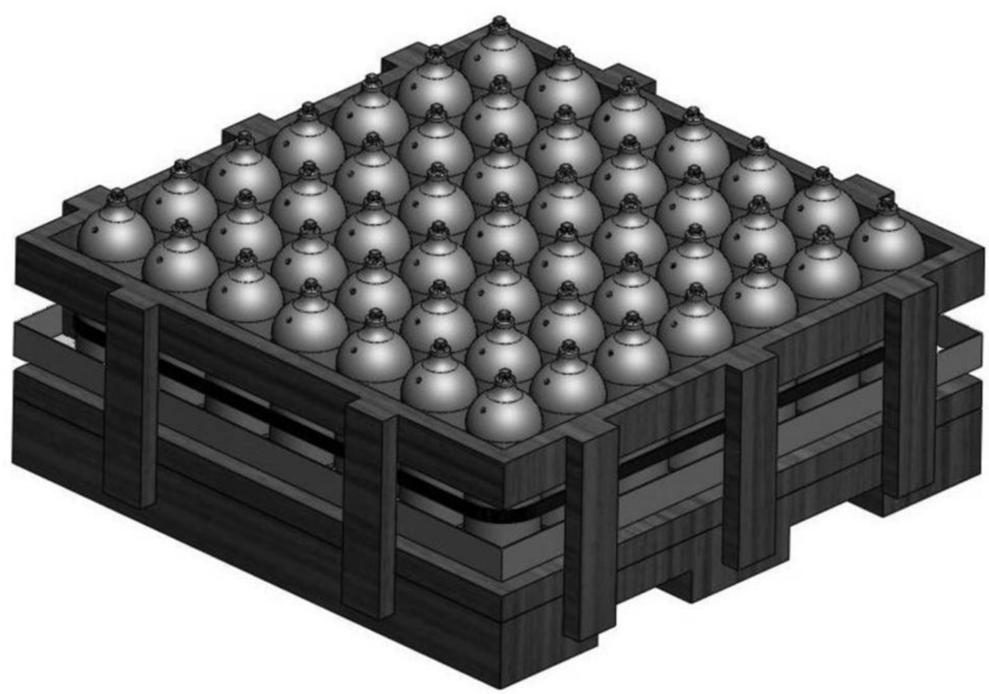
D.2.4 Assumptions About Mercury Containers

Upon arrival at the mercury storage facility(ies), a visual inspection would be performed to detect any obvious problems that may have occurred while on the truck or railcar. If the initial inspections and manifest documentation are acceptable, then the mercury would be moved to the Shipping and Receiving Area, where additional visual inspections would be performed to check for leaks, structural integrity of pallets and containers, approved container types, corrosion, etc. The mercury would then be moved to the Handling Area for any additional verification that it meets waste acceptance criteria (e.g., 99.5 percent purity). The containers and pallets that pass the acceptance/verification process would be placed into long-term storage and location data would be recorded. Mercury received into the storage facility would be in elemental form with a purity of 99.5 volume percent or greater. The mercury would be free of any radiological components. The remaining 0.5 percent content should not be capable of corroding carbon steel or stainless steel (elemental mercury has been proven not to corrode carbon steel or stainless steel) (DOE 2009).

The mercury is expected to arrive at the facility in either 3-L (0.8-gallon) (34.6-kilogram [76-pound]) or 1-MT (1.1-ton) containers. The following are assumptions about the storage containers:

- After the containers are accepted, they would be separated in the facility by size (3-L or 1-MT).
- The 3-L flasks would each contain 34.6 kilograms (76 pounds) of elemental mercury.
- Although the *Interim Guidance* discusses several different types of 3-L flasks, varying in empty mass between 3.4 and 6.3 kilograms (7.5 and 13.9 pounds), a representative mass of 4.1 kilograms (9.0 pounds) has been assumed for the present analysis. Appendix D, Section D.6.1.3, of the January 2011 *Mercury Storage EIS* provides a discussion of the sensitivity of the results to this assumption. If the heaviest flasks were used, estimated frequencies of crashes under Truck Scenario 1 would increase by about 12.5 percent (heavier pallets would mean fewer pallets per trip and therefore more truck trips). This increase means that there would be a slight non-conservatism in the calculations. However, since it is unlikely that all of the elemental mercury would be shipped in the heaviest flasks, this non-conservatism is not further investigated here. The effect on rail transportation would be much smaller and there would be no effect on Truck Scenario 2, in which the truck would be only half full.

- The 3-L flasks would be both transported and stored in box pallets that contain an array of 7 by 7 flasks, as shown in Figure D–1; the dimensions of each pallet would be 1.44 by 1.44 meters (56 by 56 inches).



Source: DOE 2009.

Figure D–1. 7- by 7-Array of 3-Liter Flasks

- The *Interim Guidance* states, "The 3-L containers are preferred to be sent in box pallets that comply with the following: …(4) the pallet may be constructed of painted steel, untreated hardwood with fire protective paint applied, treated hardwood, or other materials that have equivalent load capacity, fire resistance, degradation rate (e.g., expected life), and would not require disposal as hazardous waste." The case chosen for study in this *Mercury Storage SEIS* is use of wooden pallets because this case conservatively maximizes the amount of flammable material that would be available to vaporize elemental mercury in the event of a fire.

- The 7- by 7-pallets of 3-L flasks would stand in a metal spill tray capable of holding the contents of 10 percent (approximately five) of the flasks in the pallet.

- In the facility, the 3-L flasks in box pallets may be placed onto seismically rated storage racks and stacked two or three high. The height of the rack would not exceed 3.7 meters (12 feet). See Figure D–2.

- The racks would require a 3-degree slope toward the aisle to allow leaked mercury to flow toward the edge of the spill tray to assist in quickly locating failed flasks. The walls of the spill tray would be sufficiently high to contain the contents of five flasks at the indicated angle. The *Interim Guidance* states that overpacking the 3-L flasks into drums is not recommended for transportation or long-term storage.

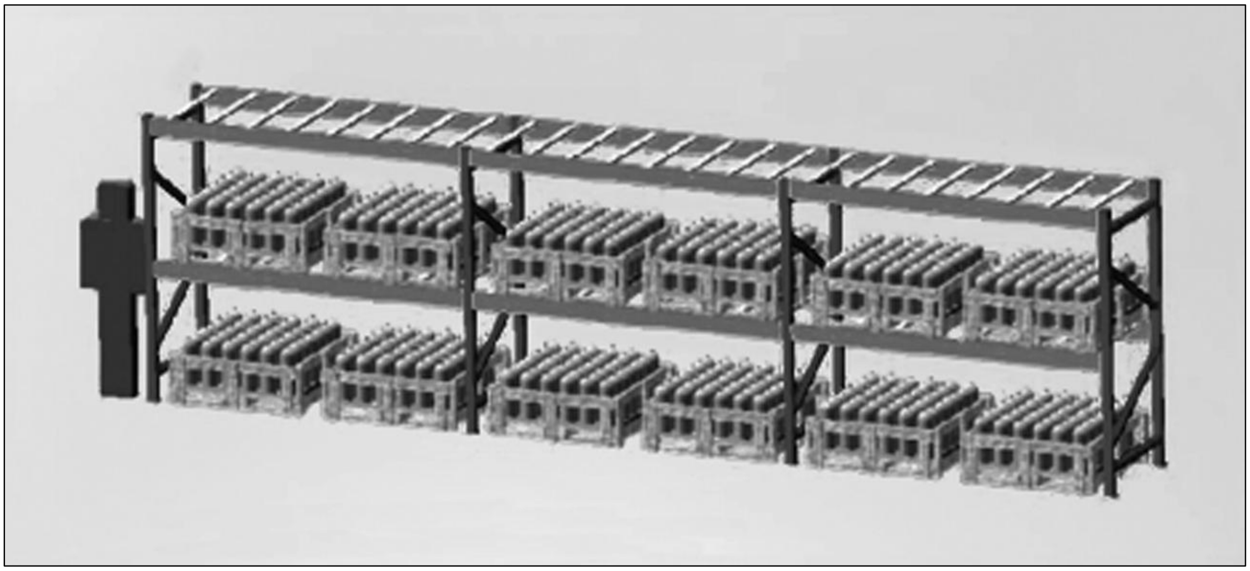
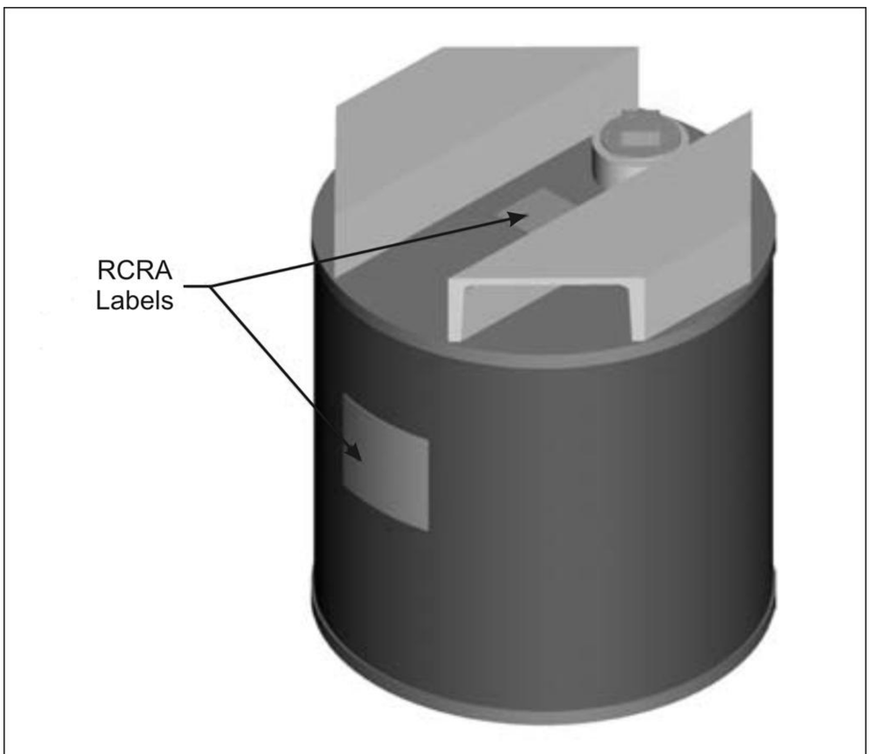


Figure D–2. 3-Liter Flasks in Box Pallets on a Seismically Rated Rack

- The 1-MT container should not be filled with more than approximately 1.1 metric tons (1.2 tons) (1,090 kilograms [2,400 pounds]) of liquid mercury and must provide a minimum head space of 15 percent after maximum fill. The gross weight of the full container should not exceed 1.25 metric tons (1.4 tons) (1,250 kilograms [2,750 pounds]). For the purposes of this analysis, it is assumed that each 1-MT container contains exactly 1 metric ton (about 1.1 tons) (about 1,000 kilograms [2,200 pounds]) of elemental mercury and weighs 1.16 metric tons (about 1.3 tons) (1,160 kilograms [2,550 pounds]). A typical 1-MT container with Resource Conservation and Recovery Act labeling is shown in Figure D–3.



Key: RCRA=Resource Conservation and Recovery Act.

Figure D–3. 1-Metric-Ton Container

- The 1-MT containers are expected to be sent on pallets, one container per pallet. The pallet should have a built-in spill tray capable of containing 1 metric ton of mercury. The spill tray side walls should be approximately 10 centimeters (4 inches) lower than the height of the container to allow for a forklift to remove the container.

- Upon arrival at the storage facility, the 1-MT containers would be removed from their pallets and set into spill trays on the floor of the facility.

- The 1-MT containers could be stored single or double stacked on the floor in spill trays; Figure D–4 shows a single-stack configuration with eight 1-MT containers. The spill tray would be designed to contain the full contents of one 1-MT container. The single-stack configuration was assumed for the purposes of analysis.

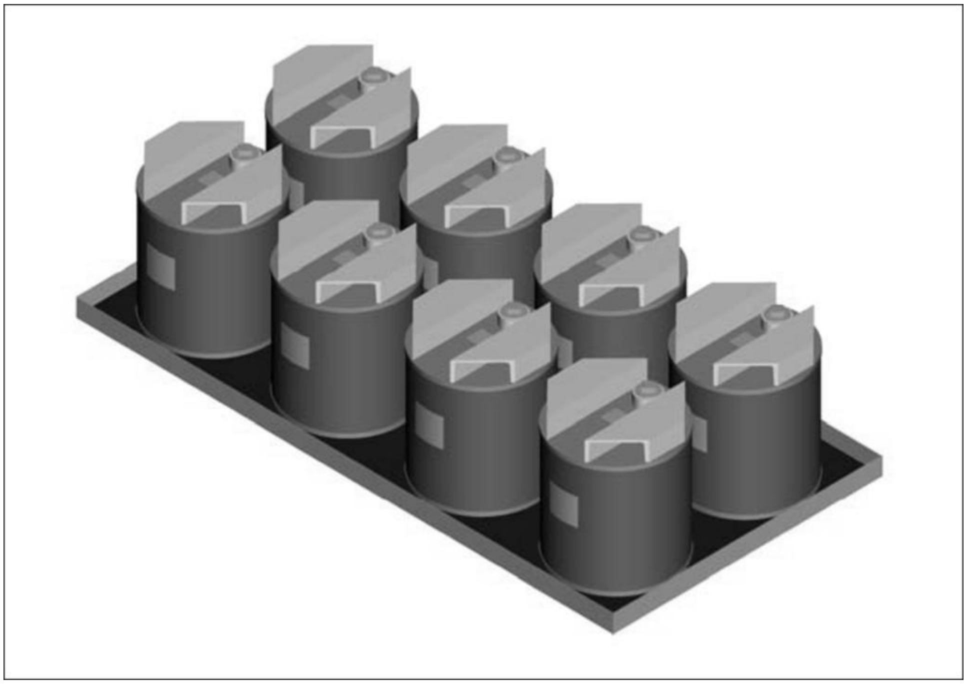


Figure D–4. 1-Metric-Ton Containers in a Spill Tray

D.3 OVERVIEW OF MERCURY TOXICITY AND RISK

The methodology and approach for conducting the risk analyses are described in Appendix D of the January 2011 *Mercury Storage EIS*, as updated in Appendices B and E of this SEIS.[5] The methodology and approach are summarized here for the convenience of the reader and augmented where appropriate with data specific to the WIPP Vicinity reference locations.

[5] Since publication of the January 2011 *Mercury Storage EIS*, DOE has published revised Protective Action Criteria for exposure to mercury vapor. This has resulted in changes to the definition of severity levels (i.e., magnitude of impacts) for assessing acute-inhalation exposures to the public under certain accident scenarios. Appendices B and E of this SEIS update parts of Chapter 4 and Appendix D of the January 2011 *Mercury Storage EIS*. The impact analyses for the WIPP Vicinity reference locations discussed in this SEIS have incorporated the revised criteria.

D.3.1 Toxic Effects of Mercury

This study considers three forms of mercury:[6] (a) elemental mercury, which is the form in which mercury would be stored and transported; (b) inorganic/divalent mercury,[7] which is the form into which elemental mercury can be converted if it is involved in a fire;[8] and (c) methylmercury, which can potentially be formed if elemental mercury or inorganic mercury becomes mixed with soil or sediment.[9] The U.S. Environmental Protection Agency (EPA) , in its *Mercury Study Report to Congress* (EPA 1997a, 1997b, 1997c), provides exhaustive descriptions of the potential effects of these forms of mercury on humans. Appendix D, Sections D.3.1 through D.3.3, of the January 2011 *Mercury Storage EIS* provide a summary of that information; a condensed version is presented below.

The principal route of exposure to elemental mercury is by inhalation. Once absorbed through the lungs, it is readily distributed throughout the body and may cause a range of adverse neurological effects at low exposure levels, such as (a) tremors; (b) emotional liability; (c) insomnia; (d) muscle weakness, twitching, and atrophy; (e) headaches; and (f) impairment of cognitive function. Elemental mercury may also result in adverse renal effects and pulmonary dysfunction.

In contrast to elemental mercury, ingestion of inorganic mercury salts with subsequent absorption through the gastrointestinal tract is an important route of exposure. Adverse effects of exposure to inorganic mercury include kidney disease, peripheral and motor neurotoxicity, and renal impairment.

Methylmercury is a highly toxic substance that is readily absorbed through the gastrointestinal tract. As is well known, the principal concern is ingestion of methylmercury in fish. Once in the body, it readily passes into the adult and fetal brain, where it accumulates and is subsequently converted to inorganic mercury. Consequently, the nervous system is considered to be the critical target organ system for methylmercury toxicity. The nervous system of developing organisms is considered of special concern.

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[6] The consequences of exposure to mercury depend on the form of mercury. See Appendix D, Section D.1.1.2, of the January 2011 *Mercury Storage EIS*, for further discussion. For a more-detailed primer on the forms of mercury, see GreenFacts (2004).

[7] Mercury can exist in three oxidation states (EPA 1997a:2-2): elemental (Hg^0), mercurous (Hg_2^{2+}), and mercuric (Hg^{2+}). Mercurous compounds are unstable in the environment. In this SEIS, Hg^{2+} is referred to interchangeably as “inorganic” or “divalent” mercury; both terms are shorthand for inorganic mercury compounds. See Appendix D, Section D.1.1.2, of the January 2011 *Mercury Storage EIS* for further discussion.

[8] The potential formation of divalent mercury in a fire is extremely important for the assessment of risk in this SEIS. Elemental mercury (i.e., the form in which the mercury would be stored) has a very small dry deposition velocity and is only slightly affected by precipitation scavenging (i.e., washout by rain or snow). However, divalent mercury has a significant dry deposition velocity and is quite effectively removed by precipitation. Therefore, the only scenarios in this SEIS that lead to deposition on the ground from a vapor cloud are the fire scenarios. See Appendix D, Section D.7.3.3, of the January 2011 *Mercury Storage EIS* for further discussion.

[9] Methylmercury is used as a surrogate for all organomercuric compounds, as is the case in the U.S. Environmental Protection Agency’s *Mercury Study Report to Congress* (EPA 1997b). See Appendix D, Section D.1.1.2, of the January 2011 *Mercury Storage EIS* for further discussion.

Human Receptors

The purpose of the human health analysis in this SEIS is to assess the risk of exposure of various human receptors to levels of mercury in its various forms that could cause health effects, as described in the foregoing paragraphs. Three human receptors are considered:

- Involved workers – those inside the storage building or working on unloading mercury trucks or railcars
- Noninvolved workers – those nearby but still on site
- Members of the public/public receptors

Assessment of Risk

Risk under any specific accident scenario is generally expressed as a function of two quantities: the predicted frequency of occurrence of the scenario and the predicted severity of the consequences. For the purposes of this analysis, the matrix shown in Figure D–5 was used to assess the magnitude of the risk.

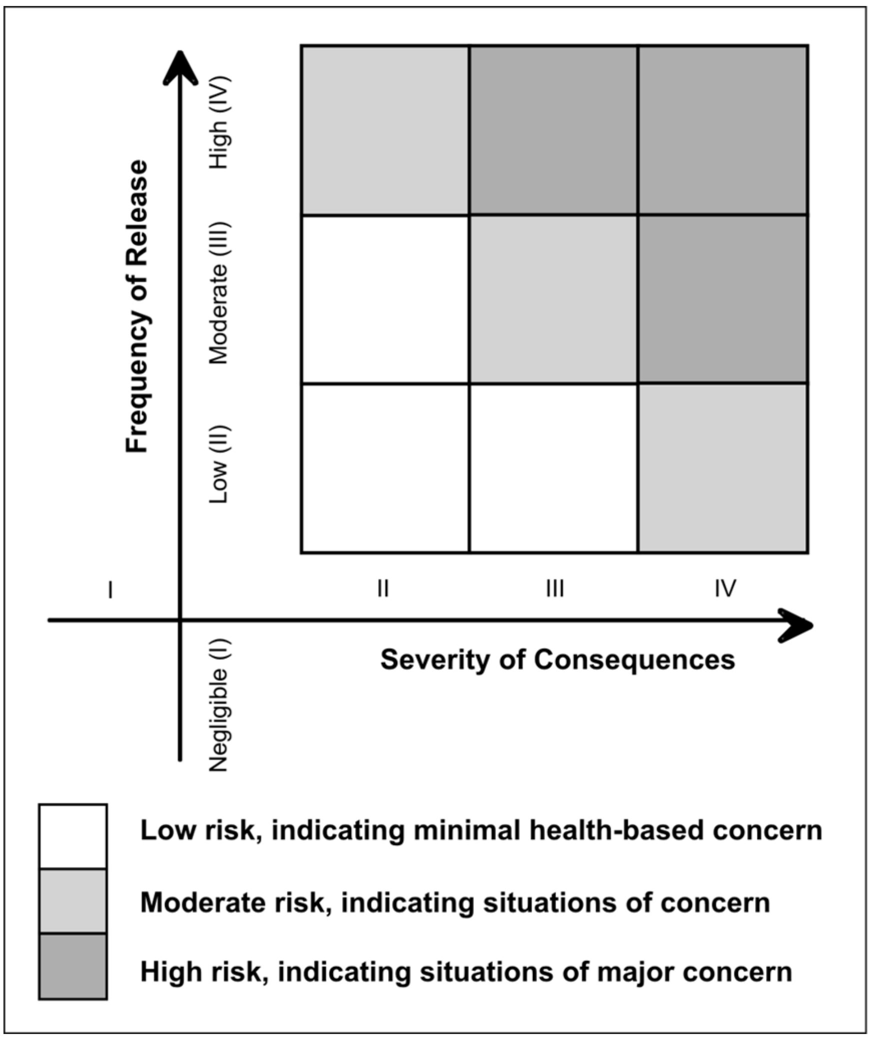

Figure D–5. Risk (Frequency and Consequence) Ranking Matrix

The derivation of the frequencies (*f*) of the scenarios that were considered for this risk assessment is provided in Appendix D, Section D.1.1.1, of the January 2011 *Mercury Storage EIS*. The predicted frequencies are then assigned to one of four bands:

- Frequency Level (FL)-IV (high) – more than or equal to once in 100 years ($f \geq 10^{-2}$ per year)
- FL-III (moderate) – less than once in 100 years to once in 10,000 years (10^{-2} per year $> f \geq 10^{-4}$ per year)
- FL-II (low) – less than once in 10,000 years to once in 1 million years (10^{-4} per year $> f \geq 10^{-6}$ per year)
- FL-I (negligible) – less than once in 1 million years ($f < 10^{-6}$ per year)

The form of the risk matrix and the definition of the FLs are consistent with guidance provided by DOE (DOE Standard 3009-94) in its *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*.

The definition of Severity Levels (SLs) I through IV for human receptors is described in detail in Appendix D, Section D.1.1, of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this *Mercury Storage SEIS*). It is necessary to assign these levels for several cases: (a) acute-inhalation exposures to the public, (b) acute-inhalation exposures to workers, (c) chronic-inhalation exposures to the public and workers, (d) exposures to mercury deposited on the ground, and (e) consumption of methylmercury in fish. How these SLs are assigned is discussed in Section D.1.1.2 of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this *Mercury Storage SEIS*).

The assignment of ***SLs for acute inhalation*** (i.e., inhalation of elemental mercury or inorganic mercury) is discussed in detail in Sections D.1.1.2.1 and D.1.1.2.3 of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this *Mercury Storage SEIS*). The SLs are related to EPA's Acute Exposure Guideline Levels (AEGLs), DOE's Protective Action Criteria (PACs) and Temporary Emergency Exposure Limits (TEELs), and the American Conference of Governmental Industrial Hygienists' (ACGIH's) threshold limit values, as summarized in Table D–5.

Table D–5. Definition of Consequence Severity Bands for Acute Inhalation of Elemental Mercury and Inorganic Mercury – Public Receptors[a]

Acute-Inhalation Consequence Severity Level	Corresponding Airborne Concentrations of Elemental Mercury	Expected Health Effects
Inhalation Severity Level IV	≥ AEGL-3 (see Table D–6)	Potential for lethality as concentration increases above AEGL-3
Inhalation Severity Level III	< AEGL-3 and ≥ AEGL-2 (see Table D–6)	Potential for severe, sublethal, irreversible health effects
Inhalation Severity Level II	< AEGL-2 and (a) ≥ PAC-1 ($t_d \leq 1$ hour) (b) ≥ ACGIH TLV 8-hour TWA ($t_d > 1$ hour)	Potential for transient health effects, reversible on cessation of exposure
Inhalation Severity Level I	(a) < PAC-1 ($t_d \leq 1$ hour) (b) < ACGIH TLV 8-hour TWA ($t_d > 1$ hour)	Negligible-to-very-low consequences

[a] Exposure period up to 8 hours.

[b] PAC-1=0.15 mg/m³ (DOE 2012); ACGIH-0=0.025 mg/m³ (OSHA 2012).

Key: ≥ =greater than or equal to; <=less than; ACGIH=American Conference of Governmental Industrial Hygienists; AEGL=Acute Exposure Guideline Level; mg/m³=milligrams per cubic meter; PAC=Protective Action Criterion; t_d=duration of exposure; TLV=threshold limit value; TWA=time-weighted average.

As described below, there are three AEGLs. They represent threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. It is believed that the recommended exposure levels protect the general population, including infants and children and other individuals who may be susceptible. However, although the AEGL values represent threshold levels for the general public, it is recognized that individuals, subject to unique or idiosyncratic responses, could experience the effects described at concentrations below the corresponding AEGL. The three AEGLs have been defined as follows:

AEGL-1 is the airborne concentration above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL-2 is the airborne concentration above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL-3 is the airborne concentration above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Airborne concentrations below AEGL-1 represent exposure levels that can produce mild and progressively increasing but transient and nondisabling odor, taste, and sensory irritation or certain asymptomatic, nonsensory effects.

EPA's proposed AEGLs for elemental mercury are shown in Table D–6.

Table D–6. Proposed EPA Values for Mercury Vapor AEGLs

Exposure	10 minutes	30 minutes	60 minutes	4 hours	8 hours
Guideline					
AEGL-1[a]	NR	NR	NR	NR	NR
AEGL-2	3.1 mg/m^3	2.1 mg/m^3	1.7 mg/m^3	0.67 mg/m^3	0.33 mg/m^3
AEGL-3	16 mg/m^3	11 mg/m^3	8.9 mg/m^3	2.2 mg/m^3	2.2 mg/m^3

a Table D–5 uses Protective Action Criterion 1 and the American Conference of Governmental Industrial Hygienists' threshold limit value for 8-hour time-weighted average as a surrogate AEGL-1. The reasons for doing so are described in Appendix B, Section B.2, of this SEIS. In short, EPA has yet to publish values for the AEGL-1 for elemental mercury.

Note: Reported values are in milligrams per cubic meter, not parts per million. AEGLs for durations of exposure other than those explicitly listed in this table are obtained by linear interpolation.

Key: AEGL=Acute Exposure Guideline Level; EPA=U.S. Environmental Protection Agency; mg/m^3=milligrams per cubic meter; NR=not recommended (due to insufficient data).

Source: EPA 2009a.

Note that AEGL-1 has not been defined for mercury. In such cases, DOE recommends the use of PACs, otherwise known as TEELs (DOE 2008). There are three levels of PACs and three levels of TEELs:

PAC-3/TEEL-3 is the airborne concentration (expressed as parts per million [ppm] or milligrams per cubic meter) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

PAC-2/TEEL-2 is the airborne concentration (expressed as ppm or milligrams per cubic meter) of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting, adverse health effects or an impaired ability to escape.

PAC-1/TEEL-1 is the airborne concentration (expressed as ppm or milligrams per cubic meter) of a substance above which it is predicted that the general population, including susceptible individuals, could experience discomfort, irritation, or certain asymptomatic, nonsensory effects. However, these effects are not disabling and are transient and reversible upon cessation of exposure.

Each PAC or TEEL is assigned a single concentration for a single exposure time (1 hour). PACs or TEELs are intended to be used when AEGLs or their predecessors, Emergency Response Planning Guidelines (ERPGs), are not available. As discussed in Appendix B, it was judged that the following is conservative as a "surrogate AEGL-1:" the boundary between SL-II and SL-I is equal to the PAC-1 (TEEL-1) of 0.15 milligrams per cubic meter for durations of exposure up to 1 hour and equal to the ACGIH threshold limit value for an 8-hour time-weighted average of 0.025 milligrams per cubic meter for durations of exposure exceeding 1 hour. This latter assumption is highly conservative.

Appendix D, Section D.1.1.2.3, of the January 2011 *Mercury Storage EIS* also explains why Table D–5 applies to inorganic/divalent mercury as well as to elemental mercury. AEGLs and PACs/TEELs for methylmercury were not used in this study because the accident scenarios considered are such that they can only lead to inhalation of elemental mercury or inorganic mercury. Methylmercury can only be formed after deposition of the inorganic mercury on the ground or on water and mixing with soil or sediment.

One important consideration is that the AEGLs are intended for one-time exposures only. Therefore, it is necessary to consider the possibility that these levels would not be protective if the same individual were exposed twice. Appendix D, Section D.4.6, of the January 2011 *Mercury Storage EIS* (as updated in Appendix E, Section E.2, of this *Mercury Storage SEIS*) shows that, even with conservative assumptions, the acute-inhalation risks from exposure to two accidental spills of mercury over the period of 40 years assumed for this analysis would be negligible, even taking into account the revised PAC-1 of 0.15 milligrams per cubic meter; this issue is not discussed further in this SEIS.

For workers, the National Institute for Occupational Safety and Health has published a benchmark for acute exposures that are immediately dangerous to life or health (IDLH) (CDC 2009). For mercury, this is 10 milligrams per cubic meter (see Appendix D, Table D–19, of the January 2011 *Mercury Storage EIS*). The IDLH represents the maximum concentration of a substance in air from which healthy workers can escape without loss of life or irreversible health effects under conditions of a maximum 30-minute exposure time.

In principle, it would be possible to develop an SL scheme, tied to the IDLH, similar to that in Table D–5. Unfortunately, there are no IDLH equivalents of the three AEGLs. However, the IDLH approximately equals AEGL-3 for a 30-minute exposure (11 milligrams per cubic meter; see Table D–6). It therefore seems reasonable to adopt the same acute-inhalation SLs for workers as for members of the public. One could make a case that this is conservative because workers are generally expected to be healthy while the AEGLs are crafted to include susceptible members of the public. Therefore, Table D–5 applies to workers as well as to the public.

For ***chronic-inhalation exposures to humans inside a building***, it is assumed that, during normal operations, involved workers would never be exposed to airborne concentrations of mercury vapor above the ACGIH's time-weighted average/threshold limit value (TWA/TLV) of 0.025 milligrams per cubic meter of mercury vapor (OSHA 2012). Referring to Figure D–5, this defines the threshold between SL-I and SL-II. The analysis performed for this SEIS shows that involved worker exposures would always be below this threshold, assuming a combination of ventilation, inspection, monitoring, and use of personal protective equipment, as recommended by the *Interim Guidance* (DOE 2009). Therefore, there is no need to define the thresholds for SL-III and SL-IV.

In addition, measurements taken at facilities in which the DLA has stored mercury for many decades show that, under the storage conditions expected at the candidate sites, mercury vapor concentrations inside the building would not exceed the TWA/TLV. Appendix D, Section D.4.1.1, of the January 2011 *Mercury Storage EIS* reports on mercury vapor concentrations observed over several months in 2001 and 2002 in mercury storage warehouses at the DLA's Somerville Depot (Shim, Hsieh, and Watts 2002). The only occasions on which concentrations above 0.025 milligrams per cubic meter were encountered occurred during overpacking of flasks in drums, which is not expected during the 40-year period of analysis of the proposed new storage building. In addition, the measurements showed that many of the higher observed levels arose from residual contamination of the floor, which would not be the case in a new storage facility. In addition, once the mercury had been overpacked and placed in a warehouse that had not previously been used for storage, the average mercury vapor concentration[10] taken over various periods from 2 days to a week was 0.00012 milligrams per cubic meter, with a peak of 0.00032 milligrams per cubic meter.

For ***chronic-inhalation exposures to humans outside buildings***, EPA has published a reference concentration (RfC) of 0.0003 milligrams per cubic meter (EPA 2002). The consequences of exposures below this level are negligible, so, in terms of the SLs in Figure D–5, the RfC marks the boundary between SL-I and SL-II. The analysis performed for this SEIS shows that all chronic-inhalation exposure scenarios lead to predicted airborne exposures to both the noninvolved worker and the general public in the SL-I range. Therefore, there is no need to define thresholds for SL-III and SL-IV.

Appendix D, Section D.4.1.2, of the January 2011 *Mercury Storage EIS* reviews observed concentrations near DLA mercury storage warehouses (Shim, Hsieh, and Watts 2002) and confirms that these observations are consistent with the prediction that long-term exposure to elemental mercury vapor during normal operations is well below EPA's RfC of 3.0×10^{-4} milligrams per cubic meter.

Appendix D, Section D.1.1.2.6, of the January 2011 *Mercury Storage EIS* discusses a value for the level of ***deposited mercury*** that can be used to define the boundary between SL-I and SL-II based on an extensively studied real-life case, that of the remediation of East Fork Poplar Creek in Oak Ridge, Tennessee, and its floodplain (ATSDR 2009a, 2009b; ORNL 2009). Mercury was discharged into the creek from 1950 to 1963 as a result of operations involving separations of lithium isotopes at Y–12 in support of the hydrogen bomb project. Note that this discharge was not a result of elemental mercury storage at Y–12. The Agency for Toxic Substances and Disease Registry made a finding, based on mercuric chloride, that a cleanup level of 180 milligrams of mercury per kilogram of soil is protective of public health. This is based on a "worst-case" scenario involving young children who live close to East Fork Poplar Creek and play in the East Fork Poplar Creek floodplain. This scenario is considered the worst case because it involves the most sensitive population (young children) exposed to the most highly absorbable forms of inorganic mercury (mercuric chloride and elemental mercury). The most probable route of exposure to inorganic mercury would be swallowing dust and dirt.

Based on the foregoing case, it is judged that the boundary between SL-I (negligible-to-very-low consequences) and SL-II (onset of adverse consequences due to ingestion of inorganic mercury) is 180 milligrams per kilogram of inorganic mercury. Beyond that, no guidance has been found as to what level would cause irreversible health effects or fatalities. However, the analysis performed for this SEIS shows that there are no scenarios in which mercury would be deposited (either by dry or wet deposition) at levels above 180 milligrams per kilogram, so there is no need to define the thresholds for SL-III and SL-IV.

[10] The sampling times for the concentrations were either 30 seconds (Lumex monitor) or a few minutes (Tekran monitor), so the concentrations discussed above show that the 8-hour TWA was not exceeded.

One highly publicized concern is that of ***the accumulation of methylmercury in fish***, which would be subsequently consumed by humans. The EPA criterion for methylmercury in fish is 0.3 milligrams of methylmercury per kilogram of fish tissue, wet weight (EPA 2009b). This is the concentration in fish tissue that should not be exceeded based on a total fish and shellfish consumption-weighted rate of 0.0175 kilograms of fish per day (EPA 2001), which is essentially a national average. Consumption of methylmercury in amounts less than this criterion is expected to have negligible effects on human health. Therefore, the EPA criterion is taken to be the boundary between SL-I and SL-II for health effects resulting from the average American's consumption of fish.

There are certain individuals or communities that would consume more fish than 0.0175 kilograms per day. According to EPA (1997d), a subsistence fisherman would on average consume 0.059 kilograms per day, while the 95th percentile of fish consumption for subsistence fishermen is 0.170 kilograms per day (approximately 62 kilograms per year). These consumption amounts could be relevant, for example, to certain scenarios in which mercury is spilled near or within tribal reservations where fish is an important part of the diet. These higher consumption rates would require lower concentrations of 0.09 and 0.03 milligrams of methylmercury per kilogram of fish tissue, wet weight, for the respective boundaries between SL-I and SL-II.

No information is available that would provide a basis for a choice of boundaries between SL-II and SL-III and between SL-III and SL-IV.

The definitions of consequence SLs are summarized in Table D–7.

Table D–7. Summary of Definitions of Consequence Severity Levels

Severity Level	Acute-Inhalation Exposures – Involved and Noninvolved Workers and Public Receptors[a]		Chronic-Inhalation Exposures – Involved Workers[b]		Chronic-Inhalation Exposures – Noninvolved Workers and Public Receptors[b]		Exposure to Deposited Mercury – All Human Receptors		Exposure to Methylmercury Accumulated in Fish – All Human Receptors	
	Level Definition	Consequence	Level Definition	Consequence	Level Definition	Consequence	Level Definition	Consequence	Level Definition	Consequence
IV	≥ AEGL-3	Potential for lethality as concentration increases above AEGL-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
III	< AEGL-3 and ≥ AEGL-2	Potential for severe, sublethal, irreversible health effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
II	< AEGL-2 and ≥ PAC-1 (t_d ≤ 1 hour) or ≥ACGIH TLV 8-hour TWA (t_d > 1 hour)	Potential for reversible health effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
I	<PAC-1 (t_d ≤ 1 hour) or <ACGIH TLV 8-hour TWA (t_d > 1 hour)	Potential for negligible-to-very-low health consequences	< ACGIH's 8-hour TWA/TLV 0.025 mg/m^3	Negligible	< EPA RfC 0.0003 mg/m^3	Negligible	< ATSDR-approved cleanup level (180 mg/kg) for East Fork Poplar Creek	Negligible	Methyl-mercury limit in fish tissue (mg/kg) < 0.3 <0.09 <0.03	Negligible National average Average, subsistence fisherman 95th percentile, subsistence fisherman

[a] Applies to both elemental mercury vapor and inorganic mercury.

[b] Elemental mercury vapor inhalation.

Key: ≥ =greater than or equal to; < =less than; ≤ =less than or equal to; ACGIH=American Conference of Governmental Industrial Hygienists; AEGL=Acute Exposure Guideline Level; ATSDR=Agency for Toxic Substances and Disease Registry; EPA=U.S. Environmental Protection Agency; mg/kg=milligrams per kilogram; mg/m^3=milligrams per cubic meter; N/A=not applicable; PAC=Protective Action Criterion; RfC=reference concentration; t_d=duration of exposure; TLV=threshold limit value; TWA=time-weighted average.

D.3.2 Factors Strongly Influencing the Risks Associated with the Proposed Action

There are a number of reasons for expecting the risks associated with the transport and storage of elemental mercury to be low; these are described below.

Elemental mercury has been stored and transported safely for many years. There is a long history of mercury storage at sites holding the Defense National Stockpile Center (DNSC) inventory. Up until February 2012, 4,436 metric tons (4,890 tons) were safely stored at three depots: New Haven, Indiana; Somerville, New Jersey; and Warren, Ohio. Formerly, 699 metric tons (770 tons) of this inventory was held at Y–12, but this portion was moved to Warren in early 2005 (BWXTymes 2005). DLA completed the successful transfer of all 4,436 metric tons (4,890 tons) of defense-related elemental mercury to Hawthorne Army Depot, in Hawthorne, Nevada, for long-term management and storage; the last shipment was completed in February 2012 (DLA 2012).

In the course of preparation of the DLA *Final Mercury Management Environmental Impact Statement* (DLA 2004a, 2004b), information was gathered from site visits, phone calls, and various documents. The inspection reports for the mercury storage areas were reviewed for information about past releases of mercury. No mercury has reportedly escaped from any of the warehouses, and there is no known member of the public that has been affected at any of the existing storage locations. Decades of experience in maintaining the stockpile of mercury indicate that spills of mercury resulting in environmental contamination have not occurred, and that that normal (accident-free) operating conditions can be maintained at the storage facilities. The storage facilities are built to ensure containment of the mercury under most conditions. Spilled mercury is not known to overrun the spill trays (that can hold the contents of several flasks) or containment berms or penetrate the concrete floors and reach any surface-water or groundwater sources before cleanup.

In addition, Oak Ridge National Laboratory examined 3-L flasks removed from the DNSC inventory (DOE 2009). It is known that mercury does not react with steel containers at ambient temperatures; this was confirmed by metallurgical analysis of 3-L flasks from the DNSC inventory. Thus, containers in static storage in a well-maintained facility should have a long lifetime.

The vapor pressure of mercury at typical ambient temperatures is very low. As noted in Appendix D, Section D.7.1.3, of the January 2011 *Mercury Storage EIS*, the assumed temperature of any spillage of elemental mercury is 20 degrees Celsius (°C) (68 degrees Fahrenheit [°F] or 293 Kelvin). At that temperature, its saturated vapor density is only 14 milligrams per cubic meter.[11] This is equivalent to a release of pure elemental mercury vapor that has already been diluted by five orders of magnitude (i.e., mixed with 100,000 times its mass of air). Hence, a relatively small amount of additional dilution is required to bring the concentration down to the benchmarks such as the 30-minute AEGL-3 of 11 milligrams per cubic meter or the 60-minute AEGL-2 of 1.7 milligrams per cubic meter. It is for this reason that the human health risks predicted under all scenarios involving the evaporation of a spill of elemental mercury are in the negligible-to-low range at all sites.

For releases of elemental mercury vapor, the dry deposition velocity and the scavenging rate[12] are essentially zero. It is only during fire scenarios that elemental mercury is converted into forms that have non-zero dry deposition velocities or scavenging rates (see Appendix D, Section D.7.3.3, of the January 2011 *Mercury Storage EIS*). Therefore, for spills of elemental mercury with no accompanying

[11] Even at a conservatively high temperature of 40 °C (104 °F or 313 Kelvin), the saturated vapor pressure is only 65.9 milligrams per cubic meter, still approximately five orders of magnitude more dilute than a pure release of elemental mercury vapor.

[12] The scavenging rate is a measure of how rapidly rainfall can remove mercury from a plume. It is defined and discussed in Appendix D, Section D.7.3.3, of the January 2011 *Mercury Storage EIS*.

fires, there is no need to be concerned about any pathways that result from deposition onto the ground or into water bodies from airborne plumes.

For releases of elemental mercury vapor leaking from the storage building or accidentally released nearby, there is substantial dilution in the building wake.[13] New construction such as that envisaged at the WIPP Vicinity reference locations is sufficiently large that mixing in the turbulent building wake would dilute the elemental mercury concentrations to levels well below PAC-1/TEEL-0 (see Appendix D, Section D.7.2.1, of the January 2011 *Mercury Storage EIS*).

For fires accompanied by a spill of mercury, substantial plume rise is always predicted. This means that there is considerable initial dilution as the plume rises. Therefore, predicted close-in airborne concentrations and deposited levels of mercury under the plume are very low, and the peaks occur at various distances downwind that depend on the specific weather conditions, by which time considerable dilution in addition to that caused by plume rise dilution has already taken place.

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[13] The building wake is a volume of highly turbulent air immediately downwind of the building. Any release of mercury vapor from or adjacent to the building would be thoroughly mixed into this wake and extensively diluted before traveling downwind. Appendix D, Section D.7.2.1, of the January 2011 *Mercury Storage EIS* describes how to calculate concentrations in the wake.

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APPENDIX E
UPDATES TO THE
JANUARY 2011 *MERCURY STORAGE EIS*

APPENDIX E
UPDATES TO THE JANUARY 2011 *MERCURY STORAGE EIS*

> This appendix updates the occupational and public health and safety, socioeconomics, and environmental justice data and analysis presented in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*. The data and analysis for occupational and public health and safety presented in the January 2011 *Mercury Storage EIS* were based on Protective Action Criteria that have been revised. The data and analysis for socioeconomics and environmental justice presented in the January 2011 *Mercury Storage EIS* in Chapter 3, "Affected Environment," and Chapter 4, "Environmental Consequences," were based on 2000 census data, whereas the data and analysis presented in this appendix are based on 2010 census data. These updates are provided to ensure an appropriate comparison between the seven candidate sites evaluated in the January 2011 *Mercury Storage EIS* and the three additional candidate sites evaluated in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*. Environmental documentation that has become available since publication of the January 2011 *Mercury Storage EIS* has been reviewed, and no other changes to the affected environment as presented in the January 2011 *Mercury Storage EIS* were found to be necessary. Therefore, the environmental impact analyses for all other resource areas at the seven candidate sites evaluated in the January 2011 *Mercury Storage EIS*, as well as the No Action Alternative, remain unchanged.

E.1 INTRODUCTION

This appendix updates data and analysis on occupational and public health and safety, socioeconomics, and environmental justice associated with implementation of each of the alternatives considered in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*. As presented in Chapter 1 of this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)*, the U.S. Department of Energy's (DOE's) proposed action is to select a suitable location for the long-term management and storage of elemental mercury generated in the United States. The seven candidate sites evaluated in the January 2011 *Mercury Storage EIS* as alternatives for long-term mercury[1] storage are as follows: Grand Junction Disposal Site (GJDS), Hanford Site (Hanford), Hawthorne Army Depot, Idaho National Laboratory (INL), Kansas City Plant (KCP), Savannah River Site (SRS), and Waste Control Specialists, LLC, site (WCS). Additionally, the Y–12 National Security Complex (Y–12) at the Oak Ridge Reservation is evaluated as a No Action Alternative. Section E.2 of this appendix updates the occupational and public health and safety analysis for the candidate sites in the January 2011 *Mercury Storage EIS*. Section E.3 of this appendix updates the socioeconomic and environmental justice analysis for the candidate sites in the January 2011 *Mercury Storage EIS*. Section E.4 of this appendix lists the available environmental documentation that has been reviewed to ascertain that no changes have occurred to other resource areas at the candidate sites since the January 2011 *Mercury Storage EIS* was published that would necessitate additional updates to the affected environment descriptions or analyses.

E.2 UPDATES TO OCCUPATIONAL AND PUBLIC HEALTH AND SAFETY ANALYSIS

The updated occupational and public health and safety analysis in this appendix supersedes parts of the analysis in the January 2011 *Mercury Storage EIS*. As discussed in Appendix B, Section B.2, of this SEIS, the definition of severity levels (SLs) (i.e., magnitude of impacts) for assessing acute-inhalation exposures to the public under certain accident scenarios has changed; however, the methodology and approach to conducting occupational and public health and safety analysis remain otherwise unchanged and are described in Appendix D of the January 2011 *Mercury Storage EIS.*

[1] Unless the context indicates otherwise, elemental mercury is referred to hereafter simply as "mercury" in this supplemental environmental impact statement.

The environmental consequences for the Waste Isolation Pilot Plant (WIPP) Vicinity reference locations for occupational and public health and safety incorporate the changes to the definition of SLs and are presented in this SEIS in Chapter 4, Section 4.2.9.

Changes to occupational and public health and safety analyses associated with the candidate sites in the January 2011 *Mercury Storage EIS* are as follows: (1) references to the Protective Action Criterion 1 (PAC-1) value of 0.3 milligrams per cubic meter and Temporary Emergency Exposure Limit 0 (TEEL-0); (2) definition of SLs; (3) the earthquake with a building collapse; (4) transportation accidents without fire; (5) transportation accidents with fire; (6) multiple exposures; and (7) intentional destructive acts with fire. In summary, the revised PAC-1 value only affects the calculated distances to which SL-II may impact members of the public for exposures of 1 hour or less. The risks associated with all accident scenarios affected by the revised PAC-1 value, including those on site and during transportation and those with and without fire, remain unchanged for all of the candidate sites. Since the American Conference of Governmental Industrial Hygienists' (ACGIH's) threshold limit value (TLV) for an 8-hour time-weighted average (TWA) of 0.025 milligrams per cubic meter is the same as the value previously used as a surrogate value for TEEL-0, the impact analyses for exposures exceeding 1 hour also remain unchanged.

Updated tables and text for Chapter 4 and Appendix D of the January 2011 *Mercury Storage EIS* are as follows, with changes indicated in **bold type**.

References to PAC-1 and TEEL-0:

The PAC-1 value of "0.3 milligrams per cubic meter" is now **"0.15 milligrams per cubic meter"** and "TEEL-0" is now **"ACGIH TLV 8-hour TWA"** (value remains the same as 0.025 milligrams per cubic meter); the original text is found in Chapter 4 on page 4–10 and in Appendix D on pages D–10 and D–58 of the January 2011 *Mercury Storage EIS*.

Definition of Severity Levels:

Table E–1, below, updates Table 4–1 on page 4–9 and Table D–2 on page D–11 of the January 2011 *Mercury Storage EIS*.

Table E–1. Definition of Consequence Severity Bands for Acute Inhalation of Elemental Mercury, Public Receptors[a]

Acute-Inhalation Consequence Severity Level	Corresponding Airborne Concentrations of Elemental Mercury	Expected Health Effects
Inhalation Severity Level IV	≥ AEGL-3 (see Table D–5)	Potential for lethality as concentration increases above AEGL-3
Inhalation Severity Level III	< AEGL-3 and ≥ AEGL-2 (see Table D–5)	Potential for severe, sublethal, irreversible health effects
Inhalation Severity Level II	< AEGL-2 and (a) ≥ PAC-1[b] ($t_d \leq 1$ hour) (b) ≥ **ACGIH TLV 8-hour TWA**[b] ($t_d > 1$ hour)	Potential for transient health effects, reversible on cessation of exposure
Inhalation Severity Level I	(a) < PAC-1 ($t_d \leq 1$ hour) (b) < **ACGIH TLV 8-hour TWA** ($t_d > 1$ hour)	Negligible-to-very low consequences

a Exposure period up to 8 hours.

b **PAC-1 = 0.15 mg/m³(DOE 2012a); ACGIH TLV 8-hour TWA = 0.025 mg/m³ (OSHA 2012).**

Key: ≥=greater than or equal to; >=greater than; <=less than; ACGIH=American Conference of Governmental Industrial Hygienists; AEGL=Acute Exposure Guideline Level; mg/m³=milligrams per cubic meter; PAC=Protective Action Criterion; t_d=duration of exposure; TLV=threshold limit value; TWA=time-weighted average.

Earthquake with Building Collapse:

Updated text to revise that found in Appendix D, Section D.4.2.4, on page D–60 of the January 2011 *Mercury Storage EIS* is as follows, and Table E–2 updates Table D–27 on page D–61 of the January 2011 *Mercury Storage EIS*.

> *This calculation predicts that the maximum downwind distance from new construction to which a concentration could exceed SL-IV would be less than 100 meters (330 feet); SL-III could be exceeded to a distance of about 200 meters (660 feet); and SL-II could be exceeded to a distance of about **790 meters (2,600 feet)**. There are similar results for existing buildings. Distances for all sites are shown in Table D–27 (as updated by Table E–2).*

Table E–2. Distances to the Closest Site Boundary or Public Receptor Compared with Calculated Distances – Outdoor Earthquake Scenario

Site	Distance	Direction	Notes	Predicted Distance (meters)		
				SL-II	**SL-III**	**SL-IV**
GJDS[a]	30 meters	North and west	Fence line	**790**	200	<100
Nearest resident to GJDS 4 kilometers away.						
Hanford Site (200 Areas)[a]	3.5 km	West	Site boundary	**790**	200	<100
Hawthorne Army Depot[b]	3.7 km	Southwest	Site boundary	**1,010**	250	<100
INL (INTEC)[a]	13.4 km	South	Site boundary U.S. Routes 20 and 26	**790**	200	<100
INL (RWMC)[b]	5.8 km	South	Site boundary U.S. Routes 20 and 26	**860**	210	<100
KCP[c]	350 meters	South	Site boundary	**200**	<100	<100
Nearest resident to KCP 350 meters away.						
SRS (E Area)[a]	8 km	West	South Carolina Highway 125	**790**	200	<100
WCS[a]	67 meters	East	Fence line	**790**	200	<100
Nearest resident to WCS 5.4 kilometers away.						
Y–12[b]	360 meters	North	Fence line	**250**	<100	<100
Nearest resident to Y–12 890 meters away.						

[a] New construction in predicted distances calculation. Rural site.
[b] Existing building in predicted distances calculation. Rural site.
[c] Existing building in predicted distances calculation. Urban site.

Note: To convert meters to feet, multiply by 3.281; kilometers to miles, by 0.6214.

Key: <=less than; GJDS=Grand Junction Disposal Site; INL=Idaho National Laboratory; INTEC=Idaho Nuclear Technology and Engineering Center; KCP=Kansas City Plant; km=kilometer; RWMC=Radioactive Waste Management Complex; SL=severity level; SRS=Savannah River Site; WCS=Waste Control Specialists, LLC, site; Y–12=Y–12 National Security Complex.

Transportation Accidents Without Fire:

Updated text to revise that found in Chapter 4, Section 4.2.9.1.5, on pages 4–17 and 4–18 and in Appendix D, Section D.4.3.1, on pages D–62 and D–63 of the January 2011 *Mercury Storage EIS* is as follows:

> *For exposures occurring via evaporation from a spill of elemental mercury with no fire during a transportation accident, the fraction of the mercury being carried by the truck or railcar that would be spilled is highly uncertain. It is extremely unlikely that all flasks or all 1-MT [1-metric-ton] containers would be breached. However, to be conservative, it is assumed that such a catastrophic release could take place. The largest amount of mercury that can be carried in a truck or railcar is that contained in 54 1-MT containers. Assuming that all of this mercury is spilled and spreads until the pool is at its capillary depth (so conservative as to be essentially inconceivable in an outdoor spill), the predicted rate of evaporation given a windspeed* u *of 4.5 m/s [meters per second] would be* 7.35×10^{-5} *kg/s [kilograms per second], with the evaporation rates for a different windspeed* u *being scaled by the factor* $(u/4.5)^{0.8}$ *(see Section D.7.1.2). Running this through the Gaussian model and ranging over all possible combinations of atmospheric stability class and windspeed, the predicted maximum distances to the airborne toxic benchmarks for GJDS (for example) are as follows: SL-IV, less than 100 meters (330 feet); SL-III, less than 100 meters (330 feet); and SL-II, about* ***230 meters (750 feet)****. As a result, a specific individual could not be exposed to concentrations that are greater than SL-I if he or she lives more than about* ***230 meters (750 feet)*** *from a crash. Conservatively, that specific individual could only be exposed above SL-I if the crash occurs along a* ***460-meter (1,500-foot)*** *stretch of road, and then only if he or she lives by the roadside. The length of roadway on which a crash could occur and affect a specific individual is estimated by drawing a circle with a* ***230-meter (750-foot)*** *radius centered on the individual. The relevant length of roadway is that which lies inside the circle. The maximum possible relevant length is two radii (i.e.,* ***460 meters or 1,500 feet****) if the individual lives immediately next to the roadway. This is a small fraction of any of the routes. For GJDS, the average length of a truck trip is 2,000 kilometers (1,260 miles);* ***460 meters (1,500 feet)*** *is approximately* ***0.00023*** *of this. The frequency of occurrence of a truck crash with spill on the routes to GJDS is 0.0031 per year; see Table D–14 (Scenario 2). The product of the function of the route and the frequency of the occurrence is approximately* $\mathbf{7.1 \times 10^{-7}}$ ***per year****, a negligible frequency. Under Truck Scenario 1 and the Railcar Scenario, the corresponding frequencies would also be negligible. Therefore, the risk to an individual member of the public from transportation spills onto the ground en route to GJDS without a fire would be negligible under all transportation scenarios. The same results apply to all of the other sites.*

Transportation Accidents with Fire:

Table E–3 updates Table 4–5 on page 4–20 and Table D–31 on page D–66 of the January 2011 *Mercury Storage EIS*.

Table E–3. Predicted Range of Distances (meters) Downwind to Which Acute Airborne Severity Levels Are Exceeded – Crashes with Fires

Type of Accident	Atmospheric Stability Class/Windspeed	PAC-1 (SL-II)	AEGL-2 (SL-III)	AEGL-3 (SL-IV)
Truck crash	A/1.5 m/s	**<100–3,500**	<100–130	Nowhere
	D/4.5 m/s	**<100–25,000**	Nowhere	Nowhere
	F/1.5 m/s	<100–>40,000[a]	500–1,200	Nowhere
Railcar crash	A/1.5 m/s	**<100–3,700**	130–830	Nowhere
	D/4.5 m/s	**<100–30,000**	550–2,300	Nowhere
	F/1.5 m/s	<100–>40,000[a]	350–2,050	Nowhere

[a] The limit of validity of the dispersion model is 40,000 meters (approximately 25 miles).

Note: To convert meters to feet, multiply by 3.281.

Key: <=less than; >=greater than; AEGL=Acute Exposure Guideline Level; m/s=meters per second; PAC=Protective Action Criterion; SL=severity level.

Multiple Exposures:

Updated text to revise that found in Appendix D, Section D.4.6, on page D–72 of the January 2011 *Mercury Storage EIS* is as follows:

> *The highest frequency of truck accidents with spills and no fires is 0.0041 per year (see Table D–14). The corresponding value of P(2:40) is 0.0114, where P(2:40) is the probability of two accidents in 40 years. It is conceivable that two exposures in the SL-I range could add up to an exposure in the SL-II range. From Section E.2.1.3, the distance to which an exposure at the SL-II level might occur is* ***230 meters (750 feet)****. Additional calculations show that the corresponding distance to which an exposure at the SL-II/2 level might occur is* ***330 meters (1,080 feet)****. Using the same reasoning as in Section D.4.3.1, the probability that a second crash will occur within* ***330 meters*** *of an individual who was affected at the PAC-1/2 and potentially bring the total exposure level up to PAC-1 or more is* ***0.00033*** *(taking GJDS as a representative example). Therefore, the probability with which a second crash might take place within* ***330 meters*** *of an individual affected at level PAC-1/2 or higher is 0.0114 × **0.00033** = approximately* $\boldsymbol{3.8 \times 10^{-6}}$ *over a period of 40 years. To apply this probability to the risk matrix, it is necessary to establish the relationship between a frequency, such as* 10^{-6} *per year – the upper boundary of the FL-I [Frequency Level I] range – and the corresponding probability over a period of 40 years. By simple multiplication by 40, the upper bound on the FL-I range over a period of 40 years is* 4.0×10^{-5}*, so that the probability of* 3.8×10^{-6} *over 40 years calculated above is in the FL-I range and the corresponding risk would be negligible. Similar reasoning leads to negligible risk of two accidents with exposure in the SL-II range leading to a cumulative exposure in the SL-III range, and two accidents with exposures in the SL-III range leading to a cumulative exposure in the SL-IV range.*

<u>Intentional Destructive Acts with Fire:</u>

Table E–4 updates Table 4–8 on page 4–23 and Table D–34 on page D–73 of the January 2011 *Mercury Storage EIS*.

Table E–4. Predicted Range of Distances (meters) Downwind to Which Acute Airborne Severity Levels Are Exceeded – IDA Fires

Atmospheric Stability Class/Windspeed	ACGIH TLV 8-hour TWA (SL-II)	AEGL-2 (SL-III)	AEGL-3 (SL-IV)
A/1.5 m/s	<100–9,000	370–780	Nowhere
D/4.5 m/s	<100–>40,000[a]	Nowhere	Nowhere
F/1.5 m/s	<100–>40,000[a]	100–5,700	680–870

[a] The limit of validity of the dispersion model is 40,000 meters (approximately 25 miles).

Note: To convert meters to feet, multiply by 3.281.

Key: <=less than; >=greater than; **ACGIH=American Conference of Governmental Industrial Hygienists**; AEGL=Acute Exposure Guideline Level; IDA=intentional destructive act; m/s=meters per second; SL=severity level; **TLV=threshold limit value; TWA=time-weighted average**.

<u>Other Changes:</u>

Updated text to revise that found in Chapter 4, Section 4.3.9.2.2, on page 4–45 of the January 2011 *Mercury Storage EIS* for the GJDS location is as follows:

> *The maximum downwind distance to which a concentration greater than AEGL-3 [Acute Exposure Guideline Level 3] could be exceeded at GJDS is predicted to be less than 100 meters (330 feet) (the model is not valid at distances shorter than 100 meters [330 feet]); AEGL-2 could be exceeded downwind to a distance of about 200 meters (660 feet); and PAC-1 could be exceeded to a distance of about* ***790 meters (2,600 feet)****.*

Updated text to revise that found in Chapter 4, Section 4.4.9.2, on page 4–62 of the January 2011 *Mercury Storage EIS* for the Hanford location is as follows:

> *The atmospheric dispersion calculations show that, for this spill, the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is approximately 200 meters (660 feet); and for PAC-1, it is* ***790 meters (2,600 feet)****.*

Updated text to revise that found in Chapter 4, Section 4.5.9.2, on page 4–78 of the January 2011 *Mercury Storage EIS* for the Hawthorne Army Depot location is as follows:

> *The atmospheric dispersion calculations show that, for this spill, the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is about 250 meters (820 feet); and for PAC-1, it is approximately* ***1,010 meters (3,310 feet)****.*

Updated text to revise that found in Chapter 4, Section 4.6.9.2, on page 4–97 of the January 2011 *Mercury Storage EIS* for the INL location is as follows:

> *For a member of the public in the case of an outside earthquake spill at RWMC [Radioactive Waste Management Complex], the atmospheric dispersion calculations show that the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is about 210 meters (690 feet); and for PAC-1, it is approximately* ***860 meters (2,820 feet)****. At INTEC [Idaho Nuclear Technology and Engineering Center], the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is approximately 200 meters (660 feet); and for PAC-1, it is* ***790 meters (2,600 feet)****.*

Updated text to revise that found in Chapter 4, Section 4.7.9.2, on page 4–113 of the January 2011 *Mercury Storage EIS* for the KCP location is as follows:

> *For a member of the public in the case of an outside earthquake spill, the atmospheric dispersion calculations show that the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is also less than 100 meters (330 feet); and for PAC-1, it is about* ***200 meters (660 feet)****.*

Updated text to revise that found in Chapter 4, Section 4.8.9.2, on page 4–130 of the January 2011 *Mercury Storage EIS* for the SRS location is as follows:

> *For a member of the public in the case of an outside earthquake spill, the atmospheric dispersion calculations show that the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is about 200 meters (660 feet); and for PAC-1, it is* ***790 meters (2,600 feet)****.*

Updated text to revise that found in Chapter 4, Section 4.9.9.2, on page 4–147 of the January 2011 *Mercury Storage EIS* for the WCS location is as follows:

> *For a member of the public in the case of an outside earthquake spill, the atmospheric dispersion calculations show that the maximum distance downwind to which a concentration greater than AEGL-3 could be exceeded is less than 100 meters (330 feet); for AEGL-2, the corresponding distance is about 200 meters (660 feet); and for PAC-1, it is* ***790 meters (2,600 feet).***

E.3 UPDATES TO SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE ANALYSIS

The updated socioeconomics and environmental justice analysis in this appendix supersedes the analysis in the January 2011 *Mercury Storage EIS*, as indicated in Table E–5. The methodology and approach to conducting socioeconomics and environmental justice analysis remain otherwise unchanged and are described in Appendix B, Sections B.10 and B.11, of the January 2011 *Mercury Storage EIS*; however, updates to Tables B–13, B–14, and B–15 from the January 2011 *Mercury Storage EIS* were prepared based upon the 2010 census data. Updated tables are presented in Appendix B of this SEIS.

The affected environment for the WIPP Vicinity reference locations for socioeconomics and environmental justice is presented in this SEIS in Chapter 3, Sections 3.2.10 and 3.2.11. The environmental consequences for the WIPP Vicinity reference locations for socioeconomics and environmental justice are presented in this SEIS in Chapter 4, Sections 4.2.11 and 4.2.12.

Table E–5. Section Updates for Socioeconomics and Environmental Justice Analyses

Candidate Site		January 2011 *Mercury Storage EIS* Section	*Mercury Storage SEIS* Updated Section
Y–12 National Security Complex (No Action) Tennessee	Affected Environment	3.9.10	E.3.2.1.1
		3.9.11	E.3.2.1.2
	Environmental Consequences	4.2.11	E.3.2.2.1
		4.2.12	E.3.2.2.2
Grand Junction Disposal Site Colorado	Affected Environment	3.2.10	E.3.3.1.1
		3.2.11	E.3.3.1.2
	Environmental Consequences	4.3.11	E.3.3.2.1
		4.3.12	E.3.3.2.2
Hanford Site 200-West Area Washington	Affected Environment	3.3.10	E.3.4.1.1
		3.3.11	E.3.4.1.2
	Environmental Consequences	4.4.11	E.3.4.2.1
		4.4.12	E.3.4.2.2
Hawthorne Army Depot Nevada	Affected Environment	3.4.10	E.3.5.1.1
		3.4.11	E.3.5.1.2
	Environmental Consequences	4.5.11	E.3.5.2.1
		4.5.12	E.3.5.2.2
Idaho National Laboratory INTEC and RWMC Idaho	Affected Environment	3.5.10	E.3.6.1.1
		3.5.11	E.3.6.1.2
	Environmental Consequences	4.6.11	E.3.6.2.1
		4.6.12	E.3.6.2.2
Kansas City Plant Missouri	Affected Environment	3.6.10	E.3.7.1.1
		3.6.11	E.3.7.1.2
	Environmental Consequences	4.7.11	E.3.7.2.1
		4.7.12	E.3.7.2.2
Savannah River Site E Area South Carolina	Affected Environment	3.7.10	E.3.8.1.1
		3.7.11	E.3.8.1.2
	Environmental Consequences	4.8.11	E.3.8.2.1
		4.8.12	E.3.8.2.2
Waste Control Specialists, LLC Texas	Affected Environment	3.8.10	E.3.9.1.1
		3.8.11	E.3.9.1.2
	Environmental Consequences	4.9.11	E.3.9.2.1
		4.9.12	E.3.9.2.2

Key: INTEC=Idaho Nuclear Technology and Engineering Center; RWMC=Radioactive Waste Management Complex.

E.3.1 Summary Comparison of Candidate Site Updates

Updating the environmental justice analysis previously presented in the January 2011 *Mercury Storage EIS* from 2000 to 2010 census data resulted in some changes to the data associated with those candidate sites previously analyzed. Specifically, residential populations within the 16-kilometer (10-mile) and 3.2-kilometer (2-mile) regions of influence (ROIs) changed, as well as the number of census blocks that contain either a minority or low-income population for some of the candidate sites within these ROIs. Table E–6 provides a summary comparison of changes to environmental justice data presented in the January 2011 *Mercury Storage EIS* as updated in this appendix.

Table E–6. Summary Comparison of Changes to Environmental Justice Data

Candidate Site	Census Data	Residential Population 16-km (10-mile)	Minority or Low-Income Populations Within 16-km (10-mile) ROI	Residential Population 3.2-km (2-mile)	Minority or Low-Income Populations Within 3.2-km (2-mile) ROI
Y–12 National Security Complex (No Action) Tennessee	2000	101,939 (7.6% minority) (7.9% low-income)	1 minority and 1 low-income census block group (out of 89 blocks).	3,093 (27% minority) (14% low-income)	3 minority and no low-income census block groups (out of 9 blocks).
	2010	117,490 (11% minority) (9.5% low-income)	1 minority only, 2 low-income only, and 1 that is both a minority and low-income census block group (out of 92 blocks).	3,862 (33% minority) (28% low-income)	1 minority only and 1 that is both a minority and low-income census block group (out of 7 blocks).
Grand Junction Disposal Site Colorado	2000	2,119 (15% minority) (11% low-income)	No minority or low-income census block groups.	138 (13% minority) (12% low-income)	No minority or low-income census block groups.
	2010	2,823 (14% minority) (11% low-income)	No minority or low-income census block groups.	194 (12% minority) (10% low-income)	No minority or low-income census block groups.
Hanford Site 200-West Area Washington	2000	0	No minority or low-income census block groups.	0	No minority or low-income census block groups.
	2010	147 (38% minority) (18% low-income)	2 minority only census block groups and 1 that is both a minority and low-income census block group (out of 4 blocks).	0	No minority or low-income census block groups.
Hawthorne Army Depot Nevada	2000	3,561 (20% minority) (10% low-income)	No minority or low-income census block groups.	0	No minority or low-income census block groups.
	2010	2,583 (23% minority) (15% low-income)	1 that is both a minority and low-income census block group (out of 4 blocks).	169 (23% minority) (20% low-income)	1 that is both a minority and low-income census block group (out of 2 blocks).
Idaho National Laboratory – INTEC Idaho	2000	201 (13% minority) (19% low-income)	No minority or low-income census block groups.	0	No minority or low-income census block groups.
	2010	205 (11% minority) (15% low-income)	No minority or low-income census block groups.	0	No minority or low-income census block groups.

Table E–6. Summary Comparison of Changes to Environmental Justice Data *(continued)*

Candidate Site	Census Data	Residential Population 16-km (10-mile)	Minority or Low-Income Populations Within 16-km (10-mile) ROI	Residential Population 3.2-km (2-mile)	Minority or Low-Income Populations Within 3.2-km (2-mile) ROI
Idaho National Laboratory – RWMC Idaho	2000	255 (12% minority) (25% low-income)	No minority or low-income census block groups.	0	No minority or low-income census block groups.
	2010	175 (9.8% minority) (18% low-income)	No minority or low-income census block groups.	0	No minority or low-income census block groups.
Kansas City Plant Missouri	2000	700,041 (31% minority) (10% low-income)	172 minority only, 2 low-income only, and 74 that are both minority and low-income census block groups (out of 671 blocks).	28,184 (42% minority) (11% low-income)	16 minority only and 1 that is both a minority and low-income census block group (out of 41 blocks).
	2010	705,513 (36% minority) (13% low-income)	157 minority only, 5 low-income only, and 88 that are both minority and low-income census block groups (out of 659 blocks).	26,192 (52% minority) (20% low-income)	16 minority only and 6 that are both minority and low-income census block groups (out of 39 blocks).
Savannah River Site E Area South Carolina	2000	8,178 (36% minority) (17% low-income)	4 minority and no low-income census block groups (out of 14 blocks).	0	No minority or low-income census block groups.
	2010	6,691 (38% minority) (20% low-income)	4 minority and 1 low-income census block groups (out of 15 blocks).	0	No minority or low-income census block groups.
Waste Control Specialists, LLC Texas	2000	2,900 (40% minority) (17% low-income)	1 minority and no low-income census block groups (out of 8 blocks).	20 (27% minority) (6% low-income)	No minority or low-income census block groups.
	2010	3,322 (47% minority) (12% low-income)	2 minority and no low-income census block groups (out of 8 blocks).	27 (35% minority) (7.8% low-income)	No minority or low-income census block groups.

Key: INTEC=Idaho Nuclear Technology and Engineering Center; km=kilometer; ROI=region of influence; RWMC=Radioactive Waste Management Complex.

E.3.2 Y–12 National Security Complex

E.3.2.1 Affected Environment

E.3.2.1.1 Socioeconomics

Socioeconomic variables at Y–12 are associated with community growth and development within the Y–12 ROI that could potentially be affected, directly or indirectly, by project-related changes. Included are economic characteristics, the region's demography, housing, and local transportation.

Y–12 is located on the Oak Ridge Reservation in eastern Tennessee, approximately 29 kilometers (18 miles) west of the city of Knoxville. Approximately 90 percent of people employed at Y–12 reside in four counties: Anderson, Knox, Loudon, and Roane (DOE 2008:4-404). Therefore, these four counties are identified as the ROI in this socioeconomics analysis. Y–12 employs approximately 6,000 persons (DOE 2009).

E.3.2.1.1.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of the ROI increased by approximately 16.9 percent from 280,986 to 328,363. During this period, the unemployment rate of the ROI increased from 3.4 percent to 7.3 percent. The unemployment rate in the ROI peaked during 2009, at 8.5 percent. By July 2012, the unemployment rate of the ROI was 7.1 percent, which was lower than the unemployment rate for Tennessee (8.3 percent) (BLS 2012).

E.3.2.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the four-county ROI was 610,092. From 2000 to 2010, the ROI population grew by 12 percent, compared with 11.5 percent growth throughout the state of Tennessee (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. The percentage of the ROI population under the age of 18 was 22 percent; women ages 18 to 39 composed 15 percent (DOC 2011a). There were 277,107 housing units in the ROI in 2010 (DOC 2011b), 62 percent of which were owner-occupied, 29 percent were renter-occupied, and 9.5 percent were vacant (DOC 2011b, 2011c).

E.3.2.1.1.3 Environmental Justice

Under Executive Order 12898, DOE is responsible for identifying and addressing any disproportionately high and adverse impacts on minority and low-income populations. Minority persons are those who identify themselves as American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino (of any race), Native Hawaiian or other Pacific Islander, or multiracial (CEQ 1997). Persons who report that their income is less than the Federal poverty threshold are designated as low-income.

A 16-kilometer (10-mile) radius was chosen as the ROI for this analysis to provide a reasonable estimate of the potentially affected population surrounding the facility. An additional ROI of those residing within an approximately 3.2-kilometer (2-mile) radius of each candidate site was used as a subset of the 16-kilometer ROI to guard against inadvertently diluting represented minority and low-income populations most likely to experience any potentially adverse impacts associated with mercury storage.

The 16-kilometer (10-mile) radius surrounding Y–12 encompasses parts of five Tennessee counties: Anderson, Knox, Loudon, Morgan, and Roane. Figure E–1 shows populations residing in the five-county area, as reported in the 2000 and 2010 censuses (DOC 2001a, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. From 2000 to 2010, the population of the five-county area increased by approximately 12 percent to 632,079. Over this period, the total minority population increased by approximately 47 percent to 86,199, and the low-income population increased by approximately 23 percent to 85,461 (DOC 2001a, 2001b, 2011d, 2011e).

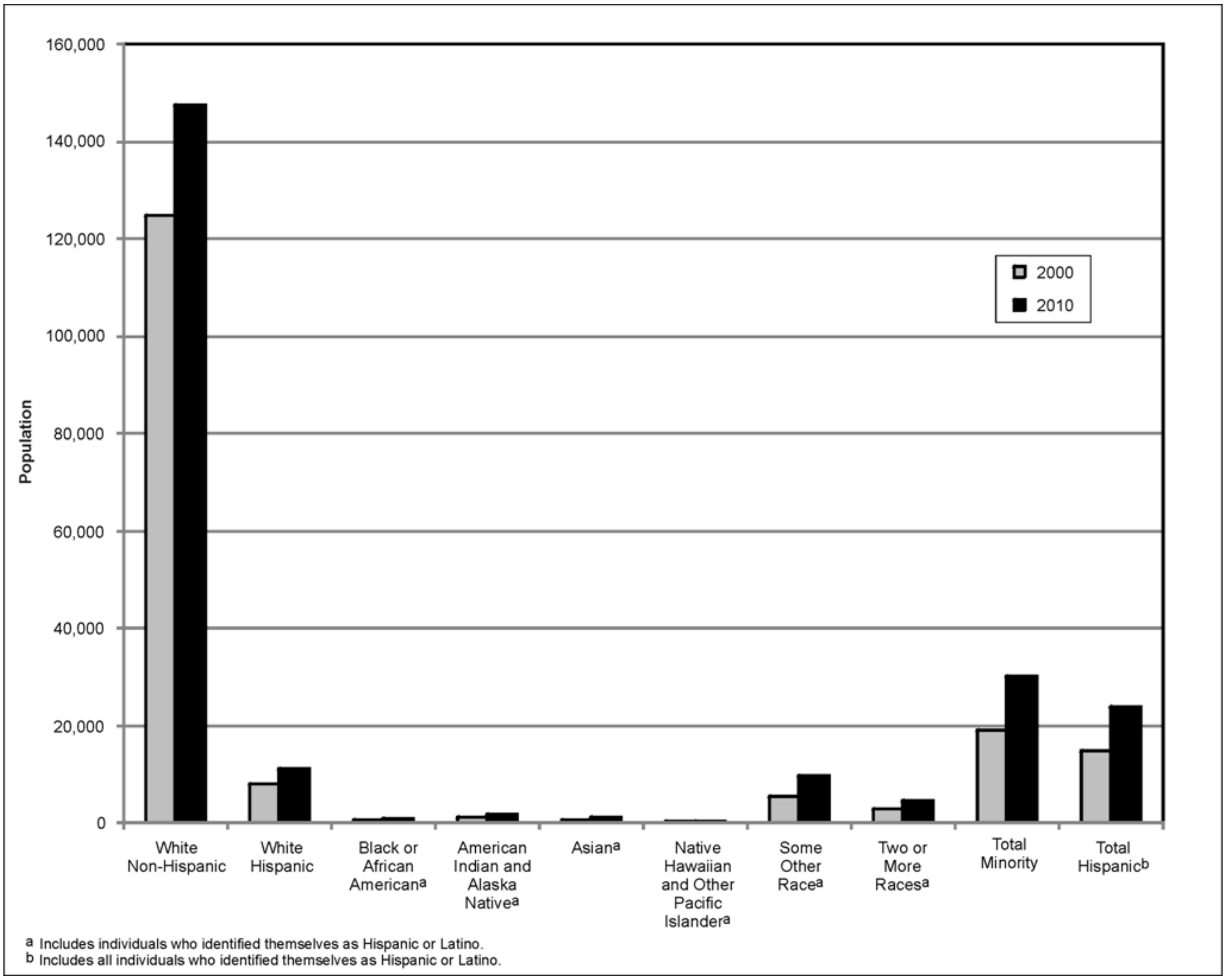


Figure E–1. Populations Residing Within the Five-County Area Surrounding Y–12 National Security Complex

Demographic data from the 2010 census show that the total minority population residing in the five-county area composed approximately 14 percent of the total population. The Black or African American population residing in the five-county area composed approximately 51 percent of the area's total minority population, while those self-identified as "two or more races" composed approximately 13 percent of the area's total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 3.3 percent of the total population and approximately 24 percent of the total minority population residing in the five-county area in 2010 (DOC 2011d).

In 2010, 117,490 people lived within 16 kilometers (10 miles) of Y–12 (DOC 2011d). This area included an estimated 11 percent minority and 9.5 percent low-income population. By comparison, the five-county area included a 14 percent minority and 14 percent low-income population, and the state included a 24 percent minority and 17 percent low-income population. There are 92 census block groups located within the 16-kilometer radius surrounding Y–12. Of this total, one contained a minority population, two contained a low-income population, and one contained both a minority and low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population.

In 2010, 3,862 people lived within approximately 3.2 kilometers (2 miles) of Y–12 (DOC 2011d). This area included an estimated 33 percent minority and 28 percent low-income population. There are seven census block groups located within this ROI; one contained a minority population, none contained a low-income population, and one contained both a minority and a low-income population.

Figure E–2 shows the proximity of the identified minority and low-income communities to Y–12.

Figure E–3 shows the cumulative populations living at a given distance from Y–12.

E.3.2.2 Environmental Consequences

Under the No Action Alternative, DOE would not designate and operate a facility(ies) for the long-term management and storage of elemental mercury generated within the United States, as further described in Chapter 2, Section 2.4.1, of the January 2011 *Mercury Storage EIS*. Elemental mercury would continue to be generated, including from chlor-alkali facilities, the gold-mining industry, and waste reclamation and recycling facilities. As identified in Chapter 1, Table 1–1, of this SEIS, the vast majority of mercury would be generated by reclamation and recycling facilities and the gold-mining industry. Under the No Action Alternative, this mercury would have to be stored indefinitely at multiple non-DOE facilities. It could be argued that the biggest impact of the No Action Alternative would be widely dispersed storage. The potential benefit of Federal action would be long-term storage and management of this material in one centralized location, as opposed to continued, dispersed storage by multiple private entities. Excess elemental mercury in storage that could not be sold would be stored in accordance with law. Non-DOE storage facilities may be constructed and some non-DOE storage sites may need to modify their storage capacity by constructing additional storage space. Such storage would not necessarily occur at the sites identified as potential sources of excess mercury. This storage service might be provided by a commercial waste management company(ies). In brief, such facilities vary in location, size, geographic distribution, natural and human environments, and in the nature of their operations. Therefore, the potential for and nature of environmental impacts from implementing the No Action Alternative at such sites would be highly speculative.

The approximately 1,200 metric tons (1,330 tons) of DOE mercury currently stored in some 35,000 3-liter (34.6-kilogram [76-pound]) flasks at Y–12 would continue to be managed and stored in this location. No new construction would be required.

E.3.2.2.1 Socioeconomics

The No Action Alternative is discussed in Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS.* Under the No Action Alternative, some non-DOE storage sites may require new construction or need to modify their storage capacity by constructing additional storage space. Any analysis of impacts on socioeconomics at non-DOE storage sites would be highly speculative at this time. Elemental mercury would remain in storage at Y–12. Labor resources associated with mercury storage at Y–12 would remain at less than 0.05 full-time equivalent workers (DLA 2004:4-26). Therefore, no incremental socioeconomic or related transportation impacts would occur at Y–12.

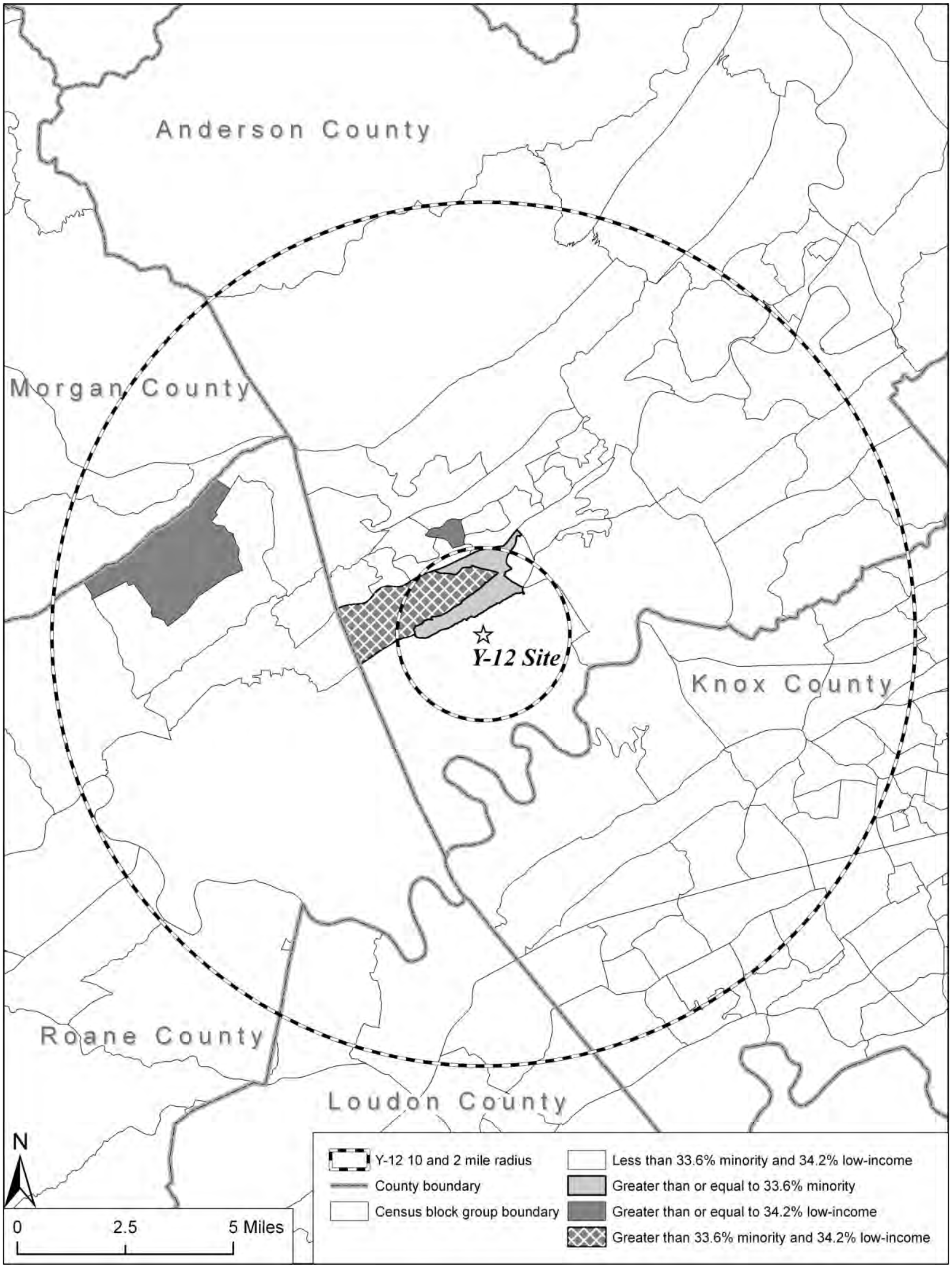


Figure E–2. Block Groups Containing Minority and Low-Income Populations Surrounding Y–12 National Security Complex

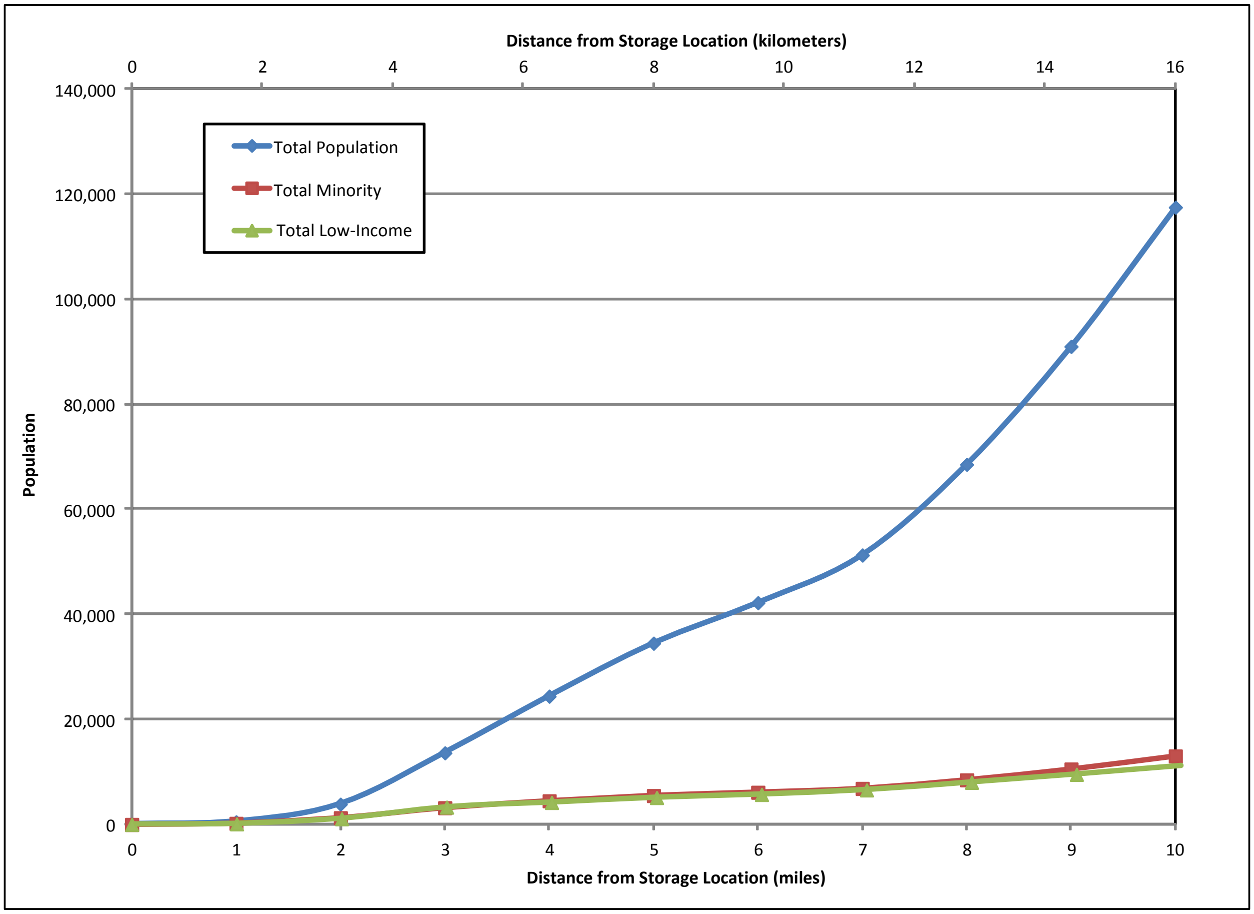


Figure E–3. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Y–12 National Security Complex

E.3.2.2.2 Environmental Justice

The population of one of the block groups within the 16-kilometer (10-mile) radius surrounding Y–12 was identified as minority, the population of two of the block groups was identified as low-income, and the population of one block group was identified as both minority and low-income. The population of one of the block groups within the 3.2-kilometer (2-mile) radius surrounding Y–12 was identified as a minority population and the population of one block group was identified as both minority and low-income (see Figure E–2).

As discussed in Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*, implementing the No Action Alternative would result in negligible offsite human health and ecological risks from mercury emissions during normal operations and accidents. Therefore, no disproportionately high and adverse effects on minority or low-income populations would occur at Y–12 under the No Action Alternative.

E.3.3 Grand Junction Disposal Site

E.3.3.1 Affected Environment

E.3.3.1.1 Socioeconomics

GJDS is located approximately 29 kilometers (18 miles) southeast of the city of Grand Junction, Colorado. Approximately 90 percent of people employed in this area are assumed to reside in Mesa County based on the local employment data compiled by the U.S. Census Bureau (DOC 2009).

Therefore, Mesa County has been identified as the ROI in this socioeconomics analysis. The disposal site employs approximately seven people during the several weeks every year that it is open to receive uranium mill tailings. During the remainder of the year, routine inspections are expected to require less than one full-time employee (GJDS 2009).

E.3.3.1.1.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of Mesa County increased by approximately 34 percent from 59,016 to 79,048. During this period, the unemployment rate of the ROI increased from 3.3 percent to 9.6 percent. The unemployment rate in the ROI peaked during 2010 at 10.7 percent. By July 2012, the unemployment rate for the county was 9.3 percent, which was higher than the unemployment rate for Colorado (7.8 percent) (BLS 2012).

E.3.3.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of Mesa County was 146,723. From 2000 to 2010, the population of the county grew by 26 percent, compared with 17 percent growth in Colorado (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. The percentage of the population within the county under the age of 18 was 24 percent; women ages 18 to 39 composed 14 percent (DOC 2011a). There were 62,644 housing units in the county in 2010 (DOC 2011b), 66 percent of which were owner-occupied, 27 percent were renter-occupied, and 7.3 percent were vacant (DOC 2011b, 2011c).

E.3.3.1.2 Environmental Justice

A 16-kilometer (10-mile) radius was chosen as the ROI for this analysis to provide a reasonable estimate of the potentially affected population surrounding the facility. An additional ROI of those residing within an approximately 3.2-kilometer (2-mile) radius of each candidate site was used as a subset of the 16-kilometer (10-mile) ROI to guard against inadvertently diluting represented minority and low-income populations most likely to experience any potentially adverse impacts associated with mercury storage.

The 16-kilometer (10-mile) radius surrounding the candidate storage location at GJDS encompasses parts of two counties in Colorado: Mesa and Delta. Figure E–4 shows populations residing in the two-county area, as reported in the 2000 and 2010 censuses (DOC 2001a, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. From 2000 to 2010, the population of the two-county area increased by approximately 23 percent to 177,675. Over this period, the total minority population increased by approximately 58 percent to 30,046, and the low-income population increased by approximately 42 percent to 21,252 (DOC 2001a, 2001b, 2011d, 2011e).

Demographic data from the 2010 census show that the total minority population residing in the two-county area composed approximately 17 percent of the total population. The White Hispanic population residing in the two-county area composed approximately 38 percent of the area's total minority population, while those self-identified as "some other race" (meaning those who provided write-in entries such as Mexican, Puerto Rican, or Cuban) composed approximately 32 percent of the ROI's total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 13 percent of the total population and approximately 80 percent of the total minority population residing in the two-county area in 2010 (DOC 2011d).

In 2010, approximately 2,823 people lived within 16 kilometers (10 miles) of GJDS. This area included an estimated 14 percent minority and 11 percent low-income population. By comparison, Mesa and Delta Counties included a 17 percent minority and 13 percent low-income population, and Colorado included a 30 percent minority and 12 percent low-income population (DOC 2011d, 2011e). There are five census block groups located within the 16-kilometer radius surrounding GJDS, none of which contained a minority or low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population.

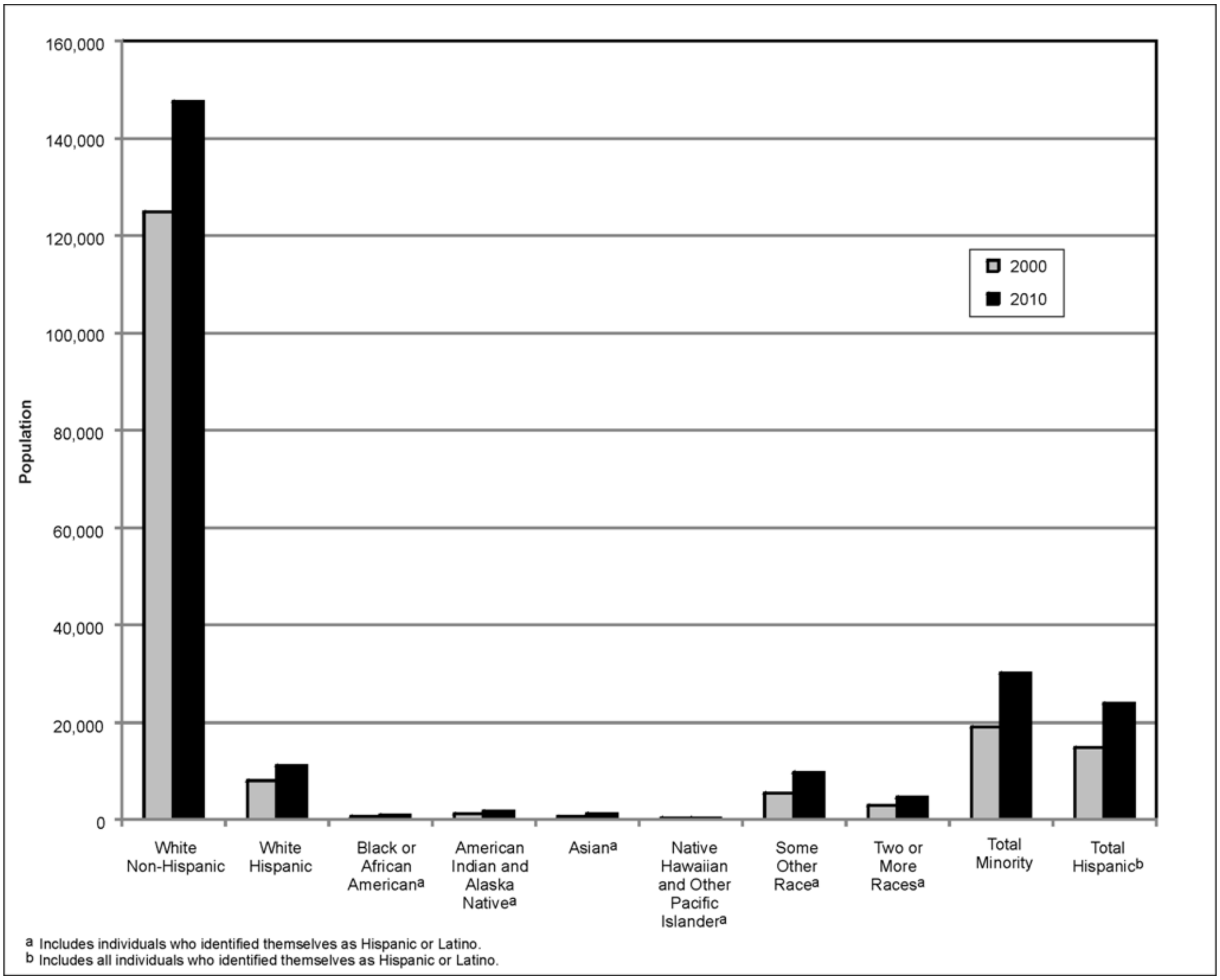


Figure E–4. Populations Residing Within the Two-County Area Surrounding the Grand Junction Disposal Site

In 2010, 194 people lived within approximately 3.2 kilometers (2 miles) of GJDS. This area included an estimated 12 percent minority and 10 percent low-income population (DOC 2011d, 2011e). There is only one census block group located within this ROI, and it did not contain a minority or low-income population.

Figure E–5 shows the cumulative populations living at a given distance from the site.

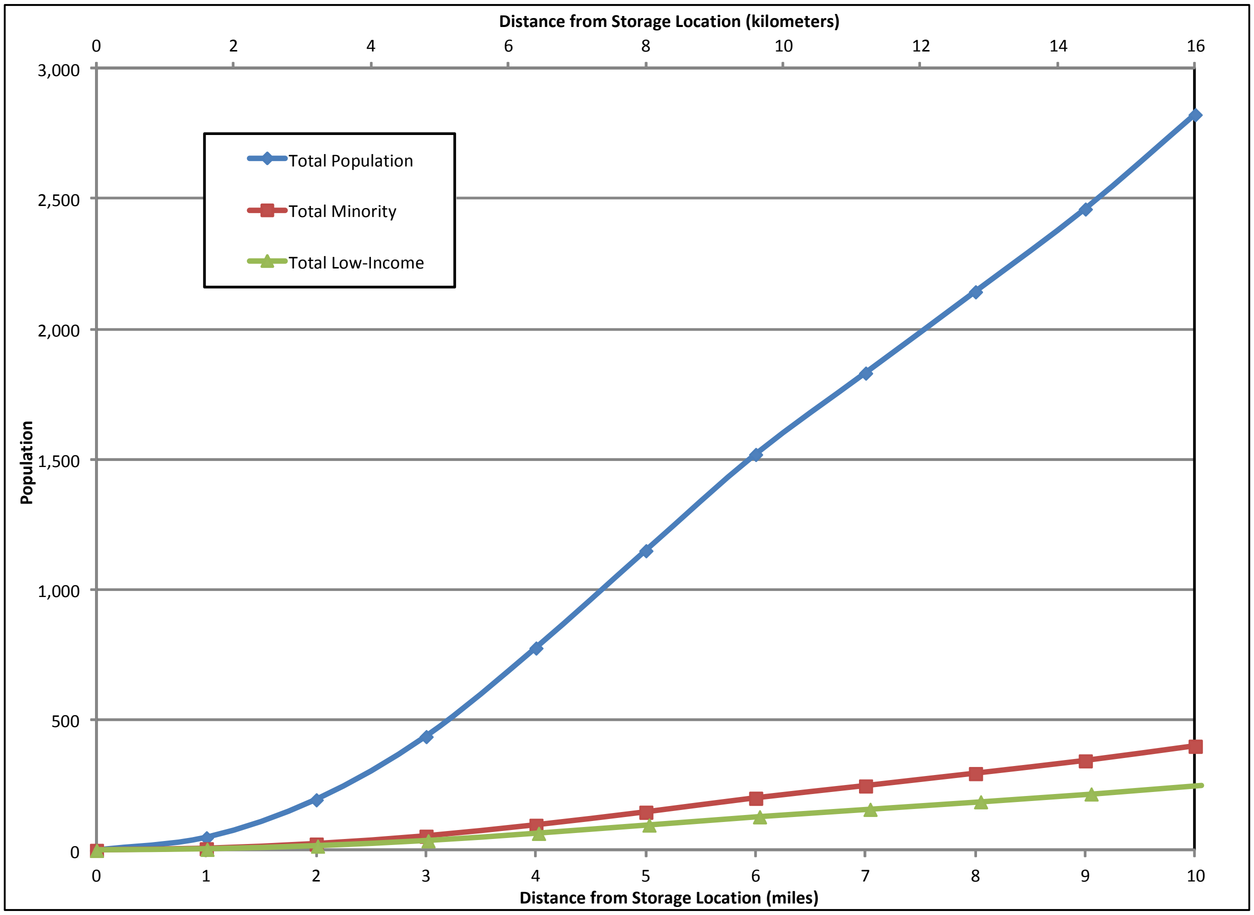


Figure E–5. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Grand Junction Disposal Site

E.3.3.2 Environmental Consequences

Under this alternative, a new mercury storage facility would be constructed at DOE's GJDS. GJDS occupies 146 hectares (360 acres) located in Mesa County, Colorado, 29 kilometers (18 miles) southeast of Grand Junction, Colorado, as further described in Chapter 2, Section 2.4.2, of the January 2011 *Mercury Storage EIS*.

E.3.3.2.1 Socioeconomics

Employment during construction is expected to average 18 people for approximately 6 months. Operation of the facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately 5 to 6 individuals thereafter, resulting in an increase of the full-time equivalent workforce at GJDS by a factor of 3 to 4 during construction and roughly doubling the workforce at GJDS during operations. In spite of this projected increase in jobs supporting construction and operations at GJDS and associated indirect employment, this alternative would have a negligible impact on socioeconomic conditions (i.e., overall employment and population trends) in the ROI because the largest estimated increase in employment would only increase the ROI workforce by approximately 0.01 percent.

Construction-related transportation, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is assumed that there would be approximately 1.5 employees per vehicle, and every vehicle is counted twice to account for round trips. It is estimated that average construction transportation of 45 vehicles a day could increase the average annual daily traffic count on U.S. Route 50 by less than 0.5 percent. Impacts on traffic during construction would be negligible.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of elemental mercury for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual daily traffic count on U.S. Route 50 by approximately 0.1 percent. At the peak of operations, it is estimated that up to 79 shipments of elemental mercury would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be negligible.

E.3.3.2.2 Environmental Justice

None of the block groups within either the 16-kilometer (10-mile) or the 3.2-kilometer (2-mile) radius surrounding GJDS contain a minority or low-income population. Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

E.3.4 Hanford Site

E.3.4.1 Affected Environment

E.3.4.1.1 Socioeconomics

Hanford is located along the Columbia River in southeastern Washington. Approximately 90 percent of the people employed at Hanford reside in Franklin and Benton Counties (Duncan 2007). Therefore, Franklin and Benton Counties have been identified as the ROI in this socioeconomics analysis. In fiscal year 2006, Hanford employed 9,759 persons.

E.3.4.1.1.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of the ROI increased by approximately 36 percent from 99,026 to 134,627. During this period, the unemployment rate of the ROI increased from 5.5 percent to 7.9 percent. By July 2012, the unemployment rate for the ROI was 8.2 percent, which was lower than the unemployment rate for Washington State (8.5 percent) (BLS 2012).

E.3.4.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the two-county ROI was 253,340. From 2000 to 2010, the ROI population grew by 32 percent, compared with 14 percent growth throughout the state of Washington (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. The percentage of the ROI population under the age of 18 was 29 percent; women ages 18 to 39 composed 15 percent (DOC 2011a). There were 93,041 housing units in the ROI in 2010 (DOC 2011b), 64 percent of which were owner-occupied, 31 percent were renter-occupied, and 4.8 percent were vacant (DOC 2011b, 2011c).

E.3.4.1.2 Environmental Justice

The 16-kilometer (10-mile) radius surrounding the candidate storage location in the 200-West Area at Hanford encompasses parts of two counties in Washington: Benton and Grant. Figure E–6 shows populations residing in the two-county area, as reported in the 2000 and 2010 censuses. In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. In the decade between 2000 and 2010, the total population of Benton and Grant Counties increased by approximately

18 percent to 264,297; the minority population increased by approximately 37 percent to 82,794; and the low-income population increased by 38 percent to 38,082 (DOC 2001a, 2001b, 2011d, 2011e).

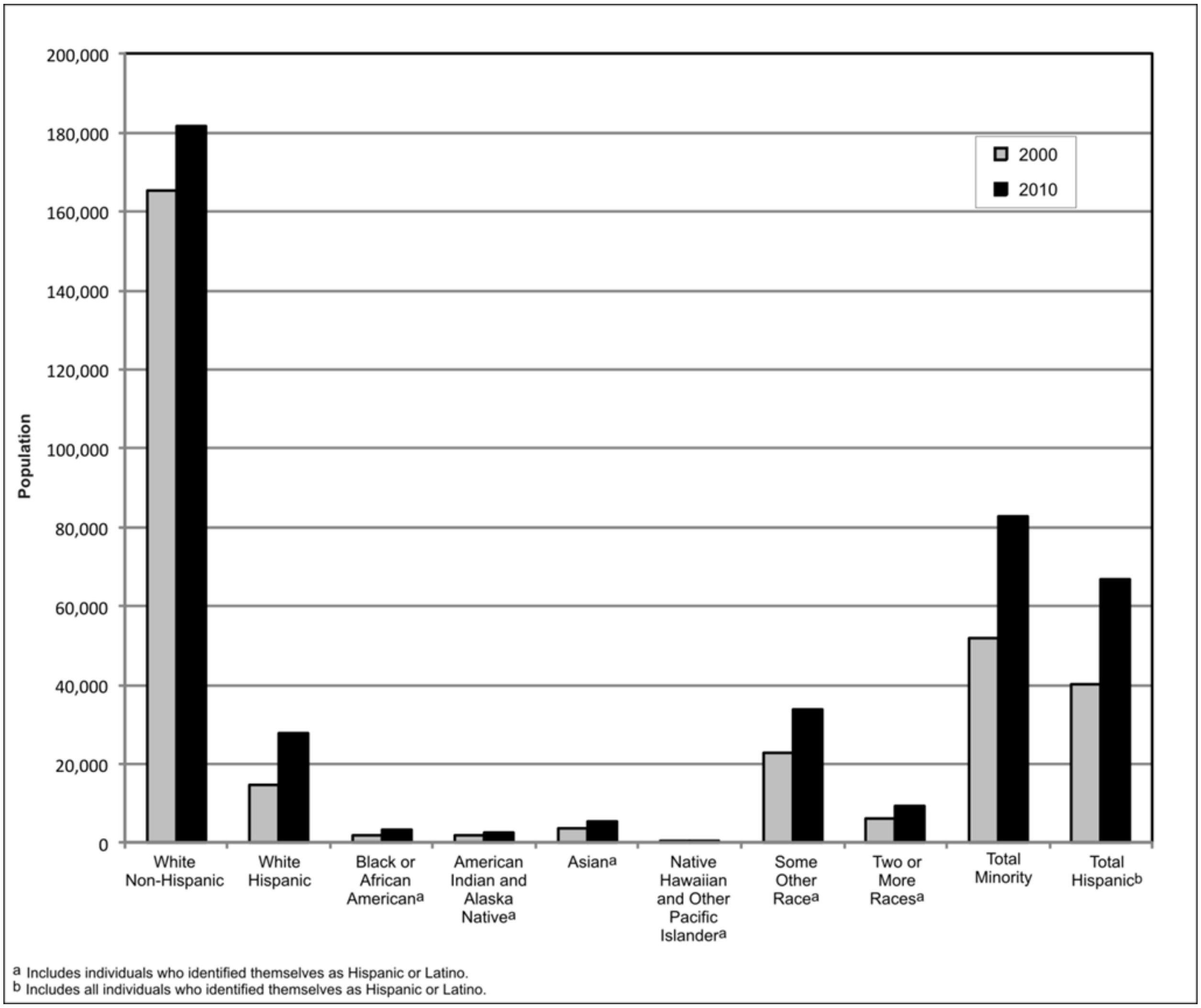


Figure E–6. Populations Residing Within the Two-County Area Surrounding the 200-West Area at the Hanford Site

Demographic data from the 2010 census show that the total minority population residing in the two-county area composed approximately 31 percent of the total population. The White Hispanic population residing in the two-county area composed approximately 34 percent of the area's total minority population, while those self-identified as "some other race" (meaning those who provided write-in entries such as Mexican, Puerto Rican, or Cuban) composed approximately 41 percent of the area's total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 81 percent of the total minority population and approximately 25 percent of the total population residing in the two-county area around Hanford in 2010 (DOC 2011d).

In 2010, 147 people lived within 16 kilometers (10 miles) of the 200-West Area at Hanford (DOC 2011d). This area included an estimated 38 percent minority and 18 percent low-income population. By comparison, the two-county area included a 31 percent minority and 15 percent low-income population, and Washington included a 27 percent minority and 12 percent low-income population (DOC 2011d, 2011e). There are four census block groups located within the 16-kilometer (10-mile) radius surrounding the 200-West Area at Hanford, two of which contained a minority population only and one that contained both a minority and low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, the minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population. No one resides within approximately 3.2 kilometers (2 miles) of the 200-West Area at Hanford.

Figure E–7 shows the proximity of the identified minority and low-income communities to the 200-West Area at Hanford.

Figure E–8 shows the cumulative populations living at a given distance from the 200-West Area at Hanford.

There are two American Indian reservations in proximity to the Hanford region. The Yakama Reservation is located approximately 48 kilometers (30 miles) southwest of the 200-West Area, and the Umatilla Reservation is located 113 kilometers (70 miles) southeast of the 200-West Area.

E.3.4.2 Environmental Consequences

Under this alternative, a new mercury storage facility would be constructed at DOE's Hanford Site. Hanford occupies 151,775 hectares (approximately 375,040 acres) along the Columbia River in the southeastern portion of the state of Washington. Within this site, the new mercury storage facility would be built in the 200-West Area adjacent to the Central Waste Complex, as further described in Chapter 2, Section 2.4.3, of the January 2011 *Mercury Storage EIS*.

E.3.4.2.1 Socioeconomics

Under this alternative, a new facility for long-term storage of elemental mercury would be constructed in the 200-West Area. Employment during construction is expected to average 18 people for approximately 6 months. Operation of the facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately 5 to 6 individuals thereafter, resulting in a possible increase of the existing Hanford workforce of less than 0.1 percent and an increase in the ROI workforce of approximately 0.004 percent. Neither construction nor operation of a new facility is expected to generate substantial direct or indirect employment. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

Construction-related transportation, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is assumed that there would be approximately 1.5 employees per vehicle, and every vehicle is counted twice to account for round trips. It is estimated that average construction transportation of 45 vehicles a day could increase the average annual daily traffic counts by as little as 1 percent, if utilizing State Route 240, to as much as 5 percent, if utilizing State Route 24. It is likely that these additional vehicles would use a combination of routes; thus, the additional load would not be concentrated on one route. Fifty-three percent of these vehicles would be attributed to employee transportation. Impacts on traffic during construction would be minor.

Figure E–7. Block Groups Containing Minority and Low-Income Populations Surrounding the 200-West Area at the Hanford Site

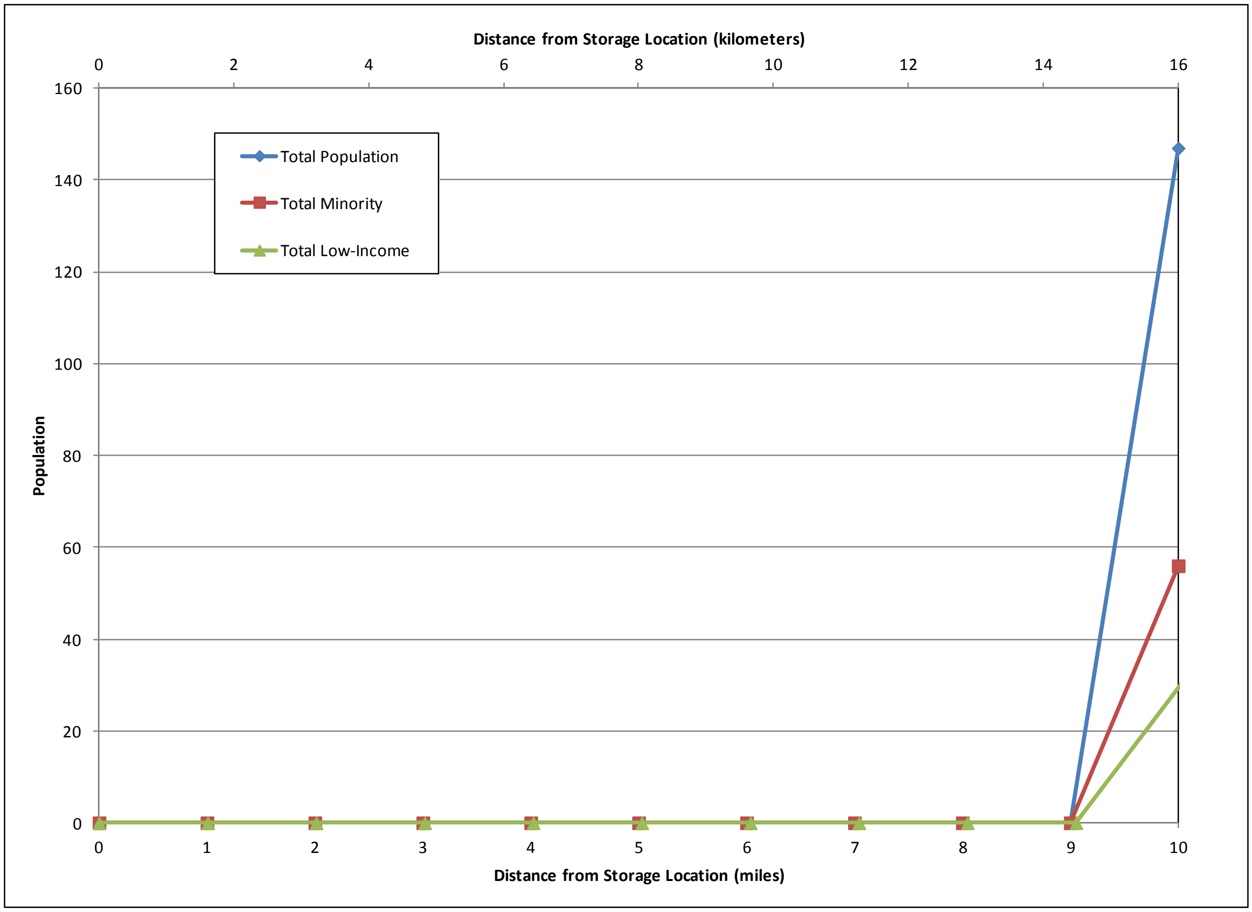


Figure E–8. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the 200-West Area at the Hanford Site

Transportation impacts during the operations phase would include employee vehicle trips and shipments of elemental mercury to the site for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual daily traffic counts by as little as 0.2 percent, if utilizing State Route 240, to slightly over 1 percent, if utilizing State Route 24. At the peak of operations, it is estimated that up to 79 shipments of elemental mercury would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be negligible to minor.

E.3.4.2.2 Environmental Justice

Two of the block groups within the 16-kilometer (10-mile) radius surrounding the proposed storage site at Hanford contain a minority population only and one of the block groups contains both a minority and low-income population. There are no populations identified within the 3.2-kilometer (2-mile) radius surrounding the storage site. As discussed in Chapter 3, Section 3.3.1.1, and Chapter 4, Section 4.4.1, of the January 2011 *Mercury Storage EIS*, the land use designations surrounding the 200-West Area include Preservation, Conservation (Mining), Recreation, Industrial-Exclusive, and Research and Development (see Figure 3–3 of the January 2011 *Mercury Storage EIS*); there would be no impacts on land use as a result of implementing the Hanford alternative. Impacts on air quality under this alternative would be negligible, as discussed in Section 4.4.4.2 of the January 2011 *Mercury Storage EIS*. No impacts on ecological resources would occur under this alternative, as discussed in Section 4.4.5 of the January 2011

Mercury Storage EIS. Construction of a new storage facility would occur in previously disturbed lands and there are no known traditional cultural properties located within the 200 Areas; therefore, the probability of discovering American Indian archaeological sites would be negligible. Thus, there would be negligible impacts on American Indian cultural resources, as discussed in Section 4.4.6.3 of the January 2011 *Mercury Storage EIS*. A negligible change in socioeconomic conditions would result under this alternative, as discussed above in Section E.3.4.2.1. As discussed in Section 4.4.9 of the January 2011 *Mercury Storage EIS*, implementing the Hanford alternative would result in negligible offsite human health risks from mercury emissions during normal operations and facility accidents. As discussed in Section 4.4.9.3 of the January 2011 *Mercury Storage EIS*, transportation accidents are predicted to pose a negligible-to-low human health risk following dry deposition onto the ground or into water bodies. The 200 Area at Hanford is located in an area proximal to block groups identified as both minority and low-income communities, as described in Section E.3.4.1.2. The analysis of the Hanford alternative identified the presence of minority and low-income communities adjacent to potential transportation routes. The transportation accident analysis is discussed in Section 4.4.9.3 and Appendix D, Section D.4.5, of the January 2011 *Mercury Storage EIS*.

In addition, under transportation accident scenarios in which a fire occurs, it is possible for nearby downwind surface-water bodies to become contaminated, raising concerns for populations where fish is an important part of the diet. Chapter 4, Section 4.5.9.3.3, of the January 2011 *Mercury Storage EIS* discusses the possibility of accumulation of mercury in fish under such scenarios. Three fish consumption rates were analyzed: the national average consumption rate, the average subsistence fisherman consumption rate, and the 95th percentile subsistence fisherman consumption rate (see Section 4.2.9.1.1 of the January 2011 *Mercury Storage EIS*). Such consumption rates could be representative of a low-income or American Indian subsistence fishing population. Under the Truck Scenarios, the risks to human receptors that consume fish at one of the three rates would be negligible. Under the Railcar Scenario, the risk to the 95th percentile subsistence fisherman would be negligible to low. American Indian reservations have not been identified within the 16-kilometer (10-mile) ROI surrounding the 200-West Area of Hanford; however, as discussed in Section E.3.4.1.2, there are low-income and minority communities present in the ROI. Although the risk is negligible to low, if a transportation accident that resulted in fish contamination were to occur, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements for mercury concentrations in waters and fish stocks.

E.3.5 Hawthorne Army Depot

E.3.5.1 Affected Environment

E.3.5.1.1 Socioeconomics

Based on the local employment data compiled by the Census Bureau, approximately 90 percent of people employed in the Hawthorne area are assumed to reside in three Nevada counties: Mineral, Lyon, and Churchill (DOC 2009). Therefore, these three counties have been identified as the ROI in this socioeconomics analysis. In 2010, the Hawthorne Army Depot employed approximately 550 to 650 persons.

E.3.5.1.1.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of the ROI increased by approximately 21 percent from 32,259 to 39,096. During this period, the unemployment rate of the ROI increased from 6.2 percent to 15.0 percent. The unemployment rate in the ROI peaked during 2010 at 15.1 percent. By July 2012, the unemployment rate of the ROI was 13.5 percent, which was higher than the unemployment rate for Nevada (12.0 percent) (BLS 2012).

E.3.5.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the three-county ROI was 81,629. From 2000 to 2010, the ROI population grew by 28 percent, which was lower than the growth rate throughout the entire state of Nevada (35.1 percent) (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. In 2010, the percentage of the ROI population under the age of 18 was 25 percent; women ages 18 to 39 composed 12 percent (DOC 2011a). There were 36,203 housing units in the ROI in 2010, 61 percent of which were owner-occupied, 27 percent were renter-occupied, and 12 percent were vacant (DOC 2011b, 2011c).

E.3.5.1.2 Environmental Justice

The 16-kilometer (10-mile) radius surrounding the candidate storage location at the Hawthorne Army Depot encompasses part of Mineral County, Nevada. Figure E–9 shows populations residing in Mineral County, as reported in the 2000 and 2010 censuses (DOC 2001b, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. In the decade between 2000 and 2010, the total population of Mineral County declined by approximately 5.9 percent from 5,071 to 4,772; the minority population decreased by approximately 1 percent from 1,516 to 1501; and the low-income population increased by 17 percent from 761 to 887 (DOC 2001a, 2001b, 2011d, 2011e). Demographic data from the 2010 census show that the total minority population accounted for approximately 31 percent of the total population. The American Indian and Alaska Native populations residing in Mineral County composed approximately 49 percent of the county's total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 9.1 percent of the total population and approximately 29 percent of the total minority population residing in Mineral County in 2010 (DOC 2011d).

In 2010, 2,583 people lived within 16 kilometers (10 miles) of the Hawthorne Army Depot. This area included an estimated 23 percent minority and 15 percent low-income population. By comparison, Mineral County included a 31 percent minority and 19 percent low-income population, and Nevada included a 46 percent minority and 12 percent low-income population (DOC 2011d, 2011e). There are four census block groups located within the 16-kilometer radius surrounding the Hawthorne Army Depot, one of which contained both a minority and low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population.

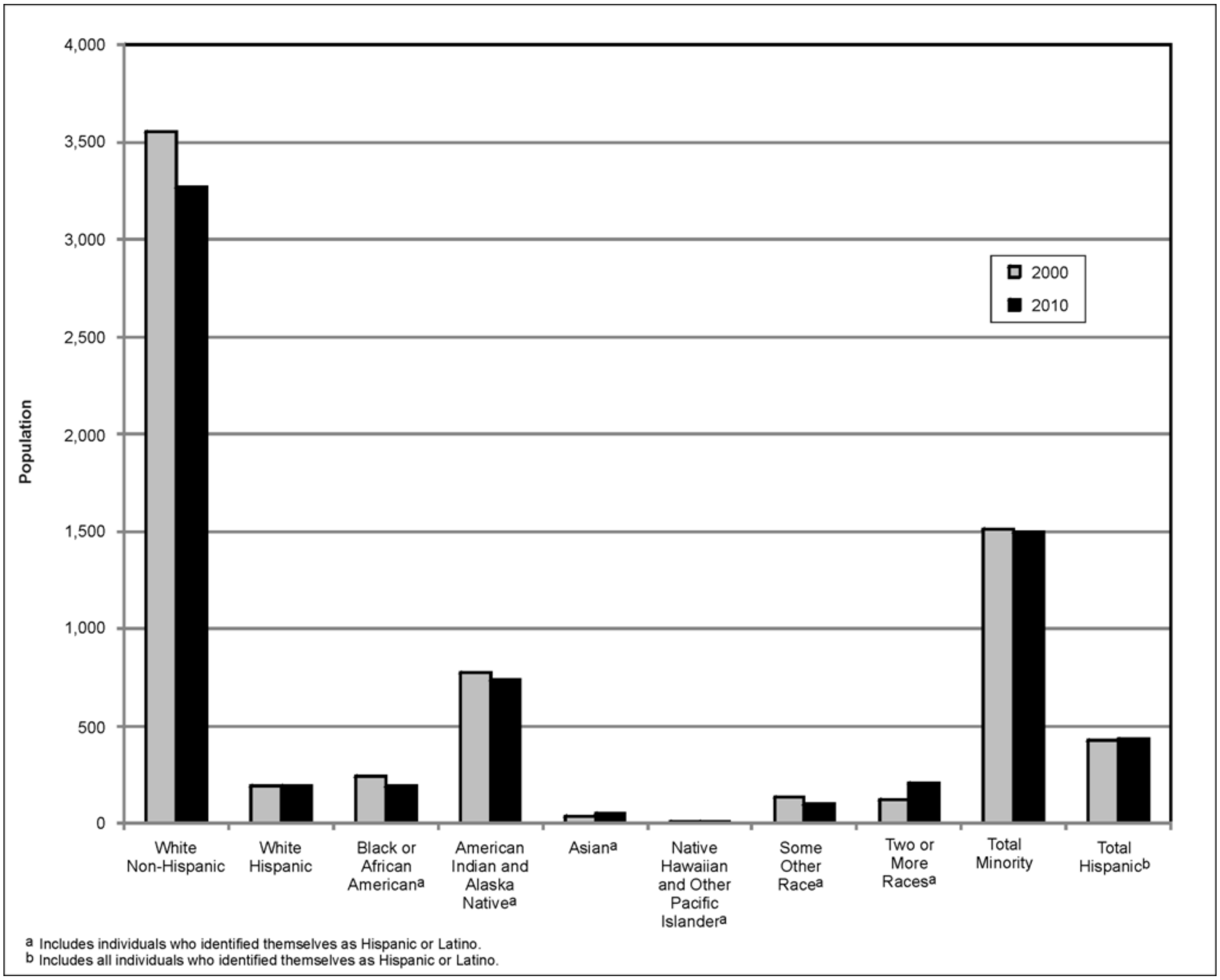


Figure E–9. Populations Residing Within Mineral County, Nevada, Surrounding the Hawthorne Army Depot

In 2010, 169 people lived within approximately 3.2 kilometers (2 miles) of the Hawthorne Army Depot. This area included an estimated 23 percent minority and 20 percent low-income population (DOC 2011d, 2011e). There are two census block groups located within this ROI, one of which contained both a minority and low-income population. Differences in the results of the population analysis within the 3.2-kilometer (2-mile) ROI calculated using data from the 2000 census (i.e., population=0) and the 2010 census (i.e., population=169) are primarily due to changes to the boundaries of block groups associated with the respective data sets and the methodology involved in estimating populations within specific radii. During each decennial census, the boundaries of geographic units at finer spatial resolution (such as census tracts, block groups, and blocks) are typically redrawn to more accurately reflect the dispersion of the population in a given area, which aids local communities in the redistricting process.

Figure E–10 shows the proximity of the identified minority and low-income communities to the Hawthorne Army Depot.

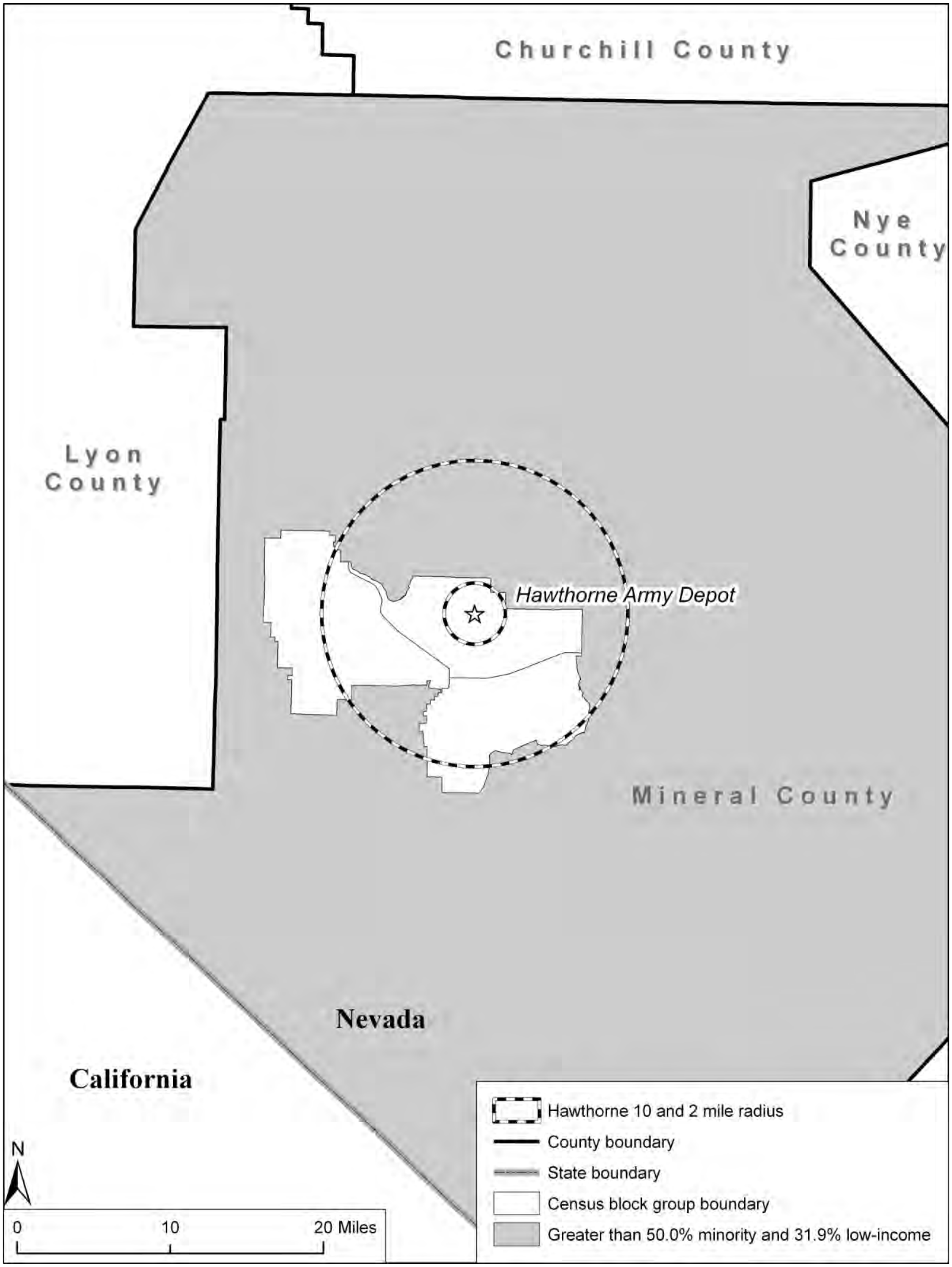


Figure E–10. Block Group Containing Minority and Low-Income Populations Surrounding the Hawthorne Army Depot

Figure E–11 shows the cumulative populations living at a given distance from the Hawthorne Army Depot.

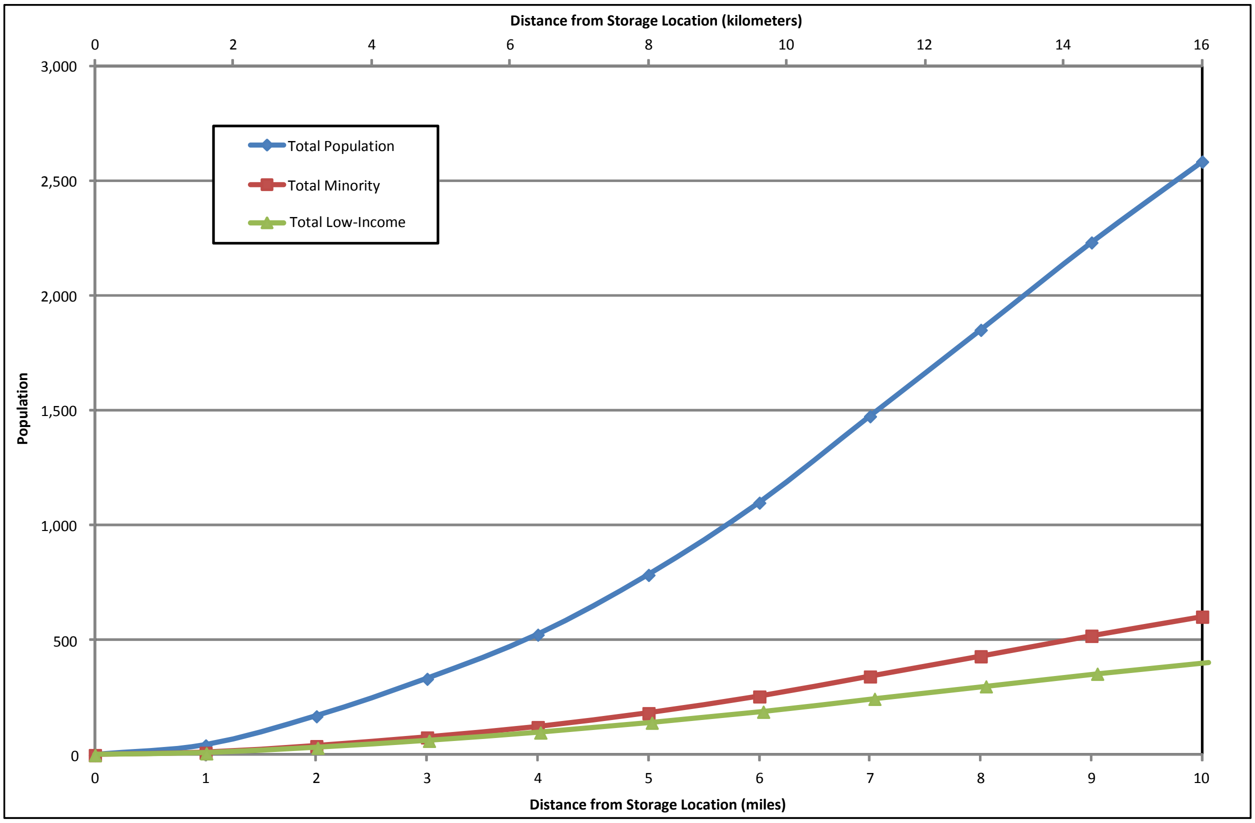


Figure E–11. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Hawthorne Army Depot

E.3.5.2 Environmental Consequences

Under this alternative, elemental mercury would be stored at the Hawthorne Army Depot. The depot comprises 59,500 hectares (147,000 acres) and is located approximately 16 kilometers (10 miles) from Hawthorne, Nevada. Implementation of this alternative would involve modification of a maximum of 29 existing storage buildings within the depot's Central Magazine Area to accommodate mercury storage, as further described in Chapter 2, Section 2.4.4, of the January 2011 *Mercury Storage EIS*.

E.3.5.2.1 Socioeconomics

Under this alternative, existing storage facilities (igloos) in the Hawthorne Army Depot's Central Magazine Area would be modified for long-term storage of elemental mercury. Employment during renovations is expected to be less than that estimated for constructing a new facility, as described in Chapter 4, Section 4.5.11, of the January 2011 *Mercury Storage EIS*. Appendix C, Table C–1, of this SEIS summarizes the necessary modifications to bring the existing storage buildings at the Hawthorne Army Depot up to specifications to support mercury storage. Operation of the existing buildings for mercury storage is estimated to require approximately eight individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately five to six individuals thereafter, resulting in a possible increase in the depot's workforce of approximately 2 percent and an increase in the ROI workforce of 0.02 percent. Neither modification nor operation of the storage buildings is expected to generate substantial, new direct or indirect employment. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

Construction-related transportation needed to modify the existing facility, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is likely that significantly fewer than the 45 vehicles a day estimated for construction of a new mercury storage facility would be needed to support facility modification (see Chapter 4, Section 4.5.11, of the January 2011 *Mercury Storage EIS*). Therefore, construction-related transportation is expected to increase the average annual daily traffic count on U.S. Route 95 by no more than 2 percent. Impacts on traffic during construction would be minor.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of mercury to the site for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operation are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual daily traffic count on U.S. Route 95 by less than 0.5 percent. At the peak of operations, it is estimated that up to 79 shipments would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be negligible.

E.3.5.2.2 Environmental Justice

One of the block groups within the 16-kilometer (10-mile) radius surrounding the proposed storage site at the Hawthorne Army Depot contains both a minority and low-income population. The same block group has been identified within the 3.2-kilometer (2-mile) radius surrounding the storage site. As discussed in Chapter 3, Section 3.4.1.1, and Chapter 4, Section 4.5.1, of the January 2011 *Mercury Storage EIS*, the surrounding area includes light industrial land use; there would be no offsite impacts on land use as a result of implementing the Hawthorne Army Depot alternative. Impacts on air quality under this alternative would be negligible, as discussed in Chapter 4, Section 4.5.4.2, of the January 2011 *Mercury Storage EIS*. No impacts on ecological resources would occur under this alternative, as discussed in Section 4.5.5 of the January 2011 *Mercury Storage EIS*. Modification of existing storage buildings would not require any additional land to be disturbed and the probability of discovering American Indian archaeological sites would be negligible; thus, there would be negligible impacts on American Indian cultural resources, as discussed in Chapter 3, Section 3.4.6.3, and Chapter 4, Section 4.5.6.3, of the January 2011 *Mercury Storage EIS*. A negligible change in socioeconomic conditions would result under this alternative, as discussed above in Section E.3.5.2.1. As discussed in Section 4.5.9 of the January 2011 *Mercury Storage EIS*, implementing the Hawthorne Army Depot alternative would result in negligible offsite human health risks from mercury emissions during normal operations and facility accidents. As discussed in Section 4.5.9.3 of the January 2011 *Mercury Storage EIS*, transportation accidents are predicted to pose a negligible-to-low human health risk following dry deposition onto the ground or into water bodies. The Hawthorne Army Depot is located in an area proximal to a block group identified as both a minority and low-income community, as described in Section E.3.5.1.2. The analysis of the Hawthorne Army Depot alternative identified the presence of minority and low-income communities adjacent to potential transportation routes. The transportation accident analysis is discussed in Section 4.2.9.3 and Appendix D, Section D.4.5, of the January 2011 *Mercury Storage EIS*.

In addition, under transportation accident scenarios in which a fire occurs, it is possible for nearby downwind surface-water bodies to become contaminated, raising concerns for populations where fish is an important part of the diet. Chapter 4, Section 4.5.9.3.3, of the January 2011 *Mercury Storage EIS* discusses the possibility of accumulation of mercury in fish under such scenarios. Three fish consumption rates were analyzed: the national average consumption rate, the average subsistence fisherman consumption rate, and the 95th percentile subsistence fisherman consumption rate (see Section 4.2.9.1.1 of the January 2011 *Mercury Storage EIS*). Such consumption rates could be representative of a low-income or American Indian subsistence fishing population. Under the Truck Scenarios, the risks to human receptors that consume fish at one of the three rates would be negligible. Under the Railcar Scenario, the risk to the 95th percentile subsistence fisherman would be negligible to low. American Indian reservations have not been identified within the 16-kilometer (10-mile) ROI surrounding the Hawthorne Army Depot; however, as discussed in Section E.3.5.1.2, there are low-income and minority communities present in the ROI. The Walker River Indian Reservation lies outside the 16-kilometer radius of the proposed storage site; however, transportation of mercury through the reservation is a consideration. Although the risk is negligible to low, if a transportation accident that resulted in fish contamination were to occur, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements for mercury concentrations in waters and fish stocks.

E.3.6 Idaho National Laboratory

E.3.6.1 Affected Environment

E.3.6.1.1 Socioeconomics

INL is located in southeastern Idaho, approximately 39 kilometers (24 miles) west of Idaho Falls. Over 90 percent of people employed at INL reside in four counties: Bannock, Bingham, Bonneville, and Jefferson. Therefore, these four counties are identified as the ROI in this socioeconomics analysis. In 2008, INL employed 8,485 persons (Wiser 2008).

E.3.6.1.1.1 Regional Economic Characteristics

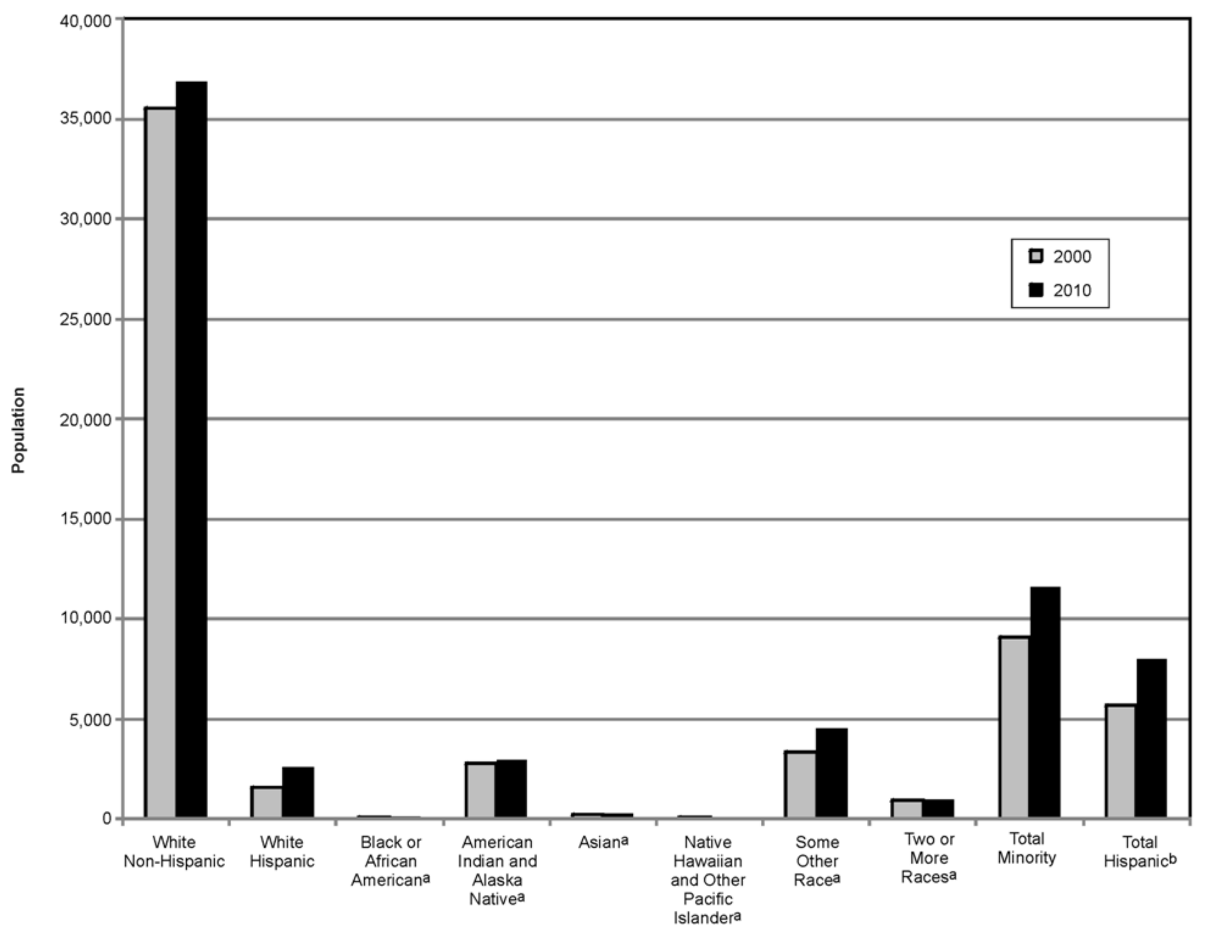
From 2000 to 2011, the labor force of the ROI increased by approximately 17 percent from 108,820 to 126,982. During this period, the unemployment rate of the ROI increased from 4.0 percent to 7.4 percent. The unemployment rate in the ROI peaked during 2010 at 7.2 percent. By July 2012, the unemployment rate of the ROI was 6.2 percent, which was lower than the unemployment rate for Idaho (6.9 percent) (BLS 2012).

E.3.6.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the four-county ROI was 258,820. From 2000 to 2010, the ROI population grew by 18 percent, compared with 21 percent growth throughout the state of Idaho (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. The percentage of the ROI population under the age of 18 was 31 percent; women ages 18 to 39 composed 15 percent (DOC 2011a). There were 97,785 housing units in the ROI in 2010 (DOC 2011b), 67 percent of which were owner-occupied, 26 percent were renter-occupied, and 7.5 percent were vacant (DOC 2011b, 2011c).

E.3.6.1.2 Environmental Justice

The 16-kilometer (10-mile) radius surrounding the candidate storage locations at INL encompasses parts of two counties in Idaho: Bingham and Butte. Figure E–12 shows populations residing in the two-county area, as reported in the 2000 and 2010 censuses (DOC 2001a, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. In the decade between 2000 and 2010, the total population of Bingham and Butte Counties increased by approximately 8.7 percent to 48,498; the minority population increased by approximately 28 percent to 11,609; and the low-income population increased by 22 percent to 6,879 (DOC 2001a, 2001b, 2011d, 2011e). Demographic data from the 2010 census show that the total minority population accounted for approximately 24 percent of the total population. The population self-identified as "some other race" (meaning those who provided write-in entries such as Mexican, Puerto Rican, or Cuban) residing in the two-county area composed approximately 39 percent of the area's total minority population, while those identified as American Indian and Alaska Native composed 26 percent of the total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 69 percent of the total minority population residing in Bingham and Butte Counties in 2010 (DOC 2011d).



[a] Includes individuals who identified themselves as Hispanic or Latino.
[b] Includes all individuals who identified themselves as Hispanic or Latino.

Figure E–12. Populations Residing Within the Two-County Area Surrounding Idaho National Laboratory

Radioactive Waste Management Complex Option

In 2010, 175 people lived within 16 kilometers (10 miles) of the Radioactive Waste Management Complex (RWMC). This area included an estimated 9.8 percent minority and 19 percent low-income population. By comparison, Bingham and Butte Counties included a 24 percent minority and 15 percent low-income population, and Idaho included a 16 percent minority and 14 percent low-income population (DOC 2001a, 2001b, 2011d, 2011e). There are three census block groups located within the 16-kilometer radius surrounding the RWMC, none of which contained a minority or low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population. No one resides within approximately 3.2 kilometers (2 miles) of the RWMC (DOC 2011d).

The Fort Hall Reservation is located approximately 71 kilometers (44 miles) southeast of the RWMC.

Figure E–13 shows the cumulative populations living at a given distance from the RWMC.

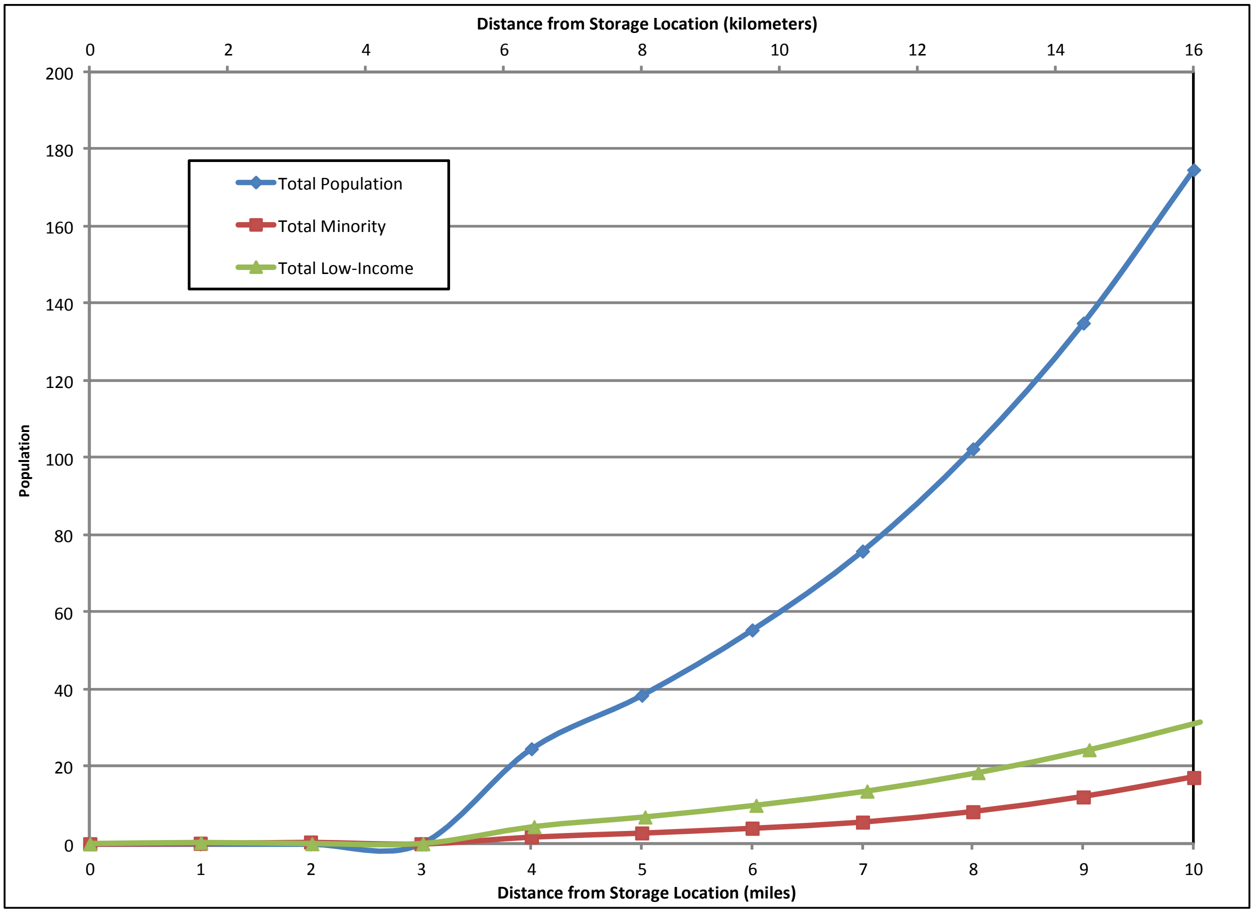


Figure E–13. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Radioactive Waste Management Complex

Idaho Nuclear Technology and Engineering Center Option

In 2010, 205 people lived within 16 kilometers (10 miles) of the Idaho Nuclear Technology and Engineering Center (INTEC). This area included an estimated 11 percent minority and 15 percent low-income population. By comparison, Bingham and Butte Counties included a 24 percent minority and 15 percent low-income population, and Idaho included a 16 percent minority and 14 percent low-income population (DOC 2001a, 2001b, 2011d, 2011e). There are three census block groups located within the 16-kilometer radius surrounding INTEC, none of which contained a minority or low-income population. No one resides within approximately 3.2 kilometers (2 miles) of INTEC (DOC 2011d).

The Fort Hall Reservation is located approximately 69 kilometers (43 miles) southeast of INTEC.

Figure E–14 shows the cumulative populations living at a given distance from INTEC.

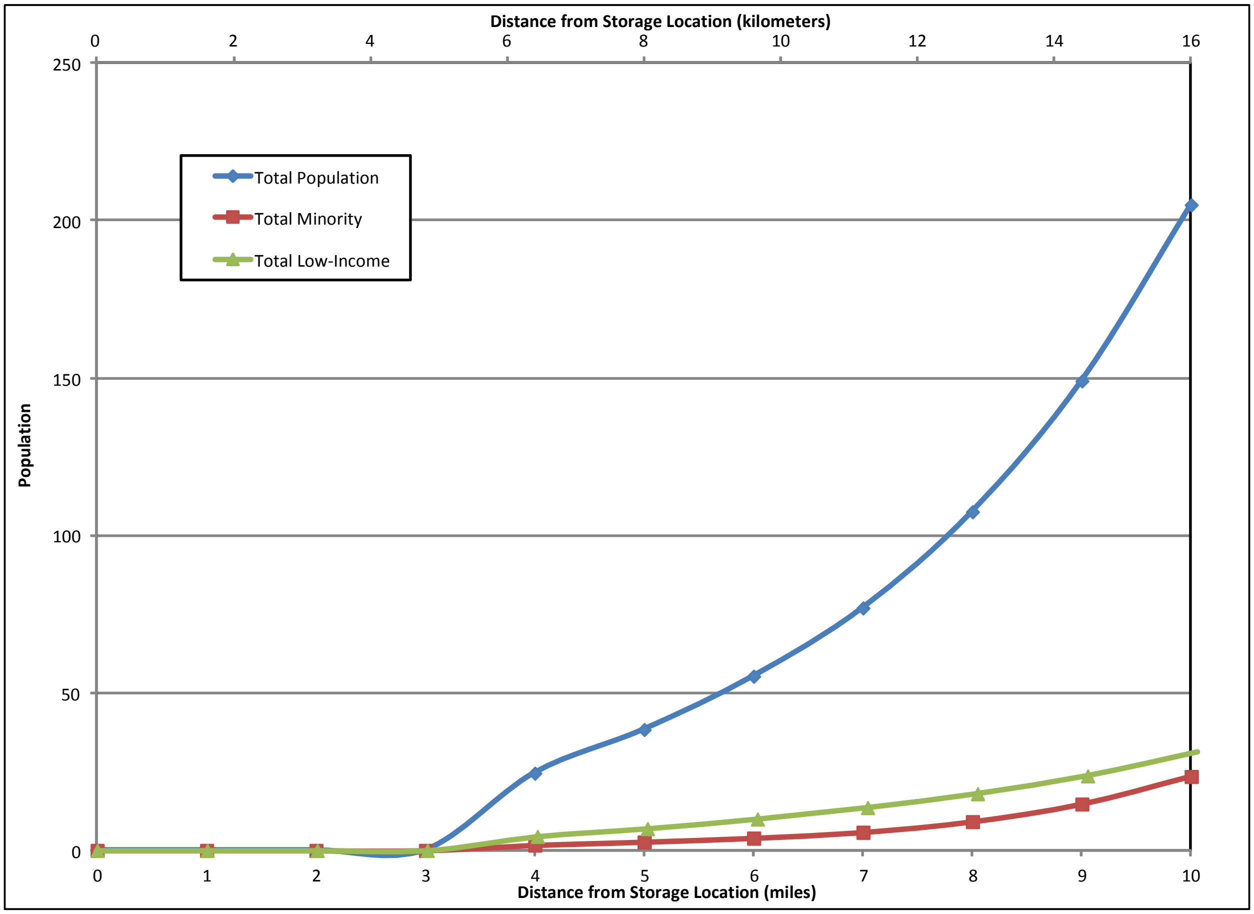


Figure E–14. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Idaho Nuclear Technology and Engineering Center

E.3.6.2 Environmental Consequences

Under this alternative, elemental mercury would be stored at DOE's INL. INL is a 230,323-hectare (569,135-acre) area located in southeastern Idaho. Two options have been identified at INL: (1) construction of a new mercury storage facility within INTEC, or (2) modification of existing waste storage facilities at the RWMC to accommodate mercury storage. These options are further described in Chapter 2, Section 2.4.5, of the January 2011 *Mercury Storage EIS*. In the following sections, differences in potential impacts between the options are identified, where appropriate.

E.3.6.2.1 Socioeconomics

Idaho Nuclear Technology and Engineering Center Option

Under the INTEC Option at INL, a new facility for long-term storage of elemental mercury would be constructed. Employment during construction is expected to average 18 people for approximately 6 months. Operation of the facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately 5 to 6 individuals thereafter, resulting in a possible increase of the INL workforce of less than 0.1 percent and an increase in the ROI of 0.005 percent. This estimate assumes that new employees would be hired for construction and operations of the new facility rather than drawn from existing onsite personnel. Regardless, neither construction nor operation of a new facility is expected to generate substantial direct or indirect employment. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

Construction-related transportation, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is assumed that there would be approximately 1.5 employees per vehicle, and every vehicle is counted twice to account for round trips. It is estimated that average construction transportation of 45 vehicles a day could increase the average annual daily traffic count on Idaho State Route 33 by approximately 6 percent. Fifty-three percent of these vehicles would be attributed to employee transportation. Impacts on traffic during construction would be minor.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of mercury to the site for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual traffic count on State Route 33 by approximately 2 percent. At the peak of operations, it is estimated that up to 79 shipments would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be minor.

Radioactive Waste Management Complex Option

Modifications of the existing RWMC storage modules and subsequent operations for storage of elemental mercury under the RWMC Option would result in substantially smaller socioeconomic impacts than those described above for the INTEC Option. The total impact on socioeconomic and traffic conditions in the ROI surrounding INL would be negligible to minor. Appendix C, Table C–1, of the January 2011 *Mercury Storage EIS* summarizes the necessary modifications to the RWMC storage modules to meet the specifications for mercury storage.

E.3.6.2.2 Environmental Justice

Idaho Nuclear Technology and Engineering Center Option

None of the block groups within either the 16-kilometer (10-mile) radius or the 3.2-kilometer (2-mile) radius surrounding INTEC contain a minority or low-income population. Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

The Fort Hall Reservation lies well beyond the 16-kilometer (10-mile) radius of the proposed storage site; however, it is possible that mercury shipments originating from points south and east of the site could be transported through the reservation.

Radioactive Waste Management Complex Option

None of the block groups within either the 16-kilometer (10-mile) radius or the 3.2-kilometer (2-mile) radius surrounding the RWMC contain a minority or low-income population. Therefore, no disproportionately high and adverse effects on minority or low-income populations are expected.

The Fort Hall Reservation lies well beyond the 16-kilometer radius of the proposed storage site; however, it is possible that mercury shipments originating from points south and east of the site could be transported through the reservation.

E.3.7 Kansas City Plant

E.3.7.1 Affected Environment

E.3.7.1.1 Socioeconomics

KCP is located in Kansas City, Missouri, approximately 13 kilometers (8 miles) south of the city center. KCP employs approximately 2,400 persons. Approximately 90 percent of the people employed at KCP reside in four counties: Cass, Clay, and Jackson in Missouri and Johnson in Kansas. Therefore, these four counties are identified as the ROI in this socioeconomics analysis (GSA and NNSA 2008:22).

E.3.7.1.1.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of the four-county ROI increased by approximately 6.5 percent from 763,352 to 813,127. During this period, the unemployment rate of the ROI increased from 3.1 percent to 7.9 percent. The unemployment rate in the ROI peaked during 2009 at 8.8 percent and remained at that level through 2010. By July 2012, the unemployment rate of the ROI was 7.3 percent, which was higher than the unemployment rate across the two-state area of Missouri and Kansas (6.8 percent) (BLS 2012).

E.3.7.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the four-county ROI was 1,539,754. From 2000 to 2010, the ROI population grew by 12 percent, compared with 6.7 percent growth throughout the two-state region of Missouri and Kansas (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. The percentage of the ROI population under the age of 18 was 26 percent; women ages 18 to 39 composed 15 percent of the population (DOC 2011a). There were 672,624 housing units in the ROI in 2010 (DOC 2011b), 61 percent of which were owner-occupied, 30 percent were renter-occupied, and 9.0 percent were vacant (DOC 2011b, 2011c).

E.3.7.1.2 Environmental Justice

The 16-kilometer (10-mile) radius surrounding the candidate storage location at KCP encompasses parts of four counties: Cass and Jackson in Missouri and Johnson and Wyandotte in Kansas. Figure E–15 shows populations residing in the four-county area, as reported in the 2000 and 2010 censuses (DOC 2001a, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. In the decade between 2000 and 2010, the total population of Cass, Jackson, Johnson, and Wyandotte Counties increased by approximately 9.6 percent to 1,475,320; the minority population increased by approximately 30 percent to 445,453; and the low-income population increased by 40 percent to 172,177 (DOC 2001a, 2001b, 2011d, 2011e). Demographic data from the 2010 census show that the total minority population accounted for approximately 30 percent of the total population. The Black or African American population residing in the four-county area accounted for approximately 51 percent of the area's total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 9.6 percent of the total population and approximately 32 percent of the total minority population residing in Cass, Jackson, Johnson, and Wyandotte Counties in 2010 (DOC 2011d).

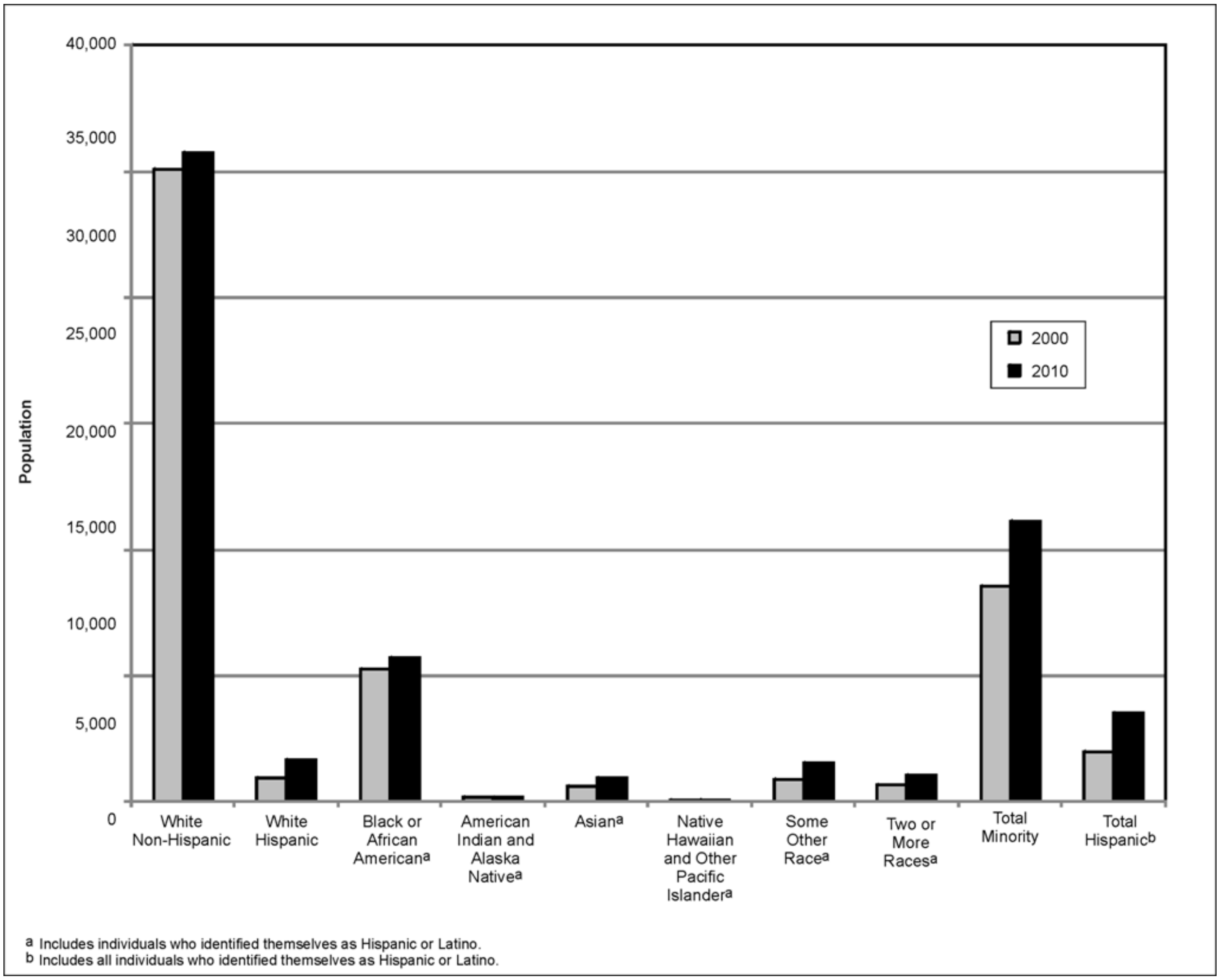


Figure E–15. Populations Residing Within the Four-County Area Surrounding the Kansas City Plant

In 2010, 705,513 people lived within 16 kilometers (10 miles) of KCP. This area included an estimated 36 percent minority and 13 percent low-income population. By comparison, the four-county area included a 30 percent minority and 12 percent low-income population, and the two-state area included a 19 percent minority and 14 percent low-income population (DOC 2011d, 2011e). There are 659 census block groups located within the 16-kilometer radius surrounding KCP; of this total, 157 contained a minority population, 5 contained a low-income population, and 88 contained both a minority and low-income population. A total of 409 block groups did not contain a low-income or minority population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population.

In 2010, 26,192 people lived within approximately 3.2 kilometers (2 miles) of KCP. This area included an estimated 52 percent minority and 20 percent low-income population (DOC 2011d, 2011e). There are 39 census block groups located within this ROI; of this total, 16 contained a minority population, none contained a low-income population, and 6 contained both a minority and low-income population. Seventeen block groups did not contain a minority or low-income population.

Figure E–16 displays the proximity of minority and low-income communities to KCP.

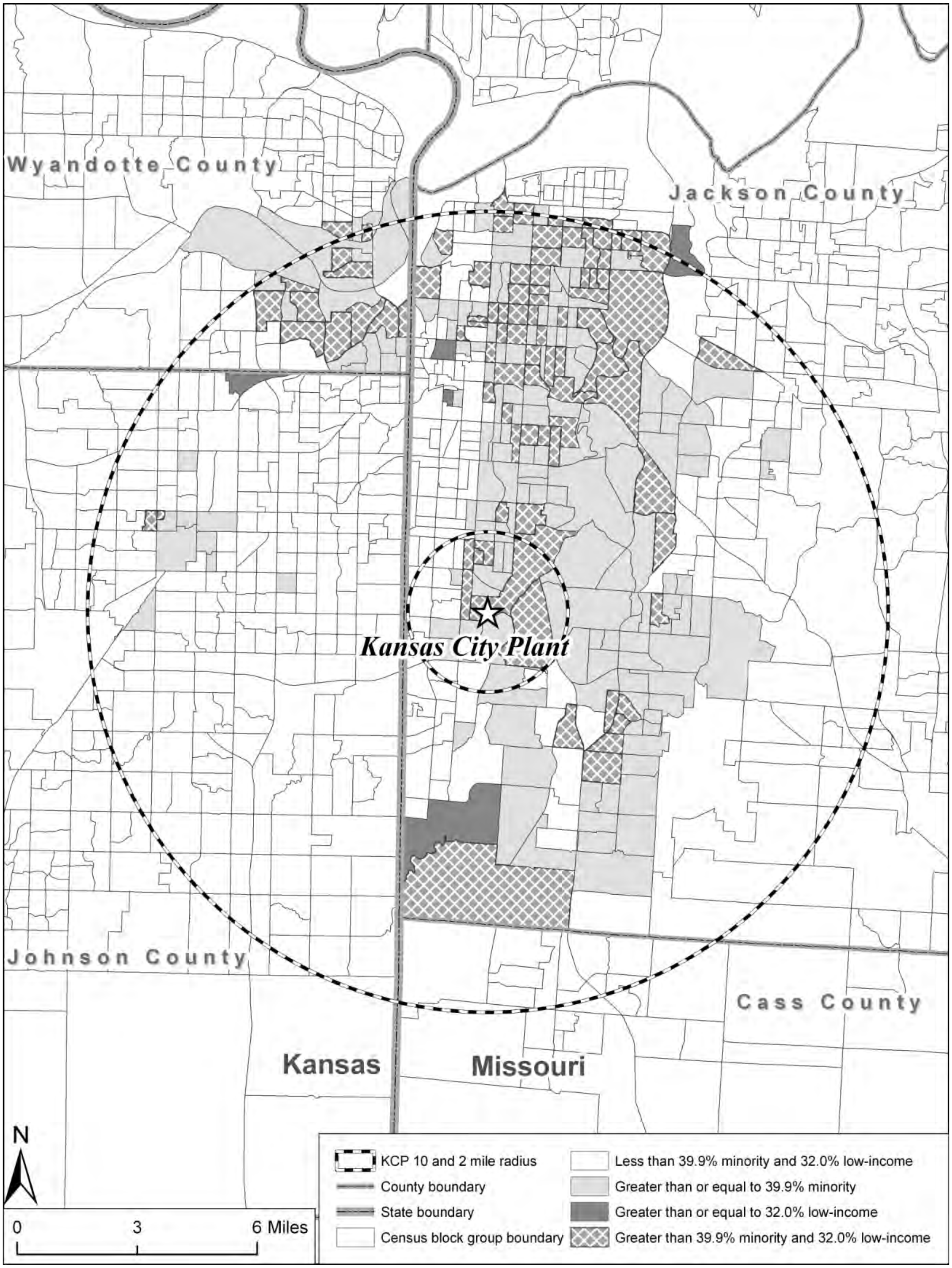


Figure E–16. Block Groups Containing Minority and Low-Income Populations Surrounding the Kansas City Plant

Figure E–17 shows the cumulative populations living at a given distance from the site.

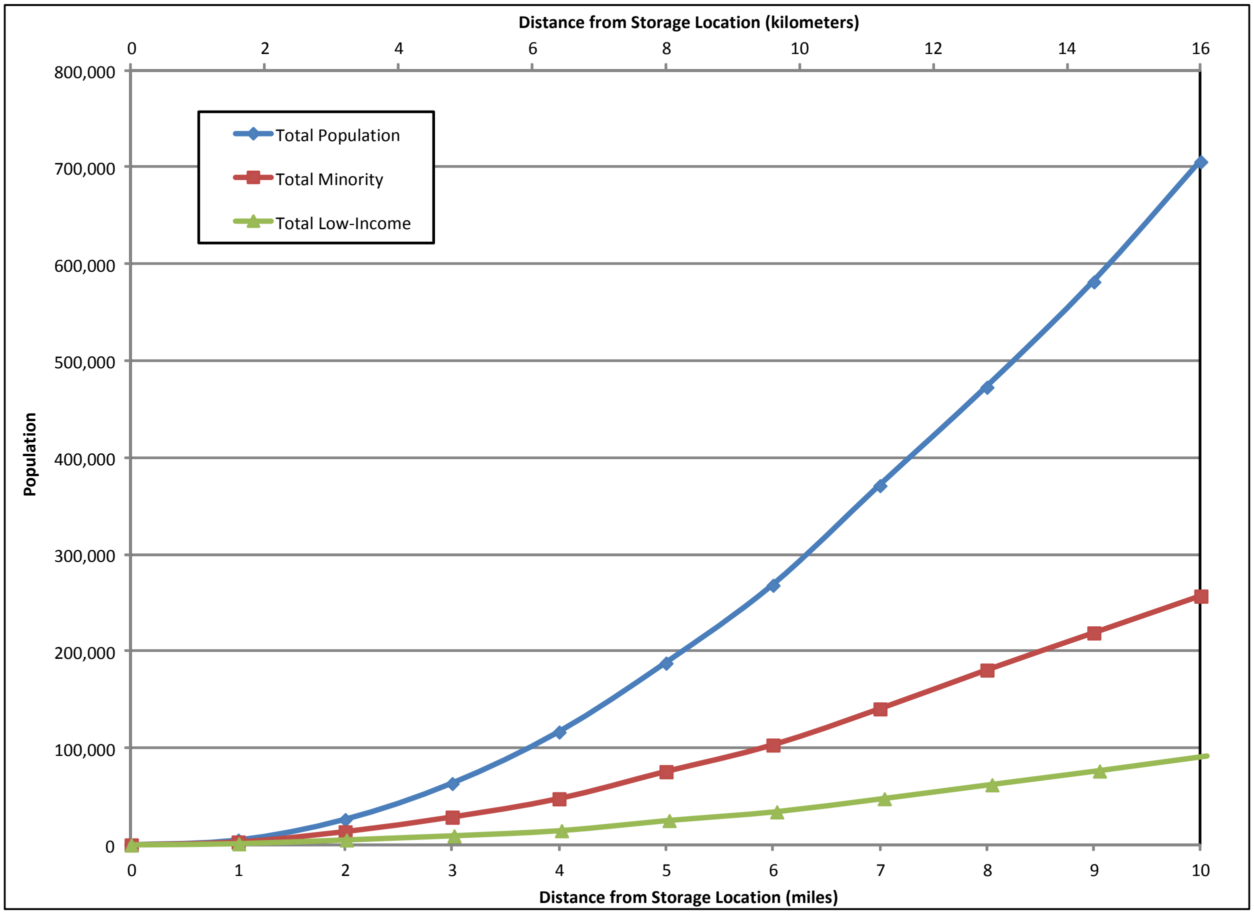


Figure E–17. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Kansas City Plant

E.3.7.2 Environmental Consequences

Under this alternative, elemental mercury would be stored at DOE's KCP. KCP is part of the 125-hectare (310-acre) Bannister Federal Complex located 13 kilometers (8 miles) south of downtown Kansas City, Missouri. KCP occupies 55 hectares (136 acres) of the complex and is under the custody and control of DOE's National Nuclear Security Administration. Implementation of this alternative would involve modification of an existing building (i.e., Main Manufacturing Building), as further described in Chapter 2, Section 2.4.6, of the January 2011 *Mercury Storage EIS*.

E.3.7.2.1 Socioeconomics

Under this alternative, existing space in KCP would be modified for long-term storage of elemental mercury. Employment during renovations is expected to be less than that estimated for constructing a new facility. Appendix C, Table C–1, of the January 2011 *Mercury Storage EIS* summarizes the necessary modifications to bring the facility up to specifications to support mercury storage. Operation of the facility is estimated to require approximately eight individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately five to six individuals thereafter. Operation of the facility is not expected to generate substantial direct or indirect employment. The largest estimated increase in employment would only increase the ROI workforce by 0.001 percent. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

Construction-related transportation needed to modify the existing facility, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is likely that significantly fewer than the 45 vehicles estimated to construct a new mercury storage facility would be needed to support facility modifications. Therefore, construction-related transportation is expected to increase the average annual daily traffic count on Bannister Road by no more than 0.3 percent. Impacts on traffic during construction would be negligible.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of elemental mercury to the site for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual daily traffic count on Bannister Road by less than 0.1 percent. At the peak of operations, it is estimated that up to 79 shipments would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be negligible.

E.3.7.2.2 Environmental Justice

An analysis of populations in census block groups found that, of the 659 block groups within the 16-kilometer (10-mile) radius of KCP, 157 contained only a minority population, 5 contained only a low-income population, and 88 contained both minority and low-income populations. A total of 409 block groups did not contain minority or low-income populations. Of the 39 census block groups within the 3.2-kilometer (2-mile) radius of KCP, 16 contained only a minority population and 6 contained both minority and low-income populations. Seventeen block groups within this ROI did not contain a minority or low-income population.

As discussed in Chapter 3, Section 3.6.1.1, and Chapter 4, Section 4.7.1, of the January 2011 *Mercury Storage EIS*, the surrounding area includes residential, commercial, industrial, and public use lands; there would be no impacts on land use as a result of implementing the KCP alternative. Impacts on air quality under this alternative would be negligible, as discussed in Section 4.7.4.2 of the January 2011 *Mercury Storage EIS*. No impacts on ecological resources would occur under this alternative, as discussed in Section 4.7.5 of the January 2011 *Mercury Storage EIS*. There is a low probability of discovering American Indian archaeological sites in the KCP area; thus, there would be negligible impacts on American Indian cultural resources, as discussed in Sections 3.6.6.3 and 4.7.6.3 of the January 2011 *Mercury Storage EIS*. A negligible change in socioeconomic conditions would result under this alternative, as discussed above in Section E.3.7.2.1.

As discussed in Chapter 4, Section 4.7.9, of the January 2011 *Mercury Storage EIS*, implementing the KCP alternative would result in negligible offsite human health risks from mercury emissions during normal operations and facility accidents. As discussed in Section 4.7.9.3 of the January 2011 *Mercury Storage EIS*, transportation accidents are predicted to pose a negligible-to-low human health risk following dry deposition onto the ground or into water bodies. KCP is located in an area proximal to both minority and low-income communities, as described in Section E.3.7.1.2. The analysis of the KCP alternative identified minority and low-income communities adjacent to potential transportation routes. The transportation accident analysis is discussed in Section 4.2.9.1.5 and Appendix D, Section D.4.5, of the January 2011 *Mercury Storage EIS*.

In addition, under transportation accident scenarios in which a fire occurs, it is possible for nearby downwind surface-water bodies to become contaminated, raising concerns for populations where fish is an important part of the diet. Chapter 4, Section 4.7.9.3.3, of the January 2011 *Mercury Storage EIS* discusses the possibility of accumulation of mercury in fish under such scenarios. Three fish consumption rates were analyzed: the national average consumption rate, the average subsistence fisherman consumption rate, and the 95th percentile subsistence fisherman consumption rate (see Section 4.2.9.1.1 of the January 2011 *Mercury Storage EIS*). Such consumption rates could be representative of a low-income or American Indian subsistence fishing population. Under the Truck Scenarios, the risks to human receptors that consume fish at one of the three rates would be negligible. Under the Railcar Scenario, the risk to the 95th percentile subsistence fisherman would be negligible to low. American Indian reservations have not been identified within the 16-kilometer (10-mile) ROI surrounding KCP; however, as discussed above in Section E.3.7.1.2, there are several low-income and minority communities present within the ROI, including communities immediately adjacent to the Bannister Federal Complex. Although the risk is negligible to low, if a transportation accident that resulted in fish contamination were to occur, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements for mercury concentrations in waters and fish stocks.

E.3.8 Savannah River Site

E.3.8.1 Affected Environment

E.3.8.1.1 Socioeconomics

SRS is located approximately 19 kilometers (12 miles) south of Aiken, South Carolina, and 24 kilometers (15 miles) southeast of Augusta, Georgia. Based on local employment data compiled by the Census Bureau, it is assumed that approximately 90 percent of the people employed at SRS reside in four counties: Aiken and Barnwell in South Carolina and Columbia and Richmond in Georgia (DOC 2009). Therefore, these four counties are identified as the ROI in this socioeconomics analysis. As of April 2009, SRS employed approximately 11,000 persons (SRNS 2009).

E.3.8.1.1.1 Regional Economic Characteristics

From 2000 to 2011, the labor force of the four-county ROI increased by 10 percent from 215,077 to 236,490. During this period, the unemployment rate of the ROI increased from 3.8 percent to 9.2 percent. As of July 2012, the unemployment rate of the ROI had increased to 9.8 percent, which was higher than the unemployment rate across the two-state area of South Carolina and Georgia (9.2 percent) (BLS 2012).

E.3.8.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the four-county ROI was 507,322. From 2000 to 2010, the ROI population grew by 11 percent, compared with 17 percent growth throughout the two-state area of Georgia and South Carolina (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. The percentage of the ROI population under the age of 18 was 25 percent; women ages 18 to 39 composed 15 percent (DOC 2011a). There were 217,690 housing units in the ROI in 2010 (DOC 2011b), 60 percent of which were owner-occupied, 30 percent were renter-occupied, and 10 percent were vacant (DOC 2011b, 2011c).

E.3.8.1.2 Environmental Justice

The 16-kilometer (10-mile) radius surrounding the candidate storage location at SRS encompasses parts of four counties: Aiken and Barnwell in South Carolina and Burke and Richmond in Georgia. Figure E–18 shows populations residing in the four-county area, as reported in the 2000 and 2010 censuses (DOC 2001a, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. In the decade between 2000 and 2010, the total population of Aiken, Barnwell, Burke, and Richmond Counties increased by approximately 4.8 percent to 406,585; the minority population increased by approximately 13 percent to 199,224; and the low-income population increased by approximately 19 percent to 80,813 (DOC 2001a, 2001b, 2011d, 2011e). Demographic data from the 2010 census show that the total minority population accounted for approximately 49 percent of the total population. The Black or African American population residing in the four-county area accounted for approximately 85 percent of the total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 4.2 percent of the total population and approximately 8.6 percent of the total minority population residing in the four-county region (DOC 2011d).

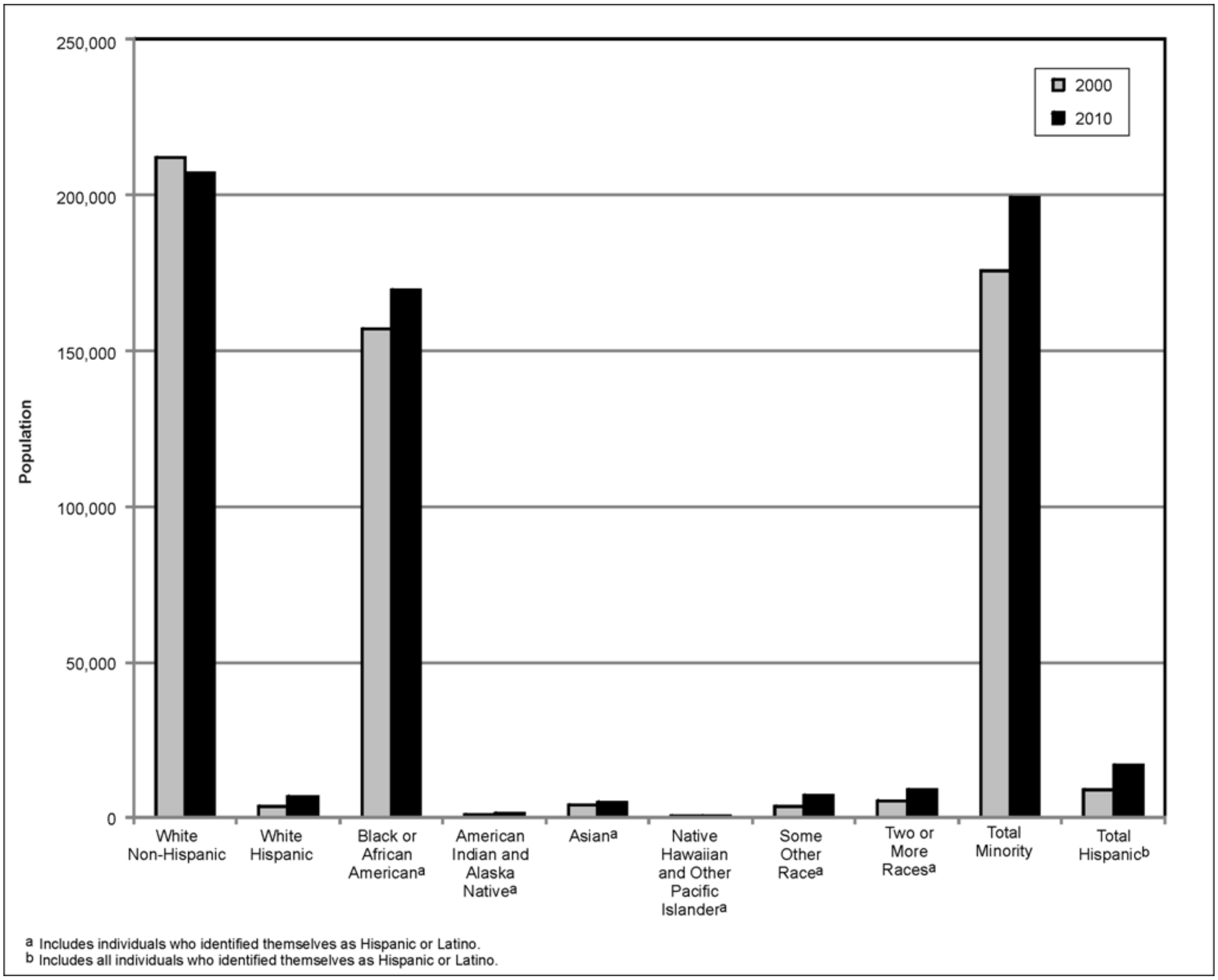


Figure E–18. Populations Residing Within the Four-County Area Surrounding the Savannah River Site

In 2010, 6,691 people lived within 16 kilometers (10 miles) of E Area at SRS (DOC 2011d). This area included an estimated 38 percent minority and 20 percent low-income population. By comparison, the four-county area included a 49 percent minority and 21 percent low-income population, and the two-state region of South Carolina and Georgia included a 41 percent minority and 16 percent low-income population (DOC 2011d, 2011e). There are 15 census block groups located within the 16-kilometer radius surrounding E Area, 4 of which contained a minority population and 1 contained a low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population. No one resides within approximately 3.2 kilometers (2 miles) of E Area.

Figure E–19 shows the proximity of the identified minority communities to E Area.

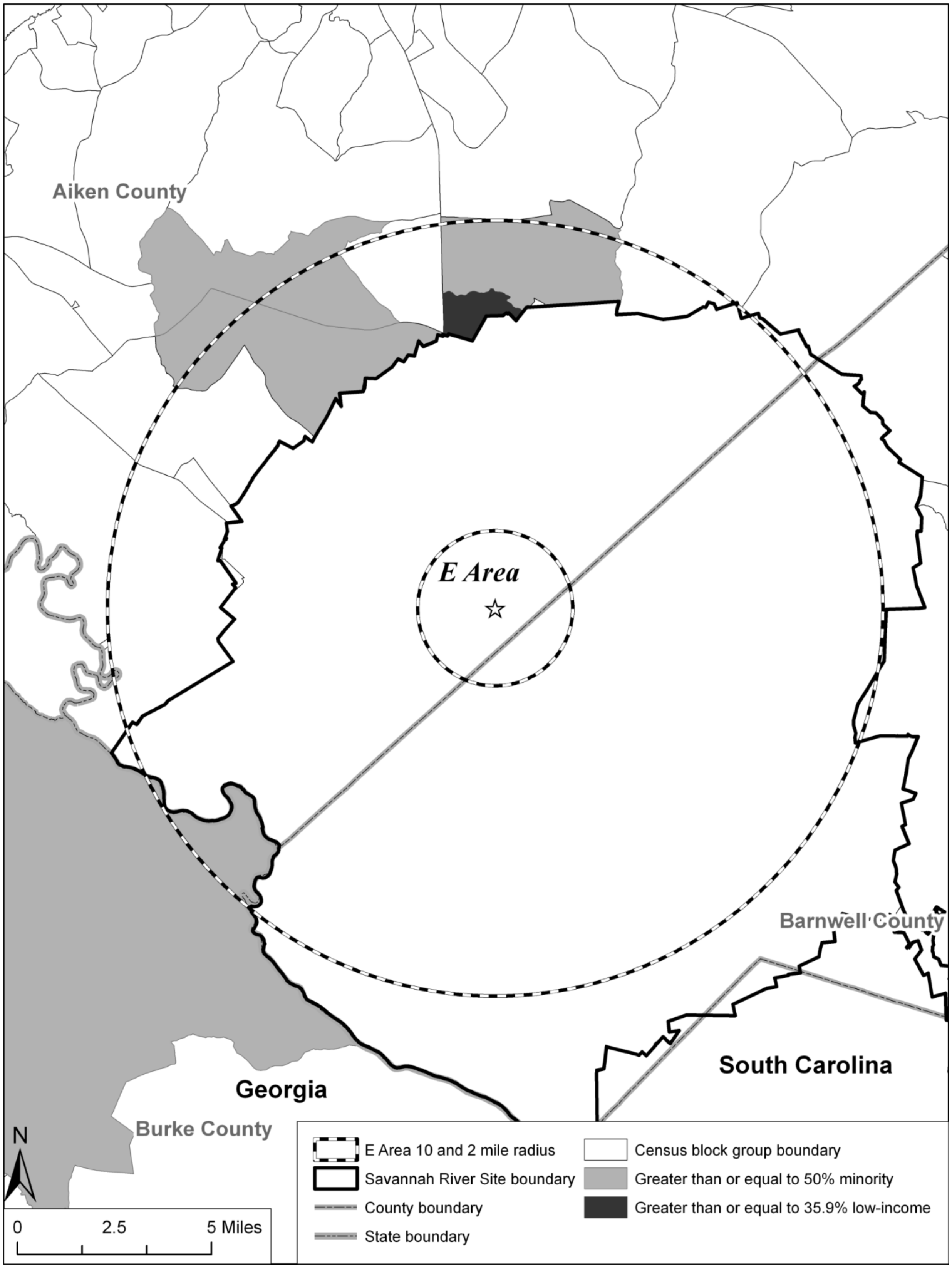


Figure E–19. Block Groups Containing Minority and Low-Income Populations Surrounding the Savannah River Site

Figure E–20 shows the cumulative populations living at a given distance from the site.

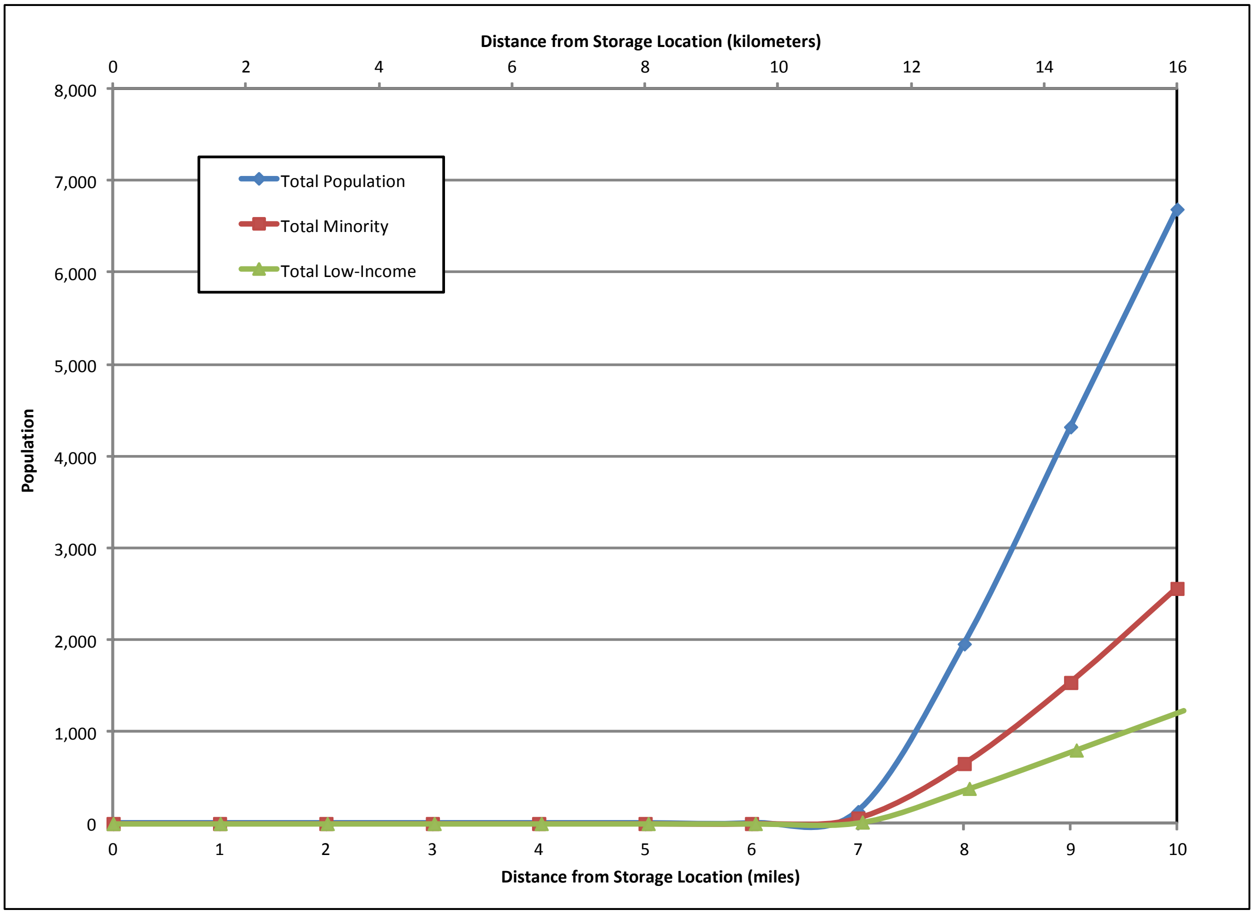


Figure E–20. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Savannah River Site

E.3.8.2 Environmental Consequences

Under this alternative, a new mercury storage facility would be constructed at DOE's SRS. SRS occupies approximately 80,290 hectares (198,400 acres) and is located approximately 24 kilometers (15 miles) southeast of Augusta, Georgia, and 19 kilometers (12 miles) south of Aiken, South Carolina. Within this site, the new mercury storage facility would be built in E Area, as further described in Chapter 2, Section 2.4.7, of the January 2011 *Mercury Storage EIS*.

E.3.8.2.1 Socioeconomics

Under this alternative, a new facility for long-term storage of elemental mercury would be constructed in the SRS E Area. Employment during construction is expected to average 18 people for approximately 6 months. Operation of the facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately 5 to 6 individuals thereafter, resulting in an increase of the SRS workforce of less than 0.1 percent and an increase in the ROI workforce of 0.003. Neither construction nor operation of a new facility is expected to generate substantial direct or indirect employment. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

Construction-related transportation, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is assumed that there would be approximately 1.5 employees per vehicle, and every vehicle is counted twice to account for round trips. It is estimated that average construction transportation of 45 vehicles a day could increase the average annual daily traffic counts by less than 1 percent, if utilizing South Carolina Highway 19, to approximately 3 percent, if utilizing Secondary Road 64. It is likely that these additional vehicles would use a combination of routes; thus, the additional traffic would not be concentrated on one particular route. Fifty-three percent of the vehicles would be attributed to employee transportation. Impacts on traffic during construction would be minor.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of elemental mercury to the site for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual daily traffic counts by no more than 0.1 percent, if utilizing Highway 19, to as much as approximately 1 percent, if utilizing Secondary Road 62. At the peak of operations, it is estimated that up to 79 shipments would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be negligible to minor.

E.3.8.2.2 Environmental Justice

An analysis of populations in census block groups found that, of the 15 block groups within the 16-kilometer (10-mile) radius of the SRS E Area, 4 contained a minority population and 1 contained a low-income population. No populations have been identified within the 3.2-kilometer (2-mile) radius surrounding E Area.

As discussed in Chapter 3, Section 3.7.1.1, and Chapter 4, Section 4.8.1, of the January 2011 *Mercury Storage EIS*, the surrounding area includes urban, residential, industrial, agricultural, and recreational land uses; there would be no offsite impacts on land use as a result of implementing the SRS alternative. Impacts on air quality under this alternative would be minor during construction and negligible during operations, as discussed in Section 4.8.4.2 of the January 2011 *Mercury Storage EIS*. Impacts on ecological resources are expected to be minimal under this alternative, as discussed in Section 4.8.5. There is a low probability that resources of interest to American Indian tribes occur in E Area at SRS; thus, there would be no impacts on American Indian cultural resources, as discussed in Sections 3.7.6.3 and 4.8.6.3 of the January 2011 *Mercury Storage EIS*. A negligible change in socioeconomic conditions would result under this alternative, as discussed above in Section E.3.8.2.1.

As discussed in Chapter 4, Section 4.8.9, of the January 2011 *Mercury Storage EIS*, implementing the SRS alternative would result in negligible offsite human health risks from mercury emissions during normal operations and facility accidents. As discussed in Section 4.8.9.3 of the January 2011 *Mercury Storage EIS*, transportation accidents are predicted to pose a negligible-to-low human health risk following dry deposition onto the ground or into water bodies. Three of the four block groups identified that consist of a disproportionately high number of minority individuals and the one block group identified that consists of a disproportionately high number of low-income individuals are located adjacent to one of the entrances into SRS located at South Carolina Highway 19 and adjoining U.S. Route 278. The transportation accident analysis is discussed in Section 4.2.9.1.5 and Appendix D, Section D.4.5, of the January 2011 *Mercury Storage EIS*. No minority or low-income populations have been identified adjacent to the other site entrances. Therefore, if a transportation accident were to occur at or near any of the other site entrances, it would be reasonable to conclude that the consequences to human health of the accident would not be borne by a minority or low-income community.

In addition, under transportation accident scenarios in which a fire occurs, it is possible for nearby downwind surface-water bodies to become contaminated, raising concerns for populations where fish is an important part of the diet. Chapter 4, Section 4.7.9.3.3, of the January 2011 *Mercury Storage EIS* discusses the possibility of accumulation of mercury in fish under such scenarios. Three fish consumption rates were analyzed: the national average consumption rate, the average subsistence fisherman consumption rate, and the 95th percentile subsistence fisherman consumption rate (see Section 4.2.9.1.1 of the January 2011 *Mercury Storage EIS*). Such consumption rates could be representative of a low-income or American Indian subsistence fishing population. Under the Truck Scenarios, the risks to human receptors that consume fish at one of the three rates would be negligible. Under the Railcar Scenario, the risk to the 95th percentile subsistence fisherman would be negligible to low. American Indian reservations have not been identified within the 16-kilometer (10-mile) ROI surrounding SRS; however, as discussed above in Section E.3.8.1.2, there are several low-income or minority communities present within the ROI. Although the risk is negligible to low, if a transportation accident that resulted in fish contamination were to occur, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements for mercury concentrations in waters and fish stocks.

E.3.9 Waste Control Specialists, LLC, Site

E.3.9.1 Affected Environment

E.3.9.1.1 Socioeconomics

WCS is located approximately 50 kilometers (31 miles) west of Andrews, Texas, near the Texas–New Mexico state line. As of 2009, WCS employed approximately 150 persons. Approximately 90 percent of the people employed at WCS reside in two counties: Andrews in Texas and Lea in New Mexico (WCS 2009). Therefore, these two counties are identified as the ROI in this socioeconomics analysis.

E.3.9.1.1.1 Regional Economic Characteristics

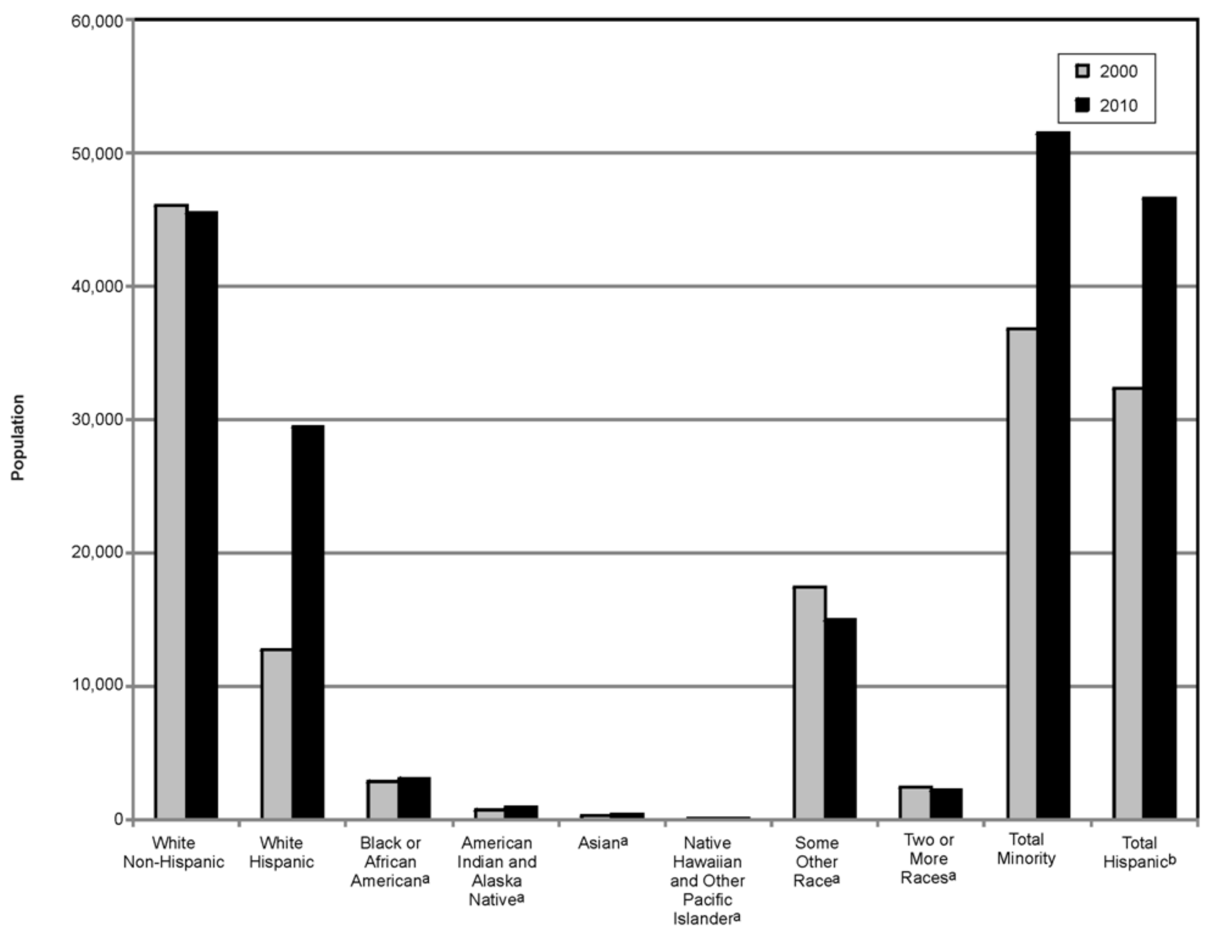
From 2000 to 2011, the labor force of the two-county ROI increased by approximately 30 percent from 28,277 to 36,788. During this period, the unemployment rate of the ROI experienced minor fluctuations both positive and negative, and by 2011 had returned to the 2000 rate of 5.2 percent. The unemployment rate in the ROI peaked during 2009 at 7.1 percent and remained at that level through 2010. By July 2012, the unemployment rate of the ROI was 4.6 percent, lower than the unemployment rate across the two-state region of Texas and New Mexico (7.0 percent) (BLS 2012).

E.3.9.1.1.2 Demographic and Housing Characteristics

In 2010, the estimated population of the two-county ROI was 79,513. From 2000 to 2010, the ROI population grew by approximately 16 percent, compared with 20 percent growth throughout the two-state region of Texas and New Mexico (DOC 2001a, 2011a). Young children and pregnant women are considered to be among the most vulnerable populations to mercury poisoning. In 2010, the percentage of the ROI population under the age of 18 was 29 percent; women ages 18 to 39 composed 15 percent (DOC 2011a). There were 30,733 housing units in the ROI in 2010, 63 percent of which were owner-occupied, 26 percent were renter-occupied, and 11 percent were vacant (DOC 2011b, 2011c).

E.3.9.1.2 Environmental Justice

The 16-kilometer (10-mile) radius surrounding the candidate storage location at WCS encompasses parts of three counties: Andrews and Gaines in Texas and Lea in New Mexico. Figure E–21 shows populations residing in the three-county area, as reported in the 2000 and 2010 censuses (DOC 2001b, 2011d). In this figure, lightly shaded bars show populations in 2000, and the darker bars show those in 2010. In the decade between 2000 and 2010, the total population of Andrews, Gaines, and Lea Counties decreased by approximately 17 percent to 97,039, while the minority population increased by approximately 40 percent to 51,483, and the low-income population decreased by approximately 3.9 percent to 15,905 (DOC 2001a, 2001b, 2011d, 2011e). Demographic data from the 2010 census show that the total minority population accounts for approximately 53 percent of the total population. The White Hispanic population accounts for approximately 57 percent of the total minority population, while those people self-identified as "some other race" (meaning those who provided write-in entries such as Mexican, Puerto Rican, or Cuban) residing in the three-county area accounted for approximately 29 percent of the total minority population. Persons who declared that they are of Hispanic or Latino origin are included in the "total Hispanic" population, regardless of race. They composed approximately 48 percent of the total population and approximately 91 percent of the total minority population residing in Andrews, Gaines, and Lea Counties in 2010 (DOC 2011d).



[a] Includes individuals who identified themselves as Hispanic or Latino.
[b] Includes all individuals who identified themselves as Hispanic or Latino.

Figure E–21. Populations Residing Within the Three-County Area Surrounding the Waste Control Specialists Site

In 2010, 3,322 people lived within 16 kilometers (10 miles) of WCS. This area included an estimated 47 percent minority and 12 percent low-income population. By comparison, the three-county area included a 53 percent minority and 18 percent low-income population and the two-state region of Texas and New Mexico included a 55 percent minority and 17 percent low-income population (DOC 2011d, 2011e). There are eight census block groups located within the 16-kilometer radius surrounding WCS, two of which contained a minority population; none contained a low-income population. As described in Appendix B, Section B.11.1, of the January 2011 *Mercury Storage EIS* and updated in Appendix B of this SEIS, minority and low-income populations or communities are identified by comparing block-group data to the surrounding state- and county-level data to determine if the minority or low-income population percentage is meaningfully greater than that of the general population.

Approximately 27 people lived within approximately 3.2 kilometers (2 miles) of WCS in 2010. This area included an estimated 35 percent minority and 7.8 percent low-income population (DOC 2011d, 2011e). There are two census block groups located within this ROI; of this total, none contained a minority or low-income population.

Figure E–22 shows the proximity of the identified minority communities to WCS.

Figure E–23 shows the cumulative populations living at a given distance from WCS.

E.3.9.2 Environmental Consequences

Under this alternative, elemental mercury would be stored at WCS. Waste Control Specialists, LLC, owns and operates the 541-hectare (1,338-acre) site for the treatment, storage, and landfill disposal of various hazardous and radioactive wastes. The site is located approximately 50 kilometers (31 miles) west of Andrews, Texas, and 13 kilometers (8 miles) east of Eunice, New Mexico. Implementation of this alternative would involve interim use of the Container Storage Building located in the existing facility complex at the site until a new facility could be constructed. The new mercury storage facility would be similar to that proposed at the other candidate sites and would be constructed at one of two identified locations (i.e., a north and a south site relative to the developed WCS facilities area) on WCS, as further described in Chapter 2, Section 2.4.8, of the January 2011 *Mercury Storage EIS*. Consideration was given to the two locations at WCS where a new facility could be sited; no significant differences in potential impacts were identified.

E.3.9.2.1 Socioeconomics

Under this alternative, a new facility for long-term storage of elemental mercury would be constructed at WCS. Employment during construction is expected to average 18 people for approximately 6 months. Operation of the facility is estimated to require approximately 8 individuals for routine maintenance and support activities during the first 7 years, when higher volumes of shipments are expected, and approximately 5 to 6 individuals thereafter, resulting in an increase of the existing WCS workforce of approximately 3 to 5 percent and an increase in the ROI workforce of approximately 0.02 percent. Neither construction nor operation of a new facility is expected to generate substantial direct or indirect employment. Thus, negligible impacts on socioeconomic conditions (i.e., overall employment and population trends) in the ROI would result from implementing this alternative.

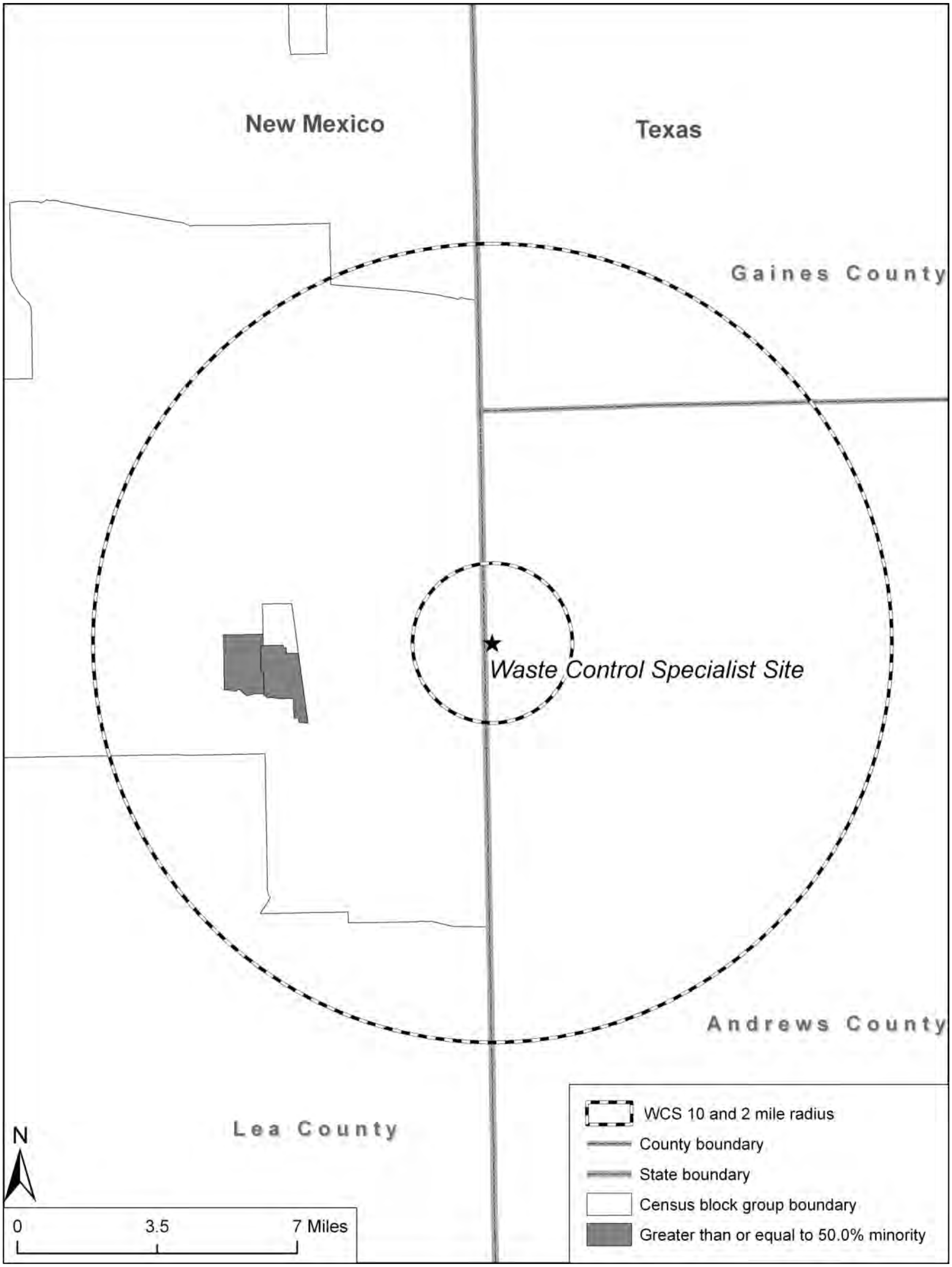


Figure E–22. Block Groups Containing Minority and Low-Income Populations Surrounding the Waste Control Specialists Site

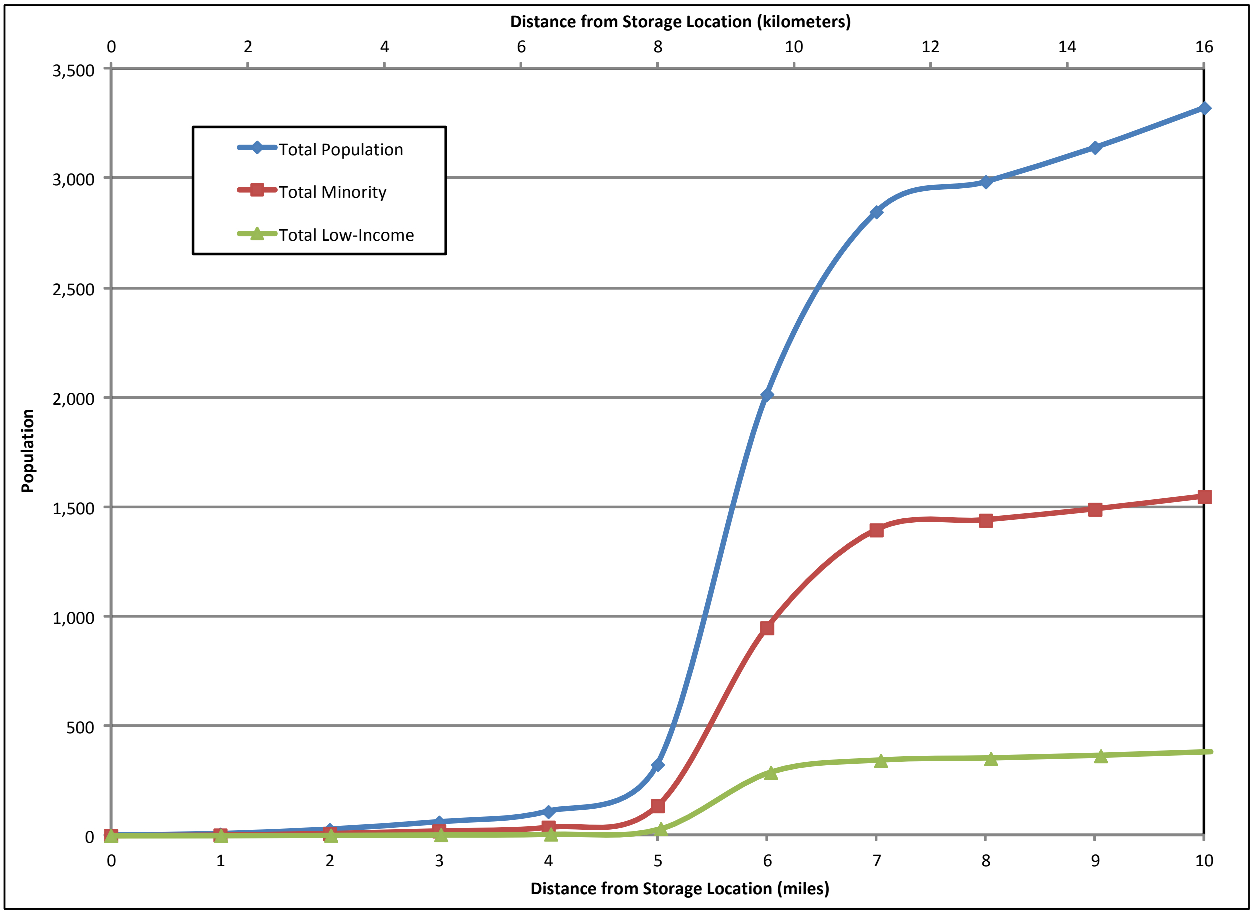


Figure E–23. Populations Residing Within 16 Kilometers (10 Miles) of the Storage Location at the Waste Control Specialists Site

Construction-related transportation, including employee vehicle trips and equipment and materials shipments, is not expected to adversely impact traffic conditions on roads leading to the site. It is assumed that there would be approximately 1.5 employees per vehicle, and every vehicle is counted twice to account for round trips. It is estimated that average construction transportation of 45 vehicles a day could increase the average annual daily traffic count on State Highway 176 by less than 2 percent; 53 percent of these vehicles would be attributed to employee transportation. Impacts on traffic during construction would be minor.

Transportation impacts during the operations phase would include employee vehicle trips and shipments of elemental mercury to the site for storage. Appendix C, Section C.1, of this SEIS provides an estimate of the number of shipments by truck. The additional vehicles due to facility operations are not expected to noticeably increase traffic volumes on roads leading to the site. The greatest impact would be during the first 2 years of operations, when it is estimated that approximately 11 vehicles a day could increase the average annual daily traffic count on State Highway 176 by less than 0.5 percent. At the peak of operations, it is estimated that up to 79 shipments would be made in a year. Approximately 96 percent of the additional vehicles would be attributed to employee transportation. Impacts on traffic during operations would be negligible.

E.3.9.2.2 Environmental Justice

An analysis of populations in census block groups found that, of the eight block groups within the 16-kilometer (10-mile) radius of WCS, two contained a minority population and none contained a low-income population. There are only two block groups within the 3.2-kilometer (2-mile) ROI, none of which contained a minority or low-income population.

As discussed in Chapter 3, Section 3.8.1.1, and Chapter 4, Section 4.9.1, of the January 2011 *Mercury Storage EIS*, land use in the surrounding area includes industrial activity and ranching, and there would be no offsite impacts on land use as a result of implementing the WCS alternative. Impacts on air quality under this alternative would be minor during construction and negligible during operations, as discussed in Section 4.9.4.2 of the January 2011 *Mercury Storage EIS*. Impacts on ecological resources are expected to be minimal under this alternative, as discussed in Section 4.9.5 of the January 2011 *Mercury Storage EIS*. There have been no American Indian resources identified on WCS; thus, there would be no impacts on American Indian cultural resources, as noted in Sections 3.8.6.2 and 4.9.6.3 of the January 2011 *Mercury Storage EIS*. A negligible change in socioeconomic conditions would result under this alternative, as discussed above in Section E.3.9.2.1.

As discussed in Chapter 4, Section 4.9.9, of the January 2011 *Mercury Storage EIS*, implementing the WCS alternative would result in negligible offsite human health risks from mercury emissions during normal operations and facility accidents. As discussed in Section 4.9.9.3 of the January 2011 *Mercury Storage EIS*, transportation accidents are predicted to pose a negligible-to-low human health risk following dry deposition onto the ground or into water bodies. The two block groups identified that consist of a disproportionately high number of minority individuals are located approximately 10 kilometers (6 miles) to the west in the city of Eunice near potential transportation routes. Potential truck transportation routes include Texas State Highway 176 from points east, New Mexico State Highway 176 from points west, and New Mexico State Road 18 from points north.

In addition, under transportation accident scenarios in which a fire occurs, it is possible for nearby downwind surface-water bodies to become contaminated, raising concerns for populations where fish is an important part of the diet. Chapter 4, Section 4.7.9.3.3, of the January 2011 *Mercury Storage EIS* discusses the possibility of accumulation of mercury in fish under such scenarios. Three fish consumption rates were analyzed: the national average consumption rate, the average subsistence fisherman consumption rate, and the 95th percentile subsistence fisherman consumption rate (see Section 4.2.9.1.1 of the January 2011 *Mercury Storage EIS*). Such consumption rates could be representative of a low-income or American Indian subsistence fishing population. Under the Truck Scenarios, the risks to human receptors that consume fish at one of the three rates would be negligible. Under the Railcar Scenario, the risk to the 95th percentile subsistence fisherman would be negligible to low. American Indian reservations have not been identified within the 16-kilometer (10-mile) ROI surrounding WCS; however, as discussed above in Section E.3.9.1.2, there are minority communities present within the ROI. Although the risk is negligible to low, if a transportation accident that resulted in fish contamination were to occur, it would be advisable as a mitigation measure to monitor the levels of methylmercury in fish to ensure that subsistence fishermen do not consume amounts of methylmercury that might cause adverse health effects. Subsequent to mandated reporting of any such release by the shipper of the elemental mercury, the appropriate state environmental agency would be responsible for determining appropriate fish consumption advisories and monitoring requirements for mercury concentrations in waters and fish stocks.

E.4 ENVIRONMENTAL DOCUMENTATION REVIEW

This SEIS is being published approximately 2½ years after the publication of the January 2011 *Mercury Storage EIS*. As such, there was a possibility that some environmental data upon which the impact analyses rely for the seven candidate sites analyzed in the January 2011 *Mercury Storage EIS* may have changed significantly, potentially affecting the analyses or comparison of alternatives. Previously in this appendix, updates to occupational and public health and safety, socioeconomics, and environmental justice were discussed. Most of the candidate sites publish annual site environment reports, periodic monitoring reports, or other environmental data. Environmental documentation that has become available since publication of the January 2011 *Mercury Storage EIS* has been reviewed, and no other changes to the affected environment or analyses as presented in the January 2011 *Mercury Storage EIS* were found to be necessary. The documents reviewed for each candidate site are listed below.

<u>Grand Junction Disposal Site:</u>

- *2012 Annual Inspection of the Grand Junction, Colorado, UMTRCA Title I Disposal Site*, February 2013 (DOE 2013).
- *Data Validation Package – August 2012 Groundwater Sampling at the Grand Junction, Colorado, Disposal Site*, October 2012 (DOE 2012b).
- *2011 Uranium Mill Tailings Radiation Control Act Title I Annual Report*, January 2012 (DOE 2012c).

<u>200-West Area at the Hanford Site:</u>

- *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*, November 2012 (DOE 2012d).
- *Hanford Site Environmental Report for Calendar Year 2009*, September 2010 (Poston, Duncan, and Dirkes 2010).

<u>Central Magazine Area at Hawthorne Army Depot:</u>

- *Hawthorne Army Depot Webpage – The Nevada Division of Environmental Protection*, http://ndep.nv.gov/hwad/haap02.htm, accessed in January 2013 (NDEP 2013).

<u>Idaho National Laboratory's Idaho Nuclear Technology and Engineering Center or the Radioactive Waste Management Complex:</u>

- *Idaho National Laboratory Site Environmental Report, Calendar Year 2011*, September 2012 (DOE 2012e).
- *Idaho National Laboratory Site Environmental Report, Calendar Year 2010*, September 2011 (DOE 2011a).

<u>Bannister Federal Complex's Kansas City Plant:</u>

- *Final Environmental Assessment for the Transfer of the Kansas City Plant*, May 2013 (NNSA 2013).
- *2010 Kansas City Plant Annual Injury and Illness Surveillance Report*, 2011 (DOE 2011b).

<u>E Area at the Savannah River Site:</u>

- *Draft Surplus Plutonium Disposition Supplemental Environmental Impact Statement*, July 2012 (NNSA 2012).
- *Savannah River Site Environmental Report for 2011*, 2012 (SRNS 2012).

Waste Control Specialists, LLC Site:

- *Waste Control Specialists, LLC, Homepage*, http://www.wcstexas.com/, accessed in January 2013 (WCS 2013).

Y–12 National Security Complex:

- *Oak Ridge Reservation Annual Site Environmental Report for 2011*, September 2012 (ORNL 2012).
- *Final Site-Wide Environmental Impact Statement for the Y–12 National Security Complex*, February 2011 (NNSA 2011).

E.5 REFERENCES

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DOC (U.S. Department of Commerce), 2011a, *U.S. Census Bureau, 2010 Decennial Census*, Summary File 1, P12: Sex by Age - Universe: Total Population, accessed through http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

DOC (U.S. Department of Commerce), 2011b, *U.S. Census Bureau, 2010 Decennial Census*, Summary File 1, Table H3: Occupancy Status - Universe: Housing Units, accessed through http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

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DOE (U.S. Department of Energy), 2011b, *2010 Kansas City Plant Annual Injury and Illness Surveillance Report*, 11-OEWH-0098, Office of Heath, Safety, and Security.

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DOE (U.S. Department of Energy), 2012e, *Idaho National Laboratory Site Environmental Report, Calendar Year 2011*, DOE/ID-12082(11), Idaho Operations Office, Idaho Falls, Idaho, September.

DOE (U.S. Department of Energy), 2013, *2012 Annual Inspection of the Grand Junction, Colorado, UMTRCA Title I Disposal Site*, February.

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APPENDIX F
COMMON AND SCIENTIFIC NAMES OF PLANT AND ANIMAL SPECIES

APPENDIX F
COMMON AND SCIENTIFIC NAMES OF PLANT AND ANIMAL SPECIES

The scientific names of plant and animal species associated with the Waste Isolation Pilot Plant Vicinity reference locations as cited in Chapter 3 and throughout this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* are listed in Table F–1. Plant, bird, and mammal species are grouped by common name and listed in alphabetical order. The scientific names of plant and animal species associated with the other candidate sites previously analyzed, as cited in the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)*, are provided in Appendix E of the January 2011 *Mercury Storage EIS* and have not been reproduced here.

Table F–1. List of Common and Scientific Names of Plant and Animal Species

Common Name	Scientific Name
Plants	
Dune yucca	*Yucca campestris*
Glass Mountain coral-root	*Hexalectris nitida*
Guadalupe jewelflower	*Streptanthus sparsiflorus*
Gypsum wild-buckwheat	*Eriogonum gypsophilum*
Hershey’s cliff daisy	*Chaetopappa hersheyi*
Kuenzler hedgehog cactus	*Echinocereus fendleri* var. *kuenzleri*
Lee’s pincushion cactus	*Escobaria sneedii* var. *leei*
Mesquite	*Prosopis glandulosa*
Russian thistle	*Salsola kali*
Sand sagebrush	*Artemisia filifolia*
Shinnery oak	*Quercus havardii*
Smallhead snakeweed	*Gutierrezia microcephala*
Sneed pincushion cactus	*Coryphantha sneedii* var. *sneedii*
Wright’s water-willow	*Justicia wrightii*
Birds	
American peregrine falcon	*Falco peregrinus anatum*
Arctic peregrine falcon	*Falco peregrinus tundrius*
Baird’s sparrow	*Ammodramus bairdi*
Black-throated sparrow	*Amphispiza bilineata*
Least tern (interior population)	*Sterna antillarum athalassos*
Lesser prairie-chicken	*Tympanuchus pallidicinctus*
Loggerhead shrike	*Lanius ludovicianus*
Pyrrhuloxia	*Cardinalis sinuatus*
Southwestern willow flycatcher	*Empidonax trallii extimus*
Sprague’s pipit	*Anthus spragueii*

Table F–1. List of Common and Scientific Names of Plant and Animal Species *(continued)*

Common Name	Scientific Name
Mammals	
Black-footed ferret	*Mustela nigripes*
Coyote	*Canis latrans*
Mule deer	*Odocoileus hemionus*
Pronghorn	*Antilocapra americana*

APPENDIX G
COOPERATING AGENCY AGREEMENTS

APPENDIX G
COOPERATING AGENCY AGREEMENTS

This appendix provides copies of invitation letters, responses, and final agreements between the U.S. Department of Energy and cooperating agencies associated with this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*. Invitation letters, responses, and final cooperating agency agreements associated with the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* are provided in Appendix F of the January 2011 *Mercury Storage EIS* and have not been reproduced here.

G.1 CORRESPONDENCE WITH THE U.S. DEPARTMENT OF THE INTERIOR

G.1.1 U.S. Department of Energy's Correspondence to the U.S. Department of the Interior

Department of Energy
Washington, DC 20585

SEP 19 2012

Mr. James K. Stovall
Field Manager
U.S. Department of the Interior
Bureau of Land Management
Carlsbad Field Office
620 E. Greene Street
Carlsbad, NM 88221

Dear Mr. Stovall:

This letter is to invite the Bureau of Land Management (BLM) to participate as a cooperating agency in the Department of Energy's (DOE's) preparation of a supplemental environmental impact statement (SEIS), pursuant to the National Environmental Policy Act (NEPA), on alternatives for long-term management and storage of elemental mercury. Section 5 of the Mercury Export Ban Act of 2008 (the Act), Pub. L. 110-414, 122 Stat. 4341, sets forth requirements for DOE to establish and manage a facility for the purpose of long-term management and storage of elemental mercury generated within the United States. DOE prepared the final EIS (FEIS) for the Long-Term Management and Storage of Elemental Mercury (DOE/EIS-0423) in January 2011. Since its publication, DOE has reconsidered the range of reasonable alternatives evaluated, and now proposes to analyze additional alternatives in an SEIS. This SEIS will evaluate two additional locations for a long-term mercury storage facility, one within the boundary of the Waste Isolation Pilot Plant (WIPP) in New Mexico, and a second in the vicinity of WIPP.

DOE published a Notice of Intent (NOI) on June 5, 2012 in the Federal Register (77 FR 33204). BLM's participation as a cooperating agency is requested; we would appreciate your response to this invitation as soon as practicable. If you or your staff has any questions or issues concerning the SEIS and/or FEIS, please contact David Levenstein of DOE's Office of Environmental Management at 301-903-6500 or david.levenstein@em.doe.gov. Mr. Levenstein is the DOE NEPA Document Manager for the SEIS. If you have any questions about DOE's NEPA process, please contact me at 202-586-4600.

Sincerely,

Carol Borgstrom

Carol M. Borgstrom
Director
Office of NEPA Policy and Compliance

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cc: David Levenstein, EM-11

G.1.2 Response from the U.S. Department of the Interior

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Pecos District
Carlsbad Field Office
620 E. Greene
Carlsbad, New Mexico 88220-6292
www.blm.gov/nm

In Reply Refer To:
1610 (P020)ol

Ms. Carol M. Borgstrom
Director of NEPA Policy and Compliance
U.S. Department of Energy
Washington Office

Dear Ms. Borgstrom:

This letter is in reference to your letter dated September 19, 2012, inviting our office to become a Cooperating Agency in the preparation of the supplemental environmental impact statement for the Long-Term Management and Storage of Elemental Mercury (DOE/EIS-0423). Our office accepts the invitation and looks forward to working with you through this process.

Please inform us as to the agreement that will follow to ratify the Cooperating Agency relationship. If you have any questions, please contact Owen Lofton of my staff at 575-234-5923 or email olofton@blm.gov.

Sincerely,

George MacDonell

for Jim Stovall
Field Manager
Carlsbad Field Office

Cc: David Levenstein, EM-11

G.2 CORRESPONDENCE WITH THE U.S. ENVIRONMENTAL PROTECTION AGENCY

G.2.1 U.S. Department of Energy's Correspondence to the U.S. Environmental Protection Agency

Department of Energy
Washington, DC 20585

SEP 19 2012

Ms. Susan Bromm
Director, Office of Federal Activities
U.S. Environmental Protection Agency
Mail Code 2251-A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Ms. Bromm:

This letter is to invite the U.S. Environmental Protection Agency (EPA) to participate as a cooperating agency in the Department of Energy's (DOE's) preparation of a supplemental environmental impact statement (SEIS), pursuant to the National Environmental Policy Act (NEPA), on alternatives for long-term management and storage of elemental mercury. Section 5 of the Mercury Export Ban Act of 2008 (the Act), Pub. L. 110-414, 122 Stat. 4341, sets forth requirements for DOE to establish and manage a facility for the purpose of long-term management and storage of elemental mercury generated within the United States. DOE prepared the final EIS (FEIS) for the Long-Term Management and Storage of Elemental Mercury (DOE/EIS-0423) in January 2011, and appreciates EPA's past participation as a cooperating agency (May 18, 2009 letter from Susan Bromm to Carol Borgstrom) on that FEIS. Since its publication, DOE has reconsidered the range of reasonable alternatives evaluated, and now proposes to analyze additional alternatives in an SEIS. This SEIS will evaluate two additional locations for a long-term mercury storage facility, one within the boundary of the Waste Isolation Pilot Plant (WIPP) in New Mexico, and a second in the vicinity of WIPP.

DOE published a Notice of Intent (NOI) on June 5, 2012 in the Federal Register (77 FR 33204). EPA's continued participation as a cooperating agency on the SEIS is requested; we would appreciate your response to this invitation as soon as practicable. If you or your staff has any questions or issues concerning the SEIS and/or FEIS, please contact David Levenstein of DOE's Office of Environmental Management at 301-903-6500 or david.levenstein@em.doe.gov. Mr. Levenstein is the DOE NEPA Document Manager for the SEIS. If you have any questions about DOE's NEPA process, please contact me at 202-586-4600.

Sincerely,

Carol Borgstrom

Carol M. Borgstrom
Director
Office of NEPA Policy and Compliance

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cc: David Levenstein, EM-11

G.2.2 Response from the U.S. Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

NOV 1 2012

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Ms. Carol M. Borgstrom
Director, Office of NEPA Policy and Compliance
GC–20
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585–0103

Dear ~~Ms. Borgstrom~~ Carol:

Thank you for your September 19, 2012 letter inviting the U.S. Environmental Protection Agency (EPA) to participate as a cooperating agency in the Department of Energy's preparation of a Supplemental Environmental Impact Statement (SEIS) on additional alternatives for long-term management and storage of mercury. EPA accepts this invitation, and as a cooperating agency, we look forward to providing early review and comment on select technical studies and reports concerning procedures and standards for storage, as well as preliminary drafts of the SEIS. We will also participate in cooperating agency conference calls.

The extent to which EPA can assist with these efforts will be dependent upon the availability of Agency resources and the timeliness of information sharing.

If you have any questions concerning this matter, please contact me or my staff point of contact, Marthea Rountree, at (202) 564-7141.

Sincerely,

Susan

Susan E. Bromm
Director
Office of Federal Activities

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G.3 CORRESPONDENCE WITH THE NEW MEXICO ENVIRONMENT DEPARTMENT

G.3.1 U.S. Department of Energy's Correspondence to the New Mexico Environment Department

Department of Energy
Washington, DC 20585

SEP 19 2012

Mr. David Martin
Secretary
New Mexico Environment Department
1190 St. Francis Drive
Room N4050
Santa Fe, NM 87502

Dear Mr. Martin:

This letter is to invite the New Mexico Environment Department to participate as a cooperating agency in the Department of Energy's (DOE's) preparation of a supplemental environmental impact statement (SEIS), pursuant to the National Environmental Policy Act (NEPA), on alternatives for long-term management and storage of elemental mercury. Section 5 of the Mercury Export Ban Act of 2008 (the Act), Pub. L. 110-414, 122 Stat. 4341, sets forth requirements for DOE to establish and manage a facility for the purpose of long-term management and storage of elemental mercury generated within the United States. DOE prepared the final EIS (FEIS) for the Long-Term Management and Storage of Elemental Mercury (DOE/EIS-0423) in January 2011. Since its publication, DOE has reconsidered the range of reasonable alternatives evaluated, and now proposes to analyze additional alternatives in an SEIS. This SEIS will evaluate two additional locations for a long-term mercury storage facility, one within the boundary of the Waste Isolation Pilot Plant (WIPP) in New Mexico, and a second in the vicinity of WIPP.

DOE published a Notice of Intent (NOI) to prepare the SEIS on June 5, 2012 in the Federal Register (77 FR 33204). The New Mexico Environment Department's participation as a cooperating agency is requested; we would appreciate your response to this invitation as soon as practicable. If you or your staff has any questions or issues concerning the SEIS and/or FEIS, please contact David Levenstein of DOE's Office of Environmental Management at 301-903-6500 or david.levenstein@em.doe.gov. Mr. Levenstein is the DOE NEPA Document Manager for the SEIS. If you have any questions about DOE's NEPA process, please contact me at 202-586-4600.

Sincerely,

Carol Borgstrom

Carol M. Borgstrom
Director
Office of NEPA Policy and Compliance

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cc: David Levenstein, EM-11

APPENDIX H
CONTRACTOR NATIONAL ENVIRONMENTAL POLICY ACT DISCLOSURE STATEMENT

APPENDIX H
CONTRACTOR NATIONAL ENVIRONMENTAL POLICY ACT
DISCLOSURE STATEMENT

NATIONAL ENVIRONMENTAL POLICY ACT DISCLOSURE STATEMENT FOR PREPARATION OF THE *LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT*

The Council of Environmental Quality (CEQ) Regulations at Title 40 of the *Code of Federal Regulations* (CFR) Section 1506.5(c), which have been adopted by the U.S. Department of Energy (10 CFR 1021), require contractors and subcontractors who will prepare an environmental impact statement to execute a disclosure specifying that they have no financial or other interest in the outcome of the project.

"Financial or other interest in the outcome of the project" is defined as any direct financial benefits such as a promise of future construction or design work in the project, as well as indirect financial benefits the contractor is aware of.

In accordance with these requirements, the offeror and any proposed subcontractors hereby certify as follows, to the best of their actual knowledge as the date set forth below:

(a) X Offeror and any proposed subcontractors have no financial or other interest in the outcome of the project.

(b)__ Offeror and any proposed subcontractor have the following financial or other interest in the outcome of the project and hereby agree to divest themselves of such interest prior to award of this contract, or agree to the attached plan to mitigate, neutralize or avoid any such conflict of interest.

Financial or Other Interests
1.
2.
3.

Certified by:

____
Signature

Gil Olivas
Name

AVP, Operations Contracts Manager
Title

Science Applications International Corporation
Company

10 December 2012
Date

APPENDIX I
RESPONSES TO CONSULTATION REQUESTS

APPENDIX I
RESPONSES TO CONSULTATION REQUESTS

This appendix provides copies of consultation requests and agency responses associated with this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*. Consultation requests and agency responses associated with the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* are provided in Appendix H of the January 2011 *Mercury Storage EIS* and have not been reproduced here.

I.1 CORRESPONDENCE WITH THE NEW MEXICO ECOLOGICAL SERVICES OFFICE

I.1.1 U.S. Department of Energy's Correspondence to the New Mexico Ecological Services Office

Department of Energy
Washington, DC 20585

AUG 2 4 2012

Mr. Wally Murphy, Field Supervisor
U.S. Fish and Wildlife Service
New Mexico Ecological Services Office
2105 Osuna NE
Albuquerque, New Mexico 87113

Dear Mr. Murphy:

The purpose of this letter is to notify you that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for the Long-Term Management and Storage of Elemental Mercury (see enclosed Notice of Intent). Pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414), DOE has been directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. DOE is analyzing the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury in a facility or facilities constructed and operated in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. To evaluate the range of reasonable alternatives for siting, constructing, and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS in accordance with the National Environmental Policy Act and its implementing regulations (40 CFR Parts 1500-1508 and 10 CFR Part 1021) and issued the Mercury Storage Final EIS in January 2011. The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste.

This Supplement to the *Mercury Storage EIS* will analyze the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at two locations near WIPP. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Act) (P.L. No. 102-579) as amended, across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3 miles north of the WIPP facility (see enclosed map). Mercury storage at either location would require the construction of a new facility occupying approximately 3.1 hectares (7.7 acres).

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In support of the preparation of this Supplement to the Mercury Storage EIS, DOE is requesting information on listed or sensitive species and critical habitat, if present, that may be affected by the proposed project.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. *Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* (77 FR 33204).

2. Map indicating potential mercury storage locations.

33204 Federal Register/Vol. 77, No. 108/Tuesday, June 5, 2012/Notices

20202. Email: *equitycommission@ed.gov.* Telephone: (202) 453–6567.

John DiPaolo,

Chief of Staff, Assistant Secretary for Civil Rights, Office for Civil Rights.

[FR Doc. 2012–13499 Filed 6–4–12; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF ENERGY

Notice of Intent To Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury

AGENCY: Department of Energy.

ACTION: Notice of intent.

SUMMARY: As required by the Mercury Export Ban Act of 2008 (the Act), the Department of Energy (DOE) plans to identify a facility or facilities for the long-term management and storage of elemental mercury generated in the United States. To this end, DOE intends to prepare a supplement to the January 2011 *Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* to analyze additional alternatives, in accordance with the National Environmental Policy Act (NEPA). This supplemental EIS (SEIS) will evaluate alternatives for a facility at and in the vicinity of the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico.

DATES: DOE invites public comment on the scope of this SEIS until July 5, 2012. The first scoping meeting will be held on June 26, 2012, from 5:30 p.m.–8 p.m., at the Skeen-Whitlock Building auditorium at the U.S. DOE, Carlsbad Field Office, 4021 National Parks Highway, Carlsbad, New Mexico 88220. An open house will be held on the same day at the same location from 4:30 p.m.–5:30 p.m. A second scoping meeting will be held on June 28, 2012, from 6 p.m.–8:30 p.m. at the Crowne Plaza Albuquerque, 1901 University Blvd. NE., Albuquerque, New Mexico 87102. An open house will be held on the same day at the same location from 4:30 p.m.–6 p.m.

ADDRESSES: Written comments on the scope of the SEIS should be sent to: Mr. David Levenstein, Document Manager, Office of Environmental Compliance (EM–11), U.S. Department of Energy, Post Office Box 2612, Germantown, Maryland 20874; to the Mercury Storage EIS Web site at *http://mercurystorageeis.com/;* or via email to *David.Levenstein@em.doe.gov.*

This Notice will be available on the Internet at *http://www.energy.gov/NEPA/* and on the project Web site at *http://mercurystorageeis.com/.*

FOR FURTHER INFORMATION CONTACT: To request further information about the SEIS or the Mercury Storage EIS, or to be placed on the SEIS distribution list, use any of the methods (mail, Web site, or email) listed under **ADDRESSES** above. In requesting a copy of the Draft SEIS, please specify a request for a paper copy of the Summary only; a paper copy of the full SEIS; the full SEIS on a computer CD; or any combination thereof.

For general information concerning DOE's NEPA process, please contact: Ms. Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance (GC–54), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585, either by telephone at (202) 586–4600, by fax at (202) 586–7031, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Background

The Mercury Export Ban Act of 2008 (Pub. L. 110–414) amends the Toxic Substances Control Act (TSCA) (15 U.S.C. 2605(f)) to prohibit the sale, distribution, or transfer by Federal agencies to any other Federal agency, any state or local government agency, or any private individual or entity, of any elemental mercury under the control or jurisdiction of a Federal agency (with certain limited exceptions). It also amends TSCA (15 U.S.C. 2611(c)) to prohibit the export of elemental mercury from the U.S. effective January 1, 2013 (subject to certain essential use exemptions). Section 5 of the Act, *Long-Term Storage*, directs DOE to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the U.S. Pursuant to this law, this facility is required to be operational and ready to accept custody of any elemental mercury generated within the U.S. by January 1, 2013. The Act also requires DOE to assess fees based upon the *pro rata* costs of long-term management and storage of elemental mercury delivered to the facility or facilities.

The sources of elemental mercury in the U.S. include mercury used in the chlorine and caustic soda manufacturing process (i.e., chlor-alkali industry), reclaimed from recycling and waste recovery activities, and generated as a byproduct of the gold mining process. In addition, DOE's National Nuclear Security Administration stores approximately 1,200 metric tons of elemental mercury at the Oak Ridge Reservation in Tennessee.

To evaluate the range of reasonable alternatives for siting, constructing and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS (DOE/EIS–0423) in accordance with NEPA and its implementing regulations (40 CFR parts 1500–1508 and 10 CFR part 1021) and issued the Mercury Storage Final EIS in January 2011 (76 FR 5156). DOE estimated that up to approximately 10,000 metric tons of elemental mercury would need to be managed and stored at the DOE facility during the 40-year period of analysis. These estimates do not include approximately 4,400 metric tons of elemental mercury that the Department of Defense (DOD) stores at its facility in Hawthorne, Nevada.

Purpose and Need for Action

As indicated in the Mercury Storage EIS, DOE needs to designate a facility for the long-term management and storage of elemental mercury generated within the U.S., as required by the Act.

Proposed Action

As also indicated in the Mercury Storage EIS, DOE proposes to construct one or more new facilities and/or select one or more existing facilities (including modification as needed) for the long-term management and storage of elemental mercury in accordance with the Act. Facilities to be constructed as well as existing or modified facilities must comply with applicable requirements of section 5(d) of the Act, *Management Standards for a Facility*, including the requirements of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*), and other permitting requirements.

Proposed Alternatives

The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Those candidate locations are: DOE Grand Junction Disposal site near Grand Junction, Colorado; DOE Hanford site near Richland, Washington; Hawthorne Army Depot near Hawthorne, Nevada; DOE Idaho National Laboratory near Idaho Falls, Idaho; DOE Kansas City Plant in Kansas City, Missouri; DOE Savannah River Site near Aiken, South Carolina; and Waste Control Specialists, LLC, site near Andrews, Texas.

Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both

Federal Register / Vol. 77, No. 108 / Tuesday, June 5, 2012 / Notices **33205**

near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Pub. L. 102–579) as amended (Act), across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3½ miles north of the WIPP facility. Through development of the SEIS, DOE will evaluate the cumulative impacts of constructing and operating a facility for long-term management and storage of elemental mercury with the ongoing and planned operations of WIPP for disposal of defense transuranic waste, as well as the potential disposal of greater-than-Class C waste (*Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-level Radioactive Waste and GTCC-Like Waste* (GTCC EIS, DOE/EIS–0375, February 2011). The locations to be evaluated in the SEIS would be suitable for an above-ground storage facility.

Identification of Environmental Issues

DOE proposes to analyze the potential environmental impacts of the two additional alternatives for management and storage of elemental mercury as they apply to the following:

- Land use and visual resources.
- Geology, soils, and geologic hazards, including seismicity.
- Water resources (surface water and groundwater).
- Meteorology, air quality and noise.
- Ecological resources (terrestrial resources, wetlands and aquatic resources, and species that are Federal- or state-listed as threatened, endangered, or of special concern).
- Cultural and paleontological resources such as prehistoric, historic, or Native American sites.
- Site infrastructure.
- Waste management.
- Occupational and public health and safety, including from construction, operations, facility accidents, transportation, and intentional destructive acts.
- Ecological risk.
- Socioeconomic impacts on potentially affected communities.
- Environmental Justice (i.e., whether long-term mercury management and storage activities have a disproportionately high and adverse effect on minority and low-income populations).
- Facility closure.
- Cumulative impacts, including global commons cumulative impacts, i.e., ozone depletion and climate change.
- Potential mitigation measures.
- Unavoidable adverse environmental impacts.
- Irreversible and irretrievable commitments of resources.
- Relationship between short-term uses of the environment and maintenance and enhancement of long-term productivity.

Public Participation in the SEIS Process

NEPA implementing regulations require an early and open process for determining the scope of an EIS (or SEIS) and for identifying the significant issues related to the proposed action. To ensure that the full range of issues related to the proposed action are addressed, DOE invites Federal agencies, state, local, and tribal governments, and the general public to comment on the scope of the SEIS, including identification of reasonable alternatives and specific issues to be addressed. DOE will hold a public scoping meeting in Carlsbad, New Mexico, on June 26, 2012, and in Albuquerque, New Mexico, on June 28, 2012, as previously described (see **DATES**).

Issued in Washington, DC, on May 24, 2012.

Mark A. Gilbertson,

Deputy Assistant Secretary for Site Restoration.

[FR Doc. 2012–13614 Filed 6–4–12; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings

May 30, 2012.

Take notice that the Commission has received the following Natural Gas Pipeline Rate and Refund Report filings:

Filings Instituting Proceedings

Docket Numbers: RP12–754–000.
Applicants: Arkansas Electric Cooperative Corp., Hot Spring Power Company, LLC.
Description: Petition for Waiver of Gas Regulations of Arkansas Electric Cooperative Corporation and Hot Spring Power Company, LLC in RP12–754.
Filed Date: 5/25/12.
Accession Number: 20120525–5153.
Comments Due: 5 p.m. ET 6/6/12.

Docket Numbers: RP12–755–000.
Applicants: MarkWest Pioneer, LLC.
Description: MarkWest Pioneer—Quarterly FRP Filing to be effective 7/1/2012.
Filed Date: 5/29/12.
Accession Number: 20120529–5201.
Comments Due: 5 p.m. ET 6/11/12.

Any person desiring to intervene or protest in any of the above proceedings must file in accordance with Rules 211 and 214 of the Commission's Regulations (18 CFR 385.211 and 385.214) on or before 5:00 p.m. Eastern time on the specified comment date. Protests may be considered, but intervention is necessary to become a party to the proceeding.

Filings in Existing Proceedings

Docket Numbers: CP10–16–001.
Applicants: Cadeville Gas Storage LLC.
Description: Abbreviated amendment of Cadeville Gas Storage LLC under CP10–16.
Filed Date: 5/15/12.
Accession Number: 20120515–5240.
Comments Due: 5 p.m. ET 6/4/12.

Any person desiring to protest in any the above proceedings must file in accordance with Rule 211 of the Commission's Regulations (18 CFR 385.211) on or before 5:00 p.m. Eastern time on the specified comment date.

The filings are accessible in the Commission's eLibrary system by clicking on the links or querying the docket number.

eFiling is encouraged. More detailed information relating to filing requirements, interventions, protests, and service can be found at: *http://www.ferc.gov/docs-filing/efiling/filing-req.pdf.* For other information, call (866) 208–3676 (toll free). For TTY, call (202) 502–8659.

Nathaniel J. Davis, Sr.,

Deputy Secretary.

[FR Doc. 2012–13552 Filed 6–4–12; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings

Take notice that the Commission has received the following Natural Gas Pipeline Rate and Refund Report filings:

Filings Instituting Proceedings

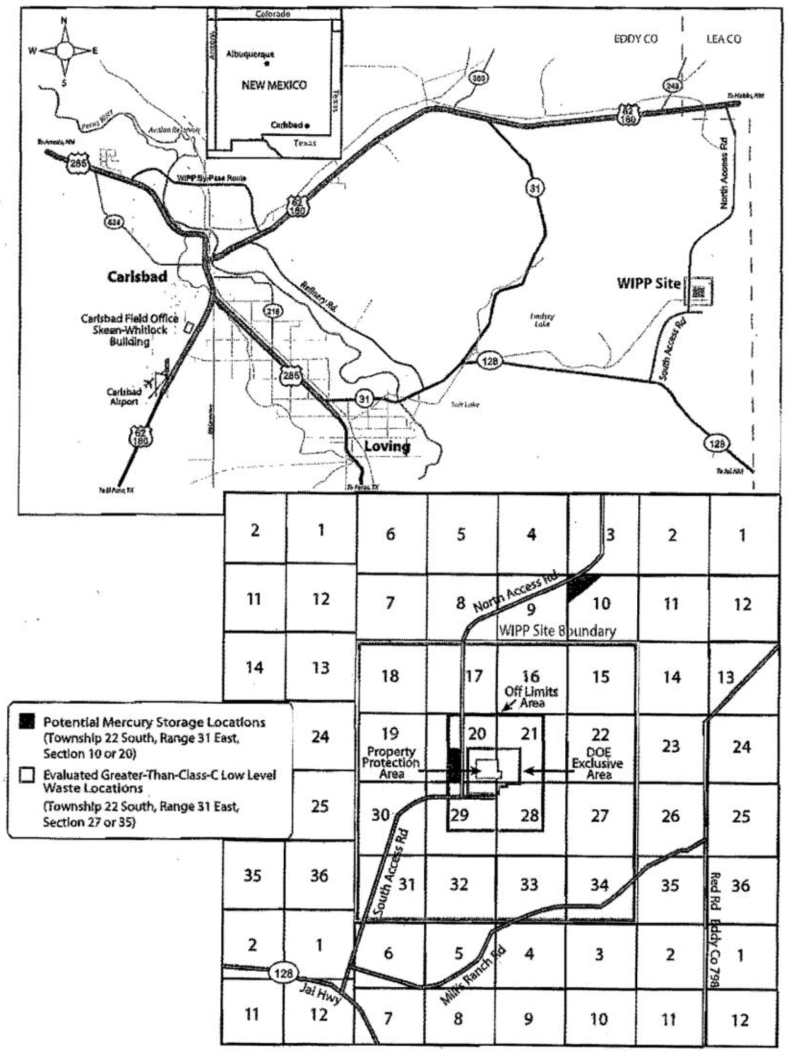
Docket Numbers: RP12–748–000.
Applicants: Algonquin Gas Transmission, LLC.
Description: AGT Negotiated Rate—Taunton 66667 to be effective 6/1/2012.
Filed Date: 5/24/12.

Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)

DOE's goal is to provide safe, secure, long-term mercury storage.

Additional Candidate Mercury Storage Sites to be Analyzed in a Supplemental EIS

Since publication of the *Final Mercury Storage EIS* in January 2011, the U.S. Department of Energy (DOE) has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which is located approximately 26 miles southeast of Carlsbad, New Mexico.



To Submit Comments or Request More Information

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
Office of Environmental Compliance
EM-11
P.O. Box 2612
Germantown, MD 20874-2612
http://www.mercurystorageeis.com

Department of Energy
Washington, DC 20585

JAN 15 2013

Mr. Wally Murphy, Field Supervisor
U.S. Fish and Wildlife Service
New Mexico Ecological Services Office
2105 Osuna NE
Albuquerque, New Mexico 87113

Dear Mr. Murphy:

The purpose of this letter is to amend the U.S. Department of Energy's (DOE's) previous notification to you on August 24, 2012, regarding the Supplement to the Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury. In August, DOE informed you of its intent to develop the supplemental environmental impact statement (SEIS) to evaluate two locations in the vicinity of the Waste Isolation Pilot Plant (WIPP): Sections 10 and 20, Township 22 South, Range 31 East. DOE received a response on January 10, 2013.

However, as a result of comments received during the SEIS scoping process, DOE has decided to evaluate a third location, also in the vicinity of WIPP. The additional location is in Section 35, within the same township and range as Sections 10 and 20 and outside of the lands withdrawn by the WIPP Land Withdrawal Act (P.L. No. 102-579), as amended. Section 35 is approximately 3.5 miles southeast of the WIPP facility (see enclosed map). Construction and operation of a long-term mercury storage facility would be the same as described in the August 24th correspondence, occupying approximately 3.1 hectares (7.7 acres).

In support of the preparation of the Supplement to the Mercury Storage EIS, DOE is requesting a review to determine if there is any additional information regarding listed or sensitive species and critical habitat specific to Section 35 that should be considered in our analyses or if the response received on January 10th would apply equally to Section 35 as it does for Sections 10 and 20.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. Map indicating potential mercury storage locations.

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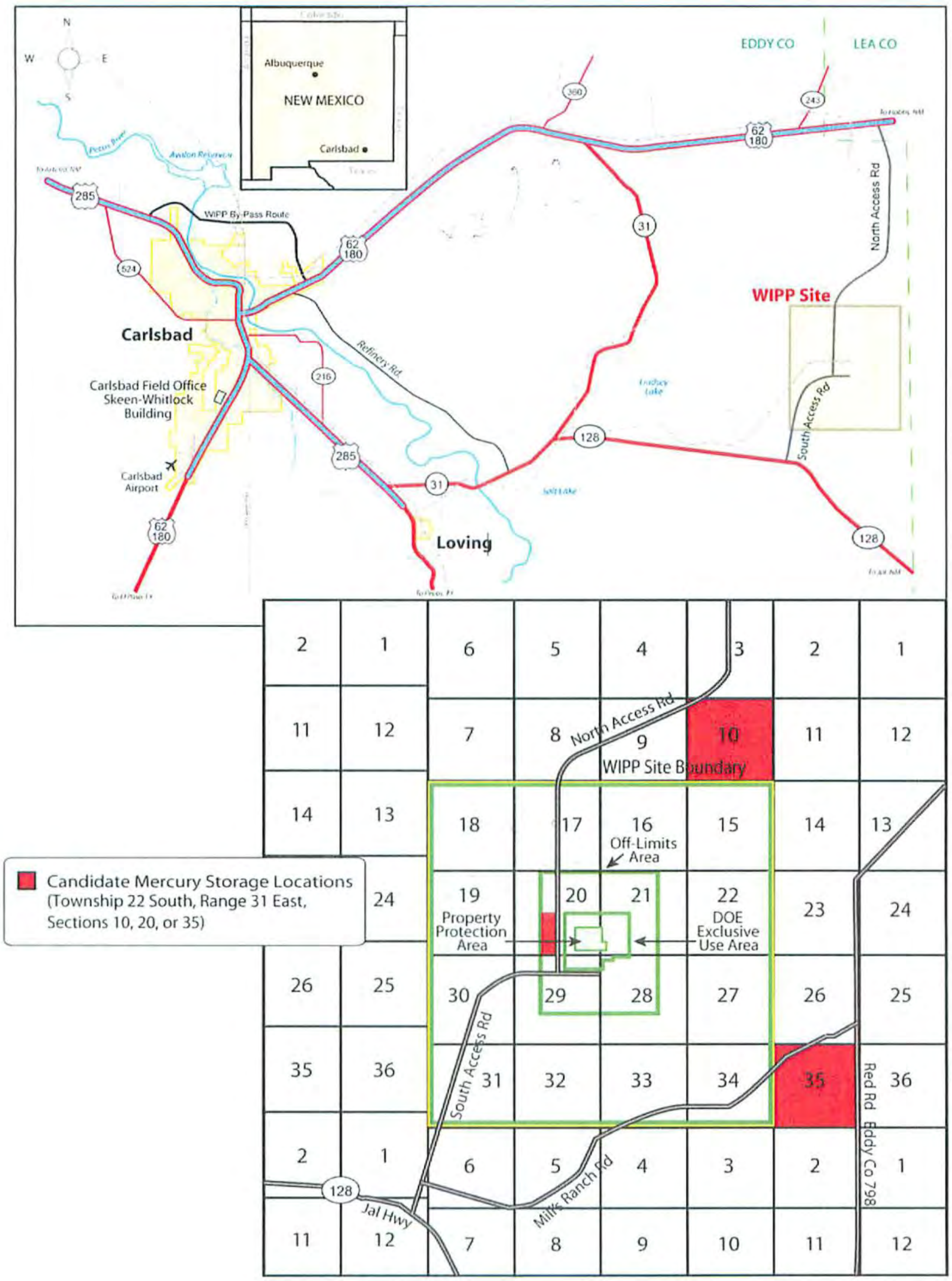

Candidate Locations Evaluated in the
Long-Term Management and Storage of Elemental Mercury
Supplemental Environmental Impact Statement

I.1.2 Response from the New Mexico Ecological Services Office

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

Thank you for your recent request for information on threatened or endangered species or important wildlife habitats that may occur in your project area. The New Mexico Ecological Services Field Office has posted lists of the endangered, threatened, proposed, candidate and species of concern occurring in all New Mexico Counties on the Internet. Please refer to the following web page for species information in the county where your project occurs: http://www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm. If you do not have access to the Internet or have difficulty obtaining a list, please contact our office and we will mail or fax you a list as soon as possible.

After opening the web page, find New Mexico Listed and Sensitive Species Lists on the main page and click on the county of interest. Your project area may not necessarily include all or any of these species. This information should assist you in determining which species may or may not occur within your project area.

Under the Endangered Species Act of 1973, as amended (Act), it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. Similarly, it is their responsibility to determine if a proposed action has no effect to endangered, threatened, or proposed species, or designated critical habitat. On December 16, 2008, we published a final rule concerning clarifications to section 7 consultations under the Act (73 FR 76272). One of the clarifications is that section 7 consultation is not required in those instances when the direct and indirect effects of an action pose no effect to listed species or critical habitat. As a result, we do not provide concurrence with project proponent's "no effect" determinations.

If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

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Candidates and species of concern have no legal protection under the Act and are included on the web site for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened. Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

Also on the web site, we have included additional wildlife-related information that should be considered if your project is a specific type. These include communication towers, power line safety for raptors, road and highway improvements and/or construction, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. We recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value.

The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding fish, wildlife, and plants of State concern.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area.

Sincerely,

Wally Murphy

Wally Murphy
Field Supervisor

OVER

Department of Energy
Washington, DC 20585

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USFWS-NMESFO

Mr. Wally Murphy, Field Supervisor
U.S. Fish and Wildlife Service
New Mexico Ecological Services Office
2105 Osuna NE
Albuquerque, New Mexico 87113

Dear Mr. Murphy:

The purpose of this letter is to notify you that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for the Long-Term Management and Storage of Elemental Mercury (see enclosed Notice of Intent). Pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414), DOE has been directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. DOE is analyzing the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury in a facility or facilities constructed and operated in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. To evaluate the range of reasonable alternatives for siting, constructing, and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS in accordance with the National Environmental Policy Act and its implementing regulations (40 CFR Parts 1500-1508 and 10 CFR Part 1021) and issued the Mercury Storage Final EIS in January 2011. The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste.

This Supplement to the *Mercury Storage EIS* will analyze the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at two locations near WIPP. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Act) (P.L. No. 102-579) as amended, across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3 miles north of the WIPP facility (see enclosed map). Mercury storage at either location would require the construction of a new facility occupying approximately 3.1 hectares (7.7 acres).

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In support of the preparation of this Supplement to the Mercury Storage EIS, DOE is requesting information on listed or sensitive species and critical habitat, if present, that may be affected by the proposed project.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Please send a species list letter to this address. and return to me.

Sincerely, George

David Levenstein
EIS Document Manager

Enclosures: 1. *Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* (77 FR 33204).

2. Map indicating potential mercury storage locations.

I.2 CORRESPONDENCE WITH THE NEW MEXICO DEPARTMENT OF GAME AND FISH

I.2.1 U.S. Department of Energy's Correspondence to the New Mexico Department of Game and Fish

Department of Energy
Washington, DC 20585

AUG 24 2012

Mr. Matthew Wunder, Division Chief
Conservation Services
New Mexico Department of Game and Fish
P.O. Box 25112
Santa Fe, New Mexico 87504

Dear Mr. Wunder:

The purpose of this letter is to notify you that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for the Long-Term Management and Storage of Elemental Mercury (see enclosed Notice of Intent). Pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414), DOE has been directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. DOE is analyzing the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury in a facility or facilities constructed and operated in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. To evaluate the range of reasonable alternatives for siting, constructing, and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS in accordance with the National Environmental Policy Act and its implementing regulations (40 CFR Parts 1500-1508 and 10 CFR Part 1021) and issued the Mercury Storage Final EIS in January 2011. The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste.

This Supplement to the *Mercury Storage EIS* will analyze the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at two locations near WIPP. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Act) (P.L. No. 102-579) as amended, across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3 miles north of the WIPP facility (see enclosed map). Mercury storage at either location would require the construction of a new facility occupying approximately 3.1 hectares (7.7 acres).

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In support of the preparation of this Supplement to the Mercury Storage EIS, DOE is requesting information on state-listed or sensitive species, if present, that may be affected by the proposed project.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. *Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* (77 FR 33204).

2. Map indicating potential mercury storage locations.

Department of Energy
Washington, DC 20585

JAN 15 2013

Mr. Matthew Wunder, Division Chief
Conservation Services
New Mexico Department of Game and Fish
P.O. Box 25112
Santa Fe, New Mexico 87504

Dear Mr. Wunder:

The purpose of this letter is to amend the U.S. Department of Energy's (DOE's) previous notification to you on August 24, 2012, regarding the Supplement to the Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury. In August, DOE informed you of its intent to develop the supplemental environmental impact statement (SEIS) to evaluate two locations in the vicinity of the Waste Isolation Pilot Plant (WIPP): Sections 10 and 20, Township 22 South, Range 31 East.

However, as a result of comments received during the SEIS scoping process, DOE has decided to evaluate a third location, also in the vicinity of WIPP. The additional location is in Section 35, within the same township and range as Sections 10 and 20 and outside of the lands withdrawn by the WIPP Land Withdrawal Act (P.L. No. 102-579), as amended. Section 35 is approximately 3.5 miles southeast of the WIPP facility (see enclosed map). Construction and operation of a long-term mercury storage facility would be the same as described in the August 24th correspondence, occupying approximately 3.1 hectares (7.7 acres).

In support of the preparation of the Supplement to the Mercury Storage EIS, DOE is requesting that any information provided by your department regarding state-listed or sensitive species and critical habitat, if any, that may be affected by the proposed project also include Section 35, as well as Sections 10 and 20 previously mentioned in the August 24th correspondence.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. Map indicating potential mercury storage locations.

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I.2.2 Response from the New Mexico Department of Game and Fish

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
James S. Lane, Jr.

Daniel E. Brooks, Deputy Director

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Santa Fe, NM 87507
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8008
Fax: (505) 476-8124

Visit our website at www.wildlife.state.nm.us
For information call: (888) 248-6866
To order free publications call: (800) 862-9310

STATE GAME COMMISSION

JIM McCLINTIC
Chairman
Albuquerque, NM

THOMAS "DICK" SALOPEK
Vice-Chairman
Las Cruces, NM

DR. TOM ARVAS
Albuquerque, NM

SCOTT BIDEGAIN
Tucumcari, NM

ROBERT ESPINOZA, SR.
Farmington, NM

PAUL M. KIENZLE III
Albuquerque, NM

BILL MONTOYA
Alto, NM

July 3, 2012

David Levenstein, Document Manager
Office of Environmental Compliance (EM-11)
US Department of Energy
P.O. Box 2612
Germantown, MD 20874

Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement Scoping; NMGF Project No.15156

Dear Mr. Levenstein:

In response to the Federal Register Notice of Intent dated 8 June 2012, the New Mexico Department of Game and Fish (Department) has reviewed information pertaining to the above referenced project. The Mercury Export Ban Act of 2008 requires the Department of Energy (DOE) to designate a facility for the long-term management and storage of elemental mercury generated within the U.S. DOE estimates a future need to manage and store up to 10,000 metric tons of elemental mercury during the 40-year period of analysis. The project will comprise an aboveground storage and containment building with ancillary delivery facilities. An EIS issued in 2011 evaluated seven candidate locations in the states of Colorado, Washington, Nevada, Idaho, Missouri, South Carolina and Texas. This Supplemental EIS will evaluate two additional alternatives located at and in the vicinity of the Waste Isolation Pilot Plant, Eddy County, New Mexico. They are located in Sections 10 and 20, Township 22S, Range 31E. Our comments pertain only to the locations in New Mexico. No site inspection was conducted by Department staff in connection with this consultation request.

For your information we have enclosed a list of sensitive, threatened and endangered species occurring in Eddy County. For more information on listed and other species of concern, contact the following sources:

1. BISON-M Species Accounts, Searches, and County lists: bison-m.org
2. Habitat Handbook Project Guidelines: wildlife.state.nm.us/conservation/habitat_handbook/index.htm
3. For custom, site-specific database searches on plants and wildlife. Go to Data then to Free On-Line Data and follow the directions go to: nmnhp.unm.edu
4. New Mexico State Forestry Division (505-827-5830) or nmrareplants.unm.edu/index.html for state-listed plants
5. For the most current listing of federally listed species always check the U.S. Fish and Wildlife Service at (505-346-2525) or fws.gov/ifw2es/NewMexico/index.cfm.

Long-Term Management and Storage of Elemental Mercury | Page 2 – 2 | July 3, 2012

The entire project area is within historic Lesser Prairie Chicken (LPC) habitat. The proposed project location may intersect current occupied habitat in Section 10. The Southern Great Plains Critical Habitat Assessment Tool classifies LPC habitat in the project area as "significant." The Department recommends avoiding impacts to suitable LPC habitat. For more information, please contact Grant Beauprez, Department LPC biologist at 575-478-2460 or grant.beauprez@state.nm.us.

The project area likely includes suitable habitat for Burrowing Owls. Please follow the survey and mitigation procedures recommended in the Department Habitat Handbook Burrowing Owl guideline, available at wildlife.state.nm.us/conservation/habitat_handbook/index.htm. Ephemerally wet, low lying portions of the project area may support leopard frogs and other amphibians. The Department recommends avoiding construction in or disturbance of hydrologic balance affecting ephemeral wet areas. No probable playa lakes are mapped by the Playa Lakes Joint Venture in the proposed project area.

Thank you for the opportunity to comment on this Supplemental EIS. We look forward to the opportunity to review a Draft EIS for this project. If there are any questions, please contact Rachel Jankowitz, Mining Habitat Specialist at 505-476-8159 or rjankowitz@state.nm.us.

Sincerely,

Matthew Wunder

Matt Wunder, Ph.D.
Chief, Conservation Services Division

MW/rj

Encl: 1

xc: USFWS NMES Field Office
Leon Redman, SE Area Operations Chief, NMDGF
George Farmer, SE Area Habitat Specialist, NMDGF
Grant Beauprez, Lesser Prairie Chicken Biologist, NMDGF

NEW MEXICO WILDLIFE OF CONCERN
EDDY COUNTY

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at http://www.fws.gov/southwest/es/NewMexico/SBC.cfm. For information on state-listed plants, contact the NM Energy, Minerals and Natural Resources Department, Division of Forestry, or go to http://nmrareplants.unm.edu/. If your project is on Bureau of Land Management, contact the local BLM Field Office for information on species of particular concern. If your project is on a National Forest, contact the Forest Supervisor's office for species information. E = Endangered; T = Threatened; s = sensitive; SOC = Species of Concern; C = Candidate; Exp = Experimental non-essential population; P = Proposed

Common Name	Scientific Name	NMGF	US FWS	critical habitat
Mexican Tetra	Astyanax mexicanus	T		
Rio Grande Chub	Gila pandora	s		
Rio Grande Shiner	Notropis jemezanus	s	SOC	
Pecos Bluntnose Shiner	Notropis simus pecosensis	E	T	Y
Blue Sucker	Cycleptus elongatus	E	SOC	
Gray Redhorse	Moxostoma congestum	T	SOC	
Headwater Catfish	Ictalurus lupus	s	SOC	
Pecos Pupfish	Cyprinodon pecosensis	T	SOC	
Pecos Gambusia	Gambusia nobilis	E	E	
Greenthroat Darter	Etheostoma lepidum	T	SOC	
Bigscale Logperch	Percina macrolepida (Native pop.)	T		
Western River Cooter	Pseudemys gorzugi	T		
Sand Dune Lizard	Sceloporus arenicolus	E	P	
Gray-banded Kingsnake	Lampropeltis alterna	E		
Blotched Water Snake	Nerodia erythrogaster transversa	E		
Arid Land Ribbon Snake	Thamnophis proximus diabolicus	T		
Mottled Rock Rattlesnake	Crotalus lepidus lepidus	T		
Brown Pelican	Pelecanus occidentalis	E		
Neotropic Cormorant	Phalacrocorax brasilianus	T		
Bald Eagle	Haliaeetus leucocephalus	T		
Northern Goshawk	Accipiter gentilis	s	SOC	
Common Black-Hawk	Buteogallus anthracinus	T	SOC	
Aplomado Falcon	Falco femoralis	E	Exp	
Peregrine Falcon	Falco peregrinus	T	SOC	
Lesser Prairie-Chicken	Tympanuchus pallidicinctus	s	C	
Piping Plover	Charadrius melodus circumcinctus	T	T	
Mountain Plover	Charadrius montanus	s	SOC	
Least Tern	Sterna antillarum	E	E	
Black Tern	Chlidonias niger surinamensis		SOC	
Common Ground-Dove	Columbina passerina	E		
Yellow-billed Cuckoo	Coccyzus americanus	s	SOC	
Mexican Spotted Owl	Strix occidentalis lucida	s	T	Y
Burrowing Owl	Athene cunicularia		SOC	
Broad-billed Hummingbird	Cynanthus latirostris	T		
Lucifer Hummingbird	Calothorax lucifer	T		
Northern Beardless-Tyrannulet	Camptostoma imberbe	E		
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y
Thick-billed Kingbird	Tyrannus crassirostris	E		

NEW MEXICO WILDLIFE OF CONCERN
EDDY COUNTY

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at http://www.fws.gov/southwest/es/NewMexico/SBC.cfm. For information on state-listed plants, contact the NM Energy, Minerals and Natural Resources Department, Division of Forestry, or go to http://nmrareplants.unm.edu/. If your project is on Bureau of Land Management, contact the local BLM Field Office for information on species of particular concern. If your project is on a National Forest, contact the Forest Supervisor's office for species information. E = Endangered; T = Threatened; s = sensitive; SOC = Species of Concern; C = Candidate; Exp = Experimental non-essential population; P = Proposed

Common Name	Scientific Name	NMGF	US FWS	critical habitat
Loggerhead Shrike	Lanius ludovicianus	s		
Bell's Vireo	Vireo bellii	T	SOC	
Gray Vireo	Vireo vicinior	T		
Baird's Sparrow	Ammodramus bairdii	T	SOC	
Sprague's Pipit	Anthus spragueii		C	
Varied Bunting	Passerina versicolor	T		
Western Small-footed Myotis Bat	Myotis ciliolabrum melanorhinus	s		
Yuma Myotis Bat	Myotis yumanensis yumanensis	s		
Cave Myotis Bat	Myotis velifer	s		
Long-legged Myotis Bat	Myotis volans interior	s		
Fringed Myotis Bat	Myotis thysanodes thysanodes	s		
Eastern Red Bat	Lasiurus borealis	s		
Pale Townsend's Big-eared Bat	Corynorhinus townsendii pallescens	s	SOC	
Big Free-tailed Bat	Nyctinomops macrotis	s		
Black-tailed Prairie Dog	Cynomys ludovicianus ludovicianus	s	SOC	
Guadalupe Pocket Gopher	Thomomys bottae guadalupensis	s	SOC	
Nelson's Pocket Mouse	Chaetodipus nelsoni canescens	s		
Pecos River Muskrat	Ondatra zibethicus ripensis	s	SOC	
Swift Fox	Vulpes velox velox	s	SOC	
Ringtail	Bassariscus astutus	s		
Western Spotted Skunk	Spilogale gracilis	s		
Common Hog-nosed Skunk	Conepatus leuconotus	s		
Texas Hornshell	Popenaias popeii	E	C	
Pecos Springsnail	Pyrgulopsis pecosensis	T	SOC	
Ovate Vertigo Snail	Vertigo ovata	T	SOC	
Desert Viceroy Butterfly	Limenitis archippus obsoleta		SOC	

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
James S. Lane, Jr.

Daniel E. Brooks, Deputy Director

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Santa Fe, NM 87507
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8008
Fax: (505) 476-8124

Visit our website at www.wildlife.state.nm.us
For information call: (888) 248-6866
To order free publications call: (800) 862-9310

STATE GAME COMMISSION

JIM McCLINTIC
Chairman
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ROBERT ESPINOZA, SR.
Farmington, NM

PAUL M. KIENZLE III
Albuquerque, NM

BILL MONTOYA
Alto, NM

February 5, 2013

David Levenstein, Document Manager
Office of Environmental Compliance (EM-11)
US Dept. of Energy
P.O. Box 2612
Germantown MD 20874

Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement Scoping; NMDGF Project No.15434

Dear Mr. Levenstein:

In response to your letter dated January 15, 2013, the New Mexico Department of Game and Fish (Department) has reviewed information pertaining to the above referenced project. The Mercury Export Ban Act of 2008 requires the Department of Energy (DOE) to designate a facility for the long-term management and storage of elemental mercury generated within the US. The DOE estimates there will be a need to manage and store up to 10,000 metric tons of elemental mercury during the 40-year period of analysis. The project will comprise an aboveground storage/containment building with ancillary delivery facilities. An EIS issued in 2011 evaluated seven candidate locations in the states of Colorado, Washington, Nevada, Idaho, Missouri, South Carolina and Texas. We previously responded to your request for information regarding two additional alternatives located at and in the vicinity of the Waste Isolation Pilot Plant (WIPP), Eddy County, New Mexico (NMDGF Project No. 15156, dated July 2, 2012). A third alternative in the same vicinity is currently under evaluation. It is located in Section 35, Township 22S, Range 31E, approximately 3.5 miles east of the WIPP. No site inspection was conducted by Department staff in connection with this consultation request.

For your information, we have enclosed a list of sensitive, threatened and endangered species that occur in Eddy County. Included below are sources of additional information:

1. For Biota Information System of New Mexico (BISON-M) species accounts, searches, and county lists go to bison-m.org.
2. For the Department's Habitat Handbook Project guidelines go to wildlife.state.nm.us/conservation/habitat_handbook/index.htm.
3. For custom, site-specific database searches on plants and wildlife go to nhnm.unm.edu, then go to Data, Free On-Line Data, and follow the directions.
4. For state-listed plants contact the New Mexico State Forestry Division at (505) 476-3334) or nmrareplants.unm.edu/index.html.

David Levenstein Page -2- February 5, 2012

5. For the most current listing of federally listed species **always** check the U.S. Fish and Wildlife Service at (505) 346-2525 or fws.gov/southwest/es/NewMexico/SBC.cfm.

Section 35 intersects current occupied habitat for Lesser Prairie-Chicken (LPC). The Southern Great Plains Critical Habitat Assessment Tool classifies LPC habitat in this Section as "common." The Department recommends avoiding conversion of suitable LPC habitat. For more information, please contact Grant Beauprez, Department LPC biologist at 575-478-2460 or grant.beauprez@state.nm.us.

The project area likely includes suitable habitat for Burrowing Owls. Please follow the survey and mitigation procedures recommended in the Department Habitat Handbook Burrowing Owl guideline, available at wildlife.state.nm.us/conservation/habitat_handbook/index.htm. Ephemerally wet, low lying portions of the project area may support leopard frogs and other amphibians. The Department recommends avoiding construction in ephemeral wet areas or disturbance of the hydrologic balance affecting them. No playa lakes were mapped by the Playa Lakes Joint Venture in the proposed project area. The project area is a year-round concentration zone for Harris Hawk. The selected area should be surveyed for raptor nests prior to construction, and human activity, including noise, should be avoided within ¼ mile of an active nest. There may also be important habitat for pronghorn antelope along the eastern edge of the section.

Thank you for the opportunity to comment on this Supplemental EIS. We look forward to the opportunity to review a Draft EIS for this project. If there are any questions, please contact Rachel Jankowitz, Mining Habitat Specialist at 505-476-8159 or rjankowitz@state.nm.us.

Sincerely,

Matthew Wunder, Chief
Conservation Services Division

cc: USFWS NMES Field Office
George Farmer, SE Regional Habitat Biologist, NMDGF
Grant Beauprez, Lesser Prairie-Chicken Biologist, NMDGF

I.3 CORRESPONDENCE WITH THE NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

I.3.1 U.S. Department of Energy's Correspondence to the New Mexico Energy, Minerals and Natural Resources Department

Department of Energy
Washington, DC 20585

AUG 2 4 2012

Mr. Tony Delfin, State Forester
Forestry Division
New Mexico Energy, Minerals and Natural Resources Department
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Dear Mr. Delfin:

The purpose of this letter is to notify you that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for the Long-Term Management and Storage of Elemental Mercury (see enclosed Notice of Intent). Pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414), DOE has been directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. DOE is analyzing the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury in a facility or facilities constructed and operated in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. To evaluate the range of reasonable alternatives for siting, constructing, and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS in accordance with the National Environmental Policy Act and its implementing regulations (40 CFR Parts 1500-1508 and 10 CFR Part 1021) and issued the Mercury Storage Final EIS in January 2011. The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste.

This Supplement to the *Mercury Storage EIS* will analyze the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at two locations near WIPP. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Act) (P.L. No. 102-579) as amended, across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3 miles north of the WIPP facility (see enclosed map). Mercury storage at either location would require the construction of a new facility occupying approximately 3.1 hectares (7.7 acres).

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In support of the preparation of this Supplement to the Mercury Storage EIS, DOE is requesting information on state-listed or sensitive species, if present, that may be affected by the proposed project.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. *Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* (77 FR 33204).

2. Map indicating potential mercury storage locations.

Department of Energy
Washington, DC 20585

JAN 15 2013

Mr. Tony Delfin, State Forester
Forestry Division
New Mexico Energy, Minerals and Natural Resources Department
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Dear Mr. Delfin:

The purpose of this letter is to amend the U.S. Department of Energy's (DOE's) previous notification to you on August 24, 2012, regarding the Supplement to the Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury. In August, DOE informed you of its intent to develop the supplemental environmental impact statement (SEIS) to evaluate two locations in the vicinity of the Waste Isolation Pilot Plant (WIPP): Sections 10 and 20, Township 22 South, Range 31 East. DOE received your response dated September 17, 2012.

However, as a result of comments received during the SEIS scoping process, DOE has decided to evaluate a third location, also in the vicinity of WIPP. The additional location is in Section 35, within the same township and range as Sections 10 and 20 and outside of the lands withdrawn by the WIPP Land Withdrawal Act (P.L. No. 102-579), as amended. Section 35 is approximately 3.5 miles southeast of the WIPP facility (see enclosed map). Construction and operation of a long-term mercury storage facility would be the same as described in the August 24th correspondence, occupying approximately 3.1 hectares (7.7 acres).

In support of the preparation of the Supplement to the Mercury Storage EIS, DOE is requesting a review to determine if there is any additional information regarding state-listed or sensitive species specific to Section 35 that should be considered in our analyses or if the response dated September 17, 2012, would apply equally to Section 35 as it does for Sections 10 and 20.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. Map indicating potential mercury storage locations.

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I.3.2 Response from the New Mexico Energy, Minerals and Natural Resources Department

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

John H. Bemis
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Tony Delfin, Division Director
State Forestry Division

September 17, 2012

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
Germantown, Maryland 20874

RE: Supplemental Environmental Impact Statement for the Long-Term Storage of Elemental Mercury (77 FR 33204).

Dear Mr. Levenstein:

Thank for inquiring about a list of potential NM state-listed endangered plants that could potentially be impacted by the proposed project near Carlsbad in Eddy County, NM. The presence of potential habitat should be evaluated for the following plant species:

Amsonia tharpii (Tharp's bluestar)
Cirsium wrightii (Wright's marsh thistle)
Coryphanta scheeri var. scheeri (Scheer's pincushion cactus)
Echinocereus fendleri var. kuenzleri (Kuenzler's hedgehog cactus)
Eriogonum gypsophilum (Gypsum wild buckwheat)
Escobaria sneedii var. leei (Lee's pincushion cactus)

Additional information on these state-listed plants and other sensitive plants in Eddy County, NM, can be found at: http://nmrareplants.unm.edu/index.html
If suitable habitat is found, clearance surveys should be conducted at the appropriate time of year, optimizing chances to detect potential plants within the project area. If plants are found within the project area minimization or avoidance measures will need to be developed to minimize impacts to the species.
Please let me know if I can be of further help.

Sincerely,

Daniela Roth

Daniela Roth, Botany Coordinator
505-476-3347

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3325 • Fax (505) 476-3330 • www.emnrd.state.nm.us/fd

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

John H. Bemis
Cabinet Secretary

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Tony Delfin, Division Director
State Forestry Division

NEW MEXICO STATE FORESTRY

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
Germantown, Maryland 20874

January 24, 2013

RE: Additional site location for the Long-Term Management and Storage of Elemental Mercury

Dear Mr. Levenstein:

Thank for inquiring about NM state-listed endangered plants that could potentially be impacted by the proposed mercury storage project near Carlsbad in Eddy County, NM. As stated in my letter from September 17, 2012, the presence of potential habitat should be evaluated for the following plant species:

Amsonia tharpii (Tharp's bluestar)
Cirsium wrightii (Wright's marsh thistle)
Coryphanta scheeri var. scheeri (Scheer's pincushion cactus)
Echinocereus fendleri var. kuenzleri (Kuenzler's hedgehog cactus)
Eriogonum gypsophilum (Gypsum wild buckwheat)
Escobaria sneedii var. leei (Lee's pincushion cactus)

No additional plants need to be considered for the third location, in Section 35, within the same township and range as the previously addressed locations.

Additional information on these state-listed plants and other sensitive plants in Eddy County, NM, can be found at: http://nmrareplants.unm.edu/index.html
If suitable habitat is found, clearance surveys should be conducted at the appropriate time of year, optimizing chances to detect potential plants within the project area. If plants are found within the project area minimization or avoidance measures will need to be developed to minimize impacts to the species.

Please let me know if I can be of further help.

Sincerely,

Daniela Roth

Daniela Roth, Botany Coordinator
505-476-3347

1220 South St. Francis Drive • Santa Fe, New Mexico 87505
Phone (505) 476-3325 • Fax (505) 476-3330 • www.emnrd.state.nm.us/fd

I.4 CORRESPONDENCE WITH THE NEW MEXICO HISTORIC PRESERVATION DIVISION

I.4.1 U.S. Department of Energy's Correspondence to the New Mexico Historic Preservation Division

Department of Energy
Washington, DC 20585

AUG 2 4 2012

Ms. Jan Biella
State Historic Preservation Officer
New Mexico Historic Preservation Division
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe, New Mexico 87501

Dear Ms. Biella:

The purpose of this letter is to notify you that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for the Long-Term Management and Storage of Elemental Mercury (see enclosed Notice of Intent). Pursuant to the Mercury Export Ban Act of 2008 (P.L. 110-414), DOE has been directed to designate a facility or facilities for the long-term management and storage of elemental mercury generated within the United States. DOE is analyzing the storage of up to 10,000 metric tons (11,000 tons) of elemental mercury in a facility or facilities constructed and operated in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. To evaluate the range of reasonable alternatives for siting, constructing, and operating a facility or facilities to meet its obligations under the Act, DOE prepared the Mercury Storage EIS in accordance with the National Environmental Policy Act (NEPA) and its implementing regulations (40 CFR Parts 1500-1508 and 10 CFR Part 1021) and issued the Mercury Storage Final EIS in January 2011. The Mercury Storage EIS evaluated seven candidate locations for the elemental mercury storage facility, as well as the No Action Alternative. Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste.

This Supplement to the *Mercury Storage EIS* will analyze the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at two locations near WIPP. One of the additional locations to be evaluated is in Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Act) (P.L. No. 102-579) as amended, across the WIPP access road from the WIPP facility. The second is in the vicinity of WIPP, but outside of the lands withdrawn by the Act, in Section 10, Township 22 South, Range 31 East, approximately 3 miles north of the WIPP facility (see enclosed map).

In preparing this Supplement to the *Mercury Storage EIS*, DOE has gathered and analyzed information regarding cultural resources at these locations near WIPP.

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This consultation is in accordance with NEPA and Section 106 of the National Historic Preservation Act. Preconstruction surveys and construction monitoring for previously unknown resources would be conducted if either of these locations is chosen for construction of the facility.

In support of the preparation of this Supplement to the *Mercury Storage EIS*, DOE is soliciting any specific concerns you may have regarding cultural resources that may be affected by the proposed project. We would appreciate a reply to this letter within 30 days of receipt.

If you have any questions or concerns, please contact me at:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500.

Sincerely,

David Levenstein

David Levenstein
EIS Document Manager

Enclosures: 1. *Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* (77 FR 33204).

2. Map indicating potential mercury storage locations.

Department of Energy
Washington, DC 20585

JAN 15 2013

Ms. Jan Biella
State Historic Preservation Officer
New Mexico Historic Preservation Division
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe, NM 87501

Dear Ms. Biella:

The purpose of this letter is to amend the U.S. Department of Energy's (DOE's) previous notification to you on August 24, 2012, regarding the Supplement to the Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury. In August, DOE informed you of its intent to develop the supplemental environmental impact statement (SEIS) to evaluate two locations in the vicinity of the Waste Isolation Pilot Plant (WIPP): Sections 10 and 20, Township 22 South, Range 31 East. DOE received your response dated August 31, 2012.

However, as a result of comments received during the SEIS scoping process, DOE has decided to evaluate a third location, also in the vicinity of WIPP. The additional location is in Section 35, within the same township and range as Sections 10 and 20 and outside of the lands withdrawn by the WIPP Land Withdrawal Act (P.L. No. 102-579), as amended. Section 35 is approximately 3.5 miles southeast of the WIPP facility (see enclosed map). Construction and operation of a long-term mercury storage facility would be the same as described in the August 24th correspondence, occupying approximately 3.1 hectares (7.7 acres).

In support of the preparation of the Supplement to the Mercury Storage EIS, DOE is requesting a review to determine if there is any additional information regarding cultural resources specific to Section 35 that should be considered in our analyses or if the response dated August 31, 2012, would apply equally to Section 35 as it does for Sections 10 and 20.

Please send the requested information to:

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874
(301) 903-6500

Sincerely,

David Levenstein
EIS Document Manager

Enclosures: 1. Map indicating potential mercury storage locations.

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I.4.2 Response from the New Mexico Historic Preservation Division

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

Susana Martinez
Governor

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

August 31, 2012

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874

Subject: Supplement to the Mercury Storage EIS

Dear Mr. Levenstein:

Thank you for your notification that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for Long-Term Management and Storage of Elemental Mercury. We understand the supplement will analyze elemental mercury storage at two locations near WIPP. One of the locations to be evaluated is in Section 20, Township 22 South, Range 31 East. This location is within lands withdrawn by the WIPP Land Withdrawal Act (Act). The second location is also in the vicinity of WIPP but outside of the lands withdrawn by the ACT. This second location is in Section 10, Township 22 South, Range 31 East.

We agree with preconstruction surveys of the proposed project and construction monitoring (when appropriate) if one of these two locations were to be selected. Assuming there would be underground mining, we would also point out the need for cultural resource surveys of off-site waste disposal areas and associated access roads. We thank you for the opportunity to comment. We look forward to further project related correspondence.

Sincerely,

Norman B. Nelson
Archaeologist
Planning and Review
Historic Preservation Division
N.M. Office of Cultural Affairs
(505) 476-0255

STATE OF NEW MEXICO
DEPARTMENT OF CULTURAL AFFAIRS
HISTORIC PRESERVATION DIVISION

Susana Martinez
Governor

BATAAN MEMORIAL BUILDING
407 GALISTEO STREET, SUITE 236
SANTA FE, NEW MEXICO 87501
PHONE (505) 827-6320 FAX (505) 827-6338

January 23, 2013

Mr. David Levenstein
EIS Document Manager
U.S. Department of Energy
P.O. Box 2612
Germantown, Maryland 20874

Subject: Supplement to the Mercury Storage EIS adding Section 35

Dear Mr. Levenstein:

Thank you for your notification that the Department of Energy (DOE) is preparing a Supplement to the Environmental Impact Statement (EIS) for Long-Term Management and Storage of Elemental Mercury. We understand the supplement will analyze elemental mercury storage at three locations near WIPP. One of the locations to be evaluated is in Section 20, Township 22 South, Range 31 East. This location is within lands withdrawn by the WIPP Land Withdrawal Act (Act). The second location is also in the vicinity of WIPP but outside of the lands withdrawn by the ACT. This second location is in Section 10, Township 22 South, Range 31 East. In addition a third location, Section 35 has been added since the August 31, 2012 reply from our office (your letter dated August 24, 2012).

We agree with preconstruction archaeological surveys of the proposed project area(s) and construction monitoring (when appropriate) if one of these three locations were to be selected. Assuming there would be underground mining, we would also point out the need for cultural resource surveys of off-site waste disposal areas and for associated access roads. We thank you for the opportunity to comment. We look forward to further project related correspondence.

Sincerely,

Norman B. Nelson

Norman B. Nelson
Archaeologist
Planning and Review
Historic Preservation Division
N.M. Office of Cultural Affairs
(505) 476-0255

PART II
COMMENT RESPONSE DOCUMENT

Table of Contents

Table of Contents i
List of Figures i
List of Tables i
List of Acronyms and Abbreviations ii
Measurement Units iii
Conversions iv
List of Commentors v

Section 1 Overview of the Public Comment Process 1–1
1.1 Organization of This Comment Response Document 1–1
1.2 Public Comment Process 1–2
1.3 Public Hearings 1–4
1.4 U.S. Environmental Protection Agency Rating 1–4

Section 2 Public Comments and DOE Responses 2–1

Section 3 References 3–1

List of Figures

Figure 1–1. Comment Response Process 1–3

List of Tables

Table 1–1. Comment Document Submission Method 1–2
Table 1–2. Public Hearing Locations and Attendance 1–4

List of Acronyms and Abbreviations

BLM	U.S. Bureau of Land Management
CRD	Comment Response Document
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
Draft Mercury Storage SEIS	*Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
Final Mercury Storage SEIS	*Final Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*
FLPMA	Federal Land Policy and Management Act
GTCC	greater-than-Class C
GTCC EIS	*Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste*
Hanford	Hanford Site
HLW	high-level radioactive waste
INL	Idaho National Laboratory
Interim Guidance	*U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury*
LCF	latent cancer fatality
LWA	Land Withdrawal Act
Mercury Storage EIS	*Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement*
NEPA	National Environmental Policy Act
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
SEIS	supplemental environmental impact statement
TRU	transuranic
WCS	Waste Control Specialists, LLC, site
WIPP	Waste Isolation Pilot Plant
Y–12	Y–12 National Security Complex

Measurement Units

The principal measurement units used in this *Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Mercury Storage SEIS)* are SI units (the abbreviation for the Système International d'Unites). The SI system is an expanded version of the metric system that was accepted in 1966 in Elsinore, Denmark, as the legal standard by the International Organization for Standardization. In this system, most units are made up of combinations of seven basic units, of which length in meters, mass in kilograms, and volume in liters are of most importance in this *Mercury Storage SEIS*. Exceptions are radiological units that use the English system (e.g., rem, millirem).

SCIENTIFIC (EXPONENTIAL) NOTATION

Numbers that are very small or very large are often expressed in scientific, or exponential, notation as a matter of convenience. For example, the number 0.000034 may be expressed as 3.4×10^{-5} or 3.4E-05, and 65,000 may be expressed as 6.5×10^{4} or 6.5E+04. In this *Mercury Storage SEIS*, numerical values that are less than 0.001 or greater than 9,999 are generally expressed in scientific notation, i.e., 1.0×10^{-3} and 9.9×10^{3}, respectively.

Multiples or submultiples of the basic units are also used. A partial list of prefixes that denote multiples and submultiples follows, with the equivalent multiplier values expressed in scientific notation.

Prefix	Symbol	Multiplier	
atto	a	0.000 000 000 000 000 001	1×10^{-18}
femto	f	0.000 000 000 000 001	1×10^{-15}
pico	p	0.000 000 000 001	1×10^{-12}
nano	n	0.000 000 001	1×10^{-9}
micro	μ	0.000 001	1×10^{-6}
milli	m	0.001	1×10^{-3}
centi	c	0.01	1×10^{-2}
deci	d	0.1	1×10^{-1}
deka	da	10	1×10^{1}
hecto	h	100	1×10^{2}
kilo	k	1,000	1×10^{3}
mega	M	1,000,000	1×10^{6}
giga	G	1,000,000,000	1×10^{9}
tera	T	1,000,000,000,000	1×10^{12}
peta	P	1,000,000,000,000,000	1×10^{15}
exa	E	1,000,000,000,000,000,000	1×10^{18}

The following symbols are occasionally used in conjunction with numerical expressions:

$<$	less than
$\leq$	less than or equal to
$>$	greater than
$\geq$	greater than or equal to

Conversions

English to Metric			Metric to English		
Multiply	**by**	**To get**	**Multiply**	**by**	**To get**
Area			**Area**		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092903	square meters	square meters	10.7639	square feet
square yards	0.8361	square meters	square meters	1.196	square yards
acres	0.40469	hectares	hectares	2.471	acres
square miles	2.58999	square kilometers	square kilometers	0.3861	square miles
Length			**Length**		
inches	2.54	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	kilometers	kilometers	0.6214	miles
Temperature			**Temperature**		
degrees Fahrenheit	Subtract 32, then multiply by 0.55556	degrees Celsius	degrees Celsius	Multiply by 1.8, then add 32	degrees Fahrenheit
Volume			**Volume**		
fluid ounces	29.574	milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight			**Weight**		
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.45360	kilograms	kilograms	2.2046	pounds
short tons	0.90718	metric tons	metric tons	1.1023	short tons

List of Commentors

COMMENTOR NO. 1: ELIZABETH M. JOHNSON, DIRECTOR, HISTORICAL SERVICES, SOUTH CAROLINA ARCHIVES AND HISTORY CENTER 2–3

COMMENTOR NO. 2: W. TODD BLACKABY 2–4

COMMENTOR NO. 3: MICHAEL LOUAILLIER 2–7

COMMENTOR NO. 4: DAVE SEPICH 2–8

COMMENTOR NO. 5: RUSSELL HARDY 2–9

COMMENTOR NO. 6: DALE JANWAY, MAYOR, CITY OF CARLSBAD 2–10

COMMENTOR NO. 7: BOB J. MUFFLEY, EXECUTIVE DIRECTOR, MIDDLE SNAKE REGIONAL WATER RESOURCE COMMISSION 2–12

COMMENTOR NO. 8: RHONDA SMITH, CHIEF, OFFICE OF PLANNING AND COORDINATION, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY 2–15

COMMENTOR NO. 9: SKIP CANFIELD, NEVADA STATE CLEARINGHOUSE, STATE LAND USE PLANNING AGENCY 2–20

COMMENTOR NO. 10: STEPHEN R. SPENCER, REGIONAL ENVIRONMENTAL OFFICER, UNITED STATES DEPARTMENT OF THE INTERIOR 2–22

COMMENTOR NO. 11: MAIA D. BELLON, DIRECTOR, STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY 2–23

COMMENTOR NO. 12: MORGAN R. NELSON, ENVIRONMENTAL IMPACT REVIEW COORDINATOR, STATE OF NEW MEXICO, ENVIRONMENT DEPARTMENT 2–28

COMMENTOR NO. 13: DON HANCOCK, SOUTHWEST RESEARCH AND INFORMATION CENTER 2–35

COMMENTOR NO. 14: SCOTT KOVAC, OPERATIONS AND RESEARCH DIRECTOR, NUCLEAR WATCH NEW MEXICO 2–50

COMMENTOR NO. 15: CARLOS VALDEZ, CHAIR, NORTHERN NEW MEXICO CITIZENS' ADVISORY BOARD 2–58

COMMENTOR NO. 16: DR. LILLY K. RENDT 2–61

COMMENTS FROM THE CARLSBAD, NEW MEXICO, PUBLIC HEARING (MAY 7, 2013) 2–64

COMMENTS FROM THE ALBUQUERQUE, NEW MEXICO, PUBLIC HEARING (MAY 9, 2013) 2–67

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SECTION 1
OVERVIEW OF THE PUBLIC COMMENT PROCESS

> *Comment Document* – A communication in the form of a verbatim transcript or written comment from a public hearing, a letter, or an electronic communication (e.g., fax, email) that contains comments from a sovereign nation, government agency, organization, or member of the public regarding the *Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (Draft Mercury Storage SEIS)*.
>
> *Comment* – A specific statement or question within a comment document regarding the content of the *Draft Mercury Storage SEIS* that conveys approval or disapproval of proposed actions, recommends changes in the environmental impact statement, raises concerns or issues, or seeks additional information.

This Comment Response Document (CRD) describes the public comment process for the *Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement* (DOE/EIS-0423-S1) *(Draft Mercury Storage SEIS)*, as well as the procedure used to respond to those comments. **Section 1.1** summarizes the organization of this document. **Section 1.2** describes the public comment process and the means through which comments on the *Draft Mercury Storage SEIS* were received and addressed. **Section 1.3** describes the public hearings for the *Draft Mercury Storage SEIS*, including hearing locations and dates. **Section 1.4** discusses the U.S. Environmental Protection Agency's (EPA's) rating of the *Draft Mercury Storage SEIS* and what it means. Section 2 presents a copy of all comment documents received by August 31, 2013, and the U.S. Department of Energy's (DOE's) responses to public comments. A summary of these comments and responses is provided in Chapter 1, Section 1.6.2, of this supplemental environmental impact statement (SEIS).

1.1 ORGANIZATION OF THIS COMMENT RESPONSE DOCUMENT

This CRD comprises the following sections:

- **Section 1** describes the organization of this CRD, the public comment process, the public hearings, and EPA's rating of the SEIS.

- **Section 2** presents copies of the comment documents received during the public comment process, including transcripts of oral comments given during the public hearings. Each comment document has been delineated; each delineated comment is marked by a bar in the margin and a unique comment number. Responses to delineated comments are displayed to the right of the comment. The index at the front of this section lists all public officials, organizations, and individuals that submitted a comment document. Section 2 of this CRD was further divided into subsections, as follows:

  1. Individual and unique comment documents. Comment Document Nos. 1–99 were reserved for these submissions. However, only Nos. 1–16 were assigned.

  2. Transcripts and oral comment documents. Each person that gave an oral comment was assigned a unique comment document number. Comment Document Nos. 100–999 were reserved for public hearings. One hundred comment document numbers were reserved for each hearing location (e.g., 100–199 for Carlsbad, New Mexico, and 200–299 for Albuquerque, New Mexico). No oral comments were given in Carlsbad, New Mexico, and only six oral comments were given in Albuquerque, New Mexico.

- **Section 3** lists the references cited in this CRD.

1.2 PUBLIC COMMENT PROCESS

An important part of the National Environmental Policy Act (NEPA) process is solicitation of public comments on an SEIS and consideration of those comments in preparing a final SEIS. DOE released the *Draft Mercury Storage SEIS* in April 2013 for review and comment by other Federal agencies, states, sovereign nations (i.e., American Indian tribal governments), local governments, and the public. DOE distributed copies to those organizations and government officials who were known to have an interest in the SEIS, as well as to those organizations and individuals who requested a copy. Copies were also made available on the Internet and in regional DOE public document reading rooms and public libraries near the candidate locations. Notifications were mailed to stakeholders on record and advertisements were published in local newspapers stating the availability of the *Draft Mercury Storage SEIS* and when and where public hearings were to be held.

The formal public comment period was 45 days from April 19, 2013, through June 3, 2013. During the 45-day comment period, public hearings were held at two locations: Carlsbad, New Mexico, and Albuquerque, New Mexico. The estimated attendance is discussed in detail in Section 1.3.

In addition to comments received during the public hearing process, the public was invited to submit comments on the *Draft Mercury Storage SEIS* to DOE via (1) the project website (http://www.mercurystorageeis.com), (2) email, and (3) U.S. mail. DOE received 22 comment document submissions. The website provided electronic access to documents associated with the *Draft Mercury Storage SEIS*. Table 1–1 lists the numbers of comment documents received by method of submission.

Table 1–1. Comment Document Submission Method

Method	Number of Submissions
Public Hearing (Oral Comment)	6
Public Hearing (Written Comment)	0
Letter via U.S. Mail	5
Website or Email	11
Total	22

DOE considered all comments on the *Draft Mercury Storage SEIS* to determine whether corrections, clarifications, or other revisions were required before publishing this final SEIS, including late comments received by August 31, 2013. All comments were considered equally, whether written, spoken, mailed, or submitted electronically. Upon receipt, all comment documents were logged and assigned a document number for tracking during the comment response process. The text of each comment document was delineated into unique comments and each separate comment was assigned an individual, sequential number. Thus, one comment document could have two or more comments. Comments were reviewed and responses prepared by policy experts, subject matter experts, and NEPA specialists, as appropriate. The originally submitted comment documents and transcribed oral comments made at public hearings are included as part of the administrative record. Figure 1–1 illustrates the process used to collect, track, and respond to comments.

The comments and DOE's responses are presented in Section 2 of this CRD in a side-by-side format, with each delineated comment displayed to the left of its corresponding response.

The comment response process was integral to preparation of this *Final Mercury Storage SEIS*, as it was used to focus revision efforts and ensure consistency throughout the final document. Comments were evaluated to determine, for example, whether the alternatives and analyses presented in the *Draft Mercury Storage SEIS* should be modified or augmented; whether information presented in the draft SEIS was incorrect or out of date; and whether additional or revised text would clarify or facilitate a better understanding of certain issues.

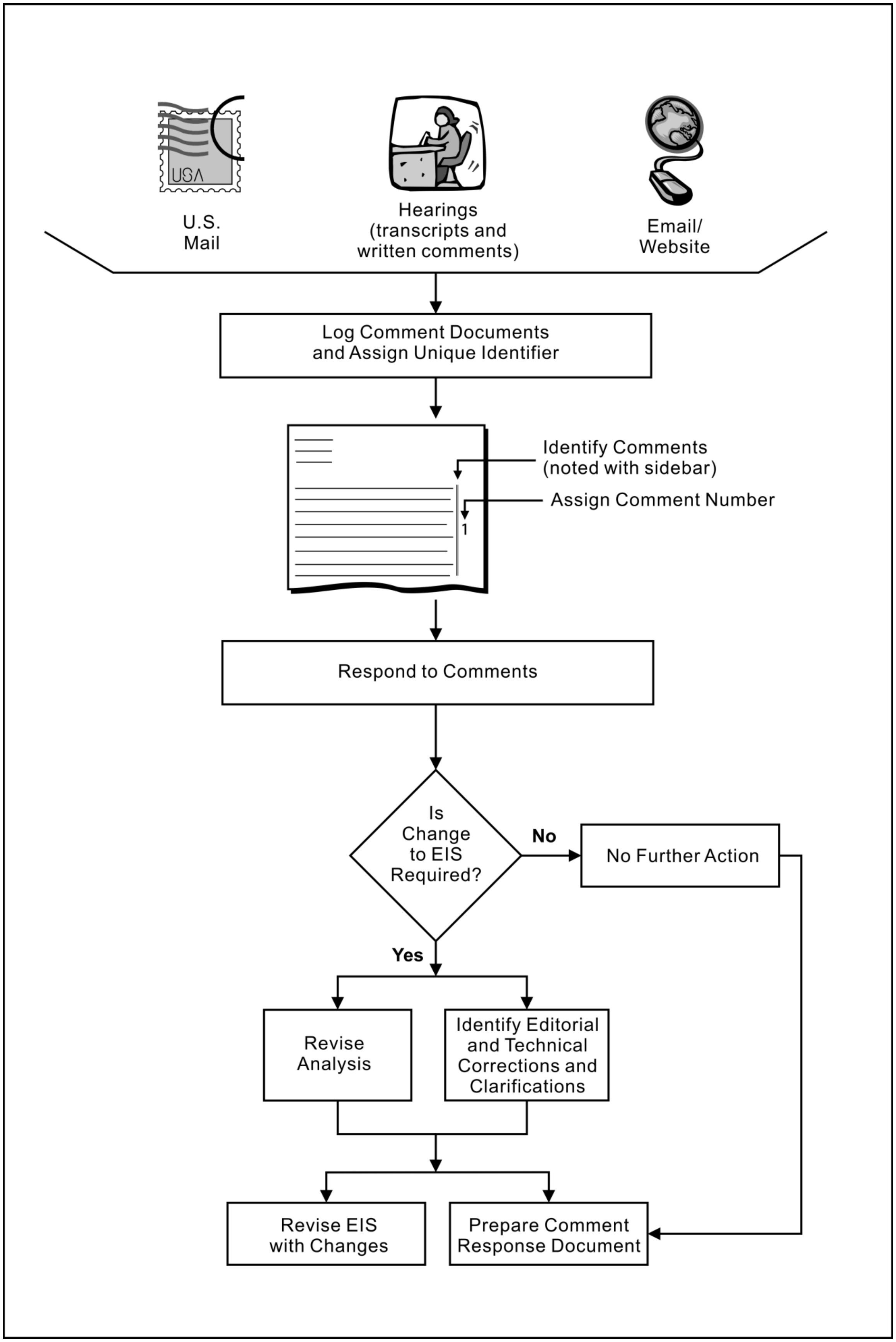

Figure 1–1. Comment Response Process

1.3 PUBLIC HEARINGS

As described in the DOE Notice of Availability of the *Draft Mercury Storage SEIS* (78 FR 23548), public hearings were held to encourage public comments on the *Draft Mercury Storage SEIS* and to provide members of the public with information about the NEPA process and the proposed action.

Each of the public hearings started with an open house that lasted approximately 1 hour. Posters were displayed and fact sheets were made available to the public. Subject matter experts were present during the open house; members of the public were invited to view the displays and ask questions of the subject matter experts either before or after the formal hearings were conducted. The posters and available fact sheets addressed the NEPA process, Mercury Export Ban Act of 2008 (P.L. 110-414), public comment process, candidate sites for long-term storage, summary of impacts, and a timeline of SEIS-related steps. Electronic (i.e., compact disk) copies of the *Draft Mercury Storage SEIS* were also available at the public hearings.

Table 1–2 lists the location, estimated number of attendees, and oral commentors for each hearing. The attendance estimates are based on the number of people who signed in, as well as a rough "head count" of the audience.

Table 1–2. Public Hearing Locations and Attendance

Location	Date	Estimated Attendance	Oral Commentors
Carlsbad, New Mexico	May 7, 2013	12	0
Albuquerque, New Mexico	May 9, 2013	18	6
Total		30	6

After the open house, DOE gave a presentation that was composed of an overview of the *Draft Mercury Storage SEIS* and an explanation of the analyses presented in the SEIS. Following this presentation, attendees were given an opportunity to provide oral and written comments. Each oral comment, recorded by the court reporter as part of the hearing transcript, was treated as a comment document. Each written comment collected during the hearing was likewise treated as a comment document. The transcripts and written comments from each public hearing are presented in **Section 2** of this CRD.

1.4 U.S. ENVIRONMENTAL PROTECTION AGENCY RATING

In accordance with EPA's responsibilities under Section 309 of the Clean Air Act (42 U.S.C. 7401 et seq.), NEPA, and the Council on Environmental Quality regulations for implementing NEPA (40 CFR 1500–1508), EPA Region 6 reviewed the *Draft Mercury Storage SEIS* and assigned an "EC-2 (Environmental Concerns-Request for Additional Information)" rating to the proposed action. EPA Region 6 requested additional information or clarification regarding air quality mitigation and tribal consultations. A copy of the EPA letter (Comment Document No. 8) is included in Section 2 of this CRD with DOE's response.

SECTION 2
PUBLIC COMMENTS AND DOE RESPONSES

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Commentor No. 1: Elizabeth M. Johnson, Director, Historical Services, South Carolina Archives and History Center

The South Carolina Archives & History Center
History & Heritage For All Generations

April 18, 2013

Mr. David Levenstein
Document Manager
U.S. Department of Energy
PO Box 2612
Germantown, MD 20874

Subject: Draft Mercury Storage SEIS

Mr. Levenstein:

Thank you for sending us a copy of the *Draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement*. As it appears that this supplemental EIS focused on three sites in New Mexico, we have no comment on the study. 1-1

We also note that the South Carolina site studied previously as part of this project, E Area at the Savannah River Site, does not have any known historic sites included in or eligible for inclusion in the National Register of Historic Places. If the Savannah River Site Alternative were to be selected, we would recommend consultation with DOE-SRS and their cultural resource consultants, the Savannah River Archaeological Research Program as regards to potential impacts to known or unknown cultural resources at SRS. 1-2

Please let me know if we can be of further assistance, 803-896-6168, emjohnson@scdah.state.sc.us.

Cordially,

Elizabeth M. Johnson

Elizabeth M. Johnson
Director, Historical Services, D-SHPO

S. C. Department of Archives & History • 8301 Parklane Road • Columbia • South Carolina • 29223-4905 • (803) 896-6100 • http://scdah.sc.gov

1-1 Thank you for your review and for informing DOE that the South Carolina Department of Archives and History has no comments on the *Draft Mercury Storage SEIS*.

1-2 Chapter 5, Table 5–4, of the January 2011 *Long-Term Management and Storage of Elemental Mercury Environmental Impact Statement (Mercury Storage EIS)* shows the consultations performed for the candidate sites evaluated in the environmental impact statement (EIS), including consultation with the South Carolina State Historic Preservation Office (DOE 2011a:5-32). The consultation letter from the South Carolina Department of Archives and History is provided in Appendix H (DOE 2011a:H-60). After a storage site is selected, consultations with the host state will be performed in accordance with applicable laws and regulations.

Commentor No. 2: W. Todd Blackaby

April 22, 2013

TO: DAVID Levenstein,
Document MANAGER
O.E.C. EM-11
DOE
P.O. BOX 2612
GERMANTOWN, MD 20874

FROM: W.TODD BLACKABY
P.O. BOX 968
Benton City, Wa 99320

DEAR SIR;

Thank you for the Hearing notification concerning STRAGE of Elemental mercury.
This Letter written is in Desperation for unemployment cannot be collected at Olympia, Wa.
2-1 The Final tank closure(s) at HANFORD could be beneFicial to the DOE. With single and Double shell tanks Drained

-1-

2-1 Storage of elemental mercury in high-level radioactive waste (HLW) storage tanks at the Hanford Site (Hanford) is not a viable alternative for the following reasons: (1) the HLW storage tanks contain large volumes of HLW; (2) the HLW storage tanks would require complete removal of the HLW and extensive decontamination to be safe to use for mercury storage; and (3) the HLW storage tanks would require substantial modifications to be used for mercury storage that would be cost prohibitive. Because of the above issues, the HLW storage tanks would not be a viable alternative for the long-term management and storage of elemental mercury.

LARGE Volumetric Capacity can be used/handled at The HANFORD waste tanks. Some Tank Do leak; How ever, A Re-Seal Program and storing the elemental mercury in Drums stored in the tanks could be done. Vitrification is being accomplished. The 242 Evaporator and the energy systems are still being Developed.

2-1 (cont'd)

A Waste Isolation Plant does exist at HANFORD. The FootPrint is LARGE but can be Reduced at HANFORD. IF there is not enough storage at Yucca, ANDREWS, IDAHO, and the other places; HANFORD could at least store any ADDitional "over-Flow" of Elemental mercury.

2-2

-2-

2-2 As described in Chapter 2, Section 2.4.3, of the January 2011 *Mercury Storage EIS*, storage in the 200-West Area at Hanford is evaluated. See also Response No. 2-1.

Commentor No. 2 (cont'd): W. Todd Blackaby

more info through
office of River Protection
DOE.
P.O Box 1178
RICHLAND, Wa 99352
Attn: TC & WM EIS
1-888-829-6347
1-888-785-2865
Viewing Disc and a GREEN magazine
Pamphlet can be Available

I would like to put in for
Volunteer/Samaritan/Severance
PAY:
make check payable to
W. TODD BLACKABY
$ 90,000.00

2-3

We are currently broke.
yours truly
W. TODD BLACKABY,

-3-

2-3 Questions regarding severance pay, etc., should be directed to the relevant Human Resources office.

Commentor No. 3: Michael Louaillier

April 25, 2013

David Levenstein
Document Manager
Office of Environmental Compliance (EM-11)
U.S. Department of Energy
P.O. Box 2612
Germantown, MD. 20874

Re: Mercury Storage

Dear David,

The risk of further lethal contamination of the Columbia River, the surrounding region and, ultimately, the Pacific Ocean far exceeds any short term benefits to Richland, Washington and the USA.

Please do not allow any further storage of lethal contaminates in the Pacific Northwest. 3-1

Kind regards,

Mike

Michael Louaillier
2415 Palisades Crest Dr.
Lake Oswego, OR. 97034

3-1 DOE acknowledges the commentor's opposition to the long-term management and storage of elemental mercury at Hanford and concerns regarding potential impacts on the Columbia River and the Pacific Ocean. As described in Chapter 4, Sections 4.4.3.1, of the January 2011 *Mercury Storage EIS*, construction or modification and operation of a mercury storage facility within the developed 200-West Area of Hanford would have negligible impacts on water resources. There would be no direct discharge of effluents to either surface water or groundwater from storage facility operations and no impact on water quality. In addition, the design, construction, and operation of the mercury storage facility would feature structural controls and practices to prevent the release of elemental mercury and to prevent any spills or other releases from reaching soils or surfaces where they could be conveyed to surface waters or groundwater. Facility operations would also be conducted in accordance with an integrated contingency plan and spill prevention, control, and countermeasures plan, which set forth the actions facility personnel would take to respond to abnormal operating conditions, including fires, explosions, or any accidental release of mercury to air, soil, surface water, or groundwater at the facility.

Commentor No. 4: Dave Sepich

From: comment@mercurystorageeis.com
Sent: Tuesday, May 07, 2013 4:56 PM
To: MercuryEIS
Subject: Mercury Storage EIS - Comment

New comment from the Mercury Storage EIS Website:

Name: Dave Sepich
Organization:
Address 1: 1904 Sentry Circle
Address 2:
City: Carlsbad
State: NM
Zip: 88220
Phone: 575-885-1931
E-Mail: dsepich@springtimesupply.com
Comment: I am personnally against a mercury storage facility being located in SE NM near or on the WIPP Land Withdrawall 16 sq. miles.Although I realize that if properly managed the mercury does notendanger the underground mining activity nor the operations of WIPP I do believe that other locations should be considered andreserve the WIPP area for further development of Nuclear cleanup efforts that would be much more beneficial to DOE and the Country. 4-1

4-1 DOE acknowledges the commentor's opposition to the long-term management and storage of elemental mercury at any of the Waste Isolation Pilot Plant (WIPP) Vicinity reference locations. The impacts on all resource areas at any of the candidate sites analyzed in the January 2011 *Mercury Storage EIS* or this SEIS from construction and operation of a mercury storage facility would range from negligible to minor (see Chapter 4). In addition to the WIPP Vicinity reference locations, DOE is still considering the seven candidate sites analyzed in the January 2011 *Mercury Storage EIS*. DOE acknowledges in Chapter 4, Section 4.2.1, that an existing potash mining lease exists in Section 10; however, a lease does not currently exist in Section 20 or 35. As stated in Section 4.4.2, the proposed mercury storage facility and greater-than-Class C (GTCC) disposal facility could co-exist in the vicinity of WIPP without interference of operations with each other; this would also apply to the current WIPP transuranic (TRU) waste disposal operations.

Commentor No. 5: Russell Hardy

From: comment@mercurystorageeis.com
Sent: Wednesday, May 08, 2013 10:41 AM
To: MercuryEIS
Subject: Mercury Storage EIS - Comment

New comment from the Mercury Storage EIS Website:

Name: Russell Hardy
Organization: Carlsbad Environmental Monitoring Research Center
Address 1: 1400 University Drive
Address 2:
City: Carlsbad
State: NM
Zip: 88220
Phone: 575-234-5555
E-Mail: rhardy@nmsu.edu
Comment: As a lifelong resident of southeast New Mexico and as the director of the Carlsbad Environmental Monitoring Research Center an entity of New Mexico State University that provides an independent environmental monitoring program of the Waste Isolation Pilot Plant on behalf of the citizens of Carlsbad and southeast New Mexico I fully support the siting of the long-term mercury storage facility on any of the proposed tracts near the WIPP facility. Several reasons for my support of this project are 1 the proposed locations are remote and not likely to endanger the public 2 the proposed facility will not negatively impact human health or the environment barring any unforeseen act of God such as an earthquake tornado or wildfire 3 the local population is well trained well versed and has a high acceptance with regard to dealing with hazardous materials and 4 the Carlsbad Environmental Monitoring and Research Center already conducts various forms of environmental monitoring air soil water... in and around the WIPP location including elemental mercury and therefore is well prepared to add the proposed long-term mercury disposal facility to its sampling and analyses repertoire - thus continuing to ensure the citizens of the area that the facility is safe and poses no negative impact to the environment or the local populace. Thank you for this opportunity to comment. 5-1

5-1 DOE acknowledges the commentor's support for the long-term management and storage of elemental mercury at WIPP. Although DOE has identified the Waste Control Specialists, LLC, site (WCS) as the Preferred Alternative, as discussed in Chapter 2, Section 2.4, of this SEIS, DOE has not made a decision on the location of the mercury storage facility(ies). DOE will make a decision no sooner than 30 days after publication of the EPA Notice of Availability for this *Final Mercury Storage SEIS* in the *Federal Register*. The final site selection will be based upon the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors and will be announced in a Record of Decision (ROD) published in the *Federal Register*.

Commentor No. 6: Dale Janway, Mayor, City of Carlsbad

CARLSBAD

Post Office Box 1569
Carlsbad, NM 88221-1569
(575) 887-1191
1-800-658-2713
www.cityofcarlsbadnm.com

DALE JANWAY
MAYOR

JON R. TULLY
CITY ADMINISTRATOR

May 14, 2013

David Levenstein, Document Manager
Office of Environmental Compliance (EM–11
U.S. Department of Energy
Post Office Box 2612
Germantown, MD 20874

Website: http://www.mercurystorageeis.com
david.levenstein@em.doe.gsv

Dear Mr. Levenstein,

My name is Dale Janway, and I'm submitting this as the Mayor of Carlsbad, New Mexico. This will be my third submission on the topic of the possible long-term management and storage of elemental mercury in Eddy County. Since the prior public hearing, I have spoken at length about this subject with many of my constituents and, as a result, wish to add or modify some of my previous comments.

According to the Supplemental Environmental Impact Statement, the Department of Energy is now considering three possible Eddy County locations for elemental mercury – one is within the Land Withdrawal Act-designated property set aside for the Waste Isolation Pilot Plant (Section 20); one is what's called Section 10, an area to the immediate northeast of the LWA property near WIPP; and one is called Section 35, an area to the immediate southeast of the LWA area near WIPP that was added as a possibility after the last period of public input.

In a previous letter to you, I objected to the consideration of Section 10, as it overlaps with the interests of a local potash company in the area. The Department of Energy addressed this concern in the SEIS by adding Section 35, and I thank you for your responsiveness to our area's industry. I'd like to again stress my request that DOE's siting not interfere with the potash interests of Eddy and Lea County, as I have concerns that Section 35 may be important to the Intercontinental Potash Corporation in the future. I oppose consideration of Sections 10 and 35 due to potash reserve concerns. 6-1

The DOE believes this mercury can be stored safely in Eddy County, and in a manner that meets all of the state's RCRA permitting requirements. I agree with the DOE that the technology and process exists allowing mercury to be stored safely in Eddy County, or any other similar location, if handled correctly. 6-2

COUNCILORS

Ward 1	Ward 2	Ward 3	Ward 4
PAUL C. AGUILAR	J.R. DOPORTO	JUDI WATERS	DICK DOSS
NICK G. SALCIDO	SANDRA K. NUNLEY	JASON G. SHIRLEY	JANELL E. WHITLOCK

6-1 DOE acknowledges the commentor's opposition to the long-term management and storage of elemental mercury at or in the vicinity of WIPP, including the WIPP Vicinity Section 10 and 35 reference locations, due to potash mining interests in the area. DOE acknowledges in Chapter 4, Section 4.2.1, that an existing potash mining lease exists in Section 10; however, a lease does not currently exist in Section 35. The proposed mercury storage facility would only occupy a maximum of 3.1 hectares (7.6 acres). Allowing for a subsidence buffer zone of approximately one-quarter mile surrounding the facility, the siting of a mercury storage facility would affect a portion, but not all, of the potash mining interests in a particular section. The proposed mercury storage facility is not a permanent disposal facility. The storage of mercury will only be necessary until EPA approves a treatment and disposal standard for elemental mercury. However, DOE does acknowledge that although the period of analysis for the long-term management and storage of mercury is 40 years, the need for storage could be longer. Once the mercury storage facility is no longer needed, additional potash reserves would then be available for mining.

6-2 DOE acknowledges the commentor's belief that elemental mercury storage at or in the vicinity of WIPP could cloud WIPP's focus on radioactive waste disposal. DOE intends to continue its operation of WIPP as an elite facility with a high standard for safety and security. The expertise at WIPP is one of the factors that make the WIPP Vicinity reference locations an attractive candidate site for the long-term management and storage of elemental mercury. If a mercury storage facility were to be constructed and operated in the vicinity of WIPP, it would not interfere with WIPP's current mission. The long-term management and storage of mercury is a passive operation requiring low routine maintenance and would not involve any processes that could potentially detract from other missions at WIPP. As discussed in Appendix C, Section C.2.4, a maximum of eight employees would be used for operations of a mercury storage facility. DOE has successfully operated many laboratories and facilities nationwide with multiple or changing missions.

Commentor No. 6 (cont'd): Dale Janway, Mayor, City of Carlsbad

The DOE also has considered that mercury storage, either at WIPP or near WIPP, would have no significant conflicts with the Waste Isolation Pilot Plant's mission to dispose of the nation's transuranic (TRU) waste. I do not agree, as I have some concerns that mercury storage could interfere with WIPP's mission in ways that are outside of the scope of the environmental impact statement. I retain serious concerns that mercury storage could hurt WIPP's overall interests in the realm of public perception. WIPP is lauded for its operational success and safety and for being the only place in the world to capably and permanently dispose of defense-generated transuranic (TRU) waste. WIPP is an elite facility, with highly-trained individuals who perform a unique and essential function for the nation.

The additional missions I have advocated for WIPP, such as thermal testing, tank waste and Greater Than Class C waste, all have very close ties to this current function. In fact, one of the strongest arguments for these missions is their similarity to WIPP's current mission. We're adding other types of surgery, but we're staying in the same field.

In my opinion, storing mercury at or in the vicinity of WIPP could cloud the project's focus on radioactive waste disposal. We have successfully sold this project as a very elite facility that directs its energies toward resolving the essential issue of nuclear waste cleanup. We should stick with that and not lose focus. 6-2 (cont'd)

Many residents of New Mexico are fairly neutral in their perceptions about WIPP. This silent majority of the population has increasingly accepted the message that we are an elite facility with a specific, important mission. I have concerns that overextending the DOE's portfolio at or near WIPP would greatly hurt our credibility with the state's many neutral observers.

WIPP has a very important mission, and there are closely-associated additional roles the DOE should consider for WIPP. I have concerns that elemental mercury storage could be a hindrance to WIPP's current scope and to associated efforts. I believe we should look for additional ways to put the WIPP area to good use, but our nation's need for nuclear waste disposal is so vital that the force of DOE's effort there should be in that direction.

Dale Janyway
City of Carlsbad, NM Mayor

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Commentor No. 7: Bob J. Muffley, Executive Director, Middle Snake Regional Water Resource Commission

From: comment@mercurystorageeis.com
Sent: Wednesday, May 22, 2013 12:25 PM
To: MercuryEIS
Subject: Mercury Storage EIS - Comment

New comment from the Mercury Storage EIS Website:

Name: Bob J. Muffley Executive Director
Organization: Middle Snake Regional Water Resource Commission
Address 1: 122 5th Ave. West
Address 2:
City: Gooding
State: ID
Zip: 83330
Phone: 2-8-934-4781
E-Mail: bmuffley@muffleyagency.myrf.net
Comment: The Middle Snake Regional Water Resource Commission representing Cassia Gooding Jerome Lincoln and Twin Falls counties in south central Idaho offers the following commentsThe Commission has reviewed the SEIS on potentail mercury storage sites in the U.S. and asks that the Idaho National Laboratory INL be removed from the list. The Commission has studied your proposal and found the risk while appearing low is more than this region of Idaho can logically accept. 7-1 South central Idaho already receives more air-born mercury then our rivers and reservoirs can safely assimilate. 7-2 Several water bodies downstream from the INL are already listed as waters of concern by the Idaho Department of Environmental Quality and advisories have been issued concerning the consumption of fish. 7-3 Mercury in its natural state can most likely be stored safely in the storage facilities described in the SEIS. Our concerns however are twofold. First is transporting the substance to the site and the second is seismic activity at the site itself. An accident duing transportation or escape caused by seismic activiey could seriously impact our above ground and groundwater resources. 7-4 The customs and culture of this region are more than any other place in Idaho dependent on the region's water resources. Thirty-eight percent of the state's agricultural product is grown in this region and ninety-two percent of the private ground is irrigated crop land. Idaho ranks fourth in the nation for dairy production and seventy percent of that production is in this region. An economic model developed by the University of Idaho shows this region of the state as the most dependent on a clean and adequate supply of water. Damage to this vital resource would impact not only Idaho residents but also the multiple recipients of Idaho's agricultural exports including vegetables wheat dairy and meat products.The commission rarely relies on the old not in my back yard argument but in this situation we believe it is justified. Please consider other sites with less potential impact to our nation's food supply and our state and regional economy. 7-5

1

7-1 DOE acknowledges the commentor's opposition to the long-term management and storage of elemental mercury at Idaho National Laboratory (INL).

7-2 As described in Chapter 4, Section 4.6.4, of the January 2011 *Mercury Storage EIS*, construction or modification and operation of a mercury storage facility within the developed Idaho Nuclear Technology and Engineering Center or Radioactive Waste Management Complex areas of INL would have negligible impacts on air quality.

7-3 DOE acknowledges the commentor's concerns regarding potential impacts on water resources in Idaho. As described in Chapter 4, Section 4.6.3.1, of the January 2011 *Mercury Storage EIS*, construction or modification and operation of a mercury storage facility within the developed Idaho Nuclear Technology and Engineering Center or Radioactive Waste Management Complex areas of INL would have negligible impacts on water resources. There would be no direct discharge of effluents to either surface water or groundwater from normal storage facility operations and no impact on water quality. In addition, the design, construction, and operation of the mercury storage facility would feature structural controls and practices to prevent the release of elemental mercury and to prevent any spills or other releases from reaching soils or surfaces where they could be conveyed to surface waters or groundwater. Facility operations would also be conducted in accordance with an integrated contingency plan and spill prevention, control, and countermeasures plan, which set forth the actions facility personnel would take to respond to abnormal operating conditions, including fires, explosions, or any accidental release of mercury to air, soil, surface water, or groundwater at the facility.

Comment side of this page intentionally left blank.

7-4 DOE acknowledges the commentor's concerns regarding the seismic hazard in relation to mercury storage at INL. Chapter 3, Section 3.5.2.3, of the January 2011 *Mercury Storage EIS* describes geologic hazards in the INL region. The section describes historical seismicity (i.e., frequency and location of earthquakes) and the site's proximity to active faults. Chapter 4, Section 4.6.2.2, of the January 2011 *Mercury Storage EIS* specifically assesses the effects earthquakes could have on a mercury storage facility at INL using probabilistic earthquake ground motion data from the U.S. Geological Survey to specifically compare the candidate sites. The data indicate a minimal risk to INL facilities. Regardless of the site chosen, the mercury storage facility would be designed and constructed to withstand the assessed hazard.

7-5 DOE acknowledges the commentor's concerns regarding the risk to water resources from a transportation or seismic accident. As presented in Appendix D of the January 2011 *Mercury Storage EIS*, DOE has fully considered the parameters and pathways that would come into play should elemental mercury be spilled inside a mercury storage facility, onto the ground, or directly into a surface-water body from a transportation accident and the resulting threat to groundwater. In part because elemental mercury is slow to infiltrate through soil and sediments due to its physical and chemical properties, DOE determined that the most problematic spill would be one that is directly into a surface-water body, as described in Appendix D, Section D.2.8, of the EIS. The possibility of spillage directly into a river or waterway is further discussed in Chapter 4, Section 4.4.9.3.2, of the January 2011 *Mercury Storage EIS*. As further evaluated in Section D.4.3.2 of the EIS, the overall conclusion is that a direct spillage of mercury into a body of water could be of concern if it is not cleaned up, but there is generally adequate time for such cleanup. This contention is stronger for a release to the ground surface that could threaten underlying groundwater, where mercury would generally pool on the surface and infiltrate to a depth dictated by the surface tension of the pool of mercury. On a smooth surface, without fractures or cracks, this depth (capillary depth) is 0.36 centimeters (0.14 inches), as

Commentor No. 7 (cont'd): Bob J. Muffley, Executive Director, Middle Snake Regional Water Resource Commission

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presented in Section D.4.2.3 of the EIS, with a spill of the entire contents of a 1-metric-ton (1.1-ton) container producing a pool with an area of no more than 20.6 square meters (222 square feet). While the natural variability of land surfaces would affect these spill pool characteristics, a pool of mercury from a transportation accident could be contained and cleaned up before reaching groundwater. Transportation of mercury would be in accordance with applicable Resource Conservation and Recovery Act (RCRA) hazardous waste and U.S. Department of Transportation hazardous material shipping requirements.

Commentor No. 8: Rhonda Smith, Chief, Office of Planning and Coordination, United States Environmental Protection Agency

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 6
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

May 31, 2013

Mr. David Levenstein
EIS Document Manager
Office of Environmental Compliance (EM-11)
U.S. Department of Energy
P.O. Box 2612
Germantown, MD 20784

Dear Mr. Levenstein:

In accordance with our responsibilities under Section 309 of the Clean Air Act (CAA), the National Environmental Policy Act (NEPA), and the Council on Environmental Quality (CEQ) regulations for implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Supplemental Environmental Impact Statement (DSEIS) prepared by the U. S. Department of Energy (DOE) for the Long-Term Management and Storage of Elemental Mercury. The EPA and the U.S. Bureau of Land Management are cooperating agencies in the preparation of this NEPA document.

The Mercury Export Ban Act (MEBA) of 2008 amends the Toxic Substances Control Act, effective October 14, 2008, to prohibit, any Federal agency, any state or local government agency, or any private individual or entity, from conveying, selling, or distributing any elemental mercury under the control or jurisdiction. It also prohibits the export of elemental mercury from the United States effective January 1, 2013. For these reasons, DOE must identify a facility where mercury can be safely and securely stored.

To evaluate a range of reasonable alternatives for siting, constructing, and operating such a facility or facilities, DOE prepared a Mercury Storage Draft and Final EIS in 2010 and 2011, respectively, to meet its obligations under the MEBA and NEPA. DOE's January 2010 EIS evaluated seven (7) candidate sites for the facility or facilities, as well as a No Action alternative as required by NEPA. As a result of this environmental review process, DOE identified the Waste Control Specialists, LLC location near Andrews, Texas, as the Preferred Alternative in the 2011 FEIS. EPA reviewed both the Draft and Final EIS's on March 29, 2010 and February 28, 2011, respectively, and rated the proposed action LO (Lack of Objections).

DOE has now decided to reconsider the range of reasonable alternatives evaluated in earlier EISs. This DSEIS submitted by DOE for review includes three new locations for a long-term mercury surface storage facility that are on or near the Waste Isolation Pilot Plant (WIPP) site near Carlsbad, New Mexico.

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Commentor No. 8 (cont'd): Rhonda Smith, Chief, Office of Planning and Coordination, Environmental Protection Agency

-2-

Based upon our review and analysis of the DSEIS, EPA rates the document as "EC-2" (Environmental Concerns- Request for Additional Information). The EPA's Rating System Criteria can be found here: http://www.epa.gov/oecaerth/nepa/comments/rating .html. The "EC" rating is based on potential impacts to air quality, and tribal coordination. The "2" indicates the DSEIS does not contain sufficient information for air quality mitigation, and Tribal consultation. We have enclosed detailed comments which more clearly identify our concerns and the informational needs requested for incorporation into the Final SEIS (FSEIS). Responses to comments should be placed in a dedicated section of the FSEIS and should include the specific location where the revision, if any, was made. If no revision was made, a clear explanation should be included. 8-1

EPA appreciates the opportunity to review the DSEIS. Please send our office two copies of the FSEIS, and an internet link, when it is sent to the Office of Federal Activities, EPA (Mail Code 2252A), Ariel Rios Federal Building, 1200 Pennsylvania Ave, N.W., Washington, D.C. 20004. Our classification will be published on the EPA website, www.epa.gov, according to our responsibility under Section 309 of the CAA to inform the public of our views on the proposed Federal action. If you have any questions or concerns, I can be reached by e-mail at smith.rhonda@epa.gov or by phone at 214-665-8006. You may also contact Michael Jansky of my staff at jansky.michael@epa.gov or 214-665-7451 for assistance.

Sincerely,

Rhonda Smith

Rhonda Smith
Chief, Office of Planning
and Coordination

Enclosure

8-1 DOE acknowledges EPA's (Region 6) "EC-2" rating of the *Draft Mercury Storage SEIS* and areas/issues that require clarification. The rating of "EC-2" assigned by EPA indicates concerns regarding impacts on air quality and tribal coordination. EPA requested additional information in the air quality and cultural resources sections. The requested information is provided in the final SEIS, as discussed in Response Nos. 8-2 and 8-3 below.

Commentor No. 8 (cont'd): Rhonda Smith, Chief, Office of Planning and Coordination, Environmental Protection Agency

DETAILED COMMENTS
ON THE
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
PREPARED BY
THE U.S. DEPARTMENT OF ENERGY
FOR THE
LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY

BACKGROUND

The Department of Energy (DOE) evaluated seven candidate sites in their 2010 and 2011 Mercury Storage EISs for the storage of elemental mercury, as well as a No Action Alternative as required under NEPA. The candidate sites considered were:

DOE Grand Junction Disposal site near Grand Junction, Colorado;
DOE Hanford site near Richland, Washington;
Hawthorne Army Depot near Hawthorne, Nevada;
DOE Idaho National Laboratory near Idaho Falls, Idaho (2 locations);
DOE Kansas City Plant in Kansas City, Missouri;
DOE Savannah River Site near Aiken, South Carolina; and
Waste Control Specialists, LLC, site near Andrews, Texas.

DOE identified the Waste Control Specialists, LLC location near Andrews, Texas, as the Preferred Alternative. Since publication of the 2011 FEIS, DOE has decided to reconsider the range of reasonable alternatives evaluated. The scope of this Draft Supplemental Mercury Storage SEIS includes three additional locations on or near the WIPP site near Carlsbad, New Mexico.

The three additional elemental mercury storage site locations evaluated in this DSEIS are in:

1) Section 20, Township 22 South, Range 31 East within the land subject to the WIPP Land Withdrawal Act (Pub. L. 102–579) as amended;

2) Section 10, Township 22 South, Range 31 East, in the vicinity of WIPP, but outside of the lands withdrawn by the WIPP Land Withdrawal Act; and

3) Section 35, Township 22 South, Range 31 East, also outside of the lands withdrawn by the WIPP Land Withdrawal Act. Each of these locations is suitable for an above-ground storage facility and can take advantage of existing roads and other infrastructure.

After further evaluation, the Waste Control Specialists, LLC location near Andrews, Texas remains the Preferred Alternative. However, the preferred alternative may or may not change as a result of comments received on this DSEIS. To finalize your Draft NEPA document, the following comments are now offered for your consideration.

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Commentor No. 8 (cont'd): Rhonda Smith, Chief, Office of Planning and Coordination, Environmental Protection Agency

-2-

COMMENTS

Air Quality

Section 4.5 – Mitigation Measures (pg. 4-46): This section of the DSEIS states that "(a)ctivities associated with the establishment of a new mercury storage facility(ies) would follow standard procedures for minimizing construction impacts on such resources as air quality…". Considering the prevalence of wind-blown dust/particulate matter as an air quality concern for the region of New Mexico that this project is located in, EPA recommends that, in addition to all applicable local, state, or federal requirements, additional mitigation measures be included in a construction emissions mitigation plan.

Recommendation: EPA recommends the following additional mitigation measures be incorporated into the plan in order to reduce air quality impacts associated with emissions of Particulate Matter (PM), as well as Nitrous Oxide (NOx), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), and other pollutants from construction-related activities. The control measures recommended for your consideration are:

Fugitive Dust Source Controls:

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative where appropriate at active and inactive sites during workdays, weekends, holidays, and windy conditions;
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions; and
- Prevent spillage when hauling material and operating non-earthmoving equipment and limit speeds to 15 miles per hour. Limit speed of earth-moving equipment to 10 mph.

8-2

Mobile and Stationary Source Controls:

- Plan construction scheduling to minimize vehicle trips;
- Limit idling of heavy equipment to less than 5 minutes and verify through unscheduled inspections;
- Maintain and tune engines per manufacturer's specifications to perform at EPA certification levels, prevent tampering, and conduct unscheduled inspections to ensure these measures are followed;
- If practicable, utilize new, clean equipment meeting the most stringent of applicable Federal or State Standards. In general, commit to the best available emissions control technology. Tier 4 engines should be used for project construction equipment to the maximum extent feasible;
- Lacking availability of non-road construction equipment that meets Tier 4 engine standards, the responsible agency should commit to using EPA-verified particulate traps, oxidation catalysts and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutants at the construction site; and
- Consider alternative fuels and energy sources such as natural gas and electricity (plug-in or battery).

8-2 As suggested by EPA, additional discussion was added to the *Final Mercury Storage SEIS* in Chapter 4, Sections 4.2.4 and 4.5, on potential mitigation measures for air quality during construction of the facility. However, specific details of mitigation measures would be developed during the construction planning and permitting of the facility.

Commentor No. 8 (cont'd): Rhonda Smith, Chief, Office of Planning and Coordination, Environmental Protection Agency

-3-

Administrative controls:

- Prepare an inventory of all equipment prior to construction and identify the suitability of add-on emission controls for each piece of equipment before groundbreaking;
- Develop a construction traffic and parking management plan that maintains traffic flow and plan construction to minimize vehicle trips; and
- Identify sensitive receptors in the project area, such as children, elderly, and infirmed, and specify the means by which impacts to these populations will be minimized (e.g. locate construction equipment and staging zones away from sensitive receptors and building air intakes).

8-2 (cont'd)

Tribal Resources

The DSEIS indicates that State Historic Preservation Officers (SHPO)s were contacted regarding cultural and historical resources, but it does not specify whether Tribes or Tribal Historic Preservation Officers (THPO)s were contacted for the purposes of coordination under National Historic Preservation Act (NHPA) Section 106. The DSEIS states that DOE has an obligation to consult with Native Americans (DSEIS Section 5.4); however, there is no information in the DSEIS or documentation letters to confirm government-to-government consultation with Tribes under E.O. 13175 occurred.

Recommendation: To address this concern, EPA recommends that DOE include information in the FEIS that confirms:

1) potentially affected Tribes, tribal resources and citizens were identified, and

2) appropriate contact was made with the Tribal officials of potentially affected Tribes (beyond the narrow context of working with THPOs or SHPOs on issues related to historic properties (NHPA), or

3) the agency otherwise concluded that there were no tribes or tribal resources that would be affected and there was no need for such contact or consultation.

8-3

8-3 DOE determined that there are no tribes or tribal resources in the vicinity of WIPP that would be affected (see Chapter 4, Section 4.2.6.1.3); therefore, no coordination or consultation was required for the WIPP Vicinity reference locations. Similar text clarifying this was added to Chapter 4, Sections 4.2.6.2 and 4.2.6.3, as well as to Chapter 5, Section 5.4.3.

Commentor No. 9: Skip Canfield, Nevada State Clearinghouse, State Land Use Planning Agency

From: Skip Canfield [scanfield@lands.nv.gov]
Sent: Friday, May 31, 2013 2:23 PM
To: MercuryEIS; david.levenstein@em.doe.gov
Cc: Skip Canfield
Subject: State Agency Comments E2013-184 Draft SEIS - Long-Term Mgt/Storage of Mercury
Attachments: E2013-184 NDWR.pdf

Mr. Levenstein:

The Nevada State Clearinghouse received the attached comments regarding this proposal, http://www.mercurystorageeis.com/

- In addition, the State Land Use Planning Agency will defer to any comments provided by the affected Nevada counties that have roadways that will see transport of the mercury, as well as Mineral County, where the mercury will be stored.

Skip Canfield
Nevada State Clearinghouse
State Land Use Planning Agency

Nevada Division of State Lands
Department of Conservation and Natural Resources
901 South Stewart Street, Suite 5003
Carson City, NV 89701
775-684-2723
http://clearinghouse.nv.gov
www.lands.nv.gov

Response side of this page intentionally left blank.

Commentor No. 9 (cont'd): Skip Canfield, Nevada State Clearinghouse, State Land Use Planning Agency

Nevada State Clearinghouse
Department of Conservation and Natural Resources
901 South Stewart Street, Suite 5003
Carson City, NV 89701
775-684-2723
http://clearinghouse.nv.gov
www.lands.nv.gov

DATE: 5/21/2013
Division of Water Resources

Nevada State Clearinghouse Notice E2013-184
Project: Draft SEIS - Long-Term Mgt/Storage of Mercury

___________No comment on this project __X___Proposal supported as written

AGENCY COMMENTS:

1. Please be advised that any water used on or for the construction of the described project must be provided by an established utility or under permit or waiver issued by the State Engineer's Office. All waters of the State belong to the public and may be appropriated for beneficial use under the provisions of Nevada Revised Statutes (NRS) Chapters 533 and 534 and not otherwise. 9-1

9-1 If the Hawthorne Army Depot is selected for long-term storage of elemental mercury, water would be supplied by the existing Hawthorne Army Depot water supply system. Appendix C, Sections C.2.3 and C.2.4, of the January 2011 *Mercury Storage EIS* discuss the quantities of water that would be required for construction and operation, respectively, of a DOE mercury storage facility. As described in Chapter 4, Section 4.5.7.2, of the January 2011 *Mercury Storage EIS*, facility modification activities would temporarily increase site water use by no more than 0.4 percent, and operations would increase water use by about 0.03 percent annually. As discussed in Section 4.11.3.3 of the EIS, water usage for a mercury storage facility is projected to have a negligible contribution to cumulative impacts on water resources at the Hawthorne Army Depot.

Commentor No. 10: Stephen R. Spencer, Regional Environmental Officer, United States Department of the Interior

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1001 Indian School NW, Suite 348
Albuquerque, New Mexico 87104

TAKE PRIDE IN AMERICA

ER 13/235
File 9043.1

June 3, 2013

VIA ELECTRONIC MAIL ONLY

David Levenstein
Document Manager
Office of Environmental Compliance (EM-11)
U.S. Department of Energy
PO Box 2612
Germantown, MD 20874

Dear Mr. Levenstein:

The U.S. Department of the Interior has reviewed the Draft Supplemental Environmental Impact Statement for Long-Term Management and Storage of Elemental Mercury (Mercury Storage SEIS, DOE/EIS-0423-S1), Carlsbad, New Mexico. In this regard, we have no comments. 10-1

Thank you for the opportunity to review this document.

Sincerely,

Stephen R. Spencer, PhD
Regional Environmental Officer

10-1 Thank you for your review and for informing DOE that the U.S. Department of the Interior (DOI) has no comments on the *Draft Mercury Storage SEIS*.

Commentor No. 11: Maia D. Bellon, Director, State of Washington, Department of Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

June 3, 2013

Mr. David Levenstein, Document Manager
Office of Environmental Compliance
U.S. Department of Energy
PO Box 2612
Germantown, MD 20874

RE: Mercury Storage Draft Supplemental Environmental Impact Statement

Dear Mr. Levenstein:

Thank you for the opportunity to comment on the U.S. Department of Energy's (USDOE's) draft Long-Term Management and Storage of Elemental Mercury Supplemental Environmental Impact Statement (DSEIS). We appreciate that USDOE is gathering comments on the DSEIS.

Due to budget and travel restrictions, the Washington State Department of Ecology (Ecology) officials were not present at the public hearings held May 7 and May 9, 2013. This letter includes comments based on the DSEIS, but we reserve the right to comment should any other future revisions be made.

Ecology continues to support the construction and operation of a single national mercury repository, as well as, efforts by USDOE to implement this mandate. We support the siting of the national repository at Waste Control Specialists, LCC, near Andrews, Texas as the preferred alternative. Ecology does not support the potential siting of a storage facility at the USDOE Hanford site in Washington, since this would conflict with the USDOE's mission to clean up the existing contaminated site at Hanford. Ecology is concerned with any action that would potentially draw resources or focus away from the Hanford cleanup. 11-1

In reviewing the DSEIS, Ecology has the following specific comments:

1. The assessment of three additional site locations, all in the vicinity of Carlsbad, New Mexico, seems unnecessary given the thorough assessment under the 2009 DSEIS. USDOE's primary statement that, for now, the preferred alternative remains the Andrews facility in Texas is adequate. 11-2

2. We recommend the USDOE not restrict its calculations of storage capacity solely to the current estimates of bulk mercury volumes. The USDOE should include estimates related to the exportation of some mercury-containing products. The recent agreement of the United Nations Environment Programme (UNEP) Minamata Convention committed the United States to discontinue, among other things, exportation or importation of mercury products within four to seven years (2017-2020). 11-3

3. Ecology is concerned the intent of some waste management companies to accumulate and store mercury at interim facilities may increase risks. Until a national repository is operating, the storage at these interim facilities could create more transportation and storage-related accidents, and may increase storage costs to businesses, local governments, and ultimately the public. 11-4

11-1 DOE acknowledges the commentor's support for long-term management and storage of elemental mercury at WCS (the Preferred Alternative) and opposition to mercury storage at Hanford. Although DOE has identified WCS as the Preferred Alternative, as discussed in Chapter 2, Section 2.4, of this SEIS, DOE has not made a decision on the location of the mercury storage facility(ies). DOE will make a decision no sooner than 30 days after publication of the EPA Notice of Availability for this final SEIS in the *Federal Register*. The final site selection will be based upon the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors and will be announced in a ROD published in the *Federal Register*.

DOE acknowledges the Washington State Department of Ecology's concerns regarding cleaning up legacy waste at Hanford. As stated in Chapter 4, Section 4.4.8, of the January 2011 *Mercury Storage EIS*, DOE continues to manage several ongoing programs and projects at Hanford in support of sitewide remediation. The proposed action and the existing cleanup missions are independent programs; thus, actions related to one would not impact the other. Cleanup activities at Hanford continue to be a high priority for DOE. Neither construction nor operation of the proposed mercury storage facility(ies) would be anticipated to impact resources (e.g., funding, labor, facilities, and equipment) associated with current and/or future site environmental restoration efforts.

11-2 During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. This prompted DOE to reconsider several DOE sites using the same selection criteria found in Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS*. Certain exclusionary selection criteria, e.g., site security, caused DOE to again rule out several DOE sites. This reevaluation of DOE sites led to a determination that several sites at and in the vicinity of WIPP would fit within the range of reasonable alternatives and should be evaluated. Similar to

Commentor No. 11 (cont'd): Maia D. Bellon, Director, State of Washington, Department of Ecology

Mr. David Levenstein
June 3, 2013
Page 2

4. The expanded environmental justice assessment provides much needed information and acknowledgment of real and potentially serious impacts to many populations. However, the revisions still do not address some critical Ecology issues, including potential cumulative exposure impacts from chemical risks, such as the use of pesticides in the area and nuclear waste exposure due to leaking tanks at Hanford. 11-5

5. The recent increased activities at the Hanford complex related to leaking tanks and cleanup needs are not incorporated in the DSEIS. We are concerned siting the repository at Hanford may be detrimental to cleanup at Hanford. This DSEIS does not assess that impact. 11-6

6. Incorporating other information requested by the public, such as details in maps, is very useful. However, the Hanford section does not provide map details that incorporate the additional activity now occurring at the site. Ecology requests the document include details of problems identified regarding the Hanford nuclear waste tanks and increasing maintenance activity, which is creating more vehicular traffic within the site. 11-7

7. We concur with your acknowledgment that mercury cannot be exported under federal law, and that therefore, interim storage is necessary, and listing the facilities that have been approved by the U.S. Environmental Protection Agency to do interim storage. 11-8

8. There is no mention of failure to receive funds from the United States Congress, which limits USDOE's ability to build and operate whatever site is chosen. Delays in funding the repository are likely to increase costs to governments and the public as small private interim storage facilities are established. 11-9

9. Ecology made significant technical comments in a letter dated August 31, 2009, on construction and operation of the mercury repository storage facility. We believe those comments are still valid and relevant and as such are incorporated by reference herein. Ecology requests the USDOE consider and respond to Ecology's earlier comments in the final version of the DSEIS. 11-10

If you wish to discuss the comments, please contact Maria Victoria Peeler at maria.peeler@ecy.wa.gov or by telephone at (360) 407-6704. Thank you again for the opportunity to comment on this important national issue.

Sincerely,

Maia D. Bellon

Maia D. Bellon
Director

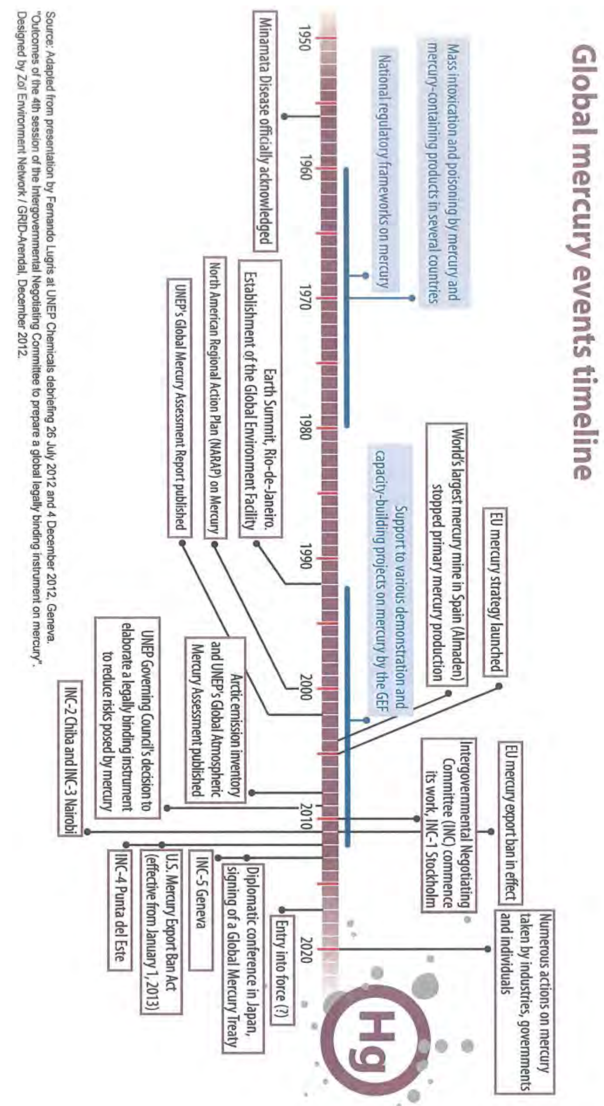
Enclosures

cc: Ted Sturdevant, Executive Director, Legislative Affairs and Policy Office, Office of the Governor
Jane Hedges, Nuclear Waste Program Manager, Department of Ecology
K Seiler, Hazardous Waste and Toxics Reduction Program Manager, Department of Ecology
Maria Victoria Peeler, Environmental Specialist, Department of Ecology

WCS (the Preferred Alternative), the WIPP vicinity is in a remote and arid location. In addition, it offers required infrastructure and is accessible to transportation routes. The WIPP site has personnel with an outstanding transportation management record and experience in implementing RCRA and other pertinent environmental requirements, records management, safety and security. The WIPP Vicinity reference locations have physical attributes that make such a site a favorable location for a DOE mercury storage facility. Input from within DOE, including Carlsbad Field Office site management, was sought prior to moving forward on this option. DOE acknowledges the commentor's support for long-term management and storage of elemental mercury at WCS (the Preferred Alternative).

11-3 As discussed in Chapter 1, Section 1.3.1, a portion of the mercury inventory estimate includes elemental mercury that may be generated from waste reclamation and recycling facilities over the 40-year period of analysis. This elemental mercury, in part, comes from reclamation of mercury from mercury-containing products and is not part of the existing bulk elemental mercury inventories. The proposed action is for DOE to construct and operate a facility for the long-term management and storage of elemental mercury only, not mercury-containing products. However, a decrease in the use of mercury in mercury-containing products could lead to an increase in recycling and reclamation or an increase in excess elemental mercury inventories. There is considerable uncertainty regarding the 10,000-metric-ton (11,000-ton) estimate of mercury that could be sent to DOE for storage, and this estimate is considered conservative over a 40-year period of analysis. Furthermore, the need for long-term storage of mercury would be eliminated if EPA were to approve a treatment and disposal standard for elemental mercury. Additional NEPA review would be required if the quantity of elemental mercury that required storage in a DOE facility exceeded 10,000 metric tons (11,000 tons).

Commentor No. 11 (cont'd): Maia D. Bellon, Director, State of Washington, Department of Ecology



11-4 DOE acknowledges the commentor's concern regarding the accumulation and storage of elemental mercury at interim facilities. Accumulation and storage at interim facilities is analyzed as part of the No Action Alternative (see Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*). As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. Whether elemental mercury would be stored in a RCRA-permitted DOE facility or a RCRA-permitted commercial waste management facility, the storage procedures for this mercury would be similar. The evaluation of potential transportation and storage-related accidents at commercial facilities would be highly speculative because data on transportation routes, numbers of shipments, quantities of mercury, and facility descriptions are not available. In any event, the transportation of mercury would be in accordance with applicable RCRA hazardous waste and U.S. Department of Transportation hazardous material shipping regulations. Also, there is no information available to address costs associated with interim storage of mercury at waste management companies relative to costs at a DOE facility. DOE would develop cost estimates after site selection, but prior to construction and operation of the DOE facility.

Note that the Mercury Export Ban Act of 2008 (P.L. 110-414) does not require generators to store their elemental mercury at a DOE site; thus, some or all such mercury could be stored at various locations. However, DOE is required under Section 5 of the Act to designate a facility (or facilities) for the long-term management and storage of mercury generated within the United States, thus providing a storage alternative.

11-5 DOE does not agree that the expanded environmental justice analysis in this *Final Mercury Storage SEIS* shows there would be "real and potentially serious impacts to many populations." As discussed in Appendix E, Section E.3.4, and summarized in

Commentor No. 11 (cont'd): Maia D. Bellon, Director, State of Washington, Department of Ecology

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Chapter 2, Table 2–2, of this SEIS, the analysis concludes that there would be no disproportionately high and adverse environmental justice impacts and that a transportation accident would pose a negligible to low risk to human health.

DOE acknowledges the commentor's concerns about cumulative exposure to elemental mercury and other materials such as pesticides and radionuclides. Cumulative impacts at Hanford are discussed in Chapter 4, Section 4.11.3.2, of the January 2011 *Mercury Storage EIS*. Because exposure of the public to mercury from normal operations is expected to be well below levels that would produce health effects (see Section 4.4.9.1 of the EIS), mercury storage activities are not expected to substantially contribute to cumulative health effects on the public near Hanford.

11-6 See Response No. 11-1.

11-7 DOE acknowledges the commentor's concerns about cumulative impacts due to maintenance activities and vehicular traffic at Hanford. Cumulative impacts at Hanford are discussed in Chapter 4, Section 4.11.3.2, of the January 2011 *Mercury Storage EIS*. Because traffic impacts associated with construction and operation of a mercury storage facility at Hanford would be negligible to minor (see Section 4.4.11 of the EIS), mercury storage activities are not expected to substantially contribute to cumulative traffic impacts at Hanford.

11-8 As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. All of these companies have certified that they will ship the elemental mercury to a DOE-designated facility, when such a facility is operational and ready to accept the mercury.

Commentor No. 11 (cont'd): Maia D. Bellon, Director, State of Washington, Department of Ecology

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11-9 During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. Therefore, since the mercury export ban took effect on January 1, 2013, storage of elemental mercury at private facilities is the only option until a DOE facility becomes operational. As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. There is no information available to address costs associated with interim storage of mercury at waste management companies relative to costs at a DOE facility. It should be noted that the Act does not require generators to send their mercury to a DOE facility; it merely directs DOE to designate such a facility for mercury storage.

11-10 DOE received Ecology's comments on the *U.S. Department of Energy Interim Guidance on Packaging, Transportation, Receipt, Management, and Long-Term Storage of Elemental Mercury (Interim Guidance)* (DOE 2009) in its August 31, 2009, letter. These comments were fully considered during the development of the *Interim Guidance*. The RCRA permit from the appropriate authorities will provide the primary regulatory mechanism for the design, construction, and operation of the mercury storage facility, along with other applicable regulations such as those for worker safety and transportation.

Commentor No. 12: Morgan R. Nelson, Environmental Impact Review Coordinator, State of New Mexico, Environment Department

State of New Mexico
ENVIRONMENT DEPARTMENT
Office of the Secretary

Harold Runnels Building
1190 Saint Francis Drive, PO Box 5469
Santa Fe, NM 87502-5469
Telephone (505) 827-2855 Fax (505) 827-2836
www.nmenv.state.nm.us

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

RYAN FLYNN
Cabinet Secretary-Designate
BUTCH TONGATE
Deputy Secretary

June 3, 2013

David Levenstein, Document Manager
Office of Environmental Compliance (EM–11)
U.S. Department of Energy
Post Office Box 2612
Germantown, MD 20874
david.levenstein@em.doe.gov

RESPONSE BY EMAIL AND USPS

RE: Long-Term Management and Storage of Elemental Mercury

Dear Mr. Levenstein:

Your letter regarding the above named project was received by the New Mexico Environment Department (NMED) and was sent to various bureaus for review and comment. Comments were provided from the Air Quality, Solid Waste, Ground Water Quality, Hazardous Waste, and Surface Water Quality Bureaus, and are as follows.

Air Quality Bureau
The Air Quality Bureau (AQB) has evaluated the information submitted with respect to the Supplemental Environment Impact Statement (SEIS) on the Long-Term Management and Storage of Elemental Mercury. The proposed sites addressed in the SEIS are located at the Waste Isolation Pilot Plant (WIPP) . The WIPP site is located in Eddy County, New Mexico in the Chihuahuan Desert of southeastern New Mexico. The site is about 42 kilometers (26 miles) east of Carlsbad, New Mexico. Eddy County is currently considered to be in attainment with all New Mexico and National Ambient Air Quality Standards.

The project as proposed should have no long-term significant impacts to ambient air quality in New Mexico, however, the AQB would like to address the following issues:

- Accidental/intentional release of mercury vapors – While this issue has been addressed in the SEIS there is concern of an accidental/intentional release of mercury due to intentional acts of destruction, spills, indoor/ outdoors, fire, natural disasters or during transport and the potential impacts such a release will have on the local communities. 12-1
- Short-term increase in air pollutant emissions from construction activities, including use of heavy equipment and trucks - To further ensure State of New Mexico air quality standards continue to be met, applicable local or county regulations requiring noise 12-2

12-1 DOE acknowledges the commentor's concerns about the accidental/intentional release of mercury vapors. As described in Chapter 2, Section 2.2, and Chapter 4, Section 4.2.3.1.1, of this *Mercury Storage SEIS*, best management practices, including the use of spill trays under mercury containers, spill containment features, and regular inspections, would be employed at a DOE facility to prevent spills and releases. Facility operations would also be conducted in accordance with an integrated contingency plan and spill prevention, control, and countermeasures plan, which set forth the actions facility personnel would take to respond to abnormal operating conditions, including fires, explosions, or any accidental release of mercury to air, soil, surface water, or groundwater at the facility. As presented in Section 4.2.9, DOE has considered the impacts should an accident occur at the elemental mercury storage facility or during transportation, including impacts from intentional destructive acts (see Section 4.2.9.1.4). As summarized in Table 2–2, risks to workers and the public from a mercury storage facility or transportation accident would be negligible to low.

12-2 DOE acknowledges the unique concerns for air quality impacts due to construction of a facility for the long-term management and storage of elemental mercury in the vicinity of WIPP in New Mexico. Chapter 4, Section 4.2.4, indicates that minor, but short-term, air quality impacts and negligible noise impacts due to construction are to be expected. Additional discussion of potential air quality mitigation measures has been added to Chapter 4, Sections 4.2.4 and 4.5. DOE will secure all required construction permits from local, state, and/or Federal regulatory agencies prior to starting construction of the facility.

and/or dust control should be followed; if none are in effect, controlling construction-related air quality impacts during projects should be considered to reduce the impact of fugitive dust and/or noise on community members. Potential exists for temporary increases in dust and emissions from earthmoving, construction equipment, and other vehicles, however the increases should not result in non-attainment of air quality standards. Dust control measures should be taken to minimize the release of particulates due to vehicular traffic and construction. Areas disturbed by the construction activities, within and adjacent to the project area should be reclaimed to avoid long-term problems with erosion and fugitive dust. 12-2 (cont'd)

- All asphalt, concrete, quarrying, crushing, and screening contracted in conjunction with the proposed project must have current and proper air quality permits. For more information on air quality permitting and modeling requirements, please refer to 20.2.72 NMAC. 12-3
- In the event that additional back electric generation is needed for the proposed new facility it will be required to be permitted under 20.2.72 NMAC.

Solid Waste Bureau

After review, the SWB determined the issue falls under the RCRA Subtitle C rules (Hazardous Waste), not the RCRA Subtitle D, rules. The Solid Waste Bureau has no. comments. 12-4

Ground Water Quality Bureau

GWQB staff reviewed the above-referenced letter as requested, focusing specifically on the potential effect to ground water resources in the area of the proposed project.

The letter states that the U.S. Department of Energy (DOE) has prepared a Supplemental Environmental Impact Statement (SEIS) for the construction and operation of a Long-Term Management and Storage Facility for Elemental Mercury (Facility). A Final Mercury Storage EIS, issued in January 2011, evaluated seven candidate locations and a No Action Alternative. The SEIS evaluates three additional locations that have been identified by DOE since the EIS was issued, all of which have been sited near the Waste Isolation Pilot Plant in southeastern New Mexico.

The proposed facility would have areas for administration, receiving and shipping, storage, and handling. The storage area would compromise 90% of the floor space. The storage area would be open similar to a warehouse setting where storage, inspections, and monitoring could be conducted. The facility would accept 3-liter flasks and 1-metric-ton (1.1-ton) containers. Flasks would be single, double, or triple stacked, and the 1-ton containers would be single or double stacked. Since there are no existing facilities available for the three New Mexico locations, a new building(s) would have to be constructed. If the facility were constructed, it would have to provide storage of up to 10,000 metric tons of mercury and could require up to approximately 13,610 square meters (146,500 square feet) of storage space.

Depending on how industrial discharges and storm water would be managed at the facility, a ground water discharge permit may be required. The information provided also does not discuss how domestic wastewater from the Mercury Storage Facility is to be discharged and disposed at the site. If the facility were to be constructed at one of the three New Mexico locations, then domestic waste would have to be discharged to an on-site wastewater disposal system. The disposal system would be required to operate under the appropriate permit from the NMED (either a liquid waste permit issued pursuant to 20.7.3 NMAC or a ground water discharge 12-5

12-3 DOE will secure all required construction permits from local, state, and/or Federal regulatory agencies prior to starting construction of the facility, including those associated with potential asphalt, concrete, quarrying, crushing, and screening. DOE will also secure all required permits for the operation of the mercury storage facility, including those associated with back-up power generators.

12-4 Thank you for your review and for informing DOE that the State of New Mexico Environment Department, Solid Waste Bureau, has no comments on the *Draft Mercury Storage SEIS*.

12-5 DOE does not anticipate any industrial wastewater discharges to occur during operation of the mercury storage facility; however, as discussed in Chapter 4, Section 4.2.3, an appropriate storm water management plan and discharge permit would be required. Section 4.2.8 discusses how sanitary discharges would be handled; Sections 10 and 35 would need an onsite treatment and septic system and Section 20 would be tied into WIPP's existing sanitary wastewater treatment system. DOE will secure all required wastewater permits from local, state, and/or Federal regulatory agencies for construction and operation of the facility.

Commentor No. 12 (cont'd): Morgan R. Nelson, Environmental Impact Review Coordinator, State of New Mexico, Environment Department

permit issued pursuant to 20.6.2 NMAC) depending upon the daily discharge volume. A Notice of Intent to Discharge form should be submitted to the NMED GWQB in order for the Department to determine how to proceed in addressing industrial and wastewater disposal at the Mercury Storage Facility. 12-5 (cont'd)

Implementation of the project, were it to be built in New Mexico, would involve the use of heavy equipment, thereby leading to a possibility of contaminant releases (e.g., fuel, hydraulic fluid, etc.) associated with equipment malfunctions. The GWQB advises all parties involved in the project to be aware of notification requirements for accidental discharges contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will further ensure the protection of ground water quality in the vicinity of the project. 12-6

Hazardous Waste Bureau
The New Mexico Environment Department (NMED) Hazardous Waste Bureau has reviewed the Draft *Long-Term Management and Storage of Elemental Mercury* Supplemental Environmental Impact Statement (SEIS) dated March 2013. The Hazardous Waste Bureau provides the following comments on the SEIS.

Comment 1
In Section 5.2: *Laws, Regulations, and Other Potentially Applicable Requirements*, last paragraph, discussion of new construction at WIPP Vicinity Section 20: The SEIS states "Land inside the WIPP LWB used for construction and operations of a long-term management and storage facility for elemental mercury would be subject to the provisions of the WIPP LWA (as discussed for WIPP) and *may require Federal legislation*." (emphasis added). This topic should be expanded to include the specific existing language in the LWA that provides for co-location of a mercury storage facility within the WIPP LWA boundary, and/or proposed specific language in the LWA that may need to be amended through federal legislation. The discussion should also include language to be changed in the current land use management plan (LMP) as required by the LWA at Section 4(b)(1). The land use management plan will need to be amended to allow for co-location of a mercury storage facility within the WIPP LWA reservation that may be subject to RCRA permitting. This type of amendment would require consultation with the BLM, State of New Mexico, and stakeholders. A discussion of the anticipated LMP amendment type and its effect on other documents, such as the WIPP Groundwater Protection Management Program Plan (DOE/WIPP 96-2162, Rev. 3 *et seq*), should be included in the SEIS. 12-7

Comment 2
In Section 2.3.2.2: *WIPP Vicinity Section 20*, the SEIS states that "Truck and rail access are available at the WIPP site." The SEIS does not describe interaction or potential interference of mercury shipping with WIPP shipments, including accident scenarios involving both mercury and TRU mixed waste for both rail and truck transportation (SEIS Appendix D). 12-8

Comment 3
In Section 5.3: *Permits and Notifications*, the SEIS does not adequately address potential dual contamination occurring from the migration of releases of mercury and TRU waste to groundwater. Monitoring wells near the WIPP Vicinity Section 20 site would overlap the area monitored by WIPP; the SEIS does not discuss potential interferences that a mercury storage facility could impose on existing WIPP monitoring. This issue also applies to the WIPP Vicinity Sections 10 and 35 locations. 12-9

12-6 Chapter 4, Section 4.2.3.1.1, discusses the potential for fuel spills from the use of heavy construction equipment. DOE's mercury storage facility would be designed, constructed, and operated in accordance with applicable laws and regulations, including requirements for spills notification.

12-7 DOE acknowledges in Chapter 5, Section 5.3, that selection of WIPP Vicinity Section 20 may involve a legislative process to amend the Land Withdrawal Act (LWA) (P.L. 102-579). This would include revisions to other related site documents such as the current land use management plan and the WIPP Groundwater Protection Management Program Plan, where appropriate. DOE intends to fulfill its legal obligations, wherever the mercury storage facility is located. The SEIS focuses on the environmental impacts associated with construction and operation of a DOE mercury storage facility; it is not within the scope of the SEIS to determine the specific legislative language that would be required or the extent to which existing planning documents would need to be amended or otherwise revised.

12-8 Chapter 4, Section 4.2.9.1.3, discusses the potential for impacts due to transportation accidents involving mercury shipments. The risks associated with transportation accidents involving a spill or release of mercury are negligible to low. Impacts associated with transporting TRU waste to WIPP are evaluated in the *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (DOE 1980) and two subsequent SEISs (DOE 1990, 1997). Section 4.4.2.1 has been revised to discuss the reasons why TRU waste and elemental mercury would not be shipped together. The likelihood of an accident between a shipment of TRU waste and a shipment of mercury involving the release of both types of materials would be considered negligible. Therefore, the contribution to cumulative risk from transporting elemental mercury to any of the WIPP Vicinity reference locations would be negligible.

Comment 4
In Sections 2.6.1.9, *Occupational Public Health and Safety*, and Section 2.6.1.10, *Ecological Impacts*, the SEIS does not discuss potential impacts at the proposed WIPP Vicinity Section 20 site caused by WIPP being in immediate proximity to the mercury storage facility. The discussion also should address potential difficulties in assessing any combined impacts. This issue also applies to the WIPP Vicinity Sections 10 and 35 locations. 12-10

Comment 5
The SEIS risk analysis does not discuss federal DOT requirements for shipping elemental mercury; secured palletized storage containers with drip trays appear to be both the storage and the shipping configuration. The SEIS does not address contingencies to contain liquid mercury in the event of a truck or train accident. This would normally require completely sealed shipping containers. 12-11

Surface Water Quality Bureau
The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) coverage for storm water discharges from construction projects (common plans of development) that will result in the disturbance (or re-disturbance) of one or more acres, including expansions, of total land area. Because this project may exceed one acre (including staging areas, etc.), it may require appropriate NPDES permit coverage prior to beginning construction (small, one - five acre, construction projects may be able to qualify for a waiver in lieu of permit coverage - see Appendix D).

The CGP requires that a SWPPP be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures (revegetation, paving, etc.), and permanent storm water management measures (storm water detention/retention structures, velocity dissipation devices, etc.) be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters. In addition, permittees must ensure that there is no increase in sediment yield and flow velocity from the construction site (both during and after construction) compared to pre-construction, undisturbed conditions (see Subpart 10.C.1.b) 12-12

You should also be aware that EPA requires that all "operators" (see Appendix A) obtain NPDES permit coverage for construction projects. Generally, this means that at least two parties will require permit coverage. The owner/developer of this construction project who has operational control over project specifications, and the general contractor who has day-to-day operational control of those activities at the site, which are necessary to ensure compliance with the storm water pollution plan and other permit conditions, and possibly other "operators" will require appropriate NPDES permit coverage for this project.

The CGP was re-issued effective February 16, 2012. The CGP, NOI, Fact Sheet, and Federal Register notice can be downloaded at: http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

I hope you find this information helpful.

12-9 DOE acknowledges the commentor's concerns about the need for monitoring to avoid groundwater contamination. Construction and routine operation of a mercury storage facility are not expected to have any impact on groundwater, as described in Chapter 4, Section 4.2.3, of this *Mercury Storage SEIS*. The design, construction, and operation of the mercury storage facility would feature structural controls and practices to prevent the release of elemental mercury and to prevent any spills or other releases from reaching soils or surfaces where they could be conveyed to surface waters or groundwater. Facility operations would also be conducted in accordance with an integrated contingency plan and spill prevention, control, and countermeasures plan, which set forth the actions facility personnel would take to respond to abnormal operating conditions, including fires, explosions, or any accidental release of mercury to air, soil, surface water, or groundwater at the facility. Finally, for the reasons stated in Appendix D, Section D.3.2, groundwater was not considered a credible pathway for potential accidental release of elemental mercury from a mercury storage facility. At this time, DOE anticipates that monitoring would be conducted during regular inspections of the mercury containers to ensure that no containers are corroding or leaking and the airspace of the mercury storage facility would be tested for elevated concentrations of mercury vapors. However, the mercury storage facility would be subject to any additional monitoring requirements imposed under a state-issued RCRA permit that would govern facility operations and would be protective of human health and the environment.

Also, as described in Chapter 3, Section 3.2.2.1, of this *Mercury Storage SEIS*, the WIPP TRU waste disposal zone is located 655 meters (2,150 feet) below the ground surface, whereas a mercury storage facility would be located above ground. As described in Section 3.2.3.2, the Salado Formation exists between these locations and is characterized by very low hydraulic conductivity. Therefore, mingling of groundwater from the zone beneath the mercury storage facility and groundwater from the WIPP disposal zone 655 meters (2,150 feet) below the ground surface

Commentor No. 12 (cont'd): Morgan R. Nelson, Environmental Impact Review Coordinator, State of New Mexico, Environment Department

Sincerely,

Morgan R. Nelson
Environmental Impact Review Coordinator
NMED File Number: EIR 3991

would be a very slow process requiring many thousands of years. Environmental monitoring associated with a mercury storage facility would be in accordance with its RCRA permit and would be independent of any environmental monitoring required under WIPP's permit. Currently, groundwater quality monitoring for the WIPP operations is conducted via six wells, none of which are within the WIPP Vicinity reference locations proposed for mercury storage.

12-10 DOE acknowledges the commentor's concerns regarding cumulative impacts at WIPP. DOE has performed a cumulative impacts analysis as part of this *Mercury Storage SEIS*, which is presented in Chapter 4, Section 4.4.

As discussed in Chapter 4, Section 4.2.9.1.1, and summarized in Chapter 2, Table 2–2, of this *Mercury Storage SEIS*, there would be negligible human health risk to involved workers, noninvolved workers, and the public from normal operations of the mercury storage facility. As described in the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* (DOE 1997), radiological impacts from TRU waste disposal operations at WIPP are expected to result in no latent cancer fatalities (LCFs) (3×10^{-4}) for the population within 80 kilometers (50 miles) and no LCFs (3×10^{-7}) to a maximally exposed individual member of the general public (DOE 1997:5-28, 5-29). TRU waste disposal operations at WIPP could result in 1 LCF to the involved worker population; no radiation-related LCFs (4×10^{-4}) would be anticipated among the noninvolved worker population (DOE 1997:5-29–5-32). In addition, as shown in Figure 2–7 of this *Mercury Storage SEIS*, WIPP Vicinity Sections 10 and 35 are a minimum of 2.4 kilometers (1.5 miles) from the WIPP exclusion area. Therefore, substantial cumulative impacts due to combining emissions from WIPP and the mercury storage facility are unlikely.

12-11 DOE acknowledges the commentor's concerns about transportation of mercury and release of mercury during an accident. Transportation of mercury would be in accordance with applicable

Commentor No. 12 (cont'd): Morgan R. Nelson, Environmental Impact Review Coordinator, State of New Mexico, Environment Department

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RCRA hazardous waste and U.S. Department of Transportation hazardous material shipping requirements. Chapter 4, Section 4.2.9.1.3, discusses potential impacts from transporting elemental mercury to a DOE facility. More detail about transportation of mercury is available in the *Interim Guidance* (DOE 2009), which establishes basic standards and procedures for the transportation, receipt, management, and long-term storage of mercury at a DOE facility. The *Interim Guidance* is based on laws, regulations, DOE orders, and best management practices. The *Interim Guidance* discusses (1) DOE's anticipated waste acceptance criteria; (2) procedures DOE would use to receive, store, and monitor the mercury; and (3) spill and emergency response procedures. As described in the *Interim Guidance*, transportation of elemental mercury would be accomplished using sealed 3-liter flasks or 1-metric-ton containers, ready for storage. Drip trays would be used to provide secondary containment if a container were to fail during transport or after the mercury was placed into storage. A copy of the *Interim Guidance* is available on the project website (http://www.mercurystorageeis.com/library.htm).

12-12 As presented in Chapter 5, Table 5–1, of the SEIS, DOE acknowledges that a National Pollutant Discharge Elimination System Construction General Permit would be required for the amount of land that would be expected to be disturbed for the construction of a full-sized mercury storage facility (up to 7.6 acres). DOE does not anticipate any industrial wastewater discharges to occur during operation of the mercury storage facility; however, as discussed in Chapter 4, Section 4.2.3, an appropriate storm water pollution prevention plan and discharge permit would be required. Section 4.2.8 discusses how sanitary discharges would be handled; Sections 10 and 35 would need an onsite treatment and septic system and Section 20 would be tied into WIPP's existing sanitary wastewater treatment system. DOE will secure all required wastewater permits from local, state, and/or Federal regulatory agencies for construction and operation of the facility.

Commentor No. 12 (cont'd): Morgan R. Nelson, Environmental Impact Review Coordinator, State of New Mexico, Environment Department

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Chapter 4, Section 4.2.3.1.1, discusses the potential for fuel spills from the use of heavy construction equipment. DOE's mercury storage facility would be designed, constructed, and operated in accordance with applicable laws and regulations, including requirements for spills notification.

Commentor No. 13: Don Hancock, Southwest Research and Information Center

SOUTHWEST RESEARCH AND INFORMATION CENTER
P.O. Box 4524 Albuquerque, NM 87196 505-262-1862 FAX: 505-262-1864 www.sric.org

June 3, 2013

David Levenstein
Document Manager
Office of Environmental Compliance (EM–41)
U.S. Department of Energy
P.O. Box 2612
Germantown, MD 20874 E-mail: David.Levenstein@em.doe.gov

RE: Elemental Mercury Draft Supplemental Environmental Impact Statement (DSEIS) (DOE/EIS-0423-S1)

Dear Mr. Levenstein:

Southwest Research and Information Center (SRIC) is a 42-year-old nonprofit organization based in Albuquerque that works to promote the health of people and communities, protect national resources, ensure citizen participation, and secure environmental and social justice now and for future generations. Among many other issues, SRIC has been actively involved with public education, health, technical, regulatory, and legal matters related to the Waste Isolation Pilot Plant (WIPP) for decades.

SRIC provided scoping comments, dated July 5, 2012, and oral comments at the June 28, 2012 Albuquerque scoping meeting. SRIC is disappointed that many of those scoping comments are not even mentioned in Section 1.6.1 of the DSEIS and remain unaddressed by the Department of Energy (DOE). Thus, those issues are reiterated in the following comments, all of which must be addressed if there is a Final Supplemental Environmental Impact Statement (FSEIS). The following comments are in addition to oral comments made by Don Hancock of SRIC at the May 9, 2013 public hearing in Albuquerque.

1. DOE should inform Congress that it has not, and will not, comply with the requirements in the Mercury Export Ban Act. DOE should request that Congress reconsider giving DOE the task of long-term management and storage of elemental mercury. 13-1

13-1 During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. Therefore, since the mercury export ban took effect on January 1, 2013, storage of elemental mercury at private facilities is the only option until a DOE facility becomes operational. As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. All of these companies have certified that they will ship the elemental mercury to a DOE-designated facility, when such a facility is operational and ready to accept the mercury. DOE will make a decision no sooner than 30 days after publication of the EPA Notice of Availability for this *Final Mercury Storage SEIS* in the *Federal Register*. The final site selection will be based upon the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors will be announced in a ROD published in the *Federal Register*.

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

DOE has fundamentally failed in the tasks given it by Congress in the Mercury Export Ban Act of 2008, Public Law 110-414. Section 5(a)(1) states:

> **SEC. 5. LONG-TERM STORAGE.**
> (a) DESIGNATION OF FACILITY.—
> (1) IN GENERAL.**—Not later than January 1, 2010, the Secretary of Energy** (referred to in this section as the ''Secretary'') **shall designate a facility or facilities of the Department of Energy**, which shall not include the Y–12 National Security Complex or any other portion or facility of the Oak Ridge Reservation of the Department of Energy, **for the purpose of long-term management and storage of elemental mercury generated within the United States. (Emphasis added)**.

Forty-one months after that deadline, DOE has still not made such a designation. Based on the Mercury Final Environmental Impact Statement (FEIS) and DSEIS, DOE has no intention of ever making such a designation. The preferred alternative in the FEIS, which is unchanged in the DSEIS (Section 2.4) and in the Notice of Availability (78 *Federal Register* 23548 (April 19, 2013)), is for a non-DOE facility – Waste Control Specialists (WCS) – to be the long-term management and storage site. Thus, DOE has so far decided that no "facility or facilities of the Department of Energy" should provide long-term mercury storage except for Y-12 which will continue to store 1,200 metric tons of mercury for years to come, despite the Act's prohibition of Y-12 and the Oak Ridge Reservation providing such management and storage.

Section 5(a)(2) of the Mercury Export Ban Act states:

> (2) OPERATION OF FACILITY.-Not later than January 1, 2013, the facility designated in paragraph (1) shall be operational and shall accept custody, for the purpose of long-term management and storage, of elemental mercury generated within the United States and delivered to such facility.

Five months after that deadline, DOE has no such operational facility. Further, DOE has provided no date in the DSEIS that such a facility would be operational. Once again, DOE has shown itself to be incapable of meeting the congressional requirements.

13-1 (cont'd)

Further, according to DSEIS Cover Sheet, page S-9, and page 2-21, and the mercury storage website - http://mercurystorageeis.com/ - all of the facilities that have notified DOE of their intent to accumulate and store excess mercury at RCRA-permitted facilities in accordance with Section 5(g)(2)(b) of the Mercury Export Ban Act are commercial sites. The DSEIS lists five commercial sites: (1) Chemical Waste Management, Inc., at its facility in Emelle, Alabama; (2) Clean Harbors Environmental Services, Inc., at its facility in Wichita, Kansas; (3) EQ Detroit, Inc., at its facility in Detroit, Michigan; (4) Veolia ES Technical Solutions, L.L.C., at its facility in Port Washington, Wisconsin; and (5) Waste Management Mercury Waste, Inc., at its facility in Union Grove, Wisconsin. The mercury website indicates that a sixth site – Lamp Recyclers of Louisiana, Inc., dba Lamp Environmental Industries in Hammond, Louisiana – has notified DOE that it also is RCRA-permitted and can store excess mercury. Here again, except for Y-12, there is no DOE facility available for mercury storage, rather several commercial sites state that they can provide such storage.

13-2

2

13-2 DOE has been designated by Congress pursuant to the Mercury Export Ban Act of 2008 as the Federal agency responsible for selecting a suitable location for the long-term management and storage of elemental mercury and operating that facility. DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury. As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. The site for construction and operation of a DOE facility has not been selected for the reasons stated above (see Response No. 13-1). DOE acknowledges in Chapter 5, Section 5.3, that selection of a WIPP Vicinity reference location may involve a legislative process to amend the LWA (P.L. 102-579) or a land withdrawal in accordance with the Federal Land Policy and Management Act (FLPMA) (P.L. 94-579).

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

Therefore, DOE should inform Congress that it cannot and will not comply with the requirements of Section 5 of the Act and that, instead, commercial sites will provide mercury storage in permitted facilities for an undetermined amount of time and that Y-12 will continue to store DOE's mercury. Further, DOE should stop its mercury EIS activities, which amount to wasting taxpayer funds on its noncompliance with the Mercury Act, the National Environmental Policy Act (NEPA), and other federal laws, including the WIPP Land Withdrawal Act (LWA) and the Federal Land Policy and Management Act (FLPMA). 13-2 (cont'd)

Mercury storage, except for DOE mercury, is not part of the agency's mission. DOE should remind Congress that it has many other responsibilities to which it must direct its financial and other resources. Those responsibilities, among others, include the National Nuclear Security Administration facilities, non-nuclear laboratories, and storage and cleanup of nuclear weapons wastes in several states. In New Mexico, among DOE's responsibilities are:

- Operation of WIPP which is planned to continue for another decade or more. Focus needs to be on safety and addressing WIPP's failure to accomplish its mission related to remote-handled (RH) waste. Because of the mismanagement of the underground storage space at WIPP and the inability of some DOE sites to characterize and package RH waste, less than 0.6 percent of the volume of waste currently emplaced at WIPP is RH waste. Further, the remaining underground space is much less than needed to accommodate all RH waste in the current WIPP inventory, using existing emplacement practices and procedures. 13-3
- Operation of and cleanup at LANL, which is years behind schedule and will cost billions of dollars.
- Operation of and cleanup of Sandia; and
- Nine current Office of Legacy Management (LM) sites:
  Acid/Pueblo Canyon Site, Ambrosia Lake Site, Bayo Canyon Site, Bluewater Site, Chupadera Mesa Site, Gasbuggy Site, Gnome-Coach Site, L-Bar Site, Shiprock Site. In addition, the Northeast Churchrock and Homestake/Barrick uranium sites are to become LM sites in the future.

Those important tasks require additional significant resources beyond those provided DOE by Congress, so additional responsibilities are not appropriate. DOE should so state to Congress and focus the agency's attention on those long-standing core responsibilities.

2. <u>DOE is not complying with the National Environmental Policy Act (NEPA)</u>.
A. The DSEIS does not include "all reasonable alternatives."
NEPA requires that an adequate document consider "all reasonable alternatives." The discussion of alternatives is the legally required heart of any EIS. 40 CFR § 1502.14. The legally adequate EIS must "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." 40 CFR § 1502.14(a). SRIC does not believe that the New Mexico sites are reasonable alternatives. The WIPP site is not authorized by Congress for mercury storage. The two "vicinity" sites cannot be used without a congressional land withdrawal that has not been issued. Despite those legal barriers, since DOE does consider New Mexico sites as reasonable alternatives, it must also consider one or more sites at the Oak Ridge Reservation as reasonable alternatives in any legally adequate DSEIS. 13-4

3

13-3 Congress, with the passage of the Mercury Export Ban Act of 2008, designated DOE as the responsible agency for selecting a suitable location for the construction and operation of a facility for the long-term management and storage of elemental mercury. DOE has numerous facilities it is responsible for nationwide.

13-4 As discussed in Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS*, DOE sought expressions of interest from facilities that could be used for the long-term management and storage of elemental mercury. Furthermore, DOE solicited comments from the public during a 45-day scoping period on the January 2011 *Mercury Storage EIS*. DOE evaluated the expressions of interest against certain criteria to screen the locations into a list of reasonable alternatives that were analyzed in the EIS. Some sites were eliminated from detailed analysis, as discussed in Chapter 2, Section 2.6, of the January 2011 *Mercury Storage EIS*. In DOE's "Notice of Intent to Prepare a Supplemental EIS for the Long-Term Management and Storage of Elemental Mercury" (77 FR 33204) and during the scoping period for this SEIS, DOE subsequently identified three more reasonable alternatives in the vicinity of WIPP. The reasons for selection of the WIPP Vicinity reference locations as candidate sites are discussed below (see Response No. 13-7).

The Mercury Export Ban Act of 2008 explicitly prohibits the Y–12 National Security Complex (Y–12) or any other portion of the Oak Ridge Reservation to be considered for the location of the DOE-designated facility for the long-term management and storage of elemental mercury. Contrary to the commentor's assertion that Y–12 (Oak Ridge Reservation) was not analyzed as a No Action Alternative, continued storage of approximately 1,200 metric tons of DOE mercury at Y–12 was evaluated under the No Action Alternative; the impacts of this storage are discussed in Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*.

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

The DSEIS states:

> A number of alternatives were considered but were not evaluated in detail. As required by Council on Environmental Quality regulations (40 CFR 1502.14(a)), the reasons for elimination of these alternatives from detailed study are presented in Chapter 2, Section 2.6, of the January 2011 *Mercury Storage EIS* (DOE 2011). Alternatives may be eliminated from further consideration because of technical immaturity, regulatory unacceptability, or because they do not support the purpose and need for the proposed action. at 2-15.

That cited FEIS section states:

> DOE may sometimes include reasonable alternatives that are outside the scope of what Congress has approved. However, in the case of this action where Congress has expressly prohibited a potential alternative, DOE finds that it is reasonable to forego its consideration. Accordingly, DOE has eliminated this option as an action alternative. FEIS at 2-32.

13-4 (cont'd)

Oak Ridge should be considered as a reasonable alternative and evaluated in comparison to the other reasonable alternatives. The FEIS and the DSEIS do not provide that analysis. Moreover, in the absence of alternative storage sites, Oak Ridge will continue to store DOE mercury for years or decades, so it must at least be fully analyzed for long-term storage under the "no action" alternative.

13-5

In addition, neither the FEIS and DSEIS considers as reasonable alternatives any of the six commercial sites that have notified DOE under Section 5(g)(2)(b) of the Mercury Export Ban Act that they are RCRA-permitted storage sites and will store excess mercury. So sites that are mercury storage sites are not included as reasonable alternatives! An adequate EIS must analyze those alternative sites and compare them with the DOE and commercial sites that are considered alternatives.

13-6

Furthermore, as is discussed in section 2.G below, the DSEIS does not include any discussion of all reasonable alternative sites managed by the Department of Interior (DOI) or Bureau of Land Management (BLM).

The DSEIS is inadequate and cannot provide the basis for an adequate FSEIS.

13-7

B. The DSEIS does not explain why WIPP should be included as a reasonable alternative now, when it was not considered to be a reasonable alternative in the FEIS.

DOE provided no substantive basis for its reconsideration of the range of alternatives in the Notice of Intent (NOI) of June 5, 2012. (77 FR 33204). There are no documents on the mercury storage EIS website to justify the selection of the New Mexico sites, despite SRIC's written request on June 21, 2012 for such documentation. Various people at the Albuquerque scoping meeting also requested such documentation.

The statement given orally at the June 28, 2012 scoping meeting by David Levenstein and sent by email on July 3, 2012 to Joni Arends of Concerned Citizens for Nuclear Safety and Don

4

13-5 As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. All of the waste management companies have certified that they will ship the mercury to a DOE facility when it is ready to accept the mercury for long-term management and storage. None of these waste management companies have indicated a desire to serve as DOE's facility for up to 40 years under an appropriate leasehold or ownership arrangement with DOE.

13-6 In March 2009, DOE published a Request for Expressions of Interest in the *Federal Register* (74 FR 11923), as well as in *Federal Business Opportunities* (Fed Biz Opps 2009), seeking potential locations for a mercury storage facility from interested Federal agencies and the private sector. The U.S. Bureau of Land Management (BLM) did not respond with a candidate site. No other entity proposed a candidate site on BLM-managed land.

13-7 During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. This prompted DOE to reconsider several DOE sites using the same selection criteria found in Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS*. Certain exclusionary selection criteria, e.g., site security, caused DOE to again rule out several DOE sites. This reevaluation of DOE sites led to a determination that several sites at and in the vicinity of WIPP would fit within the range of reasonable alternatives and should be evaluated. Similar to WCS (the Preferred Alternative), the WIPP vicinity is in a remote and arid location. In addition, it offers required infrastructure and is accessible to transportation routes. The WIPP site has personnel with an outstanding transportation management record and experience in implementing RCRA and other pertinent environmental requirements, records management, safety and

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

Hancock of SRIC does not at all satisfy legal requirements to provide the basis for including the New Mexico sites. First, the statement is not on the Mercury EIS website and is not generally available to the public as a reference, and it is not included in the DSEIS. Second, the brief explanation was not provided to anyone at the beginning of the scoping process, but rather at the very end so that adequate time has not been provided to discuss the statement. Third, the statement does not provide an actual basis for including the New Mexico sites. The "characteristics" mentioned – "the WIPP site is situated near existing infrastructure; accessible to transportation routes; and has personnel with an outstanding transportation management record, and experience in implementing RCRA and other pertinent environmental requirements, records 13-7 (cont'd)

management, and security" – are not unique to WIPP, but also are characteristics of other DOE sites that are not being considered as alternative locations, including Argonne National Laboratory, Livermore National Laboratory, and Nevada Test Site. Those three sites are not listed in Section 2.6 of the FEIS regarding sites considered and eliminated. Of course, the Oak Ridge Reservation also has those same (and additional) "characteristics." DOE must explain why those other sites do not have those "characteristics" and are not being considered. 13-8

Further, WIPP is not RCRA-permitted for commercial mercury storage. A new permit for mercury storage would be required from the State of New Mexico. Thus, the favorable characteristic does not, in fact, exist. 13-9

Moreover, WIPP was included in the March 30, 2009 DOE Memo to site offices (FEIS at A-24), but the site did not favorably respond to the request. Further, the site has not subsequently requested mercury storage, according to the Waste Isolation Pilot Plant (WIPP) Site Manager and Deputy Site Manager on a June 20, 2012 conference call with SRIC and representatives of other citizen groups. The DSEIS does not discuss why WIPP, which did not respond favorably, is being considered while other sites are not. The DSEIS is inadequate and cannot be used as the basis for an adequate FSEIS. 13-10

C. The DSEIS does not adequately consider the impacts at WIPP of mercury storage. Mercury storage could result in the early closing of WIPP's disposal operations. Consequently, there must be discussion of the impacts of continuing transuranic (TRU) waste storage at other DOE sites if there is an early closure of WIPP in case of a serious accident involving mercury that prevents all the legacy waste from being shipped to WIPP. In addition, any accident or leak at the mercury facility could result in interruption of WIPP's operations. The impacts of such an interruption on WIPP and the TRU waste storage at other DOE sites is not addressed in the DEIS. Those issues were raised in SRIC's scoping comments, yet they are not discussed in the DSEIS. 13-11

Mercury is highly toxic and shipments of mercury on the same highways used to bring radioactive waste to WIPP will increase the risks of radioactive and hazardous waste contamination from transportation accidents. Such risks are increased by the proximity of the proposed mercury storage site to the WIPP site and to WIPP transportation routes as compared with the other seven alternative sites that do not have such shipments. The transportation analysis in the DSEIS does not include a discussion of accidents involving both mercury and nuclear waste shipments. 13-12

5

security. The WIPP Vicinity reference locations have physical attributes that make such a site a favorable location for a DOE mercury storage facility. Input from within DOE, including Carlsbad Field Office site management, was sought prior to moving forward on this option.

13-8 See Response No. 13-7. As the commentor noted, many DOE sites share common features with WIPP. In fact, many DOE sites, providing a range of reasonable alternatives, were analyzed in the January 2011 *Mercury Storage EIS*. Some DOE sites (e.g., Argonne National Laboratory, Lawrence Livermore National Laboratory, and Nevada National Security Site) were deemed to present security concerns and/or mission compatibility issues that caused DOE to eliminate them from further consideration as sites for the long-term storage of mercury. The Mercury Export Ban Act of 2008 explicitly prohibits Y–12 or any other portion of the Oak Ridge Reservation to be considered for the location of the DOE-designated facility for the long-term management and storage of elemental mercury. However, the continued storage of approximately 1,200 metric tons of DOE mercury at Y–12 was evaluated under the No Action Alternative; the impacts of this storage are discussed in Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*.

13-9 DOE acknowledges that a new RCRA permit for the DOE facility would be required for the storage of mercury at the WIPP Vicinity reference locations; all of the candidate sites would require a new or modified RCRA permit. DOE personnel at the Carlsbad Field Office have extensive experience preparing and implementing RCRA permits.

13-10 See Response No. 13-7.

13-11 Chapter 4, Section 4.2.9.1.2, discusses facility accidents and Section 4.2.9.1.4 discusses intentional destructive acts. The risks associated with facility accidents are negligible to low. None of the accident scenarios evaluated involving a leak or spill of elemental mercury would cause the premature closure of WIPP. However, natural disasters (e.g., earthquakes or tornados) that could cause a

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

Regarding potash, natural gas, and oil resources at and near the WIPP site, the DSEIS does not use current data and the only current reference mentioned is not publicly available. The potash production data is from 2005 and the oil and gas data is from 1995 (at 3-10 and 3-11). Oil production has expanded significantly around the WIPP site, including more than 80 wells within a mile of the WIPP boundary in all directions. 13-13

Future resource extraction could impact WIPP's operations through accidents or blowouts at those facilities; transportation accidents with mercury, nuclear waste, and oil field shipments; or waterflooding that causes excursions into WIPP. The DSEIS does not discuss those issues and is inadequate. 13-14

The only reference to current data cited is "Rutley, J.S., 2012, personal communication." However, that document is not an appropriate reference, as it does not comply with NEPA regulations. Those regulations state:

> No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment. 40 CFR § 1502.21.

The Rutley reference is not available on the Mercury EIS website, nor is it available via a google search. The document is not available, and under the regulations, cannot be used as a reference. Consequently, the DSEIS does not include adequate, timely information, as is required to comply with NEPA.

Therefore, the DSEIS is inadequate and cannot be used as the basis for an adequate FSEIS. 13-15

D. The DSEIS does not adequately consider the cumulative impacts of using WIPP.
The DSEIS states that it considers the cumulative impacts in Section 4.4. However, the DSEIS provides no adequate analysis of the impacts of the Section 27 location for GTCC waste. A few examples of required, but missing, analysis include:

1. What are the impacts of GTCC waste operations on WIPP operations and mercury storage operations?
2. What are the impacts of GTCC waste transportation to WIPP on WIPP shipments and mercury shipments?
3. What are the impacts of accidents at the GTCC facility for WIPP operations and mercury storage?
4. What are the impacts on GTCC storage or accidents or leaks from mercury storage?

DOE also is proposing other expansions of WIPP, which have not been included in the cumulative impacts analysis. On March 11, 2013, DOE announced it was changing the previous preferred alternative for Hanford high-level waste tanks to a new preferred alternative to ship some of the tank waste to WIPP. 78 FR 15358. On January 12, 2012, DOE announced that it was changing the previous preferred alternative for surplus plutonium at the Savannah River Site to having some surplus plutonium shipped to WIPP. 77 FR 1920. The DSEIS does not include those two expansions and their substantial environmental effects in its cumulative impacts analysis.

Thus, the DSEIS is inadequate and cannot be used as the basis for an adequate FSEIS. 13-16

6

facility accident with a mercury spill, although rare, might also result in the closure or suspension of WIPP due to the consequences of the natural phenomena itself.

13-12 Chapter 4, Section 4.2.9.1.3, discusses the potential for impacts due to transportation accidents involving mercury shipments. The risks associated with transportation accidents involving a spill or release of mercury are negligible to low. Impacts associated with transporting TRU waste to WIPP are evaluated in the *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (DOE 1980) and two subsequent SEISs (DOE 1990, 1997). As of August 12, 2013, 11,516 shipments of TRU waste have been received at WIPP since its opening on March 26, 1999 (DOE 2013). There has not been a single transportation accident that has resulted in the release of radioactive material. Section 4.4.2.1 has been revised to discuss the reasons TRU waste and elemental mercury would not be shipped together. The likelihood of an accident between a shipment of TRU waste and a shipment of mercury involving the release of both types of materials would be considered negligible. Therefore, the contribution to cumulative risk from transporting elemental mercury to any of the WIPP Vicinity reference locations would be negligible.

13-13 Chapter 3, page 3–11, of the *Draft Mercury Storage SEIS* discusses oil and gas exploration activities in the WIPP vicinity through 2005 and includes known oil and gas exploration activities in Sections 10, 20, and 35 as they exist today. One oil well exists in Section 35; however, none exist in Section 10 or 20. Regarding potash mining activities, accurate production estimates and mining activities are protected by industry as proprietary information, and current information is difficult to obtain. However, page 3–5 of the *Draft Mercury Storage SEIS* describes in general where potash mining has recently been observed, as well as the status of a mining lease within Section 10 that was reassigned in 2010. BLM is a cooperating agency on this SEIS, and during the development of the document, BLM's Carlsbad Field Office was consulted regarding the current status of oil and gas exploration and potash mining in the vicinity of WIPP.

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

E. The Mercury SEIS does not fulfill the requirements for adequately supplementing the WIPP EISs.

It is not surprising that the DSEIS is not an adequate EIS regarding WIPP. Supplementing the WIPP EISs, which the DSEIS cannot do, is required. See 40 CFR § 1502.9(c). In none of the three EIS's done for WIPP (DOE/EIS-0026, DOE/EIS-0026-FS, DOE/EIS-0026-S-2) was the possibility of long-term mercury management and storage discussed or analyzed. SRIC believes that another supplemental WIPP EIS and another WIPP Record of Decision are required if WIPP is to be considered for mercury storage. The Mercury DSEIS is not a proper supplement to the WIPP EISs. 13-17

F. The environmental analysis of the two "WIPP vicinity" sites is grossly incomplete and inadequate.

There are grazing leases, oil and gas reserves, and potash resources at or near the Section 10 and Section 35 locations. But the DSEIS does not include current data or analysis of those resources. The potash production data is from 2005 and the oil and gas data is from 1995. Oil production has expanded significantly around the WIPP site, including more than 80 wells within a mile of the WIPP boundary in all directions. At least one natural gas well is located in or adjacent to Section 10. At least one salt water disposal well is located in Section 35. Those issues are not adequately discussed in the DSEIS. 13-18

The only reference to current data cited is "Rutley, J.S., 2012, personal communication." However, that document is not an appropriate reference, as it does not comply with NEPA regulations. Those regulations state:

> No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment. 40 CFR § 1502.21.

The Rutley reference is not available on the Mercury EIS website, nor is it available via a google search. Since the document is not available, under the regulations it cannot be used as a reference. Consequently, the DSEIS does not include adequate, timely information, as is required to comply with NEPA. 13-19

In addition to mercury storage, Section 35 also is proposed for GTCC disposal, as the DSEIS states. The DSEIS states:

> A mercury storage facility and GTCC waste disposal facility could be located within the 260-hectare (640-acre) area that comprises Section 35 without interference with operations or compromising the safety and security of these facilities. at 4-43.

That assertion in no way constitutes an adequate environmental analysis of how two such facilities would operate, let alone how they could operate without conflicts. Congress determined that WIPP required a 16-square mile land withdrawal to provide adequate area and buffer zone for disposal of defense transuranic (TRU) waste. A GTCC waste facility for 160,000,000 curies of GTCC waste would contain approximately 30 times more radioactivity than all of the TRU waste that is to come to WIPP. Thus, the mercury SEIS (and the GTCC EIS) must consider the likelihood that a GTCC facility would require the entire land area of Section 13-20

13-14 With the exception of the consideration of cumulative impacts, WIPP operations are not within the scope of this SEIS. Cumulative impacts are discussed in Chapter 4, Section 4.4, of this SEIS. Facility accidents are discussed in Section 4.2.9.1.2, and transportation impacts are discussed in Section 4.2.9.1.3. WIPP, as well as the WIPP Vicinity Section 20 location, falls within the land withdrawal boundary. The land withdrawal boundary provides a buffer zone extending approximately 2 miles in all directions where mining and oil and gas exploration are prohibited. If a DOE mercury facility were to be built in WIPP Vicinity Section 10 or 35, an appropriate buffer zone would be established to ensure the safe and secure storage of elemental mercury.

13-15 See Response No. 13-13. All references cited in the *Draft Mercury Storage SEIS* were made available to the public during the entire public comment period, including the reference cited by the commentor, "Rutely, J.S. 2012, personal communication." All references were available in the reading rooms listed in the *Summary and Guide for Stakeholders*, Section S.6.5, and were also made available upon request through the project website, by email, or by U.S. mail. The subject reference, "Rutley, J.S. 2012," has been sent as requested.

13-16 Chapter 4, Section 4.4, of this SEIS discusses the cumulative impacts of operating a mercury storage facility at the WIPP Vicinity reference locations. Cumulative impacts reported in this SEIS include those for land use, air quality, site infrastructure, and ecological resources. Operations at WIPP, as well as the proposed disposal of GTCC and GTCC-like waste at WIPP, were also identified in this analysis. The results show that potential impacts of constructing and operating a mercury storage facility at WIPP would be negligible.

The environmental impacts of operating WIPP were analyzed in the *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (DOE 1980) and two subsequent SEISs (DOE 1990, 1997). The environmental impacts of operating a GTCC and GTCC-like disposal facility were analyzed in the *Draft Environmental Impact*

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

35 and potentially even more land. Clearly, use of all of Section 35 for GTCC waste would preclude its use for mercury storage. 13-20 (cont'd)

Additionally, neither Section 10 nor Section 35 is included in any RCRA permit. Thus, the two sites do not comply with a supposedly major characteristic for mercury storage of having RCRA-permitting experience. 13-21

Thus, the DSEIS is inadequate and cannot be used as the basis for an adequate FSEIS.

G. The Mercury FEIS and DSEIS do not comply with the requirements regarding cooperating agencies.

In its scoping comments, SRIC pointed out the necessity of having BLM as a cooperating agency. But only after the end of the scoping period, on September 19, 2012, DOE invited DOI to be a cooperating agency. at G-2. However, the timing of that invitation does not comply with NEPA regulations, which state:

> The purpose of this section is to emphasize agency cooperation early in the NEPA process. Upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency….
> (a) The lead agency shall: (1) Request the participation of each cooperating agency in the NEPA process at the earliest possible time.
> (2) Use the environmental analysis and proposals of cooperating agencies with jurisdiction by law or special expertise, to the maximum extent possible consistent with its responsibility as lead agency….
> (b) Each cooperating agency shall:
> (1) Participate in the NEPA process at the earliest possible time.
> (2) Participate in the scoping process (described below in § 1501.7).
> 40 CFR § 1501.6

DOE did not request DOI's participation as a cooperating agency "at the earliest possible time." Such participation should have been requested prior to, and certainly no later than, June 5, 2012 when the NOI was published in the *Federal Register*. DOI was not allowed to participate in the scoping process as required by the regulations. In fact, SRIC believes that BLM should have been a cooperating agency as the time of the original NOI in 2009.

As SRIC stated in its scoping comments, the scoping was inadequate and did not comply with NEPA regulations. Thus, scoping should have been extended to include DOI's participation and public comment on DOI's input into the scoping process. Or, preferably, the scoping and DSEIS process should have been terminated. 13-22

In addition to the procedural violations, DOI's participation would have substantively changed the Mercury FEIS and DSEIS process. The BLM, which manages the Section 10 and Section 35 sites, also manages millions of acres of land and has undertaken no process (let alone any NEPA process) to indicate that those two sites are adequate for mercury storage. DOE also has not undertaken such a comprehensive national and NEPA analysis. Neither has BLM, nor DOE, provided any analysis that those two sites are superior to thousands of other BLM sites in the nation that might be considered reasonable alternatives for mercury long-term management and 13-23

8

Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste (Draft GTCC EIS) (DOE 2011b); cumulative impacts for this proposed action are discussed in Chapter 4, Section 4.5, and Chapter 11, Section 11.4, of that draft EIS. Any potential TRU waste disposal pursuant to the *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington* (DOE 2012a) would be subject to the conditions described in DOE's preferred alternative (78 FR 15358); impacts would not exceed those reported for Hanford in the 1997 *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement*. The *Draft Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (DOE 2012b) evaluated the disposal at WIPP of some surplus plutonium that would meet the WIPP waste acceptance criteria. However, as proposed in this *Mercury Storage SEIS*, the storage facility would be above ground, would not generate any radioactive waste, and therefore would not contribute to or impact disposal operations at WIPP.

13-17 The proposed action is to construct and operate a facility for the long-term management and storage of mercury in the vicinity of WIPP as an independent and separate action from the activities associated with WIPP. This SEIS is not a supplement to the NEPA documentation previously prepared for WIPP operations (the *Final Environmental Impact Statement, Waste Isolation Pilot Plant* [DOE 1980] and two subsequent SEISs [DOE 1990, 1997]).

13-18 See Response No. 13-13.

13-19 See Response No. 13-15.

13-20 See Response No. 13-16.

13-21 See Response No. 13-9.

13-22 On June 5, 2012, DOE published the "Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury" in the *Federal Register* (77 FR 33204). Publication of the Notice of Intent

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

storage. If DOE were going to consider DOI or BLM lands, it should have so stated by July 2, 2009, when it issued the original NOI, which could have complied with the "earliest possible time" requirement. At that time BLM should have been a cooperating agency, and a comprehensive analysis of potential BLM sites for long-term mercury storage should have been issued for public comment. Alternatively and less preferable, scoping should have included public comment on the comprehensive national analysis of potential BLM alternative sites. 13-23 (cont'd)

DOI's participation substantively changed the DSEIS. After the scoping period, DOE decided to include Section 35 as a second "WIPP Vicinity" site. at 1-8. That change was apparently based on DOI's concerns about using Section 10 as an alternative site. Clearly, the NOI was inadequate in that it did not identify any site in Section 35. Clearly, the scoping was inadequate in not including DOI and not providing public notice and comment. If DOI was included prior to the scoping time, it is possible that WIPP and the two "vicinity" sites would not have been included, based on DOI input, and the scoping and DSEIS would have never occurred. 13-24

Thus, the DSEIS is inadequate and cannot be used as the basis for an adequate FSEIS.

H. DOE did not comply with scoping requirements.
In addition to not complying with cooperating agency requirements related to scoping, DOE has violated other NEPA scoping requirements. The Council on Environmental Quality (CEQ) stated more than 30 years ago that scoping must make "enough information available on the proposal so that the public and relevant agencies can participate effectively." 46 FR 18030 (March 23, 1981). DOE did not provide enough information for the public to effectively participate in the Supplemental EIS. Thus, the scoping is inadequate and does not meet CEQ requirements. 13-25

DOE also has violated its own procedures for the Mercury EIS in proceeding with the New Mexico sites. In March 2009, DOE published a Request for Expressions of Interest in the *Federal Business Opportunities* and *Federal Register* (74 FR 11923). In addition, DOE site offices were requested to determine if they had a facility(ies) that could be used for mercury storage. DOE received responses from ten sites (not including WIPP) and determined that seven of the ten locations appeared to be within the range of reasonable alternatives for mercury storage. FEIS at 1-6. Subsequently, on July 2, 2009, DOE published its original NOI in the *Federal Register* (74 FR 31723). Thus, the public had an opportunity to understand what specific sites were being considered and the basis for the inclusion of the seven sites *prior to* the 52-day scoping period. Similar information was not available about the two New Mexico sites (and no information was provided about Section 35) prior to the initiation of the (inadequate) 30-day scoping comment period noticed on June 5, 2012. The posters provided at the New Mexico scoping sessions showed possible approximate locations within the two sections identified in the NOI, but did not specify the basis for identifying those two sites. 13-26

The Lowland Environmental Services and Veolia ES Technical Solutions sites, which responded to the Expressions of Interest, were eliminated because they did not meet the basic requirement to propose a specific location for siting such a facility. FEIS at 2-32. Of course, no specific location was proposed at WIPP or the Section 10 site in the NOI. Once again, DOE is not following its own procedures for the Mercury EIS. 13-27

9

initiated a 30-day public scoping period. During this time, DOE solicited comments from Federal, state, and local agencies; stakeholders; tribal nation representatives; and the general public to assist in defining the scope of the SEIS. DOE hosted two meetings to obtain public comments on the proposed scope of this SEIS. The public scoping meetings were held on June 26, 2012, in Carlsbad, New Mexico, and June 28, 2012, in Albuquerque, New Mexico. BLM did not offer any comments during this time.

DOI BLM was formally invited to serve as a cooperating agency on the preparation of the *Draft Mercury Storage SEIS* on September 19, 2012. BLM was actively involved in the scoping of the document and the preparation of the draft SEIS. BLM's participation in the process directly led to revision of the proposed action to include a third option, WIPP Vicinity Section 35, due to potential potash mining interests in WIPP Vicinity Section 10. Under FLPMA (P.L. 94-579), the presence of oil and gas exploration and potash mining would not necessarily preclude the use of the land for the construction and operation of a DOE mercury storage facility.

DOE is not aware of any BLM interests in any of the candidate sites analyzed in the January 2011 *Mercury Storage EIS* that would benefit from BLM serving as cooperating agency during the development of the January 2011 *Mercury Storage EIS*. See also Response No. 13-6.

13-23 See Response No. 13-6.

13-24 See Response No. 13-22.

13-25 Section S.6 of the *Summary and Guide for Stakeholders* discusses public involvement during the development of this SEIS. On June 5, 2012, DOE published the "Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury" in the *Federal Register* (77 FR 33204), which initiated a 30-day public scoping period. The project website (http://www.mercurystorageeis.com) provided information to the public about the

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

Even now, the DSEIS does not provide a specific location in Section 10 or in Section 35 for mercury storage. 13-28

Since DOE did not comply with scoping requirements, it should not proceed with the DSEIS.

I. DOE should withdraw the DSEIS and NOI.
Given the many violations of NEPA, DOE should not issue an FSEIS. The potential options include withdrawing the DSEIS and NOI and basing any future decisions on the FEIS or issuing a new DSEIS that complies with NEPA. Rather than continuing to waste taxpayers money on a failed effort that has not met the deadlines of Section 5(a) of the Mercury Export Ban Act, DOE should terminate the SEIS process and issue a notice in the *Federal Register* that it is so doing. Under no circumstances can a legally adequate FSEIS be issued based on the existing DSEIS. 13-29

3. DOE is not complying with the WIPP Land Withdrawal Act (LWA, PL 102-579).
Section 3(a)(1) of the LWA states that the site is "reserved for the use of the Secretary for the construction, experimentation, operation, repair and maintenance, disposal, shutdown, monitoring, decommissioning and other authorized activities associated with the purposes of WIPP as set forth in section 213" of Public Law 96-164 and this act. Mercury storage is not a purpose authorized under either law. Thus, both laws would have to be amended to allow mercury storage at WIPP. At the June 28, 2012 scoping meeting, David Levenstein agreed that the LWA would have to be amended by Congress for mercury storage to occur at WIPP.

However, the DSEIS has several statements that are not consistent with the LWA requirements and that scoping meeting statement:

> DOE acknowledges that new legislation may be required for DOE to construct and operate a facility for long-long-term management and storage of mercury at any of the WIPP Vicinity reference locations. at 1-8.
> Land inside the WIPP LWB used for a mercury storage facility would be subject to the provisions of the WIPP LWA and may require Federal legislation. at 2-17.
> Land at WIPP Vicinity Section 20 inside the WIPP LWB used for construction and operations of a longterm management and storage facility for elemental mercury would be subject to the provisions of the WIPP LWA (P.L. 102-579) and may require Federal legislation. at 2-22.
> Use of WIPP Vicinity Section 20 for construction and operation of a facility for the long-term management and storage of elemental mercury would alter the current land use and could require Federal legislation. at 4-3.
> Land inside the WIPP LWB used for construction and operations of a long-term management and storage facility for elemental mercury would be subject to the provisions of the WIPP LWA (as discussed for WIPP) and may require Federal legislation. at 5-3.

13-30

The DSEIS provides no basis for those repeated assertions that federal legislation "may" or "could" be required. There are no references cited in the DSEIS to support those assertions and there are no lawyers included in the Chapter 7 list of preparers. It is clear that use of Section 20 or any other part of the WIPP land withdrawal area "will" and "would" require amending the

10

January 2011 *Mercury Storage EIS*, the preparation of the SEIS, public hearings, comment submission, fact sheets, presentations, and other pertinent information. DOE hosted two scoping meetings to obtain public comments on the proposed scope of this SEIS: one in Carlsbad, New Mexico, on June 26, 2012, and another in Albuquerque, New Mexico, on June 28, 2012. Additionally, all stakeholders of record associated with all candidate sites were sent postcard notifications on DOE's intent to prepare an SEIS and where related information could be found.

13-26 See Response Nos. 13-7, 13-22, and 13-25.

13-27 One expression of interest came from a business partnership comprising Lowland Environmental Services; Sustainable Construction and Consulting; and 840, LLC. Another came from Veolia ES Technical Solutions, LLC. Veolia ES Technical Solutions, LLC, withdrew its submission. Neither entity identified a location where a proposed mercury storage facility could be built. As a result, neither an affected environment description nor an environmental impacts analysis could be evaluated; thus, these alternatives were not considered further. Each of the WIPP Vicinity reference locations is 1 square mile or less and can be effectively analyzed in an EIS.

13-28 Chapter 2, Section 2.3.2, of this SEIS describes the WIPP Vicinity reference locations. Section 10 and Section 35 represent an area the size of 1 square mile. A full-size mercury storage facility would occupy approximately 3.1 hectares (7.6 acres) of this area. The available area for a DOE mercury storage facility allows some flexibility for siting the facility during the design phase.

13-29 DOE disagrees with the commentor's assertion that this EIS/SEIS process has violated NEPA. DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury. See also Response No. 13-1.

LWA and Public Law 96-164. The statements in the DSEIS are not supported by references, expert analysis, or other rationale and are contrary to legal requirements. 13-30 (cont'd)

Several other provisions of the WIPP LWA are not compatible with mercury management and storage. For example, Section 9(c) of the LWA requires the Environmental Protection Agency (EPA) Administrator to require a remedial plan to address non-compliance with *any* law, regulation or permit requirement. Since if DOE continues with considering WIPP for mercury storage, it would not comply with several laws, the remedial plan could be required at any time. Section 16 of the LWA includes various transportation safety measures, including training, equipment, and emergency preparedness requirements that would have to be revised to address mercury transportation. Thus, in addition to amending the LWA to allow mercury storage, many other provisions, policies, and practices would have to be changed, which would take years and be financially costly. 13-31

Further, Greater-Than-Class C (GTCC) waste is explicitly prohibited by the LWA, as is all other commercial waste. As SRIC and dozens of other New Mexicans said in 2011, WIPP is not a reasonable alternative for GTCC waste. SRIC is attaching its June 27, 2011 comments on the GTCC Draft EIS, which were provided with the July 5, 2012 scoping comments. Those comments were not addressed in the DSEIS. Those comments must also be addressed in any adequate GTCC EIS. 13-32

4. DOE is not complying with the Federal Land Policy and Management Act (FLPMA). The WIPP LWA Section 4(a) requires the DOE Secretary to comply with FLPMA as to the WIPP site. Mercury storage at WIPP also would violate FLPMA, including as to grazing, hunting and trapping activities.

As the DSEIS states, Sections 10 and 35, Township 22 South, Range 31 East are federal land managed by the BLM. Thus, BLM also must comply with FLPMA, 43 U.S.C. §§ 1701-1785, regarding those sites. Among many other things, that land shall be managed under principles of multiple use and sustained yield. 42 U.S.C. § 1732(a). Long-term mercury management and storage is incompatible with other uses, including grazing, hunting and trapping, hiking, and mineral leasing and extraction. Those sites would have to be withdrawn, pursuant to FLPMA, which has not occurred and for which the various requirements have not discussed, let alone been completed. 13-33

The Mercury FEIS did not even include FLPMA in Table 5-1 of relevant environmental laws. FEIS at 5-2 to 5-4. Thus, that statute has not been considered for any of the other sites, while it has direct applicability to all New Mexico sites.

Use of the "WIPP Vicinity" sites also is contrary to FLPMA. The proposed 40 years of mercury storage would also require congressional withdrawal legislation, since such storage would preclude the multiple uses required by that law. Thus, a withdrawal for mercury storage cannot be done by DOI, but instead requires congressional legislation.

Nonetheless, the DSEIS states:

11

13-30 DOE acknowledges in Chapter 5, Section 5.2, that selection of a WIPP Vicinity reference location may involve a legislative process to amend the LWA (P.L. 102-579) (for Section 20) or a land withdrawal in accordance with the FLPMA (P.L. 94-579) (for Sections 10 and 35). The extent to which these statutes would need to be amended has not been determined.

The commentor notes that the withdrawal process has not yet occurred. DOE would not initiate the legislative process for considering amendments to the WIPP LWA or FLPMA administrative process until such time that a ROD is issued, if such a site is selected.

13-31 See Response No. 13-30. As part of the expanded mission in the vicinity of WIPP, DOE acknowledges that some planning documents and procedures would have to be amended and/or supplemented with information regarding activities associated with a DOE mercury storage facility. However, many of these planning and procedural documents would be required of a DOE mercury storage facility regardless of which candidate site is selected.

13-32 With the exception of the consideration of potential cumulative impacts, the disposal of GTCC and GTCC-like waste at WIPP is not within the scope of this SEIS. Chapter 4, Section 4.4, discusses the cumulative impacts of operating a mercury storage facility at the WIPP Vicinity reference locations. Operations of WIPP, as well as the proposed disposal of GTCC and GTCC-like waste at WIPP, were included in this analysis. The environmental impacts of operating a GTCC and GTCC-like waste disposal facility were analyzed in the *Draft GTCC EIS* (DOE 2011b); cumulative impacts for this proposed action are discussed in Chapter 4, Section 4.5, and Chapter 11, Section 11.4, of that draft EIS. Comments and DOE's responses on the *Draft GTCC EIS* will be published in a CRD published with the *Final GTCC EIS.*

13-33 See Response No. 13-30. The FLPMA (P.L. 94-579) allows for the administrative withdrawal of public land. FLPMA Section 204 (43 U.S.C. 1714) allows for a withdrawal of "not more than

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

> DOE acknowledges that new legislation may be required for DOE to construct and operate a facility for long-long-term management and storage of mercury at any of the WIPP Vicinity reference locations. at 1-8.

"May" is inaccurate. "Will" is the correct term.

The DSEIS does not properly analyze the requirements of FLPMA and is inadequate. The Mercury FEIS and DSEIS do not provide the basis for an adequate FSEIS. Here again, the proper course of action is to withdraw the DSEIS and NOI and not include WIPP and the "vicinity" sites as reasonable alternatives for mercury storage. 13-33 (cont'd)

5. <u>The DSEIS does not properly analyze the potential timeframe for mercury storage at WIPP</u>. As SRIC discussed in its scoping comments, mercury storage at WIPP could be limited to the disposal phase and be allowed for twenty years or less. The WIPP Hazardous Waste Act (HWA) permit is for the entire 16-square-mile site. Permit Section 1.5.3. The permit requires that when disposal operations cease, closure operations must commence. Final closure required by the permit includes decontamination and removal of all surface facilities and equipment. Such closure operations could affect the mercury storage operations, including because much heavy equipment and traffic would be at the WIPP site. Closure also could require removal of all mercury storage facilities, along with WIPP facilities and equipment. Since the end of disposal phase operations could be in as few as 12 years and is currently planned in less than 20 years, the mercury storage could be limited to that time period, which is much less than the 40 years of operations used in the FEIS and DSEIS. The adequate DSEIS must discuss the possibility that WIPP could not be used for the entire 40-year storage timeframe. 13-34

The EPA certification of WIPP, required by the LWA and EPA regulations, which does not include mercury storage, also requires that when disposal operations end that decommissioning will occur. Mercury storage would be contrary to the certification and, at a minimum, would require a public process to revise the certification. The DSEIS does not adequately discuss this issue and is inadequate.

6. <u>Using the New Mexico sites would take more time and be more financially costly than alternative sites</u>.

As noted in section 2.B above, DOE has provided no documented basis for its reconsideration of alternatives to include the New Mexico sites. However, David Huizenga, the top official of DOE Environmental Management, stated at the Forrestal Building on March 20, 2012 to representatives of SRIC and other organizations that the "lower cost" of WIPP compared with the other sites was a primary consideration for the reconsideration of alternatives.

As is discussed in #9 below, DOE has provided no cost analysis for <u>any</u> site, so it has no basis for saying that the cost of using any New Mexico site is less than the alternatives. On the contrary, any of the New Mexico sites have costs that would likely not occur at other sites. For example, because of the substantial opposition by SRIC and New Mexicans, there would be costs for, among other things, HWA permit modifications; additional EISs; other permits; and transportation, emergency response, and other procedures; and numerous litigation expenses. That opposition would also result in years of delays to operate any site for mercury storage. 13-35

12

twenty years for any other use, including but not limited to use for administrative sites, location of facilities, and other proprietary purposes." Additionally, the section further provides for a review and approval process for extending the administrative withdrawal for up to the same period as the initial withdrawal, which could be up to 20 years. Therefore, FLPMA has provisions that would allow an administrative withdrawal for a total of 40 years, with a base period of 20 years and an extension of 20 years.

FLPMA does not identify specific proposed land uses that are incompatible with the act. The concept of multiple uses provides a broad range of considerations for DOI to consider in managing the land. Siting a mercury storage facility could be comparable to the siting of an oil and gas well, or development of mineral resources, when considering the balance of uses.

13-34 A DOE mercury storage facility and WIPP are independent missions and may have different periods of operation. DOE acknowledges that a new RCRA permit for the DOE facility would be required for the storage of mercury at the WIPP Vicinity reference locations; all of the candidate sites would require a new or modified RCRA permit. The storage of mercury will only be necessary until EPA approves a treatment and disposal standard for elemental mercury. DOE does acknowledge that although the period of analysis for the long-term management and storage of mercury is 40 years, the need for storage could be shorter or longer than 40 years, and is not likely to correspond with operations at WIPP.

13-35 Costs are not presented in this *Mercury Storage SEIS*. Construction and operation of a DOE mercury storage facility at one of the WIPP Vicinity reference locations could take advantage of WIPP's extensive experience and knowledge of New Mexico permitting processes and regulations and its expertise in management and transportation planning of hazardous waste.

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

Such delays would continue storage costs at Y-12 and on the generators. Insofar as there are environmental risks from not having mercury storage consolidated, the delays in using the New Mexico sites would increase those risks. 13-35 (cont'd)

7. Using WIPP for mercury storage, GTCC wastes, or other proposals to expand WIPP's mission is a serious breach of trust.

In addition to mercury storage, GTCC waste disposal, and the Hanford tank waste at WIPP being contrary to federal laws, such expansions are also a serious breach of trust. During the 20 years of discussion and debate about WIPP's mission before the passage of the LWA, many promises were made that WIPP was only for defense transuranic waste and that the site would not be used for other types of wastes. Those promises, some enacted as explicit requirements and prohibitions into the LWA, were important in obtaining support from federal and state officials and the public that allowed WIPP to open and operate.

That support also has been deemed essential by the Blue Ribbon Commission on America's Nuclear Future. In its January 2012 report, the Commission stated that "most notably the siting of a disposal facility for transuranic radioactive waste, the Waste Isolation Pilot Plant (WIPP) in New Mexico" provides a strong basis to "sustain the public trust and confidence needed to see controversial facilities through to completion." Report at ix. Breaching that trust regarding WIPP would affect many New Mexicans. But such expansions also would seriously undermine the ability to convince the public and government officials in other states that promises and even federal laws provide an adequate basis and assurances for states and communities to consent to radioactive waste or other controversial facilities. 13-36

This issue of breach of trust is a major impact that would have to be considered in any adequate DSEIS, but it is not discussed. But DOE should not even be proposing to breach that trust. DOE should not proceed with considering WIPP a reasonable alternative for mercury storage, GTCC waste disposal, Hanford tank waste, or other expansions in WIPP's mission.

8. WIPP is failing in its RH waste mission.

WIPP can legally accept up to 7,079 cubic meters of RH waste. However, as SRIC has pointed out on numerous occasions in recent years, WIPP's actual capacity for RH waste using the existing configuration and requirements is approximately half that legal limit. Thus, substantial amounts of RH waste at Hanford, Washington; Oak Ridge, Tennessee; and the Idaho National Lab apparently will not be shipped to WIPP.

On May 28, 2013, the DOE Inspector General confirmed that RH problem. OAS-L-13-09. 13-37

DOE should develop a technically sound, publicly accepted program from its RH waste, which currently does not exist. Since DOE has not adequately addressed that problem for the past 14 years of WIPP's operations, it should not further divert its attention and resources to mercury storage at WIPP or other locations.

The DSEIS does not address this issue. Thus, the DSEIS is inadequate and cannot be used as the basis for an adequate FSEIS.

13

13-36 DOE intends to communicate with the public to help ensure that potentially affected communities and other interested parties understand DOE's proposed actions and are given opportunities to participate in decisions that may affect them. In preparing this final SEIS, DOE considered comments received during the scoping period (June 5, 2012, through July 5, 2012) and public comment period on the draft SEIS (April 19, 2013, through June 3, 2013). All comments, including late comments, were considered during preparation of this final SEIS.

13-37 With the exception of the consideration of potential cumulative impacts, the disposal of remote-handled TRU waste operations at WIPP is not within the scope of this SEIS. Chapter 4, Section 4.4, discusses the cumulative impacts of operating a mercury storage facility at the WIPP Vicinity reference locations. Operations of WIPP were included in this analysis.

Commentor No. 13 (cont'd): Don Hancock, Southwest Research and Information Center

9. The DSEIS does not provide adequate analysis of the environmental impacts at the alternative sites.
The DSEIS includes Appendix E that provides updates to the alternative sites included in the FEIS regarding Occupational and Public Health and Safety Analysis and Socioeconomics and Environmental Justice Analysis.

That analysis is insufficient. There are changed circumstances at sites that must be discussed and analyzed. For example, licensing activities and waste planned for WCS have changed since the FEIS. The Bannister Site at the Kansas City Plant is being closed. Changed circumstances at the other sites must also be discussed and analyzed. How those activities would affect mercury storage and be affected by mercury storage is not discussed in the DSEIS. 13-38

Moreover, during the original Mercury EIS scoping process, commentors stated that the costs of the facilities should be considered. However, costs were not included in the Draft EIS. Draft EIS at 1-16. Commentors on the Draft EIS also identified the lack of cost analysis as a deficiency, but costs were not included in the FEIS. FEIS, Vol. 2 at 2-16.

Costs and fees are included in PL 110-414, and they are a major impact that should be considered in any adequate NEPA analysis. Thus, it is a serious inadequacy in the Mercury FEIS that costs are not included.

The basic rationale for not including costs is:

> Section 5 of the Mercury Export Ban Act of 2008 authorizes DOE to assess and collect a fee at the time of delivery of mercury to the DOE storage facility(ies) to cover certain costs of long-term management and storage. FEIS, Vol. 2 at 2-16.

That rationale is deficient. First, the generators of mercury and the public should know the range of costs that DOE intends to assess. Such information could help policymakers and the public determine whether long-term mercury management and storage is cost-effective. That information would assist generators, the public, and Congress in determining that DOE should not be in charge of long-term mercury management and storage. 13-39

NEPA regulations state:

> The primary purpose of an environmental impact statement is to serve as an action-forcing device to insure that the policies and goals defined in the Act are infused into the ongoing programs and actions of the Federal Government. It shall provide full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment…. An environmental impact statement is more than a disclosure document. It shall be used by Federal officials in conjunction with other relevant material to plan actions and make decisions. 40 CFR § 1502.1

Second, under the Mercury Export Ban Act, not all costs can be assessed on generators of mercury. Those additional costs should be quantified for each site, as they certainly are a relevant comparison of impacts among the alternatives, and they could be a determining factor in

14

13-38 After the publication of the *Draft Mercury Storage SEIS* in April 2013, it was announced in June 2013 that WCS began accepting low-level radioactive waste in a dedicated portion of the disposal site, known as the Federal Waste Facility, and will accept low-level radioactive waste from other DOE facilities. In May 2013, the National Nuclear Security Administration published an environmental assessment regarding the conveyance and reutilization of the Bannister Federal Complex's Kansas City Plant. At this time, the status of these candidate sites does not change the environmental impacts associated with the proposed long-term management and storage of mercury at these candidate sites. However, the summary site descriptions found in Chapter 2, Section 2.3.1, and in the *Summary and Guide for Stakeholders* have been revised to reflect these recent developments.

13-39 Costs are not presented in this *Mercury Storage SEIS*. As described in Chapter 1, Section 1.6, of the January 2011 *Mercury Storage EIS*, Section 5 of the Mercury Export Ban Act of 2008 (P.L. 110-414) authorizes DOE to assess and collect a fee at the time of delivery of mercury to the DOE storage facility to cover certain costs of long-term management and storage. These costs include operations and maintenance, security, monitoring, reporting, personnel, administration, inspections, training, fire suppression, closure, and other costs required for compliance with applicable laws. Section 5 of the Act states that such costs shall not include costs associated with land acquisition or permitting. Therefore, much of the costs of mercury storage will be borne by the generators of mercury. In addition, the generators of the mercury will be responsible for the costs of shipping mercury to the DOE storage facility. Costs associated with the transportation and storage of mercury in the private sector are highly speculative. Note that the Act does not require generators to store their elemental mercury at a DOE site; thus, some or all such mercury could be stored at various locations.

whether any site(s) are selected for mercury storage. Given the well-established constraints on the federal budget, such costs also are relevant to consideration of the budget impacts of long-term mercury management and storage. Third, commercial generators of mercury would not be assessed costs for the DOE mercury at the Oak Ridge Reservation. The public and policymakers should know what the costs are of ongoing management and storage at Y-12 and what the costs would be of transporting, managing, and storing that mercury at each of the alternative sites. Those costs are relevant to the overall federal budget impacts of mercury storage. The costs could also contribute to a decision as to whether to proceed with the "no action" alternative for the mercury already under DOE authority or whether that mercury should go to an alternative site(s). 13-39 (cont'd)

Thank you very much for your careful consideration of, and your response to, these and all other comments.

Sincerely,

Don Hancock

Don Hancock

Attachment: SRIC GTCC Comments of June 27, 2011

15

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Commentor No. 14: Scott Kovac, Operations and Research Director, Nuclear Watch New Mexico

nuclear watch new mexico

June 5, 2013

Mr. David Levenstein, EIS Document Manager
U.S. Department of Energy
Office of Environmental Compliance, EM-11
P.O. Box 2612 Germantown, MD 20874-2612

Via email: David.Levenstein@em.doe.gov

Re: Comments for the Supplemental Mercury Storage EIS, *Federal Register* (77 FR 33204)

Dear Mr. Levenstein,

We respectfully submit these comments for the Department of Energy's Long-Term Management and Storage of Elemental Mercury Draft Supplemental Environmental Impact Statement (SEIS). Please address these comments and answer these questions in your upcoming final SEIS.

Nuclear Watch New Mexico seeks to promote safety and environmental protection at nuclear facilities; mission diversification away from nuclear weapons programs; greater accountability and cleanup in the nation-wide nuclear weapons complex; and consistent U.S. leadership toward a world free of nuclear weapons.

Thank you for the draft SEIS meeting in Albuquerque.

The Mercury Export Ban Act required that DOE begin operation of the mercury storage facility by January 1, 2013. Given that that did not happen we strongly urge the Department of Energy to go back to to the drawing board to develop a new set of potential storage and disposal sites that are located in closer proximity to the major inventories of elemental mercury. 14-1

This SEIS is not adequately justified
DOE does not adequately justify why this SEIS was prepared just a year after the issuance of the Final Long-Term Management and Storage of Elemental Mercury EIS. In these times of tight budgets, why was $100,000 spent on this SEIS just to end up with the same preferred alternative? 14-2

DOE's Notice of Intent (NOI) of June 5, 2012 provided no solid basis for reconsideration:

903 W. Alameda #325, Santa Fe, NM 87501 • Voice and fax: 505.989.7342
info@nukewatch.org • www.nukewatch.org • http://www.nukewatch.org/watchblog/
http://www.facebook.com/NukeWatch.NM

14-1 During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. DOE has analyzed the long-term management and storage of mercury at 10 candidate sites at 8 different geographic locations nationwide, including the states of Washington, Nevada, New Mexico, Texas, South Carolina, Missouri, and Idaho. As discussed in Chapter 2, Section 2.1, elemental mercury that might be shipped to a DOE facility for long-term management and storage would come from a variety of sources within the United States. There is uncertainty in estimating the amounts and locations where this mercury could come from. Table 2–2 shows that for the estimated maximum amount of mercury that could be shipped to a DOE facility, the truck miles traveled would range from 1,385,734 miles (Kansas City Plant) to 2,112,527 miles (Hanford 200-West Area). Comparatively, the WIPP Vicinity reference locations would involve 1,868,523 miles. Transportation risks to human health would be negligible to low for all candidate sites.

14-2 During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection. This prompted DOE to reconsider several DOE sites using the same selection criteria found in Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS*. Certain exclusionary selection criteria, e.g., site security, caused DOE to again rule out several DOE sites. This reevaluation of DOE sites led to a determination that several sites at and in the vicinity of WIPP would fit within the range of reasonable alternatives and should be evaluated. Similar to WCS (the Preferred Alternative), the WIPP vicinity is in a remote and arid location. In addition, it offers required infrastructure and is accessible to transportation routes. The WIPP site has personnel with an outstanding transportation management record and experience in implementing RCRA and other pertinent environmental requirements, records management, safety and

> "Since publication of the Final Mercury Storage EIS, DOE has reconsidered the range of reasonable alternatives evaluated in that EIS. Accordingly, DOE now proposes to evaluate two additional locations for a long-term mercury storage facility, both near the Waste Isolation Pilot Plant (WIPP), which DOE operates for disposal of defense transuranic waste." (33204, Federal Register/Vol. 77, No. 108/Tuesday, June 5, 2012/Notices)

There is no justification why the WIPP vicinity is suddenly considered as a reasonable alternative.

From the Notice of Availability:

> To this end, DOE issued the Final Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury (Mercury Storage EIS, DOE/EIS–0423, January 2011) to analyze reasonable alternatives, in accordance with the National Environmental Policy Act (NEPA), for locating and developing such a facility. Subsequently, DOE identified three additional, reasonable alternative locations in the vicinity of its Waste Isolation Pilot Plant (WIPP) in Carlsbad, NM. (23548 Federal Register/Vol. 78, No. 76/Friday, April 19, 2013/Notices)

14-2 (cont'd)

Still, no reason is given why the WIPP vicinity is now judged to be a reasonable alternative. DOE has provided no substantive basis for its reconsideration of the range of alternatives to be included in the Mercury Final EIS (FEIS). There are no documents on the Mercury Storage EIS website to justify the selection of the New Mexico locations as candidate sites. Would not locations closer to the actual inventories of mercury be more reasonable as candidate sites?

Please explain why no other DOE sites were re-considered. Please give a site-by-site breakdown why other sites will not work. Please explain why the WIPP sites are the best sites in the DOE complex and are exclusively worthy of re-consideration in this time of budget constraints. The characteristics given are not unique to WIPP, but are also characteristic of many other DOE sites that nevertheless are not being considered as alternative locations.

There Is Still Not An Expressions of Interest From WIPP

On March 30, 2009 DOE published a Request for Expressions of Interest in the *Federal Business Opportunities* and *Federal Register*. In addition, DOE site offices were requested to determine if they had a facility that could be used for mercury storage. DOE received responses from ten sites and determined that seven of the ten locations appeared to be within the range of reasonable alternatives for mercury storage. In the case of the WIPP site itself, though it was included in the DOE request (see FEIS at A-24), it did not respond at all and still has not requested mercury storage, according to the WIPP Site Manager and Deputy Site Manager in a June 20, 2012 conference call with NukeWatch and other citizen groups.

14-3

The second site in the WIPP vicinity is not a DOE site and no announced representative from it responded to the Request for Expressions of Interest. Nor has DOE provided any information

Nuclear Watch New Mexico • Comments on the Mercury Storage Draft SEIS
June 5, 2013 • Page 2

security. The WIPP Vicinity reference locations have physical attributes that make such a site a favorable location for a DOE mercury storage facility. Input from within DOE, including Carlsbad Field Office site management, was sought prior to moving forward on this option.

DOE analyzed the long-term management and storage of mercury at 10 candidate sites at 8 different geographic locations nationwide. Elemental mercury that might be shipped to a DOE facility would come from a variety of sources within the United States. There is uncertainty in estimating the amounts and locations where this mercury could come from. Also, DOE considered and eliminated a "hybrid" or multi-site strategy. See also Response Nos. 14-1, 14-6, and 14-7.

DOE acknowledges that a new RCRA permit for the DOE facility would be required for the storage of mercury at the WIPP Vicinity reference locations; all of the candidate sites would require a new or modified RCRA permit. DOE personnel at the Carlsbad Field Office have extensive experience preparing and implementing RCRA permits.

To comply with NEPA, DOE must complete appropriate steps in the NEPA process. This includes conducting appropriate impact analyses, publishing a draft EIS/SEIS, providing opportunities for public comment and involvement, and publishing a final EIS/SEIS. DOE's decision to proceed with the preparation of an SEIS does not mean that its Preferred Alternative would also change.

14-3 See Response No. 14-2. In March 2009, DOE published a Request for Expressions of Interest in the *Federal Register* (74 FR 11923), as well as in *Federal Business Opportunities* (Fed Biz Opps 2009), seeking potential locations for a mercury storage facility from interested Federal agencies and the private sector. BLM did not respond with a candidate site. No other entity proposed a candidate site on BLM-managed land. However, BLM, a cooperating agency, was actively involved in the scoping of the document and the

Commentor No. 14 (cont'd): Scott Kovac, Operations and Research Director, Nuclear Watch New Mexico

about who proposed that second site, unlike the information provided about the 10 locations identified in 2009.

The Bureau of Land Management (BLM), which manages the second site just north of the WIPP site boundary (Section 10, Township 22 South, Range 31 East), manages millions of acres of land. Neither the BLM, nor DOE, have provided any basis for believing that the site is adequate for mercury storage and is superior to thousands of other BLM sites nation-wide that might be considered reasonable alternatives for the long-term management and storage of elemental mercury.

This prompts two questions:

- Did the BLM respond to DOE's Request for Expressions of Interest?
- Given DOE's lack of basis of justification for that one particular BLM site, how can the public effectively analyze why that site was chosen and its relative merits compared to other sites?

The 2008 Mercury Export Ban Act states:

> **SEC. 5. LONG-TERM STORAGE.**
> (a) DESIGNATION OF FACILITY.—
> (1) IN GENERAL.—Not later than January 1, 2010, the Secretary of Energy (referred to in this section as the ''Secretary'') **shall designate a facility or facilities of the Department of Energy,** which shall not include the Y–12 National Security Complex or any other portion or facility of the Oak Ridge Reservation of the Department of Energy, for the purpose of long-term management and storage of elemental mercury generated within the United States.

In the draft SEIS, the Department states, "DOE has interpreted Section 5 of the Act to authorize DOE to designate existing and/or new storage facilities at property either owned or leased by DOE."

This prompts the following questions and points:

- Is BLM going to lease or sell part of the site to DOE to store mercury?
- The details of this arrangement must be explained in this EIS.
- Financial assurance must be part of this arrangement.
- As precedent, are there other examples of DOE purchasing or leasing BLM lands? If so, please include in the final SEIS.
- Please explain how DOE derives its authority to reinterpret this Act to include any facility that it may or may not lease or purchase? How does DOE know that it was not Congress' intent to limit mercury storage to what is currently known to be the DOE complex?
- Please cite any applicable DOE regulations.
- Is DOE required to explain to Congress any reinterpretation of an act?

14-3 (cont'd)

DOE should inform Congress that it has not, and will not, comply with the deadlines established for having one or more facilities for mercury storage

14-4

Nuclear Watch New Mexico • Comments on the Mercury Storage Draft SEIS
June 5, 2013 • Page 3

preparation of the draft SEIS. BLM's participation in the process directly led to revision of the proposed action to include a third option, WIPP Vicinity Section 35, due to potential potash mining interests in WIPP Vicinity Section 10. Under the FLPMA (P.L. 94-579), the presence of oil and gas exploration and potash mining would not necessarily preclude the use of the land for the construction and operation of a DOE mercury storage facility.

DOE has interpreted Section 5 of the Mercury Export Ban Act of 2008 (P.L. 110-414) to authorize DOE to designate an existing and/or new storage facility at property owned or leased by DOE. If a non-DOE site is selected, DOE would acquire an appropriate ownership or leasehold interest in that facility to comply with Section 5 of the Act. The details of the ownership or leasehold arrangement are uncertain, but would not have a bearing on the environmental impacts of mercury storage, and therefore are not presented in this SEIS. Examples of BLM-administered land that has been permanently withdrawn for DOE use include WIPP and the Grand Junction Disposal Site near Grand Junction, Colorado. Appropriate members of Congress have been included in the distribution of the January 2011 *Mercury Storage EIS* and this SEIS and are listed in Chapter 8 of these documents.

14-4 Congress, with the passage of the Mercury Export Ban Act of 2008, designated DOE as the responsible agency for selecting a suitable location for the construction and operation of a facility for the long-term management and storage of elemental mercury. DOE has numerous facilities it is responsible for nationwide. DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury. DOE will identify a suitable location and build a new facility or modify existing buildings for the long-term management and storage of mercury when the appropriate NEPA process is completed and funding is authorized.

DOE should suggest to Congress that it reconsider giving DOE the task of long-term management and storage of elemental mercury. If new mercury storage facilities are to be established, Congress will need to set new deadlines. Congress should also consider whether another agency could better identify and manage such facilities. DOE should remind Congress that it has many other responsibilities to which it must direct its financial and other resources. 14-4 (cont'd)

This SEIS Does Not Comply with the WIPP Land Withdrawal Act
The WIPP Land Withdrawal Act (LWA) will have to be amended to allow mercury storage at WIPP. At the June 28 scoping meeting, David Levenstein agreed that the LWA would have to be amended by Congress for mercury storage to occur at WIPP. DOE cannot assume that the LWA can be amended. In addition to amending the LWA to allow mercury storage, many other provisions, policies, and practices would have to be changed, which would take years and be financially costly.

From draft SEIS § 1.6.1 Summary of Major Public Scoping Comments and DOE's Responses
Candidate Sites in the WIPP Vicinity: 14-5

> "...Other commentors pointed out that there are legal restrictions under the WIPP Land Withdrawal Act limiting WIPP to the disposal of TRU waste from defense activities..."
> *Response:* ...DOE acknowledges that new legislation may be required for DOE to construct and operate a facility for long-term management and storage of mercury at any of the WIPP Vicinity reference locations...

Where in the response does it mention the LWA? Explain the possible new or amended legislation. Who will sponsor it? Will it pass?

This SEIS does not comply with the National Environmental Policy Act (NEPA)
NEPA requires DOE to consider "all reasonable alternatives," which is the heart of any EIS. To be legally adequate, an EIS must "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." But we do not believe that the New Mexico sites are reasonable alternatives in isolation. 14-6

- If the New Mexico sites are reasonable alternatives, then yet more out-of-state DOE sites must be considered as reasonable alternatives..
- In order to minimize transportation and lower costs, it would also be reasonable to examine two sites – one in the Eastern US and one in the West.

The use of multiple facilities must re-analyzed as an alternative
Since we currently do not know whether it is better to store huge amounts of mercury at one site, or store smaller amounts at many sites, the range of alternatives in the SEIS should include mercury storage at many sites versus only one site. 14-7

Alternatives to storage must be re-analyzed
Are there any new technical processes? Bethlehem Apparatus has developed a process that allows the retirement of elemental mercury from future use by stabilizing it into a form that can be safely land filled. This process (patent pending) converts elemental mercury 14-8

Nuclear Watch New Mexico • Comments on the Mercury Storage Draft SEIS
June 5, 2013 • Page 4

14-5 DOE acknowledges in Chapter 5, Section 5.3, that selection of a WIPP Vicinity reference location may involve a legislative process to amend the LWA (P.L. 102-579) (for Section 20) or a land withdrawal in accordance with FLPMA (P.L. 94-579) (for Sections 10 and 35), such as was done for the WIPP facility. Any land withdrawal would need to be coordinated through BLM as the agency responsible for administering FLPMA.

14-6 Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS* discusses the process DOE used to determine a set of reasonable alternatives for detailed analysis. Chapter 2, Section 2.6, discusses a number of alternatives that were considered but eliminated from further study, including the rationale for not designating a "hybrid" or multiple-site strategy. See also Response Nos. 14-2 and 14-7.

14-7 As discussed in Chapter 2, Section 2.6, of the January 2011 *Mercury Storage EIS*, DOE considered the possibility of using a "hybrid" or multiple-site strategy composed of candidate sites. DOE eliminated such a strategy from further evaluation because the duplicative resources that would be required would not be cost-effective. However, the Mercury Export Ban Act of 2008 does not prohibit the selection of multiple sites for the long-term management and storage of elemental mercury.

14-8 Chapter 2, Section 2.6.2, of the January 2011 *Mercury Storage EIS* discusses potential treatment alternatives. EPA has not approved a treatment and disposal standard for elemental mercury. DOE is aware of the Bethlehem Apparatus process for treating elemental mercury; however, this technology is not approved by EPA for the treatment of elemental mercury within the United States.

Commentor No. 14 (cont'd): Scott Kovac, Operations and Research Director, Nuclear Watch New Mexico

into a high purity mercury sulfide with the same physical and chemical characteristics of naturally occurring Cinnabar. Once the sulfide is formed it is blended with polymers. The product is a red pellet of approximately 7 mm X 7 mm that is suitable for land disposal. (This product is already acceptable for Canadian landfills, but will need certification from the EPA for disposal in U.S. landfills.)
http://www.bethlehemapparatus.com/mercury-retirement.html

This prompts the following questions and comments:

- This and any other feasible technological advances for the treatment of elemental mercury should be considered and analyzed.
- The possible benefits of storing these pellets in containers in an aboveground facility should be analyzed. Wouldn't this be a safer method than storing elemental mercury?
- The SEIS should describe any other feasible approaches to mercury immobilization that could lead towards a more stable and less toxic form of mercury.
- Please describe the optimal storage conditions for these immobilized forms of mercury.

14-8 (cont'd)

Analyze all potential cumulative environmental effects of past, present, and reasonably foreseeable future actions

- Describe any additional DOE actions potentially impacting mercury storage. The two WIPP vicinity sites considered for the SEIS are inside WIPP's 50-mile Region of Influence.
- Since mercury is volatile, will storage buildings or bunkers be air-conditioned or otherwise temperature controlled to prevent accidental atmospheric release?
  - Please describe and possible effects from loss of cooling.

14-9

Status of compliance with all applicable federal, state and local statutes and regulations
Please include all international agreements, and required federal and state environmental permits, consultations, and notifications.

- Please describe the time gap between when facility startup and when it will be RCRA permitted by the State of New Mexico, as described in the scoping presentation.
- Should not facilities that are already RCRA permitted be treated as the preferred alternatives?

14-10

The potential of sinkholes must be examined
Some think the removal of oil and water from deep below the earth's surface for the past 80 years is causing the ground to collapse today. Annual non-potable water use over the life of the facility is estimated to be 2 million gallons per year. The non-potable water supply at the Waste Control Specialists (WCS) site is obtained from a well in the Santa Rosa Formation, which is located under the facility. Please analyze the possibility and potential effects of sinkholes, which are a clear potential environmental hazard not analyzed in the SEIS.

14-11

Nuclear Watch New Mexico • Comments on the Mercury Storage Draft SEIS
June 5, 2013 • Page 5

14-9 In some cases, where radiological doses are concerned from treatment and/or operations of facilities, a 50-mile region of influence is commonly used for public health impacts. This has some basis in reactor operations and accident analysis guidance from the U.S. Nuclear Regulatory Commission. For impacts associated with long-term management and storage of mercury, DOE is neither evaluating radiological materials nor impacts related to any treatment processes. DOE is evaluating the long-term storage of elemental mercury, which does not involve treatment of any kind. A very conservative region of influence was selected for the cumulative impacts analysis because impacts from construction and operation of a storage facility would not result in impacts beyond this distance, and therefore, would not contribute to cumulative impacts on any resource areas. Chapter 4, Section 4.4, discusses the cumulative impacts of operating a mercury storage facility at the WIPP Vicinity reference locations. Operations of WIPP, as well as the proposed disposal of GTCC and GTCC-like waste at WIPP, were included in this analysis.

Ventilation and air conditioning of a mercury storage building is discussed in Appendix C, Section C.2.1. The Storage Area would not be air conditioned, and the human health impacts analysis takes this into account. Facility accidents are discussed in Chapter 4, Section 4.2.9.

14-10 Chapter 5 of the January 2011 *Mercury Storage EIS* and the *Draft Mercury Storage SEIS* discusses the laws, regulations, permits and other requirements that could potentially apply to the construction and operations of a DOE mercury storage facility.

DOE acknowledges that a new RCRA permit for the DOE facility would be required for the storage of mercury at the WIPP Vicinity reference locations; all of the candidate sites would require a new or modified RCRA permit. DOE personnel at the Carlsbad Field Office have extensive experience preparing and implementing RCRA permits. Experience with RCRA permits is a favorable attribute for a candidate site.

Commentor No. 14 (cont'd): Scott Kovac, Operations and Research Director, Nuclear Watch New Mexico

Place reference documents online
DOE should have made cited reference documents immediately available on the Internet after the release of the draft SEIS. This should still be promptly done. Further, in this day and age, it should be promptly done for all of DOE's NEPA processes. 14-12

Please describe DOE's technical criteria for site selection
There is none given in the SEIS. How can intelligent decisions be made without it? 14-13

What happens after 40 years?
There is no removal or treatment plan for whatever goes into a storage facility. There are no promises made about what happens at the end of the stated 40-year storage period or any information about what happens after then.

- How long could the mercury be stored at DOE's selected site - 50 years, 100 years, 1000 years or 10,000+ years?
- How can the safe storage of mercury be assured over the very long term given possible future social or economic collapse, which could disrupt the management of the stored mercury? We are now creating sites of high concentration of toxic materials that will be management problems/requirements effectively forever. How can we be assured that the site will not be vandalized and the mercury released under worst-case scenarios? What is the long-term federal commitment to management and storage of mercury?
- Closure plans for the storage facility must be defined.
- What are the impacts of retrieving the stored mercury?
- Will this mercury possibly be reused?
- What happens after WIPP closes in 2035?

14-14

Explain the financial details
The Mercury Export Ban Act requires DOE to assess fees based upon the pro rata costs of long-term management and storage.

- Please explain these costs.
- Compare the alternatives and analyze which sites would be cheaper.
- Please explain the funding mechanism.
- Private users will be encouraged to ship to the facility but will have to pay for storage. Who pays for storage of DOE mercury and what is the funding mechanism? What are taxpayers liable for?
- What are projected fees that the federal government will pay to WIPP if it is selected for long-term storage of mercury?
- Please describe any lease or purchase arrangements.

14-15

Include American Indian Tribal perspectives
It is not readily apparent to us how tribal perspectives were incorporated into this process. The real test is to actually heed the advice that Native Americans might have on the issues at hand. 14-16

Nuclear Watch New Mexico • Comments on the Mercury Storage Draft SEIS
June 5, 2013 • Page 6

14-11 Chapter 3, Section 3.2.2.3, and Chapter 4, Section 4.2.2.1.2, of the SEIS discuss the potential for subsidence at all of the WIPP Vicinity reference locations. Chapter 3, Section 3.8.2.3, of the January 2011 *Mercury Storage EIS* discusses the potential for subsidence at WCS. Construction design and final siting of a DOE mercury storage facility at these locations would be required to take the potential risk of subsidence into consideration. If a DOE mercury facility were to be built in WIPP Vicinity Section 10 or 35, an appropriate buffer zone from potash mining and oil and gas exploration would be established to ensure the safe and secure storage of elemental mercury.

14-12 All references cited in the *Draft Mercury Storage SEIS* were made available to the public during the entire public comment period. All references were available in the reading rooms listed in the *Summary and Guide for Stakeholders*, Section S.6.5, and were also made available upon request through the project website, by email, or by U.S. mail.

14-13 Chapter 1, Section 1.5.1, discusses the criteria for identifying candidate sites analyzed in this SEIS. Chapter 2, Section 2.6, provides a comparison of alternatives and identifies differences between candidate sites that are favorable and not favorable. Chapter 2, Section 2.5, of the January 2011 *Mercury Storage EIS* summarizes the reasons for selecting WCS near Andrews, Texas, as the Preferred Alternative. DOE will make a decision no sooner than 30 days after publication of the EPA Notice of Availability for this *Final Mercury Storage SEIS* in the *Federal Register*. The final site selection will be based upon the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors and will be announced in a ROD published in the *Federal Register*.

14-14 As described in Chapter 1, Section 1.3.1, and Chapter 2, Section 2.6.2, of the January 2011 *Mercury Storage EIS*, there currently is no EPA-approved method of treating high-purity elemental mercury for disposal, and it is not known when such a treatment method might become available. Therefore, since the

Commentor No. 14 (cont'd): Scott Kovac, Operations and Research Director, Nuclear Watch New Mexico

These comments and questions respectfully submitted,

Scott Kovac
Operations and Research Director
Nuclear Watch New Mexico
551 Cordova Road #808
Santa Fe, NM, 87501
505.989.7342 office & fax
www.nukewatch.org

mercury export ban took effect on January 1, 2013, storage is the only option for such elemental mercury. The Mercury Export Ban Act of 2008 does not specify how long the DOE mercury storage facility(ies) would need to be operated. For purposes of analysis, DOE assumes the operation of a mercury storage facility(ies) with a capacity of 10,000 metric tons (11,000 tons) over a 40-year period of analysis. These are estimates with a degree of uncertainty; therefore, it is possible that more or less than this amount of mercury could eventually require storage for a period longer or shorter than 40 years. In the event that more than 10,000 metric tons (11,000 tons) of mercury need to be stored or storage beyond the 40-year period of analysis becomes necessary, additional NEPA review may be required. Chapter 4, Section 4.3, discusses closure of the mercury storage facility. Elemental mercury that is sent to a DOE facility will have been declared a waste and will not be reused. In the event that WIPP is closed prior to a mercury storage facility located at a WIPP Vicinity reference location, WIPP closure would need to take into account the continued operation of the mercury storage facility.

14-15 Costs are not presented in this *Mercury Storage SEIS*. A site has not been selected in a ROD; therefore, an accurate fee schedule for acceptance of elemental mercury cannot be developed at this time. As described in Chapter 1, Section 1.6, Section 5 of the Mercury Export Ban Act of 2008 authorizes DOE to assess and collect a fee at the time of delivery of mercury to the DOE storage facility to cover certain costs of long-term management and storage. These costs include operations and maintenance, security, monitoring, reporting, personnel, administration, inspections, training, fire suppression, closure, and other costs required for compliance with applicable laws. Section 5 of the Act states that such costs shall not include costs associated with land acquisition or permitting. Therefore, much of the costs of mercury storage will be borne by the generators of mercury. In addition, the generators of the mercury will be responsible for the costs of shipping mercury to the DOE storage facility. At this time, a final disposal pathway for high-purity elemental mercury wastes is not available, nor is it reasonable

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to speculate what kind of technology would be approved by EPA for treatment of high-purity elemental mercury wastes. Therefore, the costs associated with treatment and disposal cannot be determined or reasonably estimated. Because future options that may become available for the ultimate treatment and disposal of elemental mercury are unknown, it is not possible to determine the life-cycle costs of mercury management and storage.

14-16 DOE solicited comments from Federal, state, and local agencies; stakeholders; tribal nation representatives; and the general public during the scoping process and during the public comment period for the January 2011 *Mercury Storage EIS*, as well as for the *Mercury Storage SEIS*. DOE determined that there are no tribes or tribal resources in the vicinity of WIPP that would be affected (see Chapter 4, Section 4.2.6.1.3); therefore, no coordination or consultation was required for the WIPP Vicinity reference locations. Similar text clarifying this was added to Chapter 4, Sections 4.2.6.2 and 4.2.6.3, as well as to Chapter 5, Section 5.4.3. The appropriate consultation with American Indians for the candidate sites evaluated in the January 2011 *Mercury Storage EIS* is discussed in Chapter 5, Section 5.4.3, of the January 2011 *Mercury Storage EIS.*

Commentor No. 15: Carlos Valdez, Chair, Northern New Mexico Citizens' Advisory Board

NNMCAB

Northern New Mexico Citizens' Advisory Board
A U.S. Department of Energy Site-Specific Advisory Board
94Cities of Gold Road Pojoaque, NM 87506
Phone: 505.989.1662 or 1.800.218.5942
Fax: 505.989.1752 www.nnmcab.energy.gov

June 13, 2013

David Levenstein, EIS Document Manager
U.S. Department of Energy
Office of Environmental Compliance, EM-11
P.O. Box 2612
Germantown, MD 20874-2612

Dear Mr. Levenstein,

On Behalf of the Northern New Mexico Citizens' Advisory Board, I would like to submit comments for the Mercury Supplemental Environmental Impact Statement. Several Members of the Northern New Mexico Citizens' Advisory Board attended the Public Hearing at the Crown Plaza Hotel in Albuquerque, New Mexico on May 9, 2013. The Members would like to submit the following comments for inclusion in the public comment section. The NNMCAB is comprised of residents of northern New Mexico, appointed by the Assistant Manager for Environmental Management, to advise DOE on LANL's clean up of legacy waste.

The following bullet points and examples were prepared by Mr. Bob Villarreal and accepted by the NNMCAB members during their Committee Meeting:

- The meeting and briefing did not focus on the safety and security of handling and working with mercury. 15-1
- There are considerable risks in pre-selecting a site (West Texas) that does not have a history of health, safety, and security of handling and storage of mercury. 15-2
- There did not seem to be a separate preparatory site or building for receiving and preparing mercury for storage. Also, for assuring that the mercury received met reception criteria for storage. At least there should be capability to make analysis with an Energy Dispersive X-ray Fluorescence Spectrometer to determine the purity of the received mercury. This is a straight-forward instrument that can tell you how pure the mercury is and actually tell you the identity and concentration of all impurities in a sample of mercury. This takes about 1 minute to accomplish. 15-3
- According to the presentation, the acceptable incoming mercury must be 99.5% pure to meet hazardous waste storage requirements. No plan was presented that determined the purity of the incoming mercury nor how that determination was to be made and what was to be done with rejected elemental mercury that did not meet requirements. 15-4
- The Preferred Alternative has already been selected without consideration of the above. 15-5
- A designated technical laboratory should by selected that can help set-up this mercury facility and be available for consultation for unforeseen difficulties and problems. 15-6
- As far as I know, considerations concerning extremists and perhaps terrorists have not been addressed. 15-7

15-1 DOE acknowledges the commentor's concerns about safety and security of handling and working with mercury. A DOE mercury storage facility would operate in accordance with a RCRA permit. The purpose of the public hearings on the *Draft Mercury Storage SEIS* was to provide a broad overview of the DOE Mercury Storage Program and to provide an opportunity for members of the public to comment on the *Draft Mercury Storage SEIS*.

More detail about facility design and operation is available in the *Interim Guidance* (DOE 2009), which establishes basic standards and procedures for the receipt, management, and long-term storage of mercury at a DOE facility. The guidance is based on laws, regulations, DOE orders, and best management practices. The *Interim Guidance* discusses (1) DOE's anticipated waste acceptance criteria; (2) procedures DOE would use to receive, store, and monitor the mercury; and (3) spill and emergency response procedures. Thus, implementation of the *Interim Guidance* would ensure that elemental mercury would be stored in such a manner as to protect the environment, workers, and the general public. A copy of the *Interim Guidance* is available on the project website (http://www.mercurystorageeis.com/library.htm).

15-2 DOE acknowledges the commentor's concerns about selecting WCS as the Preferred Alternative, and the experience of WCS with mercury storage. Although DOE has identified WCS as the Preferred Alternative, as discussed in Chapter 2, Section 2.4, of this *Mercury Storage SEIS*, DOE has not made a decision on the location of the mercury storage facility. DOE will make a decision no sooner than 30 days after publication of the EPA Notice of Availability for this *Final Mercury Storage SEIS* in the *Federal Register*. The final site selection will be based upon the January 2011 *Mercury Storage EIS*, this *Mercury Storage SEIS*, and other appropriate factors and will be announced in a ROD published in the *Federal Register*. As described in Chapter 3, Section 3.8.8, of the January 2011 *Mercury Storage EIS*, WCS is permitted by the State of Texas for hazardous waste storage.

Commentor No. 15 (cont'd): Carlos Valdez, Chair, Northern New Mexico Citizens' Advisory Board

- The history of the chemistry of received mercury samples did not seem adequate to protect the building systems from anti-government subversion. 15-8

To expand on the above comments, listed are some additional potential issues and why it is necessary to consider them.

It is obvious that the mercury arriving at the storage facility would originate from a diversity of locations from a variety of processes. Therefore, there has to be differences in the purity of the incoming mercury. Some of the mercury came from gold mining processes that contained a great number of elemental impurities such as palladium, silver lead, tin, bismuth and other elemental impurities that are amalgamated (alloyed) to the mercury. Some of the impurities will follow the gold product but others will follow the pathway of the mercury which results in contaminating the mercury that is eventually stored. A good number of these "hazardous impurities" require that an accounting or categorization of stored mercury vessels will be needed, and mercury vessels stored accordingly. 15-9

Mercury is an element that can form explosives without added constituents. Some of the most powerful primary explosives which includes mercury fulminates, a very powerful explosive that when exploded result in a detonation wave that is faster than the speed of sound. A mercury storage facility must have knowledge that mercury explosives are very sensitive to shock, vibration, and temperature cycles. Consequently, provisions must be made by the receiving facility to address these concerns. 15-10

Elemental mercury is volatile or has a low boiling point and can spread rather easily. At the mercury facility Mr. Villarreal worked at in Idaho, Portable mercury detectors were used to locate and detect unknown spills. He did not see or hear of spatial mercury detectors in the proposed new mercury storage facility. The potential for an accident with fire and rain is noted to be one every 185,000 years. This is misleading because there could be an accident, within the first few months of starting a facility up and it gives the impression that it is essentially impossible. One mercury spill whether inadvertent or not can shut down several labs because it is so easy to spread. You can start by assuming one mercury spill of half a bottle and recognize the difficulty in cleaning that up and the impact to other labs and personnel. 15-11

Kindest regards,

Carlos Valdez

Carlos Valdez, Chair
NNMCAB

Cc: Pete Maggiore, LASO/EPO
Lee Bishop, DDFO
NNMCAB Members

15-3 As shown in Chapter 2, Figure 2–4, of this *Mercury Storage SEIS*, the mercury storage facility would include Receiving and Shipping and Handling Areas. A DOE mercury storage facility would operate in accordance with a RCRA permit.

As discussed in Chapter 2, Section 2.1, of this *Mercury Storage SEIS*, the proposed mercury storage facility would only store elemental (metallic) mercury that is at least 99.5 percent pure. DOE has developed guidance, presented in the *Interim Guidance* (DOE 2009), that establishes basic standards and procedures for the receipt, management, and long-term storage of mercury at a DOE facility. Chapter 2, Section 2.3, of the *Interim Guidance* discusses in detail generator requirements for shipping mercury to a DOE long-term storage facility, which includes steps that must be completed prior to shipping. The generator would be responsible for ensuring that the mercury meets the waste acceptance criteria for the DOE mercury storage facility. DOE would perform random sampling to ensure compliance with the waste acceptance criteria. In the unlikely event that a shipment of mercury is found not to meet established waste acceptance criteria when received at the DOE long-term mercury storage facility, the shipment would be returned to the generator at the generator's expense. Specific instruments to perform the sample analyses have not been selected.

15-4 See Response No. 15-3.

15-5 Although DOE has identified WCS as the Preferred Alternative, as discussed in Chapter 2, Section 2.4, of this *Mercury Storage SEIS*, DOE has not made a decision on the location of the mercury storage facility. See also Response No. 15-2.

15-6 DOE acknowledges the commentor's suggestion regarding consultation with a technical laboratory and will consider this suggestion in planning for a mercury storage facility.

15-7 Chapter 4, Section 4.2.9.1.4, of this *Mercury Storage SEIS* discusses intentional destructive acts. Intentional destructive acts include actions by extremists and terrorists.

Commentor No. 15 (cont'd): Carlos Valdez, Chair, Northern New Mexico Citizens' Advisory Board

Comment side of this page intentionally left blank.

15-8 See Response No. 15-3.

15-9 DOE is cognizant of compatibility issues with mercury storage. So as to mitigate any compatibility concerns, the proposed mercury storage facility would only store elemental (metallic) mercury that is at least 99.5 percent pure. See also Response No. 15-3.

15-10 The proposed mercury storage facility would only store elemental (metallic) mercury that is at least 99.5 percent pure; none of the mercury would have explosive properties. See also Response No. 15-3.

15-11 As described in Chapter 2, Section 2.3.3, and Appendix C, Section C.2.1, of this *Mercury Storage SEIS*, DOE would conduct mercury vapor monitoring for the detection of any unplanned release of mercury or deterioration of flask or container integrity. Weekly inspections of containers in long-term storage would incorporate air sampling. See also Response No. 15-1.

Chapter 4, Section 4.2.9.1.2, discusses the frequencies of facility accidents evaluated in this *Mercury Storage SEIS*. A storage facility fire was given a negligible frequency due to limited flammable materials, fire protection systems, and lack of ignition sources, while a single flask drop accident was assigned a moderate frequency. Table 4–6 discusses the frequencies of transportation accidents under certain weather conditions. As summarized in Chapter 2, Table 2–2, risks to workers and the public from a facility or transportation accident would be negligible to low.

See Appendix D, Section D.3.2, of this *Mercury Storage SEIS* for a discussion of the factors strongly influencing risk, including the vapor pressure of mercury.

Commentor No. 16: Dr. Lilly K. Rendt

16-1

(1) Dear Mr. Levenstein,

I have been attempting to understand the processes leading up to Long Term Mgement of Elemental Mercury!"

Unfortunately, I only received this book this month in June 2013.

16-2

Evidently plans have been in existence since the meetings in June 2012. I can't understand why so little public notice was given on these meetings! (over)

(2) When I picked up my copy of your well written book, the book was 1 yr. old!! The Crowne Plaza meetings were also not publicized and I didn't hear about them until after the meetings had occurred.

16-3

Do you have any info on these newer meetings that I could browse thru? I have long been a defender of Carlsbad Caverns and need info on these meetings as well. I am now in the process of determining the effects of Mercury on Nuclear Waste materials and vice versa.

16-1 Chapter 1, Section 1.2, of the January 2011 *Mercury Storage EIS* and Chapter 1, Section 1.2, of this SEIS discuss the purpose and need for this action. The *Summary and Guide for Stakeholders* provides additional information regarding the NEPA process. The project website, http://www.mercurystorageeis.com, also provides a substantial amount of information on the project from its inception in 2008 to the present. DOE announced the availability of the draft SEIS in the *Federal Register* on April 19, 2013 (78 FR 23548). The document was distributed to all members of the public that requested a copy on April 19, 2013; additionally, the document was posted on the project website (http://www.mercurystorageeis.com) and DOE's NEPA website (http://energy.gov/nepa).

16-2 On June 5, 2012, DOE published the "Notice of Intent to Prepare a Supplemental Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury" in the *Federal Register* (77 FR 33204), which initiated a 30-day public scoping period. The project website (http://www.mercurystorageeis.com) provides information to the public about the January 2011 *Mercury Storage EIS*, the preparation of the SEIS, public hearings, comment submission, fact sheets, presentations, and other pertinent information. DOE hosted two scoping meetings to obtain public comments on the proposed scope of this SEIS: one in Carlsbad, New Mexico, on June 26, 2012, and another in Albuquerque, New Mexico, on June 28, 2012. Additionally, all stakeholders of record associated with all candidate sites were sent postcard notifications on DOE's intent to prepare an SEIS and where related information could be found. Additionally, notices were published in advance of the scoping meeting and public hearings in the *Carlsbad-Current Argus* and the *Albuquerque Journal*.

16-3 The project website (http://www.mercurystorageeis.com) provides information to the public about the January 2011 *Mercury Storage EIS*, the preparation of the SEIS, public hearings, comment submission, fact sheets, presentations, and other pertinent

Commentor No. 16 (cont'd): Dr. Lilly K. Rendt

③ I have long been one of the scientists who concern ourselves with Carlsbad Cavernes and with preservation of our meager water supplies here in N.M. My original interest in the WIPP site is as a biologist with a PhD in survival of endangered species. While there is a stream that runs close to the WIPP site that runs into Carlsbad Caverns, I will be a defendant for (over)

16-4

④ the unusual species we have in Carlsbad Caverns. I know of 2 biologists at U.N.M. who spent years Defending our bat populations in the Caverns, but they are now administrators and I haven't spoken to them in over 2 years, since I have been ill.

I do have the N.M. State bulletins on the burrowing owl + raptors (p 1-21) in your study and your lists in the DOS/EIS-0423.S1

16-5

information. A DOE mercury storage facility would store only elemental mercury (99.5 percent purity) and would not store other materials such as radioactive wastes.

16-4 Chapter 4, Section 4.2.5, discusses the impacts of constructing and operating a DOE mercury storage facility at the WIPP Vicinity reference locations on water resources. There would be no anticipated impacts on water resources due to normal operations.

16-5 Chapter 4, Sections 4.2.5 and 4.2.10, discuss the impacts of constructing and operating a DOE mercury storage facility at the WIPP Vicinity reference locations on ecological resources. No threatened or endangered species are known to exist at WIPP; therefore, no impacts would be expected in the vicinity of WIPP. Ecological risk along transportation routes due to potential accidents is estimated to be negligible to moderate, depending on the circumstances of the accident. The DOE facility would only be used for storage of elemental mercury in sealed containers and would not involve any treatment processes.

(5) However, any accurate assessment of possible mercury contamination requires careful analysis of mobility of both contaminants from your facility (proposed) and from Carlsbad. Since we have already lost several endangered species due to the WIPP site (which we were promised would not occur), I find it difficult to assess survival of the remaining species

(6) around the Carlsbad WIPP site without adding more contamination to the area in the form of Hg. Desert species are all we have here, (except in a minimum of water sites). Also we are all that the desert species have between pollution + demise ~~or~~ survival. We want to do as much as we can to retain biota in N.M.!!!

16-5 (cont'd)

(7) In conclusion, let me state that the presence of biota and not the demise of biota means that humans can also survive. We are NOT a national waste pit and I feel as if the radioactive waste at WIPP was sufficient. We really don't need the mercuric waste you are proposing to dump here. Yours truly – Dr. Lilly K. Rendt

16-6

16-6 The proposed mercury storage facility is not a permanent disposal facility and does not involve burial of waste. The aboveground storage of mercury would only be necessary until EPA approves a treatment and disposal standard for elemental mercury. However, DOE does acknowledge that although the period of analysis for the long-term management and storage of mercury is 40 years, the need for storage could be longer. In the event that more than 10,000 metric tons (11,000 tons) of mercury need to be stored or storage beyond the 40-year period of analysis becomes necessary, additional NEPA review may be required.

Comments from the Carlsbad, New Mexico, Public Hearing (May 7, 2013)

U.S. DEPARTMENT OF ENERGY

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY

PUBLIC HEARING

DATE: May 7, 2013

6:00 p.m.

U.S. Department of Energy Carlsbad Field Office
Skeen-Whitlock Building
4021 National Parks Highway
Carlsbad, NM 88220

Linda Robinson, Facilitator

PANEL MEMBER:
David Levenstein, U.S. Department of Energy

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REPORTED BY: Hayley Clifford, CCR NO. 140, CSR, RPR

FILE NO: A7041D2

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U.S. DEPARTMENT OF ENERGY

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY

FORMAL COMMENT SESSION PAGE LINE

(There were no public comments offered)

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Comments from the Carlsbad, New Mexico, Public Hearing (May 7, 2013)

REPORTER'S CERTIFICATE

I, Hayley P. Clifford, CCR #140, a Certified Court Reporter, do hereby certify that the proceedings of the above-entitled hearing were held May 7, 2013 and that no public comments were offered on the record and that the within transcript is true and accurate.

I FURTHER CERTIFY that I am neither an attorney nor counsel for, nor related to or employed by any of the parties to the action, and that I am not a relative or employee of any attorney or counsel employed by the parties hereto, or financially interested in the action.

RealLegal Notary for E-Transcript

HAYLEY CLIFFORD, RPR
Certified Court Reporter #140
License Expires: 12/31/2013

3

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U.S. DEPARTMENT OF ENERGY

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY

CORRECTED TRANSCRIPT 6/6/2013

PUBLIC HEARING

DATE: MAY 9, 2013

6:15 p.m.

Crowne Plaza Albuquerque
1901 University Boulevard, NE
Albuquerque, NM 87102

Linda Robinson, Facilitator

PANEL MEMBER:
David Levenstein, U.S. Department of Energy

REPORTED BY: JANICE J. MURPHEY, RPR, CCR
NEW MEXICO CCR #135
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Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

U.S. DEPARTMENT OF ENERGY

DRAFT SUPPLEMENTAL ENVIRONMENT IMPACT STATEMENT

FOR THE

LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY

FORMAL COMMENT SESSION	PAGE	LINE
Introduction by Ms. Robinson	03	03
Mr. Don Hancock	07	03
Mr. Bob Aly	13	02
Ms. Janet Greenwald	15	16
Ms. Floy Barrett	19	24
Ms. Romilly Tsinhnahynnie	22	14
Mr. Scott Kovac	23	05
Mr. Scott Kovac	24	09
Final comments by Mr. Levenstein	24	25
Court Reporter's Certificate	26	

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FORMAL COMMENTS FROM PUBLIC HEARING ON MAY 9, 2013

(In session at 6:15 p.m.)

MS. ROBINSON: Welcome to the DOE public hearing on the Draft Supplemental EIS on Long-Term Management and Storage of Elemental Mercury, which is known for short as the "Mercury Storage SEIS." This is a good time to silence your cell phones, if you have them on, please.

We are here for the DOE to hear your comments. In addition, the DOE document manager will also provide information. Since the EIS was issued in 2011, January 2011, DOE decided to consider additional alternatives for mercury storage locations at or near the WIPP site, so a Supplemental EIS was drafted. I am Linda Robinson, and DOE has brought me here to facilitate this public hearing. I'm not a DOE employee, and I have moderated many public hearings of this type all around the country, including the prior ones for this particular project.

There were two public meetings -- this is the second -- held near the potentially affected communities of this SEIS, one in Carlsbad two nights ago and this one. In addition to your oral and written comments that you submit tonight, DOE will consider all other comments received or postmarked by the end of the comment period, which is June 3rd, 2013. My job is to ensure that your comments are heard and reported, which will help the Department of Energy finalize the SEIS.

3

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Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

We have an agenda and a process to ensure that everyone gets a chance to air their views in a timely and respectful way. I hope you took advantage during the open house to check out the displays and to talk with the DOE's representative and his technical expert, and he will remain later to do more. The brief presentation that you will hear shortly will summarize the Government's approach to the long-term storage and management of elemental mercury. It will also describe the three additional locations that were considered for long-term storage near the WIPP site.

Fact sheets regarding the EIS and the SEIS are available in the poster area, and comment forms and question cards are also there, as well as outside at the registration desk. Tonight's presentation and fact sheets are also available on the web site. I think they went on last Friday.

David Levenstein, right here, is the DOE document manager. He will now present an overview of the SEIS, after which we will take about 15 minutes or so for clarifying questions on what he presented. However, if you want to give formal comments, we will have that after the question-and-answer period.

Mr. Levenstein.

(Presentation was given from 6:55 to 7:10 p.m. and was not recorded stenographically.)

MS. ROBINSON: So now let's move on to that

4

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portion. If you do still have any questions, feel free to write them and put them on the form and turn them in later.

Now, this is your opportunity in this part of the meeting, Madam Court Reporter.

We have the court reporter, Janice Murphey, and her objective is to produce a complete and accurate transcript of your comments. And please help her by keeping the room fairly quiet, which you are already doing, and please help her that if you need to spell your name if it might be difficult to figure out, if you could spell your name for her. However, I have what you wrote down, so as long as your handwriting is good enough, I think we will work that out.

I will call on those who registered to speak, and each time someone is called, I will name the next person, too, so you will know you are the one on deck. When it's your turn, please come now to either microphone you would like and give your full name. And if you represent a group and want to say it, you can do that. And each commenter, just to be equal to other organizations and other meetings that we've had, I'm going to time to be three minutes, and I will give you a two-minute signal with my hand saying you have reached two minutes, and a three-finger signal saying you've reached three. When I say the three, I'd ask you to wind down and finish up.

Since we do have a small group, it's going to be quite

5

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Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

acceptable -- well, please keep your three minutes, but it's quite acceptable to come up repeatedly. As long as we have gone through the people who signed up, you can come back again, if you have multiple comments to give.

So the people who have -- oh, and once all of the people who signed up -- there are four -- once all of those have spoken, I will call on anyone from the group who simply became inspired and didn't sign up. We'll call on them to give a comment, and then after that, we'll go back to the people who might have wanted to expand what they said earlier. Know that both your written and your oral comments are treated equally by the preparers of the Final SEIS, and no one will be given greater preference.

All right. So the people who called -- first signed up are Don Hancock --

UNIDENTIFIED SPEAKER: I have a question.

MS. ROBINSON: I'm sorry?

UNIDENTIFIED SPEAKER: When you say you have a signal to speak, what do you mean by showing a signal of three because isn't that the total number of minutes we can have?

MS. ROBINSON: That is. So when I do the three minutes, that means I'm asking you -- or you've already done the two minutes, so that should let you know mentally you should start winding down. And then when I do the three, I'll tell you, you have reached your three, and I really would like

6

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you to wrap up at that point.

So, Mr. Hancock.

MR. HANCOCK: So, unfortunately, I have to ask Mr. Levenstein to alter what you just said about the rules to conform with the Federal Register Notice which states on page 23550, "Participants wishing to speak during each public hearing will be asked to register and will be given ten minutes to speak."

I believe you need to comply with the Federal Register Notice, and I would ask, Mr. Levenstein, that you do that and that you instruct the facilitator that it's all right for people to speak up to ten minutes.

MR. LEVENSTEIN: I apologize. Of course, and I apologize for that oversight.

MR. HANCOCK: Thank you.

I am Don Hancock with Southwest Research and Information Center, a 42-year-old environmental organization based in Albuquerque. We have been involved in -- I've lost track, but it's many dozens of DOE and Environmental Impact Statement processes over the years. I appreciate the fact that you accommodated concerns that people had at the scoping hearing about the setup and providing the two podiums, et cetera, so I appreciate that. However, unfortunately, my organization's conclusion is that the Department of Energy should inform Congress that it cannot, is not, and will not comply with the

200-1

7

200-1 DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury. DOE has been designated by Congress pursuant to the Mercury Export Ban Act of 2008 as the Federal agency responsible for selecting a suitable location for the long-term management and storage of elemental mercury. As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. During calendar year 2011, DOE and much of the Federal Government were operating under a Continuing Resolution. Funding limitations precluded DOE from finalizing site selection.

Continued storage of approximately 1,200 metric tons of DOE mercury at Y–12 was evaluated under the No Action Alternative, and the impacts of this storage are discussed in Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

requirements of Section 5 of the Mercury Export Ban Act, and that instead, which is what is happening, commercial sites will be handling the mercury storage, and the Y-12 plant in Tennessee will continue to handle and store the Department of Energy mercury.

200-1 (cont'd)

Further, frankly, the Department Of Energy should stop wasting taxpayers' money on this Environmental Impact Statement process which, as I'll discuss further, is grossly inadequate. You're also wasting taxpayers' money and violating other laws, and I'll talk some about, too, tonight, the WIPP Land Withdrawal Act and FLPMA, the Federal Land Policy and Management Act. Because I do have minimal time, even with ten minutes, I'm only going to speak briefly about some of these things, and we will be submitting more detailed written comments for the June 3rd deadline.

As we discussed in the question period, Section 5(a)(1) of the Mercury Export Ban says, "Not later than January 1, 2010, the Secretary of Energy...shall designate a facility." We're 40 months after that. That has not happened even yet. So, clearly, the Department of Energy is out of compliance with that provision of the Act.

200-1 (cont'd)

Moreover, it appears like the Department's process and intent is to never comply with the portion of the Act that says, "The Secretary of Energy shall designate a facility or facilities of the Department of Energy." As has been

200-2

8

200-2 DOE has interpreted Section 5 of the Act to authorize DOE to designate existing and/or new storage facilities at property owned or leased by DOE. Accordingly, if DOE decides to designate a facility that currently is owned by a commercial entity or by another Federal agency, DOE would acquire an appropriate ownership or leasehold interest in that facility to comply with Section 5 of the Act. DOE would ensure that any such facility currently owned by a commercial entity or by another Federal agency would afford DOE the same level of responsibility and control over stored mercury as a facility owned by DOE.

discussed frequently tonight, the preferred alternative is not a DOE facility. It's a private facility, Waste Control Specialists. So it appears to me that you never intend to comply with the letter of Section 5(a) of the Act.

200-2 (cont'd)

Moreover, as we also discussed a little bit earlier, Section 5(a)(2) of the Act says that the facility, this Department of Energy facility -- should be "shall," mandatory language from Congress -- "shall be operational and shall accept custody, for the purpose of long-term management and storage, of elemental mercury generated within the United States."

200-1 (cont'd)

So you're, clearly, out of compliance with that. Instead, as again we have discussed some, mercury is being stored. There are six facilities in different parts of the country -- in the Midwest and South primarily -- who have formally said -- noticed the Department under other provisions of the Export Ban Act that they can and will accept mercury for storage, and so that's clearly where it's happening. So DOE isn't complying with Section 5(a) of the law. It appears to me there is no basis to even assume that DOE ever intends to comply with the provisions.

Okay. What about this noncompliance with the National Environmental Policy Act? There are lots of examples of that, but I will just talk about one, which is a principal requirement of NEPA, which is to "rigorously explore and

200-3

200-3 As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. All of the waste management companies have certified that they will ship the mercury to a DOE facility when it is ready to accept the mercury for long-term management and storage. None of these waste management companies have indicated a desire to serve as DOE's facility for up to 40 years under an appropriate leasehold or ownership arrangement with DOE.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

objectively evaluate all reasonable alternatives." Department of Energy hasn't done that. It hasn't analyzed any of the six operating commercial mercury storage sites. Those, clearly, have to be considered reasonable alternatives. And do, in fact, I understand you to say in the question time, that you considered those to be outside the scope? And I think any reasonable analysis of NEPA would say these are reasonable alternatives. They're actually functioning as mercury storage. They're permitted for mercury storage, So they have to be considered as reasonable alternatives, so you're grossly out of compliance with NEPA in not analyzing them at all. 200-3 (cont'd)

Also the other reasonable alternative, the DOE facility that has been, is, and will continue to store mercury, the Y-12 plant in Tennessee, has to be considered as well. We made this comment during the scoping, and it, like a number of other comments, seems to have been ignored, which is also, of course, not appropriate under NEPA. 200-4

What about noncompliance with the WIPP Land Withdrawal Act? The Land Withdrawal Act clearly states that that WIPP site, that entire 16 sections of the WIPP site, is for the exclusive use of the Department of Energy for transuranic waste disposal and related activities, and clearly mercury is not part of that. So what that means is that if mercury is going to be stored at the WIPP site, at least two federal laws -- Public Law 96164 and the WIPP Land Withdrawal Act -- 200-5

10

200-4 The Mercury Export Ban Act of 2008 explicitly prohibits Y–12 or any other portion of the Oak Ridge Reservation to be considered for the location of the DOE-designated facility for the long-term management and storage of elemental mercury. Continued storage of approximately 1,200 metric tons of DOE mercury at Y–12 was evaluated under the No Action Alternative, and the impacts of this storage are discussed in Chapter 4, Section 4.2, of the January 2011 *Mercury Storage EIS*.

200-5 DOE acknowledges in Chapter 5, Section 5.2, that selection of a WIPP Vicinity reference location may involve a legislative process to amend the LWA (P.L. 102-579) (for Section 20) or a land withdrawal in accordance with FLPMA (P.L. 94-579) (for Sections 10 and 35). The extent to which these statutes would need to be amended has not been determined; however, note that the amount of land that would be subject to a withdrawal for a full-size mercury storage facility would only be 3.1 hectares (7.6 acres) with an appropriate buffer to address potential subsidence concerns. The FLPMA allows for the administrative withdrawal of public land. FLPMA Section 204 (43 U.S.C. 1714) allows for a withdrawal of "not more than twenty years for any other use, including but not limited to use for administrative sites, location of facilities, and other proprietary purposes." Additionally, the section further provides for a review and approval process for extending the administrative withdrawal for up to the same period as the initial withdrawal, which could be up to 20 years. Therefore, FLPMA has provisions that would allow an administrative withdrawal for a total of 40 years, with a base period of 20 years and an extension of 20 years.

The commentor indicates that the withdrawal process has not yet occurred. DOE would not initiate the FLPMA administrative process until such time that a ROD is issued, if such a site is selected.

would have to be changed. That's very clear. You would think -- again, these issues were raised in scoping comments -- you would think, therefore, that the Draft Environmental Impact Statement would say that. However, what it says in the draft is mercury storage "would be subject to the provisions of the WIPP LWA and may require federal legislation." May? No. Will require.

So then my question was, "Oh, okay, so who wrote this document?" Why, any good lawyer or legal person knows the difference between "may" and "will" or "must," so I looked at Chapter 7: Who are the preparers? Looking to see who are the preparers. There are no preparers listed that are lawyers or even have law degrees. So, again, that's a deficiency, and that goes to the substance of the document.

The Federal Land Policy and Management Act, again, this was raised in the scoping comments for the two WIPP vicinity sites which are covered by FLPMA. They are Bureau of Land Management land. The proposed 40 years of mercury storage is more than what can be done administratively under FLPMA, which means that those two sites will have to have federal legislation, Congressional action to withdraw them. Again, that's not stated in this document, which it should have been.

200-5 (cont'd)

Again, looking at the preparers, nobody from the Bureau of Land Management or the Department of the Interior is there. Why not? We raised the question in the scoping process about

200-6

11

FLPMA does not identify specific proposed land uses that are incompatible with the act. The concept of multiple uses provides a broad range of considerations for DOI to consider in managing the land. Siting a mercury storage facility could be comparable to the siting of an oil and gas well, or development of mineral resources, when considering the balance of uses.

200-6 The DOI BLM was formally invited to serve as a cooperating agency on the preparation of the *Draft Mercury Storage SEIS* on September 19, 2012, after the public scoping period ended; however, BLM was actively involved in the scoping process of the document and the preparation of the draft SEIS after the public scoping period ended. BLM's participation in the process directly led to revision of the proposed action to include a third option, WIPP Vicinity Section 35, due to potential potash mining interests in WIPP Vicinity Section 10.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

the BLM and the Department of Interior needed to be cooperating agencies. The document shows that after those comments were received, you did send a letter -- Mr. Levenstein sent a letter asking BLM to be a cooperating agency, but there's no indication any place in the draft of what actual substantive participation BLM had in the process. 200-6 (cont'd)

They know better. They know it's not "may" require federal legislation. It would and will require federal legislation. So, again, that's clearly not in -- what you're doing is clearly not in compliance with FLPMA. 200-5 (cont'd)

Last, very quickly, the DIS continues to talk in the cumulative impact about Greater-Than-Class C waste coming to WIPP. As part of the cumulative impact, GTCC waste is also expressly prohibited by the WIPP Land Withdrawal Act. So, again, you shouldn't be considering that as an alternative, and, in fact, DOE should acknowledge the fact that WIPP is unable to fulfill its own mission when it comes to remote-handled transuranic waste. Actually, the WIPP facility doesn't have room for even as much as half of the remote-handled transuranic waste that is allowed. So you should be focused on how to deal with the waste that is supposed to come to WIPP and not adding or trying to add or proposing to add additional waste. Thank you. 200-7

MS. ROBINSON: Thank you, Mr. Hancock.

Now, the second person who signed up to speak is Bob

12

200-7 With the exception of the consideration of potential cumulative impacts, the disposal of GTCC and GTCC-like waste at WIPP and remote-handled TRU waste operations at WIPP are not within the scope of this SEIS. Chapter 4, Section 4.4, discusses the cumulative impacts of operating a mercury storage facility at the WIPP Vicinity reference locations. Operations of WIPP, as well as the proposed disposal of GTCC and GTCC-like waste at WIPP, were included in this analysis.

Aly. You may have ten minutes.

MR. ALY: I'm Bob Aly, citizen of the United States Corporation of America, and I have been opposed to WIPP and working against WIPP for the last 30 years. And it's very interesting during that history as to what the politicians have said and what's actually happened. Pete Dominici promised us that there would never be high-level waste coming to WIPP; that the only thing that would be there would be low-level transuranic waste. And he did that for ten years.

Bill Richardson, as a Congressman, was opposed to WIPP, supposedly. I think he just, basically, said that to get elected, and he managed to keep the facility from opening for, I don't know exactly, 10 or 15 years, or something like that. But then I think that he got aspirations and wanted to be governor, so then he caved on it, and he let them do the land withdrawal bill and it opened.

And during all of this time, you know, they had a site selection criteria for WIPP which had a whole lot of important points, like there was supposed to be no recoverable resources under WIPP. But instead of complying with that waste acceptance criteria, they just modified them so they could go ahead and make the site selection. Or the site selection criteria, instead of changing it, they just modified the site selection criteria so they could select the site.

So, basically, the whole history with the DOE and the

13

201-1

201-1 DOE acknowledges the commentor's opposition to the long-term management and storage of elemental mercury at any of the WIPP Vicinity reference locations. TRU waste disposal operations at WIPP are not within the scope of this SEIS.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

project is we've been lied to over and over and over again by our politicians and by the people who work for the DOE and by the Department of Energy itself. So, at this point, as a member of the public, you know, the Department of Energy has no credibility. I mean, the very things that Don Hancock was just talking about, if you were dealing with a person, you wouldn't do business with that person. And I don't understand how the people that work at the DOE can keep doing the same thing over and over again.

201-2 Now they want to bring high-level waste to WIPP, and we were promised that would never happen. So, again, there's no integrity. No integrity at all. I don't know what to say

201-3 except that, you know, how do you expect the people to believe you? I mean, the DOE, why go through this Environmental Impact Statement process? You're going to do whatever you want to do anyway, regardless of what it shows. And if the impacts don't come out right, you'll just change the inputs to the mathematical calculations to make it come out right.

If you were to read Nate Silver's book, The Signal and the Noise, that's what he talks about. He says when you start doing statistical calculations, it all depends on the assumptions that you make. And so, basically, it's like, you know, you could make it come out any way you want. So it's just bogus. Bogus crap is all it is. You are not trying to make a decision here. You are trying to make a political

14

201-2 Disposal of high-level radioactive waste at WIPP is not within the scope of this SEIS.

201-3 DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury. This *Mercury Storage SEIS* was prepared in accordance with NEPA (42 U.S.C. 4321 et seq.), the Council on Environmental Quality implementing regulations (40 CFR 1500–1508), and DOE's NEPA implementing procedures (10 CFR 1021) to evaluate reasonable alternatives for a facility for the long-term management and storage of elemental mercury. Chapter 2, Section 2.6, discusses a comparison of environmental impacts associated with all the candidate sites being considered for long-term management and storage of elemental mercury.

decision. You should just short-circuit the process and say, "We don't care what the public thinks. The DOE is going to do whatever it wants, and if you don't like it, that's too bad. Just move to Mexico."

201-3 (cont'd)

MS. ROBINSON: Thank you, Mr. Aly. And I'll comment that you may say what you wish, as long as it's within reason and good taste, but understand that the people who are writing the EIS, the people like that fellow over there, if they're going to respond to these questions or take them into account, they need to be about the EIS. So it is most helpful if your comments are about the EIS.

MR. ALY: It's about the process.

MS. ROBINSON: You can speak to the process, of course.

The next commenter is Janet Greenwald. Janet.

MS. GREENWALD: Hi. I'm Janet Greenwald from Citizens for Alternatives to Radioactive Dumping. And the first thing I'd like to say is that I did not alert our constituency to this issue and to this hearing because at this time the public is also dealing with a proposal to bring high-level waste to WIPP and a proposal to change the permit in relation to WIPP's underground. Now we have this kind of double-whammy proposal to bring mercury and considering Greater-Than-Class C waste. It's really more than the average person can deal with, and I had to hone it down. But that

202-1

15

202-1 DOE acknowledges the commentor's concern that DOE is pursuing multiple actions concurrently. DOE has various responsibilities it executes and prioritizes in accordance with its missions assigned by Congress. Subsequent to the publication of the *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington* (DOE 2012) in December 2012, DOE announced in March 2013 its preferred alternative for wastes contained in underground radioactive waste storage tanks. With regard to those wastes that, in the future, may be properly and legally classified as mixed TRU waste, DOE's preferred alternative is to retrieve, treat, package, and characterize and certify the wastes for disposal at WIPP in Carlsbad, New Mexico. This is in response to an urgent need to address leaking single- and double-shell tanks located at Hanford; associated with this process is a potential modification to WIPP's existing permit. The public comment periods for DOE's ongoing NEPA actions (e.g., *Draft GTCC EIS* and *Draft Mercury Storage SEIS*) did not overlap. The *Draft GTCC EIS* (DOE 2011b) was published in February 2011 and the *Draft Mercury Storage SEIS* was published in April 2013, more than 2 years apart.

doesn't mean that people don't care about this issue, but they're being bombarded with more changes in WIPP's permit than they are able to understand at the end of the workday to try to figure out what in the world is going on here.

So I would like to say something that has been said many times, and that is that in consideration for the public, the public should only be dealing with one WIPP issue at a time. We all deal with issues beyond WIPP, as well as WIPP, and it's just been these last few months and the months ahead just seem overwhelming to a layperson like myself.

202-1 (cont'd)

I'd like to talk about the location proposed for the mercury storage, both at WIPP and close to WIPP, and then I'd like to talk a little bit about what is happening in the state as a whole. WIPP -- the WIPP site was never an ideal site for the placement of waste, radioactive waste. As Bob Aly commented, there's lots of oil and gas drilling there. If you look at the WIPP site, it looks like a connect-the-dot picture, there are so many gas and oil wells surrounding WIPP. People get as close as they can because there's a lot of resources underneath WIPP.

So, you know, along with that go a lot of dangers. You know, if you speak to people who drill for oil and deal with gas, you know that it's not -- it's a very dangerous process. And as a matter of fact, we've got calls from Carlsbad, anonymous calls telling us about different gas fires and stuff

202-2

16

202-2 With the exception of the consideration of potential cumulative impacts, WIPP operations are not within the scope of this SEIS. Chapter 3, page 3–11, of the *Draft Mercury Storage SEIS* discusses oil and gas exploration activities in the WIPP vicinity through 2005 and includes known oil and gas exploration activities in Sections 10, 20, and 35 as they exist today. One oil well exists in Section 35; however, none exist in Section 10 or 20. Regarding potash mining activities, accurate production estimates and mining activities are protected by industry as proprietary information and current information is difficult to obtain. However, page 3–5 of the *Draft Mercury Storage SEIS* describes in general where potash mining has recently been observed, as well as the status of a mining lease within Section 10 that was reassigned in 2010. WIPP, as well as the WIPP Vicinity Section 20 location, falls within the land withdrawal boundary. The land withdrawal boundary provides a buffer zone extending approximately 2 miles in all directions where mining and oil and gas exploration are prohibited. If a DOE mercury facility were to be built in WIPP Vicinity Section 10 or 35, an appropriate buffer zone would be established to ensure the safe and secure storage of elemental mercury.

like that. People worry -- are worried about having a radioactive waste dump in a gas and oil field, and well they might be.

202-2 (cont'd)

Also there's a lot of surface subsidence in the area. I've had people call me and tell me, "Well, the school bus went by, and this is just south of WIPP, and then it came back, but it couldn't pass through the road because there's a hole about the size of the bus in the road." And if you -- there are walks that you can take south of the WIPP site in which you can see the subsidence. There are some very interesting holes, if you care to look, with animal bones in the bottom of them. It's not a very stable area. And, you know, I don't know what kind of investigation one does when one puts, like, a warehouse full of mercury, a very, very dangerous toxic substance, as we've heard a number of times tonight.

202-3

Also that area has earthquakes. I've been there in the Carlsbad area. I travel there, you know, at least a couple of times a year. And I was there during an earthquake. I was in a trailer during the earthquake. I don't remember the numbers, but the trailer shook. Everything shook. I had to grab a hold of something in order to keep from falling, you know. So as far as this being, like, an ideal place to put mercury, this dangerous substance, I think that you don't have a chance in a million of proving that to anybody, not anybody

202-4

17

202-3 Chapter 3, Section 3.2.2.3, and Chapter 4, Section 4.2.2.1.2, discuss the potential for subsidence at all of the WIPP Vicinity reference locations. Construction design and final siting of a DOE mercury storage facility at these locations would be required to take the potential risk of subsidence into consideration.

202-4 Chapter 3, Section 3.2.2.3, discusses seismic hazards in the vicinity of WIPP. Chapter 2, Table 2–1, compares all candidate sites' seismic risk, which ranges from 0.05 *g* to 0.57 *g*. The WIPP Vicinity reference locations are on the low end of seismic risk for candidate sites with a seismic risk of 0.12 *g*. Chapter 4, Section 4.2.9.1.2, discusses facility accidents and the consequences that could occur in the event of an earthquake at the WIPP Vicinity reference locations.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

202-4 (cont'd)

with common sense. I don't know what the computer will tell you, but a person with common sense would not recommend the area at WIPP, within the WIPP site, or around the WIPP for storage of dangerous substances.

202-5

Now, New Mexico. New Mexico has many nuclear projects, and none of them are not polluting, at this point, that I know of. Maybe there are some nuclear projects that I know of -- don't know of, and that's possible, but, you know, their uranium tailings leak into the water and the rivers and ruin Native agriculture out in uranium country. Los Alamos leaks and empties into the Rio Grande River, and we drink from them now in Albuquerque and Santa Fe. And, oh, now in Albuquerque's aquifers we have two major spills from Kirtland Air Force Base and Sandia National Laboratories, and nobody's in a rush to clean them up.

202-6

Then we have the people who live along the WIPP site, a bunch of environmental justice little communities. They can't even get the DOE to park in the overnight parking so that they won't have to pass the trucks which emanate radiation when they go pick up a loaf of bread or send their kid to get milk. They get very little consideration. You know, to send more waste here, it's an environmental justice issue. We're one of the few minority/majority states, and we're getting a lot of -- we're getting a lot of waste here. And even Waste Control Specialists are right on our border. I mean, do you

18

202-5 Operations at Los Alamos National Laboratory, Sandia National Laboratory, and Kirtland Air Force Base are in northern New Mexico, well outside the radius of influence for activities at the proposed DOE mercury storage facility in the vicinity of WIPP and are not within the scope of this SEIS. Long-term management and storage of elemental mercury does not involve radioactive materials.

202-6 Chapter 3, Section 3.2.11, discusses population data, and Chapter 4, Section 4.2.12, discusses potential impacts on environmental justice populations for the WIPP Vicinity reference locations. There are no minority or low-income population groups within a 16-kilometer (10-mile) radius of the WIPP Vicinity reference locations; therefore, there is no potential for high and adverse impacts on environmental justice populations as a result of construction and operation of a DOE mercury storage facility.

think there might be some relationship to the fact that all -- so much waste is being proposed here, more uranium mining is being proposed here? Could it be because we're a poor state that's mostly Native, Chicano, Asian, black, you know? What we aren't is mostly white, which, apparently, pulls some weight.

So New Mexico has a lot of waste of its own. It doesn't need anybody else's waste. It has plenty. And it's been doing its part in taking care of that waste. And this, you know, talk about environmental justice, you bring that waste here, you might not see many people here tonight, but you're going to hear a lot about how the Department of Energy and this administration doesn't give a fig about environmental justice. Because bringing that waste here, any kind of Waste -- especially, you know, when you're violating existing laws that protect us to some extent, to some small extent -- you violate those laws, you've got to have a big environmental justice issue. And if you decide to bring it here, believe me, you will see a lot more people than you do tonight. Thank you.

202-6 (cont'd)

MS. ROBINSON: Thank you, Janet.

We also have another person who signed up, so now our fourth speaker is Floy Barrett.

MS. BARRETT: Yeah. I've been here long enough --

19

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Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

UNIDENTIFIED SPEAKER: Pull the mike closer.

MS. BARRETT: I've been here long enough that I was here before there ever was a WIPP site. And we have been working against all of the horrors that have been put down there and knowing at times that there was this leakage and/or wet spot in the area all those years, and so I'm going to focus just on a couple of these things that seem -- to me, they just jump out at you.

And Congress has accepted these awful things to send to New Mexico because we've -- we've let them do it. We're tired of letting them do it now. And these things that Congress passed recently, number one -- and this one is not new -- but the current federal laws prohibit WIPP from being a mercury storage site. That's current federal laws. So DOE should comply with those laws and exclude WIPP and any New Mexico site from conversation, as it has previously done in its original EIS. 203-1

Mercury is so highly toxic, and hundreds of shipments of mercury on the same highways bringing radioactive waste to WIPP will increase the risks of radioactive and hazardous waste contamination from transportation accidents. Congress found that as many as 10 percent of women in the United States of childbearing age have mercury in their blood at a level that could put a baby at risk. That's as many as 630,000 children born annually in the United States are at risk of 203-2

20

203-1 DOE acknowledges the commentor's opposition to locating a mercury storage facility in New Mexico. DOE intends to fulfill its legal obligations, including completing the NEPA process and selecting a location for the construction and operation of a facility for the long-term management and storage of elemental mercury. DOE acknowledges in Chapter 5, Section 5.2, that selection of a WIPP Vicinity reference location may involve a legislative process to amend the LWA (P.L. 102-579) (for Section 20) or a land withdrawal in accordance with FLPMA (P.L. 94-579) (for Sections 10 and 35).

203-2 Chapter 4, Section 4.2.9.1.3, discusses the potential for impacts due to transportation accidents involving mercury shipments. The risks associated with transportation accidents involving a spill or release of mercury are negligible to low. Impacts associated with transporting TRU waste to WIPP are evaluated in the *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (DOE 1980) and two subsequent SEISs (DOE 1990, 1997). A maximum of 79 shipments of elemental mercury would be made to the proposed mercury storage facility during the peak year of operation (see Appendix C). Since TRU waste and elemental mercury would not be shipped together, the likelihood of an accident between a shipment of TRU waste and a shipment of mercury involving the release of both types of materials would be extremely rare and considered negligible. Therefore, the contribution to cumulative risk from transporting elemental mercury to any of the WIPP Vicinity reference locations would be negligible.

The fish consumption receptor pathway is included in the analyses for human health impacts presented in Chapter 4, Section 4.2.9.

neurological problems related to mercury, and that the most significant source of mercury exposure to people in the U.S. is ingestion of mercury-contaminated fish.

203-2 (cont'd)

So just to go back to that law that forbids any mercury being placed in WIPP, seems to me that that's enough to stop it. And to know what's happening to the people who get exposed to this is criminal. So I think it's time for the DOE to follow the laws that are here right now. And the current federal laws prohibit WIPP from being a mercury storage site. So how do you get around that? I mean, you change the samples, whatever it is you do. I'm not sure exactly how you go about those things of getting around the federal laws that are already there, but I just think the statistics are enough that we just have to stop the shipment of mercury into New Mexico.

203-1 (cont'd)

So I was here when they first dug the hole down at WIPP, and we have been coming to these hearings year after year after year, and we kept it out, kept it from opening for something like 20 years, which was quite an accomplishment. But now we're faced with another whole issue around it, and so I just think it's time to look at some of these really horrifying things that they already know.

And the mercury in contaminated fish also, what about, you know, trying to control that? I mean, that is a biggie. And so -- so I'm just -- I'm just -- I'm really tired of

203-2 (cont'd)

21

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Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

coming to these hearings, and I know somebody has to do this. There has to be a DOE, but I'm at the place where I just think it's time to figure out a way. So we might just lie down in front of those trucks, if you ever send them here, and then you have a big decision to make.

MS. ROBINSON: Thank you, Floy. I admire your stamina.

All right. Our next speaker -- and I'm going to ask Romilly to help me with pronunciation. So the court reporter knows, I do have the spelling in print so that I can read it.

So, Romilly, would you come forward. I know you came before and I had difficulty with the name before. Sorry I didn't remember. It's over a year's time, though.

MS. TSINHNAHYINNIE: Hi. My name is Romilly Tsinhnahyinnie. So forget about the T and all the Hs. And I'm a student at UNM. I just finished my junior year, and I've done -- every year I've done research projects on the waste that comes to New Mexico. And, basically, I just want to contest that the mercury comes to New Mexico because I think that New Mexico does their part in having a lot of waste here, and I think that it's time that we stop having so much waste here. I think that some other states could take on some of the waste. That's all I want to say. Thank you. 204-1

MS. ROBINSON: Thank you, Romilly.

As I said before, we will go to anybody who didn't have

22

204-1 DOE acknowledges the commentor's opposition to the long-term management and storage of elemental mercury at any of the WIPP Vicinity reference locations. DOE has analyzed the long-term management and storage of mercury at 10 candidate sites at 8 different geographic locations nationwide, including the states of Washington, Nevada, New Mexico, Texas, South Carolina, Missouri, and Idaho. DOE's Preferred Alternative is WCS near Andrews, Texas.

an opportunity to speak already. Is there anyone in the audience who would like to speak who did not sign up?

Sir? And you will need to give your name for the court reporter, since I don't have you written down.

MR. KOVAC: Certainly. My name is Scott Kovac, K-o-v-a-c. I'm with Nuclear Watch New Mexico. I wanted to thank you, Mr. Levenstein, for updating the old, the January 2011 original EIS. You went back and looked at other updated socioeconomic and other mental or, you know, health risks that have been updated since then. I would like to say that the preferred alternative, WCS, is a commercial site. The requirement for the DOE site -- the requirement for the mercury storage site to be a DOE site is addressed by actually renting or leasing a small area, maybe the -- you know, probably leasing, so the requirement for the mercury storage site to be a DOE site is met by leasing the land. 205-1

Also all the sites analyzed in this -- in the previous EIS show similar negligible to low impacts -- they show similar negligible to minor or low impacts. So here we have many sites spread all over the country with negligible to minor impacts. We have DOE's actually preferred alternative of a commercial site, yet the commercial sites that are storing the mercury now are not analyzed in the EIS. So I just ask that the sites that want it and have said they would like to store it and are currently storing the mercury, please 205-2

23

205-1 DOE has interpreted Section 5 of the Mercury Export Ban Act to authorize DOE to designate existing and/or new storage facilities at property owned or leased by DOE. Accordingly, if DOE decides to designate a facility that currently is owned by a commercial entity or by another Federal agency, DOE would acquire an appropriate ownership or leasehold interest in that facility to comply with Section 5 of the Act. DOE would ensure that any such facility currently owned by a commercial entity or by another Federal agency would afford DOE the same level of responsibility and control over stored mercury as a facility owned by DOE.

205-2 As of August 31, 2013, seven waste management companies have notified DOE that they intend to store mercury in accordance with RCRA pursuant to Section 5(g)(2)(B) of the Mercury Export Ban Act (see Chapter 2, Section 2.6.1, of this SEIS), until a DOE facility is operational and ready to accept the mercury. All of the waste management companies have certified that they will ship the mercury to a DOE facility when it is ready to accept the mercury for long-term management and storage. None of these waste management companies have indicated a desire to serve as DOE's facility for up to 40 years under an appropriate leasehold or ownership arrangement with DOE.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

be considered in the analysis. Thank you.

205-2 (cont'd)

MS. ROBINSON: Thank you, Scott.

Is there anyone else in the room who hasn't had an opportunity to comment who would like to? Okay. Is there anyone in the room who's already spoken who would like another opportunity to speak?

MR. KOVAC: I forgot something.

MS. ROBINSON: Okay. Go again.

MR. KOVAC: Thank you. Once again, Scott Kovac with Nuclear Watch New Mexico. I looked it up. This Supplemental EIS is costing us $100,000. For $100,000, I would think that more alternatives could be -- could be addressed. Thank you.

205-3

MS. ROBINSON: Thank you again, Scott.

Is there anyone else in the room who has already spoken, or the other way, who hasn't spoken who would like to make comments? Okay. Well, then, what we will do now is end the formal comment period. And I will remind you, as I have been told by you all that we have done ad nauseum here, you can turn them in, in writing also. And you may also stay, and we invite you to stay and talk to Mr. Levenstein and Mr. Heiser, and any other of the DOE people in the room, if you would like to just talk about other things concerning this EIS.

Mr. Levenstein will give you your closing remarks.

MR. LEVENSTEIN: Thank you all for coming this

24

205-3 Chapter 1, Section 1.5.1, of the January 2011 *Mercury Storage EIS* discusses the process DOE used to determine a range of reasonable alternatives for detailed analysis. Chapter 2, Section 2.6, discusses a number of alternatives that were considered but eliminated from further study.

Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

evening. I realize it's making your position -- as was indicated, there are a lot of these hearings that some of you folks come to, but we appreciate you coming out tonight and appreciate hearing your concerns, comments. And, well, thank you. And we will take all comments into consideration as we move forward to finalize the Supplemental EIS, and then, ultimately, the Record of Decision. Thank you again.

(Hearing concluded at 8:05 p.m.)

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25

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Comments from the Albuquerque, New Mexico, Public Hearing (May 9, 2013)

26

IN RE:
U.S.DEPARTMENT OF ENERGY
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
LONG-TERM MANAGEMENT AND STORAGE OF ELEMENTAL MERCURY
PUBLIC HEARING COMMENTS, MAY 9, 2013

REPORTER'S CERTIFICATE

I, JANICE J. MURPHEY, RPR, NM CCR #135, DO HEREBY CERTIFY that on MAY 9, 2013, the Proceedings in the above-captioned matter were taken before me, that I did report in stenographic shorthand the Proceedings set forth herein, and the foregoing pages are a true and correct transcription to the best of my ability.

I FURTHER CERTIFY that I am neither employed by nor related to nor contracted with (unless excepted by the rules) any of the parties or attorneys in this case, and that I have no interest whatsoever in the final disposition of this case in any court.

Janice J. Murphey

JANICE J. MURPHEY, RPR, CCR
New Mexico CCR #135
License Expires: 12/31/2013

JANICE J. MURPHEY, RPR, NMCR NO. 135

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SECTION 3
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